



NATURAL ENVIRONMENT ASSESSMENT

**Montrose Road and Lyons Creek/Biggar Road Municipal
Class Environmental Assessment**

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1. Introduction

Niagara Region has retained Parsons Inc. to conduct a Municipal Class Environmental Assessment (Class EA) Study to examine rehabilitation and improvement needs for Regional Road 98 (Montrose Road) and Regional Road 47 (Lyons Creek Road) / Biggar Road (See Figure 1). This study is being conducted in accordance with the planning and design process for ‘Schedule C’ projects as outlined in the Municipal Engineers Association “Municipal Class Environmental Assessment,” (2015). This Natural Environment Assessment Report has been prepared to fulfill the Class EA requirements for the entire study area.

1.1 Study Area

The study area includes 120 m from the approximate Project limits from Montrose Road at McLeod Road southerly to approximately 0.35 km south of Lyons Creek Road/Biggar Road and Biggar Road/Lyons Creek Road from 0.85 km west of Montrose Road easterly to the QEW west ramp terminal. The study area for the Natural Environment Assessment is shown in **Appendix A, Figure 1.**

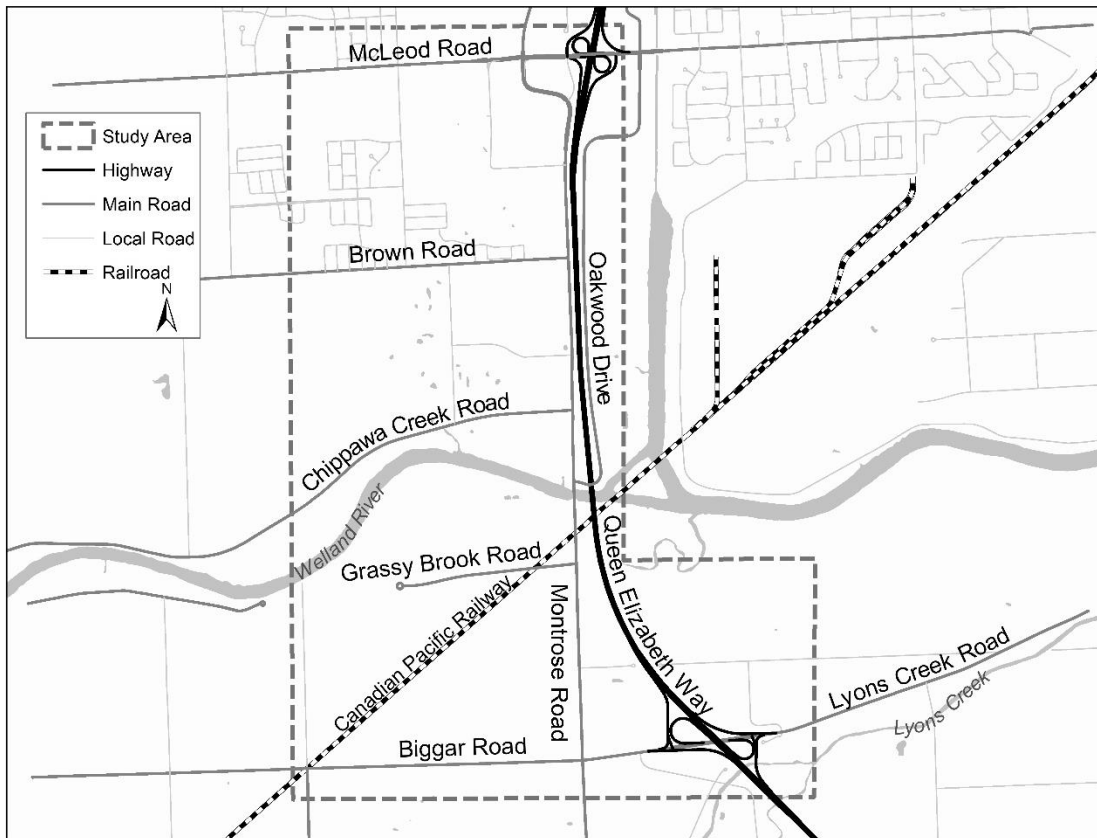


FIGURE 1 – STUDY AREA

1.2 Study Objectives

This report documents existing conditions and natural heritage features within a 120 m radius of the approximate Project limits, as shown in **Appendix A, Figure 1**. The following is a summary of the study objectives:

- Characterize existing conditions related to terrestrial and aquatic resources;
- Botanical inventory and delineation of vegetation communities following the Ecological Land Classification (ELC) System;
- Targeted wildlife studies, specifically breeding bird surveys, amphibian call surveys and bat habitat assessment;
- Fisheries and aquatic habitat assessment of waterbodies within the study area;
- Species at risk (SAR) screening of terrestrial and aquatic resources;
- Identify and evaluate significant natural heritage features and functions, including assessment of significant wildlife habitat (SWH);
- Identify potential constraints and opportunities; and
- Identify potential impacts and mitigation measures.

2. Regulatory Framework

The regulatory framework provides guidance on the protection of natural heritage features and evaluation of significance. Features identified within the Project limits were evaluated against the relevant federal, provincial, and municipal planning policies applicable to the study area.

2.1 Federal Legislation

2.1.1 FISHERIES ACT

The *Fisheries Act* sets out provisions to protect fish and fish habitat. In 2018, amendments were made to The Act with the aim to provide for the sustainability, proper management and control of fisheries and to restore lost protections to ensure the conservation and protection of fish and fish habitat, including the prevention of pollution (Government of Canada 2018). Section 34.4(1) states:

“34.4(1) No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.”

While Section 35(1) states that:

“35(1) No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.”

An additional provision is stated in Section 36(3) which prohibits the deposit of deleterious substances states:

“36(3) ...no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.”

The *Fisheries Act* (Government of Canada 2018) requires that projects avoid causing the death of fish and the harmful alteration, disruption or destruction of fish habitat unless authorized by the Minister of Fisheries and Oceans Canada (DFO) or a designated representative. As per amendments made to the *Fisheries Act* in 2018, proponents have the responsibility to follow the measures to protect fish and fish habitat during the implementation of proposed projects in or near water to avoid potential impacts of the project resulting in the death of fish or the harmful alteration, disruption or destruction of fish habitat, as defined by The Act. Should the project activities follow the specific criteria outlined within the measures to protect fish and fish habitat, the project can proceed without DFO review. However, should the project activities not meet the DFO measures to protect fish and fish habitat criteria, the project may result in the death of fish or the harmful alteration, disruption or destruction of fish habitat and would require review by DFO under the Fisheries Protection Provisions of the *Fisheries Act*.

2.1.2 SPECIES AT RISK ACT, 2002

The federal *Species at Risk Act, 2002* (SARA) includes provisions for the protection of species that are classified as Extirpated, Endangered and Threatened in Schedule 1 of the Act. This includes protection to the species and their residence (e.g., nest, den), including critical habitat. Critical habitat is defined as those habitats necessary for the survival or recovery of a listed species, as identified in the recovery strategy or in an action plan for the species. While SARA applies to species on federal land, such as Canadian oceans and waterways, national parks, national wildlife areas, some migratory bird sanctuaries and First Nations reserve lands, it also applies to migratory birds protected under the Migratory Birds Convention Act (MBCA) and fish, anywhere they occur. Under section 73 of SARA, the competent minister may enter into an agreement or issue a permit authorizing an activity affecting a listed wildlife species, any part of its critical habitat, or the residences of its individuals and provided that the activity meets the following purposes:

1. The activity is scientific research relating to the conservation of the species and conducted by qualified persons;
2. The activity benefits the species or is required to enhance its chance of survival in the wild; or

3. Affecting the species is incidental to the carrying out of the activity.

2.1.2 MIGRATORY BIRDS CONVENTION ACT, 1994

The *Migratory Birds Convention Act, 1994* (MBCA) and associated Regulations have the goal of ensuring the conservation of migratory bird populations by regulating potentially harmful human activities. Environment and Climate Change Canada administers the MBCA through the Migratory Birds Regulations and Migratory Birds Sanctuary Regulations. The MBCA protects migratory birds listed in the Act and applies to all lands in Canada regardless of ownership.

Section 12 of the MBCA prohibits capturing, killing, injuring, taking or disturbing of migratory birds, their eggs and nests listed in the Act. Aquatic and other habitats used by migratory birds is also protected in accordance with section 5 of the MBCA. This includes prohibitions on depositing (or allowing to be deposited) substances harmful to migratory birds, including in areas frequented by migratory birds, or that has the potential to enter waters where they occur.

Under section 5 of the MBCA, killing or harming listed migratory birds and/or disturbing or destroying their nests or eggs is prohibited without authorization. Compliance under the MBCA is typically mitigated through avoidance, such as adhering to timing windows for works that may impact species to occur outside of the active breeding window (e.g. April 1 - August 31), where feasible. Works can occur during the active period provided that the activities do not impact the species. If activities are occurring in bird habitat during the breeding period, nest sweeps should be completed prior to any works to minimize risk of injury or incidental take. Permits are not issued for potential for incidental take except where there may be risk to human health and safety.

2.2 Provincial Legislation

2.2.1 ENVIRONMENTAL ASSESSMENT ACT, 1990

The *Environmental Assessment Act* (1990) was created to provide for the protection, conservation, and wise management of the environment in the province of Ontario.

The Act applies to:

- a) enterprises or activities or proposals, plans, or programs in respect of enterprises or activities by or on behalf of Her Majesty in right of Ontario or by a public body or public bodies or by a municipality or municipalities
- b) major commercial or business enterprises or activities or proposals, plans, or programs in respect of major commercial or business enterprises or activities of a person or persons, other than a person referred to in clause (a), designated by the regulations
- c) an enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under Section 3.0.1 in respect of the enterprise, activity, proposal, plan, or program. R.S.O. 1990, c. E.18, s. 3; 2001, c. 9, Sched. G, s. 3 (3)

2.2.2 PROVINCIAL POLICY STATEMENT, 2020

The Provincial Policy Statement, 2020 (PPS 2020) was issued under section 3 of the Planning Act; and came into effect May 1, 2020. The PPS 2020 provides the framework for provincial planning documents and regulating land use and development planning policies for specific geographic areas within Ontario. Provincial plans relevant to the Project study area include *A Place to Grow: Growth Plan for the Greater Golden Horseshoe*.

There are a number of natural heritage provisions in section 2.1 of the PPS 2020. These provisions restrict development and site alteration in significant natural areas (e.g., woodlands, wetlands, significant wildlife habitat) unless it can be demonstrated that there will be no negative impacts on the features and ecological functions of those natural areas. Technical guidance for implementing the natural heritage policies of the PPS 2020 is found within the second edition of

the Natural Heritage Reference Manual (Ministry of Natural Resources and Forestry (MNRF), 2010). This manual recommends the approach and technical criteria for protecting natural heritage features and areas in Ontario.

Section 2.2 of the PPS 2020 requires planning to account for the quality and quantity of water at the watershed level and restricts development and site alteration “in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or restored”. This includes minimizing potential negative impacts on water resource systems and evaluating and preparing for impacts from a changing climate.

Section 6 of the PPS 2020 clarifies that development “means the creation of a new lot, change in land use, or the construction of buildings and structures requiring approval under the *Planning Act*, but does not include...activities that create or maintain *infrastructure* authorized under an environmental assessment process.”

2.2.3 PLACES TO GROW ACT

A Place to Grow: Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe (“Growth Plan”; 2019) came into effect on May 16, 2019. The plan requires an environmental assessment be undertaken to demonstrate “any impacts on key natural heritage features¹ in the Natural Heritage System (NHS) for the Growth Plan, key hydrologic features² and key hydrologic areas³ have been avoided or, if avoidance is not possible, minimized and to the extent feasible mitigated” (section 3.2.5.1 of the Growth Plan). This EIS has been prepared to document existing conditions within the study which align with the key features and areas defined in the Plan.

An NHS for the Growth Plan has been mapped by the Province but excludes lands within settlement area boundaries that were approved and in effect as of July 1, 2017. The NHS Growth Plan policies in the Plan will apply outside of settlement areas to the Natural Heritage Systems (NHSs) identified in official plans (that were approved and in effect as of July 1, 2017) until the upper- and single-tier municipalities refine the NHS Growth Plan provincial mapping in their official plans.

2.2.4 CONSERVATION AUTHORITIES ACT

Section 28(1) of the *Conservation Authorities Act* (Government of Ontario 2018) empowers Conservation Authorities (CAs) with the ability to make regulations governing development that can have an impact to watercourses, water bodies and wetlands. Under The Act, a permit is required from the applicable CA before any site alteration to a watercourse, water body, or wetland. CA’s also have the authority to grant permission to straighten, change, divert, or interfere with the existing channel of a river, creek, stream, or watercourse, or to change or interfere with a wetland under conditions outlined in The Act and associated regulation. The study area is within the jurisdiction of the of the Niagara Peninsula Conservation Area (NPCA) and overlaps areas within the “Approximate Regulation Lands”. In 2013, NPCA implemented Ontario Regulation 155/06: *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* which includes provisions that prohibit or regulate development in river or stream valleys, wetlands, shorelines and hazardous lands. Works may be permitted if it can be demonstrated through appropriate technical studies and/or assessments that the activities will not have an adverse effect on the regulated feature.

The regulation identifies that

“no person shall undertake development, or permit another person to undertake development in or on the areas within the jurisdiction of the Authority that are,

¹ Key natural heritage features include: Habitat of endangered species and threatened species; fish habitat; wetlands; life science areas of natural and scientific interest (ANSIs); significant valleylands; significant woodlands; significant wildlife habitat (including habitat of special concern species); sand barrens, savannahs, and tallgrass prairies; and alvars.

² Key Hydrologic Features include: permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.

³ Key Hydrologic Areas include: significant groundwater recharge areas, highly vulnerable aquifers, and significant surface water contribution areas that are necessary for the ecological and hydrological integrity of a watershed.

- b) river or stream valleys that have depressional features associated with a river or stream, whether or not they contain a watercourse
- d) wetlands; or
- e) other areas where development could interfere with the hydrologic function of a wetland, including areas within 120 metres of all provincially significant wetlands and areas within 30 metres of all other wetlands”

Consultation with NPCA will be required to discuss permitting and mitigation measures for works that may impact the regulated watercourses and wetlands, such as Warren Creek, an Unnamed Tributary of Warren Creek, Warren Creek PSW, Welland River, Welland River East PSW, Grassy Brook Creek, Lower Grassy Brook PSW, Unnamed Tributary of Lyons Creek, Lyons Creek North PSW and Lyons Creek PSW. The NPCA Approximate Regulation Lands are shown in **Appendix A, Figure 2**.

2.2.5 ENDANGERED SPECIES ACT

The *Endangered Species Act, 2007* (ESA; Government of Ontario 2008) applies to species that are designated as Extirpated, Endangered or Threatened and listed on the Species at Risk in Ontario (SARO) List (Ontario Regulation (O. Reg) 230/08). The ESA includes provisions to ensure protection to the species and their habitat. Species designated as Special Concern are not given species or habitat protection under the Act. General habitat protection applies to all Endangered and Threatened species with species-specific habitat protection also given to those species with regulated habitat, as identified in Ontario Regulation 242/08.

In order to balance protection and recovery goals with social and economic considerations, the ESA also gives the Minister of Environment, Conservation and Parks (MECP) the authority to issue permits or enter into agreements with proponents in order to authorize activities which would otherwise be prohibited by subsections 9(1) or 10(1) of The Act. The provisions under section 17 (2) of the ESA include the authorization of activities that would otherwise contravene the Act through the issuance of an Overall Benefit Permit as long as an overall benefit to the species in Ontario is provided. Ontario Regulation 242/08 also outlines various exemptions or agreements that may be employed under The Act, which are project or species-specific (Government of Ontario 2008). This may include registering the project activities and preparing a mitigation plan through a streamlined approval process.

Currently, no specific protection is afforded to species listed as Special Concern under the ESA, however as noted above, Special Concern species are considered Species of Conservation Concern (SoCC) and thus their habitat is considered Significant Wildlife Habitat and receives protection under the PPS.

2.3 Municipal Legislation

2.3.1 NIAGARA REGION OFFICIAL PLAN

A Working Draft of the Regional Official Plan of Niagara was originally submitted to the Regional Council at the end of 1972 (Niagara Region, 2014). Extensive reviews and revisions were conducted through the years resulting in the adoption of the Plan by Regional Council in November 1991 and was later approved by the Minister of Municipal affairs in December 1994 (Niagara Region, 2014). Multiple minor amendments have been made since then and a consolidated Regional Official Plan was made available online in 2014.

The Regional Official Plan of Niagara establishes a policy framework to guide the Region’s physical, economic and social development. The objectives and policies of the Regional Official Plan direct Council’s decisions for the physical development of the Region, while having regard for relevant social, economic, and environmental matters. All decisions of the Municipality of Niagara Region must be consistent with the policies of the Regional Official Plan.

Chapter 7 of the Regional Official Plan states that, “*The Core Natural Heritage System contains environmental features and functions of special importance to the character of the Niagara community and to its ecological health and integrity. The Core Natural Areas within the System are significant in the context of the surrounding landscape because of their size, location, outstanding quality or ecological functions. They contribute to the health of the broader landscape,*

protecting water resources, providing wildlife habitat, reducing air pollution and combating climate change. Some contain features of provincial or even national significance, such as threatened or endangered species.”

The Core Natural Heritage System consists of Core Natural Areas (Environmental Protection Areas and Environmental Conservation Areas), potential Natural Heritage Corridors connecting the Core Natural Areas, the Greenbelt Natural Heritage System, the Water Resources System and Fish Habitat as shown in Schedule C of the Official Plan (Niagara Region, 2014).

Environmental Protection Areas (EPA) include:

- Provincially Significant Wetlands (PSW)
- Provincially Significant Areas of Natural and Scientific Interest (ANSI)
- Significant Habitat of Endangered Species and Threatened Species

Environmental Conservation Areas (ECA) include:

- Significant Woodlands*
- Significant Wildlife Habitat (SWH)*
- Regionally Significant Life Science ANSIs
- Significant Habitat of Species of Concern*
- Significant Valleylands*
- Other Evaluated Wetlands*
- Publicly owned Conservation lands*
- Savannahs and tallgrass prairies*
- Alvars*
- Critical Fish Habitat (type 1)
- Other Fish Habitat (type 2 and 3)

* If these Environmental Conservation Areas fall within the Greenbelt Natural Heritage System, they are treated as Environmental Protection Areas.

Environmental Impact Study Policies

The requirements for completing an EIS are included in policies 7.B.2.1 through 7.B.2.5 as well as in the *Environmental Impact Study Guidelines* (Niagara Region, 2012). Development and site alteration may not occur in Environmental Conservation Areas and on adjacent lands to Environmental Protection and Environmental Conservation Areas, unless an EIS is prepared where “... *it has been demonstrated that, over the long term, there will be no significant negative impact on the Core Natural Heritage System component or adjacent lands and the proposed development or site alteration is not prohibited by other Policies in this Plan*” (Policy 7.B.1.11). Development is not permitted within lands identified as Environmental Protection Areas, as well as Environmental Conservation Areas within the Greenbelt Natural Heritage System.

Other applicable Policies related to potential impacts, mitigation and compensation are summarized below:

Policy 7.B.1.13 states “*Where development or site alteration is proposed in or near a Potential Natural Heritage Corridor the Corridor shall be considered in the development review process. Development should be located, designed and constructed to maintain and, where possible, enhance the ecological functions of the Corridor in linking Core Natural Areas or an alternative corridor should be developed.*”

Policy 7.B.1.19 states “*Where development or site alteration is approved within the Core Natural Heritage System or adjacent lands as set out in Table 7-1 the applicant shall submit a Tree Saving Plan maintaining or enhancing the remaining natural features and ecological functions. The Plan shall be prepared in accordance with the Regional Forest Conservation By-law and the local tree conservation by-law as appropriate and its implementation monitored by a member of the Ontario Professional Forestry Association.*”

Permitted Uses and Activities – Infrastructure Policies

The key Policy related to permitted uses and activities related to infrastructure states “*Notwithstanding other policies in this Plan essential public uses of a linear nature including utilities, communication facilities and transportation routes such as the Niagara – GTA Corridor (the Mid-Peninsula Transportation Corridor) may be permitted within the Core Natural Heritage System or adjacent lands where an Environmental Assessment for the proposed use has been approved under Provincial or Federal legislation*” (Policy 7.B.1.14).

2.3.2 CITY OF NIAGARA FALLS OFFICIAL PLAN

The Official Plan for the City of Niagara Falls was approved by the Minister of Municipal Affairs on October 6, 1993 (City of Niagara Falls 2019). The Plan establishes objectives and a policy framework to guide the city’s growth and development of urban lands, the protection of agricultural lands, conservation of natural heritage areas and the provision of necessary infrastructure. All decisions of the Municipality must be consistent with the policies of the City of Niagara Falls Official Plan.

Section 11 of the City of Niagara Falls Official Plan states that, “*Niagara Falls has an abundance of natural heritage features due to its location between two Great Lakes and along the Niagara River. The City is within the northerly extent of Carolinian Forests in Canada which boasts a high number and diversity of plant and wildlife. The conservation and wise use of natural resources is important to ensure that clean air and water will be part of the City's future. It is recognized that natural heritage features do not exist in isolation and that the health of these features is intrinsically connected and dependent on the health of heritage features both near and far away.*”

Most of the natural heritage features that comprise the natural heritage system are identified as Environmental Protection Area (EPA) or Environmental Conservation Areas (ECA) as shown on Schedule A-1 to the City of Niagara Falls Official Plan.

The EPA designation applies to the following:

- PSWs
- NPCA regulated wetlands greater than 2 ha in size
- Provincially Significant Life Science ANSIs
- Significant Habitat of Endangered Species and Threatened Species
- Floodways and Erosion Hazard Areas
- Environmentally Sensitive Areas

The ECA designation applies to the following:

- Significant Woodlands
- Significant Valleylands
- SWH
- Fish Habitat
- Significant Life and Earth Science ANSIs
- Sensitive ground water areas
- Locally significant wetlands or NPCA wetlands less than 2 ha in size

Environmental Impact Study Policies

The requirements for completing an EIS are included in policies 11.1.17 through 11.1.22. An EIS is required for site alteration or development on lands within or adjacent to EPAs and ECAs (as shown on Schedule A or A-1 to the Official Plan) and lands that contain or are adjacent to a natural heritage feature. Adjacent land includes “*lands within 120m of a Provincially Significant Wetland or a Wetland regulated by the NPCA which is greater than 2ha, 50m of a Significant Habitat of a Threatened or Endangered Species, a Provincially Significant Life Science ANSI or any lands designated as Environmental Conservation Area within the Plan; or 30 m of a fish habitat, flood/erosion hazard, or a Wetland regulated by the NPCA and less than 2ha in size*” (Policy 14.2.4).

Permitted Uses and Activities – Infrastructure Policies

The key Policies related to permitted uses and activities related to infrastructure are summarized below:

Policy 11.2.8 states “*Essential public uses of a linear nature including utilities, communication facilities and transportation routes may be permitted to extend through an EPA or ECA designation, or within adjacent lands, where an Environmental Assessment for the proposed use has been approved under Provincial or Federal legislation.*”

Policy 11.2.11 states “*Where development is permitted within an ECA or on adjacent lands existing natural linkages between the lands designated ECA and EPA lands, other designated or non-designated natural heritage features shall be maintained. Possible linkages are identified as Potential Natural Heritage Corridors on Appendix III-E to this Plan and are approximate.*”

Policy 7.B.1.19 states “*Where development or site alteration is approved within the Core Natural Heritage System or adjacent lands as set out in Table 7-1 the applicant shall submit a Tree Saving Plan maintaining or enhancing the remaining natural features and ecological functions. The Plan shall be prepared in accordance with the Regional Forest Conservation By-law and the local tree conservation by-law as appropriate and its implementation monitored by a member of the Ontario Professional Forestry Association.*”

3. Study Approach

The following sections include the study approach for completing the natural heritage assessment. This includes a summary of information sources reviewed, methodology for completing the field investigations, SAR screening and SWH assessment.

3.1 Background Review

The following sections include a summary of the background data sources reviewed and considered as part of the natural heritage assessment. All communications with MECP, Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF; previously MNRF) and NPCA undertaken throughout the environmental assessment phase are included in **Appendix B**.

3.1.1 MINISTRY OF NORTHERN DEVELOPMENT, MINES, NATURAL RESOURCES AND FORESTRY

The following sections include a summary of information sources from the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) that were considered for the Project.

Ministry of Northern Development, Mines, Natural Resources and Forestry, Guelph District

Project notification and data request regarding fish and fish habitat, SAR and important habitat features were sent to the NDMNRF Guelph District office on June 05, 2020, with a response provided on September 16, 2020 (see **Appendix B**). NDMNRF provided the wetland evaluation reports for the following: Warren Creek Wetland Complex, Welland River East Wetland Complex, Lower Grassy Brook Creek Wetland Complex, Lyons Creek North Wetland Complex, Lyons Creek Wetland Complex. NDMNRF also provided the appropriate in-water timing windows for construction. NDMNRF has classified all watercourses within the study area as ‘warmwater’ thermal regimes and provided an in-water timing window, where works are permitted of July 1st – February 28/29th of any given year to protect the spring spawning period of the local fish community. NDMNRF referred to the Land Information Ontario (LIO) Aquatic Resource Area (ARA) database for fish community information within the study area. Species identified from the ARA dataset is provided in **Appendix C**.

Land Information Ontario (LIO) Mapping

LIO data is maintained by the NDMNRF and provides key provincial geospatial data about Ontario. Shapefiles obtained from the LIO open datasets were obtained and used to map the natural features within the study area (**Appendix A, Figure 1**).

Terrestrial Data

The NHIC provincially tracked species dataset 1 x 1 km map squares that overlap the study area (17PH5265, 17PH5266, 17PH5267, 17PH5268, 17PH5269, 17PH5270, 17PH5365, 17PH5366, 17PH5367 and 17PH5466) was reviewed for SoCC and SAR. The following species were identified, as summarized in **Appendix C**: American Water-willow (*Justicia americana*), Deerberry (*Vaccinium stamineum*), Northern Bobwhite (*Colinus virginianus*), Round-leaved Greenbrier (*Smilax rotundifolia*) and Timber Rattlesnake (*Crotalus horridus*). Several PSWs were also identified: Warren Creek Wetland Complex, Welland River East Wetland Complex, Lower Grassy Brook Wetland Complex, Lyons Creek North Wetland Complex, and Lyons Creek Wetland Complex

Aquatic data

The NHIC provincially tracked species dataset 1 x 1 km map squares that overlap the study area was reviewed for aquatic SAR. Records for the following species were identified within Warren Creek, Welland River, Grassy Brook Creek and an Unnamed Tributary of Lyons Creek: Round Hickorynut, Eastern Pondmussel (*Ligumia nasuta*) and Grass Pickerel.

Kidneyshell and Round Hickorynut are freshwater mussel SAR designated as 'Endangered' provincially and federally and protected under the ESA and the SARA, respectively. Eastern Pondmussel is a freshwater mussel species designated as Special Concern on Schedule 1 of the SARA and the ESA and Grass Pickerel and Spotted Sucker are species of freshwater fish listed as 'Special Concern' on Schedule 1 of the SARA and designated as 'Special Concern' on the ESA.

A summary of findings from the watercourse, waterbody and ARA datasets are provided below:

- **Warren Creek / Unnamed Tributary of Warren Creek** – The ARA dataset did not identify any species within Warren Creek. LIO does not map the Unnamed Tributary of Warren Creek as a watercourse.
- **Welland River** – The ARA dataset identified the following species: Black Crappie (*Pomoxis nigromaculatus*), Bluegill (*Lepomis macrochirus*), Bluntnose Minnow (*Pimephales notatus*), Bowfin (*Amia calva*), Channel Catfish (*Ictalurus punctatus*) Common Carp (*Cyprinus carpio*), Emerald Shiner (*Notropis atherinoides*), Golden Shiner (*Notemigonus crysoleucas*), Goldfish (*Carassius auratus*), Green Sunfish (*Lepomis cyanellus*), Largemouth Bass (*Micropterus salmoides*), Logperch (*Percina caprodes*), Redhorse (*Moxostoma sp.*) Northern Pike (*Esox lucius*), Pumpkinseed (*Lepomis gibbosus*), Rock Bass (*Ambloplites rupestris*), Round Goby (*Neogobius melanostomus*), Rudd (*ScaRoadinius erythrophthalmus*), Smallmouth Bass (*Micropterus dolomieu*), Spottail Shiner (*Notropis hudsonius*), Sunfish (*Lepomis sp.*), Walleye (*Sander vitreus*), White Crappie (*Pomoxis annularis*), White Perch (*Morone americana*), White Sucker (*Catostomus commersonii*) and Yellow Perch (*Perca flavescens*)
- **Grassy Brook Creek** – The ARA dataset identified the following species: Black Crappie, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback (*Culaea inconstans*), Brown Bullhead (*Ameiurus nebulosus*), Central Mudminnow (*Umbra limi*), Common Carp, Creek Chub (*Semotilus atromaculatus*), Emerald Shiner, Fathead Minnow (*Pimephales promelas*), Freshwater Drum (*Aplodinotus grunniens*), GizzaRoad Shad (*Dorosoma cepedianum*), Golden Shiner, Green Sunfish, Johnny Darter (*Etheostoma nigrum*), Largemouth Bass, Sunfish, Logperch, Northern Pike, Pumpkinseed, Tadpole Madtom (*Noturus gyrinus*), Trout-Perch (*Percopsis omiscomaycus*), Rock Bass, White Crappie, White Sucker and Yellow Perch.
- **Unnamed Tributary of Lyons Creek** – The LIO database did not provide specific fish community information for the Unnamed Tributary of Lyons Creek but noted that only non-sensitive species are present.
- **Lyons Creek** – The ARA dataset identified the following species: Bluegill, Creek Chub, Largemouth Bass, Pumpkinseed, Yellow Bullhead (*Ameiurus natalis*)

Natural Heritage Areas Make a Map (NHA MaM)

The NHA MaM is a web application that provides information on provincial parks, conservation reserves, and natural features (i.e., ANSIs, wetlands, woodlands, natural heritage systems related to provincial policy plan areas (e.g., Niagara Escarpment, Oak Ridges Moraine and Greenbelt Plans). The NHA MaM also provides Natural Heritage Information Centre (NHIC) data, which includes information on plant communities, wildlife concentration areas, natural areas, SoCC (i.e., rare species), and SAR. The NHIC data is organized into 1 km² map squares. The map squares that overlap the Project include 17NH5478, 17NH5578, 17NH5577, 17NH5677, 17NH5576, 17NH5676, and 17NH5675. A list of species from the background review is provided in **Appendix C**.

Niagara River Watershed Fish Community Assessment 1997 – 2011 (MNR 2012)

The Niagara River Watershed Fish Community Assessment 1997 to 2011 (MNR 2012) was utilized to collect additional information for the watercourses within the study area and included fish community information, thermal regime and drainage information for the Welland River, Grassy Brook Creek and the Unnamed tributary of Lyons Creek.

Warren Creek / Unnamed Tributary of Warren Creek

The report did not discuss or provide information for Warren Creek or the Unnamed Tributary of Warren Creek.

Welland River East

The watershed fish community assessment report provided the following list of species as confirmed present within the reach of river considered Welland River East: Bowfin, White Sucker, Shorthead Redhorse, Greater Redhorse, Central Mudminnow, Brown Bullhead, Brindled Madtom, Channel Catfish, Brook Stickleback, Johnny Darter, Logperch, Brook

Silverside, Golden Shiner, Emerald Shiner, Spottail Shiner, Mimic Shiner, Bluntnose Minnow, Striped Shiner, Creek Chub, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Smallmouth Bass, Largemouth Bass, White Crappie, Black Crappie, Northern Pike, Muskellunge, Yellow Perch, Alewife, Gizzard Shad, Round Goby, Banded Killifish, Goldfish, Rudd and Common Carp.

Grassy Brook Creek

The report confirmed the following species present within Grassy Brook Creek: Bowfin, Grass Pickerel, Central Mudminnow, White Sucker, Shorthead Redhorse, Brown Bullhead, Tadpole Madtom, Trout-perch, Johnny Darter, Logperch, Brook Stickleback, Golden Shiner, Emerald Shiner, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Creek Chub, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Northern Pike, Muskellunge, Largemouth Bass, White Crappie, Yellow Perch, GizzaRoad Shad and Common Carp.

Unnamed Tributary of Lyons Creek

The report did not provide fish community information for the Unnamed Tributary of Lyons Creek, however the following species confirmed present within Lyons Creek may potentially use habitat within the Unnamed Tributary of Lyons Creek periodically during high flow events: Bowfin, Grass Pickerel, Central Mudminnow, White Sucker, Shorthead Redhorse, Greater Redhorse, Brown Bullhead, Tadpole Madtom, Channel Catfish, Johnny Darter, Logperch, Freshwater Drum, Golden Shiner, Emerald Shiner, Common Shiner, Spottail Shiner, Bluntnose Minnow, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Smallmouth Bass, Largemouth Bass, White Crappie, Black Crappie, Northern Pike, Yellow Perch, Goldfish, Round Goby, Rudd and Common Carp. The Niagara River Watershed Fish Community Report indicated that Lake Chubsucker (*Erimyzon Sucetta*), a SAR listed as Endangered and protected provincially under the ESA and federally under the SARA is present within the upper reaches of Lyons Creek. However, Lake Chubsucker has not been included in as potentially present within the Unnamed Tributary of Lyons Creek as the unnamed tributary enters Lyons Creek in the lower portion of the watershed and this area is subject to periodic dredging which likely removes suitable habitat to support Lake Chubsucker according to the report.

Lyons Creek

The report indicated the following species confirmed present within Lyons Creek may potentially be present within the study area: Bowfin, Grass Pickerel, Central Mudminnow, White Sucker, Shorthead Redhorse, Greater Redhorse, Brown Bullhead, Tadpole Madtom, Channel Catfish, Johnny Darter, Logperch, Freshwater Drum, Golden Shiner, Emerald Shiner, Common Shiner, Spottail Shiner, Bluntnose Minnow, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Smallmouth Bass, Largemouth Bass, White Crappie, Black Crappie, Northern Pike, Yellow Perch, Goldfish, Round Goby, Rudd and Common Carp. The Niagara River Watershed Fish Community Report indicated that Lake Chubsucker, a SAR listed as Endangered and protected provincially under the ESA and federally under the SARA is present within the upper reaches of Lyons Creek. However, Lake Chubsucker has not been included in as potentially present within Lyons Creek in the study area as the study area is within the lower portion of the Lyons Creek watershed and this area is subject to periodic dredging which likely removes suitable habitat to support Lake Chubsucker according to the report.

3.1.2 MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

Project notification and data request regarding fish and fish habitat and SAR were sent to MECP on June 5, 2020. Follow-up inquires were sent on September 15, 2020, and October 19, 2020. A response received from the MECP on October 26, 2020, indicated that the SAR screening completed by Parsons and provided to MECP for review for the project area is acceptable. Information submitted to MECP is provided in **Appendix B**.

3.1.3 NIAGARA PENINSULA CONSERVATION AUTHORITY

The NPCA GIS open data was reviewed which identified Approximate Regulation Lands within the study area. A data request was also sent to NPCA on March 29, 2019, for aquatic and fish habitat information, with a response provided on September 29, 2020 (see **Appendix B**). NPCA provided the following information for the watercourses/crossings identified within the study area.

- **Warren Creek / Unnamed Tributary of Warren Creek** – classified as Type 2 Important Fish Habitat. Warren Creek is also associated with the provincially significant Warren Creek Wetland Complex.
- **Welland River** – classified as Type 1 Critical Fish Habitat. The provincially significant Welland River East Wetland Complex is present along the shores of the Welland River adjacent to Montrose Road.
- **Grassy Brook Creek** – classified as Type 1 Critical Fish Habitat and is also associated with the provincially significant Lower Grassy Brook Wetland Complex.
- **Unnamed Tributary of Lyons Creek** – classified as Type 2 Important Fish Habitat.
- **Lyons Creek** – classified as Type 1 Critical Fish Habitat and is associated with the provincially significant Lyons Creek Wetland Complex.

3.1.4 MUNICIPAL OFFICIAL PLANS

The Official Plans and schedules for the Niagara Region and City of Niagara Falls were reviewed for natural heritage features in the study area and associated applicable policies.

3.1.5 PUBLICLY AVAILABLE DATABASES

The following information sources from publicly available databases were reviewed:

Ontario Breeding Bird Atlas (OBBA)

The OBBA (Bird Studies Canada *et al.*, 2006) was reviewed to determine which species have the potential to occur within the study area. The OBBA provides a list of bird species that have been observed within a 10 x 10 km² area during surveys completed between 1981 and 1985 and 2001 and 2005. Species that were documented between 2001 and 2005 were considered as part of this background review. The OBBA map squares that overlap the Project limits are 17NH56 and 17NH57. The OBBA provided records for eight SAR within the study area which included Acadian Flycatcher (*Empidonax virescens*), Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Chimney Swift (*Chaetura pelagica*), Common Nighthawk (*Chordeiles minor*), Eastern Meadowlark (*Sturnella magna*), and Wood Thrush (*Hylocichla mustelina*). A list of species from the background review is provided in **Appendix C**.

Ontario Reptile and Amphibian Atlas (ORAA)

The ORAA (Ontario Nature, 2015) and interactive range maps were reviewed. The ORAA provides known ranges of reptiles and amphibian species in Ontario based on historic and current species occurrences. The information is displayed in 10 x 10 km² map squares. The ORAA map squares that overlap the Project limits are 17NH56 and 17NH57. The ORAA provided records for three SAR within the study area which included Allegheny Mountain Dusky Salamander (*Desmognathus ochrophaeus*), Northern Dusky Salamander (*Desmognathus fuscus*) and Blanding's Turtle (*Emydoidea blandingii*). A list of species from the background review is provided in **Appendix C**.

iNaturalist

The NHIC and Herps of Ontario projects on iNaturalist were reviewed for records of herpetofauna and SoCC and SAR flora and fauna within the study area (iNaturalist, 2020 and Ontario Nature, 2020b). iNaturalist is a citizen scientist web application that provides up to date records of species. A list of species documented on iNaturalist within the study area is provided in **Appendix C**.

Atlas of the Mammals of Ontario

The Atlas of the Mammals of Ontario (Dobbyn, 1994) was reviewed for SAR only to determine which species have the potential to occur within the study area. The following species with potential to occur in the study area include: Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tricoloured Bat (*Perimyotis subflavus*). A list of species documented from the atlas is provided in **Appendix C**.

Fisheries and Oceans Canada (DFO) Aquatic SAR Mapping

Aquatic SAR mapping is made available by DFO through Conservation Ontario. As this area falls within the boundaries of NPCA, SAR mapping was available for the study area. The DFO Aquatic SAR mapping for 2020 indicated the potential for SAR in the watercourses below:

- **Unnamed Tributary of Warren Creek** - Grass Pickerel (*Esox americanus vermiculatus*)
- **Welland River** - Grass Pickerel, Spotted Sucker (*Minytrema melanops*), Kidneyshell (*Ptychobranchnus fasciolaris*), Round Hickorynut (*Obovaria subrotunda*)
- **Grassy Brook Creek** - Grass Pickerel, Spotted Sucker, Kidneyshell, Round Hickorynut
- **Unnamed Tributary of Lyons Creek** - Grass Pickerel, Spotted Sucker, Kidneyshell, Round Hickorynut
- **Lyons Creek** - Grass Pickerel

3.1.6 PUBLICLY AVAILABLE STUDIES

Natural Areas Inventory 2006-2009 (NPCA 2010)

A Natural Heritage Areas Inventory was conducted and completed by the NPCA between 2006 and 2009 (NPCA, 2010). Four of the study sites fall within the study area. This includes Study Site NG-01 (Lyons Creek), Study Site NF-02 (Heartland Forest), Study Site NF-07 (Horse Track Woods) and Study Site NF-20.

- **Study Site NF-01 (Lyons Creek)** - includes the Lyons Creek channel and associated floodplain with the majority of the communities being characterized as shallow marsh, thicket swamp or deciduous swamp. SAR and SoCC plants observed within this study site included Swamp Rose-mallow (*Hibiscus moscheutos ssp. moscheutos*) and Water Willow (*Justicia americana*).
- **Study Site NF-02 (Heartland Forest)** - located between McLeod Road in the north and Welland River in the south with Montrose Road/ Queen Elizabeth Way forming the eastern boundary. The site is characterized as a diversity of deciduous forests. SAR plants recorded within this site included Butternut (*Juglans cinerea*).
- **Study Site NF-07 (Horse Track Woods)** - located within the municipality of Niagara Falls and is bound by the east/west rail line in the north and Lyons Creek in the south with the Queen Elizabeth Way corridor forming the eastern boundary. This study site is very diverse and was characterized with various community types. SAR plants documented in this site included Eastern Flowering Dogwood (*Cornus florida*).
- **Study Site NF-20** - located within the municipality of Niagara Falls between Lyons Creek Road in the south and Welland River in the north. It extends eastward from the Queen Elizabeth Way past Stanley Avenue. This study site consisted of deciduous forest, savanna and swamp. No SAR or SoCC plants were documented within this site.

Niagara Heritage Assessment South Niagara Hospital Project (Colville Consulting Inc. 2019)

A Natural Heritage Assessment was completed by Colville Consulting Inc. for the lands located north of Biggar Road and west of Montrose Road, in the City of Niagara Falls, for the facilitation of the South Niagara Hospital Project (Colville Consulting, 2019). These lands overlap within the southern portion of the Project study area.

The majority of the South Niagara Hospital Project study area was mowed agricultural land/ cultural meadow and regenerating thicket and woodland (Colville Consulting, 2019). A botanical inventory did not identify the presence of any SAR or SoCC plants, however three species found are locally uncommon: Flat-topped White Aster (*Doellingeria umbellata*), Fox-gloved Beard-tongue (*Penstemon digitalis*) and Northern Dewberry (*Rubus flagellaris*).

Breeding Bird surveys identified the presence of Barn Swallow (*Hirundo rustica*), a species listed as Threatened both provincially and federally, within the study area, however no evidence of nesting was observed. No other SAR or SoCC were recorded. Bat roosting habitat assessments were also carried out and no significant roosting opportunities for bats were identified within their study area. An assessment of Significant Wildlife Habitat (SWH) was completed and no candidate or known SWH were present.

Grand Niagara Secondary Plan Environmental Impact Study (EIS) (Savanta 2017)

An Environmental Impact Study was completed by Savanta Inc. (2017) for the land bounded by the Montrose Road to the east, Biggar Road to the south, Welland River to the north and past Crowland Avenue to the west in support of the Grand Niagara Secondary Plan Study. The eastern edge of these lands overlaps with a portion of the Project limits and study area along Montrose Road between Grassy Brook Road and Reixinger Road.

The lands along the western edge of Montrose Road include deciduous swamp, cultural meadow, meadow marsh and thicket swamp communities. A botanical inventory did not identify the presence of any SAR or SoCC plants, however five species found are locally rare: Fennel-leaved Pondweed (*Stuckenia pectinata*), Greater Duckweed (*Spirodela polyrhiza*), Water-meal (*Wolffia columbiana*), Hispid Hedge-nettle (*Stachys hispida*), and Cardinal Flower (*Lobelia cardinalis*).

Breeding Bird surveys identified the presence of Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), Eastern Wood-Pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*) within the study area. Of these, only Eastern Wood-Pewee and Wood Thrush had probable breeding evidence. Snapping Turtle (*Chelydra serpentina*), a species of Special Concern in Ontario and Canada, was observed as road mortalities within the study area. Insect surveys identified the presence of the following provincially rare insect species: Monarch (*Danaus plexippus*), Slender Bluet (*Enallagma traviatum*), Unicorn Clubtail (*Argomphus villosipes*), Swamp Darner (*Epiasechna heros*), Double-Striped Bluet (*Enallagma basidens*), and Terrestrial Crayfish (*Fallicambarus sp.*). An assessment of SWH was completed and the deciduous swamps around Grassy Brook Road were identified as candidate SWH for SoCC habitat and as an animal movement corridor. Bat habitat assessments and acoustic monitoring surveys did not identify any SAR bats or suitable bat maternity SWH within the study area.

3.2 Significant Wildlife Habitat Assessment

The NDMNRF provides specific guidance on identifying and assessing wildlife habitat in the *SWH Criteria Schedules for Ecoregion 7E* (MNRF, 2015). Other guidance documents used as part of the SWH assessment included the SWHTG (MNRF, 2000) and *Natural Heritage Reference Manual* (MNRF, 2010).

The NDMNRF recognizes five main categories of wildlife habitat, each with several wildlife habitat types. The general definitions of these habitat types are provided below:

- **Seasonal Concentration Areas of Animals** – defined as “areas where animals occur in relatively high densities for the species at specific periods in their life cycles and/or in particular seasons” and areas that are “localized and relatively small in relation to the area of habitat used at other times of the year” (MNRF, 2010).
- **Rare Vegetation Communities** – defined as “areas that contain a provincially rare vegetation community and areas that contain a vegetation community that is rare within the planning area” (MNRF, 2010).
- **Specialized Habitat for Wildlife** – defined as “areas that support wildlife species that have highly specific habitat requirements, areas with high species and community diversity, and areas that provide habitat that greatly enhances species’ survival” (MNRF, 2010).
- **Habitat for SoCC** – defined as “habitats of species that are designated at the national level as endangered or threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which are not protected in regulation under Ontario’s ESA; habitats of species listed as special concern under the ESA on the SARO List (formerly referred to as “Vulnerable” in the SWHTG); and habitats of species that are rare or substantially declining, or have a high percentage of their global population in Ontario” (MNRF, 2010). More specifically, SoCC include:
 - **globally rare species** – These species are assessed by NatureServe and assigned a global conservation status rank (G-rank) of G1 to G3.
 - **nationally rare species** – These species are assessed by COSEWIC as Extirpated, Endangered, Threatened, or Special Concern but not listed in SARA; species not protected under SARA including those designated as Special Concern on Schedule 1 (e.g., Monarch [*Danaus plexippus*]) or any of the listed species in Schedule 2 and Schedule 3; species on non-federal land listed on Schedule 1 of SARA, other than migratory birds and fish.

- **provincially rare species** – These species are designated and assessed under two categories: species listed as Special Concern on the SARO list, and species that are assigned a provincial sub-national conservation status rank of S1 to S3. There are species that can be found in both categories.
 - **regionally and locally rare species** – These species are not assigned a formal designation, however, have been recognized as declining within a planning jurisdiction by government and/or non-government authorities.
 - **conservation priority species** – These include priority species that are recognized in government and/or non-government conservation plans and assigned a conservation objective.
- **Animal Movement Corridors** – defined as “elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another” (MNR, 2000).

An assessment of candidate SWH was completed for the study area following the protocols established by NDMNR. The SWH assessment was based on findings from the background review and field investigations and is discussed further in Section 4.3.4. As discussed in Section 3.3, SAR are excluded from the SWH process and are discussed independently under SAR in Section 4.5.

3.3 Species at Risk Habitat Screening

This report considers SAR as species classified as Extirpated, Endangered, or Threatened and protected under the *Endangered Species Act, 2007* (ESA) and/or *Species at Risk Act, 2002* (SARA). This includes:

- Provincially protected species on the Species at Risk in Ontario (SARO) List under O. Reg. 230/08.
- Federally listed migratory birds and fish on Schedule 1 of SARA; these species are protected anywhere they occur, including non-federal lands. All other federally listed species are generally⁴ (except through an Order) only protected under SARA if they occur on federal lands.

In this report, rare species that are not considered SAR are identified as SoCC and discussed under SWH under habitat for SoCC (see definition in Section 3.2). This approach is consistent with the definitions and protocols under NDMNR’s *Significant Wildlife Habitat Technical Guide* (SWHTG; MNR, 2000).

A screening of SAR records was undertaken to identify which of the reported species have the potential to occur within the study area. The screening identified potential species and spatial distributions collected through agency consultation and literature review. Available information regarding preferred habitat was compared to existing habitat identified within the study area during field assessments to determine if suitable habitat was present. An assessment of presence/absence and habitat suitability for aquatic SAR identified in the study area is discussed further in Section 4.5.

3.4 Field Investigations

Site investigations were completed to document existing conditions and verify the presence/absence of natural heritage features within the study area. The field inventories included characterizing vegetation communities, conducting breeding bird surveys, anural call surveys, bat habitat assessment (leaf-off survey) and fish habitat surveys. Survey type, methodology and date of the field investigation is provided in **Table 1**. Representative site photographs are provided in **Appendix D** with species observations provided in **Appendix E**.

TABLE 1 – SCHEDULE OF FIELD INVESTIGATIONS

SURVEY TYPE	DATE OF SURVEY	WEATHER CONDITIONS	FIELD INVESTIGATORS
Anuran Call Survey	June 12, 2020	Clear	Martine Esraelian
	June 29, 2020	Clear	
	April 7, 2021	Clear	

⁴ SARA can make a ministerial order to protect species and their critical habitat on non-federal lands that are not already subject to the provisions of the Act.

Bat Habitat Assessment (Leaf-off Survey)	December 4, 2020	Overcast	Megan Olson
	December 14, 2020	Overcast	Austeja Vaskeviciute Martine Esraelian
Breeding Bird Survey	June 17, 2020	Sunny	Megan Olson
	July 3, 2020	Sunny	
ELC, Botanical Inventory	September 17, 2020	Sunny	Martine Esraelian Kyle Vanin
Fish Habitat	August 14, 2020	Sunny	Brydon MacVeigh
	April 19, 2021	Overcast	Natasha Welch

3.4.1 TERRESTRIAL FIELD INVESTIGATIONS

Vegetation and Vegetation Communities

The following sections include the methodology followed for completing the botanical inventory and ELC (i.e. vegetation community characterization).

Botanical Inventory

A botanical inventory was completed within the municipal right-of-way (ROW) on September 17, 2020. A complete list of vegetation documented during the field investigations is provided in **Appendix E**. The provincial conservation status of plants documented during the field investigations was determined using NHIC’s vascular plants checklist (2021) and the regional conservation status was determined using the List of the Vascular Plants of Ontario’s Carolinian Zone (Ecoregion 7E) (Oldham, 2017). All species were also checked to determine if they are protected under the ESA, 2007 and SARA. A floristic quality assessment was also completed to determine the level of disturbance and overall quality of the vegetation / vegetation communities within the study area.

Ecological Land Classification

Vegetation communities were generally characterized following the first approximation of the *ELC System for Southern Ontario* (Lee *et al.*, 1998). The second approximation of ELC (Lee, 2008) was also used when there was no code available for a specific community type in the first approximation. Vegetation communities were field verified within the ROW on September 17, 2020. As Permits to Enter (PTEs) were not obtained, adjacent lands were characterized from the ROW and through air photo interpretation.

Prior to undertaking field surveys, vegetation communities were mapped through aerial photograph interpretation, with polygons delineated using ArcGIS at a scale of 1:5,000 and using NAD83 Universal Transverse Mercator coordinate system. Although the ELC protocol indicates a minimum size of 0.5 ha for mapping polygons, all communities regardless of size were identified to ensure a complete understanding of the environmental characteristics of the study area were captured.

The field inventories included verifying and refining the boundaries mapped during the desktop exercise. Additional data was collected on disturbances and wildlife species presence within each of the polygons that could be field-verified. The vegetation communities were also used to determine if candidate SWH is present (this includes rare vegetation community types). Vegetation communities identified within the study area are discussed in Section 4.3.1 and shown in **Appendix A, Figure 3**.

Wildlife

Breeding Bird Survey

Breeding bird surveys were conducted following the *Ontario Breeding Bird Atlas (OBBA) Guide for Participant* (Bird Studies Canada 2001) protocol. Two surveys (a combination of point counts along transects) were completed at least 15 days apart between May 27 and July 10. Birds were identified by sight and call and the breeding evidence for each species was recorded. Breeding birds were also recorded incidentally during field visits outside of the protocol period.

Point count locations were pre-determined prior to conducting the site visits and were at least 100 m apart in accordance with the protocol to avoid duplicating calls. A total of 15 stations were established within the study area. Where habitat for species at risk (SAR) birds were identified, all areas were assessed to verify presence, including locations within 100 m of a point count. Each point count location was surveyed for five minutes, and all species heard or observed were documented. Results of the breeding bird survey are provided in **Appendix E**.

Amphibian Call Survey

Amphibian call surveys were generally completed following the Great Lakes Marsh Monitoring Program *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (Bird Studies Canada 2009). This included three surveys in the spring and early summer between April and June and separated by 15 days. Weather conditions suitable for calling amphibians include low wind; minimal precipitation; and temperatures of 5 °C, 10 °C, and 17 °C for each of the three respective survey dates.

Although the protocol recommends that survey stations be at least 500 m apart, for the purpose of this Project, this spacing distance was reduced to ensure that all wetlands within the study area were surveyed to determine breeding activity. This information is used to determine level of breeding activity and whether SWH is present.

A total of 17 survey stations were established within the ROW throughout the study area. Each station was surveyed for three (3) minutes, beginning one half-hour after sunset and continuing as long as weather conditions permitted (i.e., as dictated by weather conditions such as wind and air temperature). All species heard calling were recorded, including the call abundance codes. This information is used to determine level of breeding activity and whether SWH is present. Results of the anuran call survey are provided in **Appendix E**.

Bat Habitat Assessment

A bat habitat assessment during the leaf-off period was completed within 30 m of the proposed ROW where PTEs were obtained. The bat habitat assessment was only completed for the portion between Grassy Brook Road south to Lyons Creek Road/Biggar Road, where the Region will be proceeding with detailed design in the short-term.

A bat habitat assessment was completed following the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis, and Tri-colored Bat* (MNR, 2017). This protocol includes a phased approach to determining potential habitat (based on vegetation communities) and verifying maternity roost trees and species use. The two Myotis species, Little Brown Myotis (*Myotis lucifugus*) and Northern Long-eared Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) have different roosting habitat characteristics, which have different survey windows. Surveys for the Myotis species are completed during the leaf-off period, whereas surveys for the Tri-colored Bat are completed during the leaf-on period. Only a leaf-off survey was completed for this Project. Habitat potential for Tri-colored Bat was assumed present where Maple (*Acer* spp.) and Oak (*Quercus* spp.) trees were observed.

The following information was collected during the field investigation, consistent with the NDMNR protocol:

- Location, species and size of trees ≥ 10 cm diameter at breast height (DBH);
- Presence/absence of snag characteristics such as cracks, cavities, loose bark and knot holes; and
- Decay class of each snag.

Incidental bat acoustic surveys were also completed using an Echo Meter Touch 2 Pro for iOS to record echolocation calls and determine possible presence of SAR bats within the study area. These surveys were conducted in conjunction with the anuran call surveys in June 2020 and occurred between one half-hour after sunset and midnight. Results of the bat habitat assessment is provided in **Appendix E**.

Incidental and General Wildlife Habitat Observations

All field investigations included documenting incidental observations of wildlife and wildlife habitat features. This information was collected for use as part of the SWH assessment. Wildlife habitat features that were documented included, but not limited to, rock piles, stick nests or other nests of wildlife, burrows, evidence of wildlife such as scat, tracks, predated nests, among others. Incidental wildlife observations are documented in **Appendix E**.

3.4.2 AQUATIC FIELD INVESTIGATIONS

Aquatic Habitat

Detailed aquatic habitat assessments were completed by Parsons biologists on August 12, 2020 for Warren Creek, an Unnamed Tributary of Warren Creek, the Welland River, Grassy Brook Creek and an Unnamed Tributary of Lyons Creek to document existing conditions, identify the presence of fish habitat (direct or indirect), and complete aquatic habitat mapping for all watercourses within the study area. An additional visit was completed on April 20, 2021 to conduct fish community sampling for the Unnamed Tributary of Lyons Creek as flowing water was noted to be present. Aquatic habitat characterization surveys were conducted approximately 100 m downstream and 100 m upstream of the Montrose Road crossings, where possible, to characterize the following fish habitat potential:

- General watercourse characteristics (i.e., stream pattern, confinement, and gradient);
- Channel characteristics (i.e., bank slope, channel dimensions, wetted width, depth of pools/riffles/runs);
- Streamflow and discharge, where flow exists;
- Substrate and bank materials;
- Aquatic vegetation and riparian habitat;
- Obstructions/barriers to fish passage and major disturbances;
- “Critical” or important habitat areas including potential spawning areas, nursery cover, and feeding areas; and
- Photographic documentation of the crossing locations and surrounding areas.

Photographs were taken of the instream habitat and bank characteristics upstream and downstream of each water crossing and provided in **Appendix D**.

Habitat mapping was created for each site which provides a visual to show the location of important fish habitat features including, but not limited to, instream vegetation, undercut banks, boulders, and woody debris. **Appendix E** contains the habitat field assessment and mapping for each watercourse crossing that received an aquatic habitat assessment.

Fish Community

Fish community information collected during background review and agency correspondence was supplemented with electrofishing surveys for Warren Creek and Grassy Brook Creek. The Unnamed Tributary to Warren Creek and the Unnamed Tributary to Lyons Creek were dry during summer field investigations in 2020 and no fish survey was completed. An additional site visit was conducted in spring 2021 and an electrofishing survey was undertaken for the Unnamed Tributary of Lyons Creek as flowing water was present. The Unnamed Tributary of Warren Creek was dry during the spring investigations. Sufficient fish community was available during background review for the Welland River and Lyons Creek, as such no fish community survey was undertaken during field investigations.

4. Existing Conditions

4.1 Physiography, Surficial Geology & Soils

The study area is located in the physiographic region of southwestern Ontario known as the Haldimand Clay Plain. The Haldimand Clay Plain is a broad clay plain predominately of fine-grained (silt and clay) glacial till extending through almost the entire area of the Niagara Peninsula south of the Niagara Escarpment. Near the lip of the Niagara Escarpment, the depth of the material is less than 15 metres and thickens southward to a maximum of 45 m in front of the Onondaga Escarpment (NPCA, 2010). The study area falls within the northern portions of the Haldimand Clay Plan where the soils are described as Pedalfer. This soil type is characterized by a dark surface layer followed by a lighter A horizon. The B horizon typically accumulates iron oxides and/or clays resulting in a brown or reddish colour. The material of the C horizon is derived from unaltered till below and may be partially cemented by calcium carbonate which had dissolved from the upper horizons (NPCA, 2010).

4.2 Designated Areas

Designated Areas are defined by resource agencies, municipalities, the provincial and federal government and/or the public, through legislation, policies, or approved management plans, to have special or unique value. Such areas may have a variety of ecological, recreational, and/or aesthetic features and functions that are highly valued. This EIS considers designated areas to include, provincially significant ANSIs, national, provincial, municipal and/or conservation authority parks, conservation regulation limits and provincial and municipal environmental policy areas. The following sections include all of the designated areas identified within the study area.

4.2.1 NPCA APPROXIMATE REGULATION LANDS

The study area overlaps areas mapped within the NPCA’s Approximate Regulation Lands, as shown in **Appendix A, Figure 2**. These areas are associated with the PSWs and watercourses that are regulated by NPCA.

4.2.2 MUNICIPAL ENVIRONMENTAL POLICY AREAS

Environmental policy areas identified by the Niagara Region and City of Niagara Falls are summarized in the sections below. As discussed in Section 2.3, development may be permitted within or adjacent to these policy areas for essential public uses such as transportation routes where an Environmental Assessment for the proposed use has been approved under Provincial or Federal legislation. This report has been prepared as part of the Municipal Class EA process.

Environmental Protection Areas

There are EPAs present within the study area with development proposed for areas that overlap the Project limits. The Niagara Region’s EPAs are shown in **Appendix A, Figure 2** and generally overlap those identified by the City of Niagara Falls. A summary of features that are included in the municipal EPA designation are provided in **Table 2**. The natural heritage features that may be directly impacted include PSWs and NPCA regulated wetlands greater than 2 ha in size. Significant Habitat of Endangered and Threatened Species may also be impacted, specifically related to bats.

TABLE 2 – SUMMARY OF FEATURES WITHIN THE MUNICIPAL EPA DESIGNATION

Niagara Region	City of Niagara Falls
<ul style="list-style-type: none"> • PSW • Provincially Significant Life Science ANSI • Significant Habitat of Endangered Species and Threatened Species 	<ul style="list-style-type: none"> • PSWs • Provincially Significant Life Science ANSIs • Significant Habitat of Endangered Species and Threatened Species • NPCA regulated wetlands greater than 2 ha in size • Floodways and Erosion Hazard Areas • Environmentally Sensitive Areas

Environmental Conservation Areas

There are ECAs present within the study area with development proposed for areas that overlap the Project limits. The Niagara Region’s ECAs are shown in **Appendix A, Figure 2** and generally overlap those identified by the City of Niagara Falls. A summary of features that are included in the municipal ECA designation are provided in **Table 3**. The natural heritage features that may be directly impacted include significant woodlands, SWH, significant habitat of species of concern, significant valleylands, critical fish habitat (type 1) and other fish habitat (type 2 and 3). SWH and significant habitat of species of concerns were identified as part of this report and not specifically identified in the Official Plans.

TABLE 3 – SUMMARY OF FEATURES WITHIN THE MUNICIPAL ECA DESIGNATION

Niagara Region	City of Niagara Falls
<ul style="list-style-type: none"> • Significant Woodlands • SWH • Significant Habitat of Species of Concern • Regionally significant Life Science ANSIs • Significant Valleylands • Other Evaluated Wetlands • Savannas and tallgrass prairies • Alvars • Critical Fish Habitat (type 1) • Other Fish Habitat (type 2 and 3) • Publicly owned Conservation lands 	<ul style="list-style-type: none"> • Significant Woodlands • SWH • Locally significant wetlands or NPCA wetlands less than 2 ha in size • Significant Valleylands • Fish Habitat • Significant Life and Earth Science ANSIs • Sensitive ground water areas

Potential Natural Heritage Corridors

The Niagara Region has identified Potential Natural Heritage Corridors on Schedule C of the Official Plan as areas that connect the Core Natural Areas. These areas should be considered as part of the design process to maintain and where possible, enhance the ecological functions and linkages of the surrounding natural features. The Potential Natural Heritage Corridors within the study area follow a portion of Warren Creek, as well as the Welland River, CPR and the area surrounding Biggar Road and Lyons Creek Road, including Lyons Creek North PSW and Lyons Creek PSW (see **Appendix A, Figure 2**).

4.3 Terrestrial Environment

4.3.1 ECOLOGICAL LAND CLASSIFICATION

The study area includes a mix of vegetation communities, including meadows, thickets, woodlands and wetlands. The northern limits of the Project from McLeod Road to Brown Road is dominated by meadow communities with agricultural fields with the Project becoming more naturalized south of Brown Road, where woodlands and wetlands, including PSWs, are abundant. A summary of vegetation communities documented within the study area is provided in **Table 4** and shown in **Appendix A, Figure 3**.

TABLE 4 – VEGETATION COMMUNITIES

ELC Code	Community Type	Description
CONSTRUCTED COMMUNITIES		
CGL	Manicured Lawn	This community type includes built-up areas, including residential, rural, commercial and institutional lands, as well as recreational areas such as golf courses. Greenlands such as manicured lawns are also identified within the constructed community type.
CGL_1	Golf Course	
CVC	Commercial and Institutional	
CVC_1	Business Sector	
CVR	Residential Property	
CVS_2	Hospital (to be constructed)	

ELC Code	Community Type	Description
AGRICULTURAL COMMUNITIES		
OAGM1	Annual Row Crops	This community type includes active agricultural lands used for the production of row crops such as soybean or corn.
OAGM2	Perennial Cover Crop	This community type includes hayfields and fallow lands that are dominated by grasses and herbs.
MEADOW COMMUNITIES		
MEFM1	Dry - Fresh Forb Meadow Ecosite	This community type is dominated by forbs such as Goldenrod or Asters.
MEGM3	Dry - Fresh Graminoid Meadow Ecosite	This community type is dominated by grasses.
HEDGEROW AND THICKET COMMUNITIES		
HOD	Deciduous Hedgerow	This community includes narrow treed hedgerows with a mix of species, including Bur Oak, White Elm, Eastern Cottonwood, Freeman's Maple, Pin Oak, Norway Maple and Norway Spruce.
THDM2	Dry - Fresh Deciduous Shrub Thicket Ecosite	
THDM2-4	Gray Dogwood Deciduous Shrub Thicket Type	
Woodland Communities		
CUW	Cultural Woodland Ecosite	This community was identified from satellite imagery and is located within the limits of the study area not visible from the ROW.
FOC	Coniferous Forest Ecosite	This community was identified from satellite imagery and is located along Dell Road near the eastern limits of the study.
FOD	Deciduous Forest Ecosite	This community was identified from satellite imagery and is located within the limits of the study area not visible from the ROW.
FOD2-4	Dry - Fresh Oak - Hardwood Deciduous Forest Type	This community type is located adjacent to the Lyons Creek North PSW and is also identified by the Niagara Region as a significant woodland. This community is dominated by Red Oak with White Oak associates.
FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite	This community type is located along Montrose Road and include large patches surrounding the Warren Creek PSW, Lower Grassy Brook PSW, and two communities on the north side of Montrose Road across from where the future Niagara hospital will be located. The woodlands surrounding the Lower Grassy Brook PSW are also identified by the Niagara Region as significant.
FOD9	Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite	This community type is located along Lyons Creek Road and includes three woodland units that are also identified by the Niagara Region as significant. These woodlands are dominated by Red Oak ,with Pin Oak and White Elm associates.
WETLAND COMMUNITIES		
MAM	Meadow Marsh Ecosite	This community type was identified based on satellite imagery and is located along Dell Road, off of Lyons Creek Road near the southern limits of the study area.
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type	Associated with the Lower Grassy Brook PSW. Dominated by Reed-canary Grass.
MAMM1-2	Cattail Graminoid Mineral Meadow Marsh Type	This community type is dominated by Broad-leaved Cattail. This includes one community near the Welland River and two communities near Lyons Creek Road.
MAMM1-12	Common Reed Graminoid Mineral Meadow Marsh Type	This community type is dominated by European Common Reed. There are five communities scattered throughout the study area.
MAS	Mineral Shallow Marsh Ecosite	
MAS2-1	Cattail Mineral Shallow Marsh Type	Associated with the Welland River East PSW. Dominated by Broad-leaved Cattail.
OA0	Open Aquatic	This community type includes open water ponds.
SWD1-3	Pin Oak Mineral Deciduous Swamp Type	Associated with the Lyons Creek North PSW and Lyons Creek PSW, which is also identified by the Niagara Region as a significant woodland. Dominated by Pin Oak with Silver Maple, Red Maple, Red Oak and Green Ash. This community type is considered provincially rare (S2S3) and globally rare (G2)
SWD2-2	Green Ash Mineral Deciduous Swamp Type	Associated with the Welland River East PSW. Dominated by Green Ash, with Black Walnut, White Elm, Eastern Cottonwood, Sugar Maple, and

ELC Code	Community Type	Description
		Red Maple. Red-osier Dogwood, Grey Dogwood and Hawthorn species are also present.
SWD3-1	Red Maple Mineral Deciduous Swamp Type	Associated with the Warren Creek PSW and Lyons Creek PSW. Dominated by Red Maple with Bur Oak, Pin Oak, Swamp White Oak, White Elm, Green Ash and White Willow. A portion of the wetland associated with the Warren Creek PSW also includes a cattail marsh community.
SWD3-2	Silver Maple Mineral Deciduous Swamp Type	Associated with the Lower Grassy Brook PSW and Lyons Creek PSW. Dominated by Silver Maple with White Elm, Green Ash, Shagbark Hickory, and Trembling Aspen.
SWD4-2	White Elm Mineral Deciduous Swamp Type	This community type is located near Reixinger Road on the west side of Montrose Road and north of an unnamed tributary of Lyons Creek. Dominated by White Elm with Reed-canary Grass in the groundcover. Several dead standing trees are also present.
SWT2-5	Red-osier Mineral Thicket Swamp Type	Associated with the Welland River East PSW. Dominated by Red-osier Dogwood with Grey Dogwood, Silky Dogwood and Willow species.

4.3.2 SIGNIFICANT WETLANDS

There are five PSWs within the study area (**Appendix A, Figure 4**): Warren Creek Wetland Complex, Welland River East Wetland Complex, Lower Grassy Brook Wetland Complex, Lyons Creek North Wetland Complex, and Lyons Creek Wetland Complex. Development is proposed within and adjacent to a portion of the wetlands that overlap the Project limits. A summary of these wetlands is provided in the sections below.

As discussed in Section 2.3, development may be permitted within or adjacent to an EPA (which includes PSWs) for essential public uses such as transportation routes where an Environmental Assessment for the proposed use has been approved under Provincial or Federal legislation. This report has been prepared as part of the Municipal Class EA process.

Warren Creek Wetland Complex

The Warren Creek Wetland Complex is located south of Montrose Road between Canadian Drive and east of Brown Road. This wetland complex encompasses approximately 64.84 ha, representing 99% swamp and 1% marsh. The portion of this wetland complex located east of Brown Road extends within the Project limits, specifically the areas surrounding Warren Creek and an unnamed tributary of Warren Creek. The wetland community in the study area is characterized as a Red Maple swamp with a Cattail meadow marsh community along the watercourse.

Welland River East Wetland Complex

The Welland River East Wetland Complex is bisected by Montrose Road and located east of Chippawa Creek Road and associated with the Welland River and tributaries. This wetland complex encompasses approximately 151.17 ha, representing 67% swamp and 33% marsh. The portion of this PSW that extends within the study area are dominated by Green Ash swamps with Cattail shallow marsh communities and Red-osier Dogwood thicket swamps present.

Lower Grassy Brook Wetland Complex

The Lower Grassy Brook Wetland Complex is located south of Montrose Road west and east of Grassy Brook Road. This wetland complex encompasses approximately 21.07 ha, representing 97% swamp and 3% marsh. This PSW is associated with Grassy Brook Creek and includes a Silver Maple swamp community and Reed-canary marsh community within the portion that extends within the study area.

Lyons Creek North Wetland Complex

The Lyons Creek North Wetland Complex is located south of Montrose Road and east of Biggar Road. This wetland complex encompasses approximately 376.13 ha, representing 100% swamp and is associated within an unnamed tributary of Lyons Creek. A portion of the Project limits extend within a provincially rare Pin Oak swamp community.

Lyons Creek Wetland Complex

The Lyons Creek Wetland Complex is bisected by Montrose Road, located east and west of Lyons Creek Road. This wetland complex encompasses approximately 532.24 ha, representing 77% swamp and 23% marsh and includes communities associated with Lyons Creek. A portion of the Project limits extends within a Red Maple swamp community and Silver Maple swamp community on the south side and north side of Lyons Creek Road, respectively. It is noted that the mapped PSW limits on the north side of Lyons Creek Road is active agricultural land and not considered a wetland. A Green Ash swamp is also present at Reixinger Road. This wetland appears to extend further west towards Montrose Road but is not currently mapped within the PSW limits.

4.3.3 SIGNIFICANT WOODLANDS

There are several woodland communities present within the study area, including woodlands identified as significant by the Niagara Region. Significant woodlands are part of the ECA designation; however, are not specifically mapped in Niagara Region or City of Niagara Falls Official Plans. The Niagara Region did provide a GIS layer with the mapped significant woodlands which are shown in **Appendix A, Figure 4**. This includes 11 woodland units within the study area which are generally associated with the PSWs and surrounding woodlands.

As discussed in Section 2.3, development may be permitted within or adjacent to an ECA (which includes significant woodlands) for essential public uses such as transportation routes where an Environmental Assessment for the proposed use has been approved under Provincial or Federal legislation. This report has been prepared as part of the Municipal Class EA process.

4.3.4 SIGNIFICANT WILDLIFE HABITAT

The following sections include a summary of the candidate and confirmed SWH types within 120 m of the Project. SWH is shown in **Appendix A, Figure 5**, with a complete assessment provided in **Appendix F**.

Seasonal Concentration Areas

- **Waterfowl Stopover and Staging Areas (Aquatic)** – The Welland River has the potential to function as a waterfowl stopover and staging area for aquatic habitat. Waterfowl staging was also noted in the wetland evaluation report for the Welland River East PSW, although the specific location was not identified.
- **Shorebird Migratory Stopover Area** – The Welland River has the potential to support this habitat type, although there is likely limited opportunities within the portion that extends within the study area.
- **Bat Maternity Colonies** – All woodlands within the study area have the potential to support habitat for bat maternity colonies. A snag tree survey was completed between Grassy Brook Road and Biggar Road / Lyons Creek Road which identified several potential roosting trees that would meet the criteria for candidate SWH. Incidental acoustic surveys using a handheld active Echo Meter Touch 2 Pro for iOS was completed during the June 2020 amphibian call surveys which identified bats in the woodlands and PSWs in multiple locations in the study area. Eastern Red Bat and Silver-haired Bat were recorded in the woodland south of the CPR. Hoary Bat, Big Brown Bat and Eastern Red Bat were recorded in the Lyons Creek North PSW and Lyons Creek PSW. Silver-haired Bat was also recorded in the Lyons Creek PSW.
- **Turtle Wintering Areas** – The Welland River has the potential to support overwintering habitat for turtles.
- **Reptile Hibernaculum** – Overwintering habitat for snakes may be present in all vegetation communities throughout the study area. This habitat type is difficult to confirm, even with targeted surveys and will therefore be assumed present with mitigation measures provided should hibernaculum be discovered during construction.
- **Deer Winter Congregation Areas** – The NDMNRF identified deer wintering areas (stratum 2) within the Warren Creek PSW, Welland River East PSW, Lyons Creek North PSW and Lyons Creek PSW. The Project limits only extend within this habitat type in the Lyons Creek North and Lyons Creek PSWs, along Biggar Road and Lyons Creek Road, respectively.

Rare Vegetation Communities

The following provincially and globally rare vegetation community is present within the study area.

- **Pin Oak Mineral Deciduous Swamp (SWD1-3)** – This community type is considered provincially rare (S2S3) and globally rare (G2). This community type is associated with the Lyons Creek North PSW along Biggar Road.

Specialized Habitat for Wildlife

- **Waterfowl Nesting Area** – All wetland communities >0.5 ha within the study area have the potential to support waterfowl nesting.
- **Turtle Nesting Areas** – Turtle nesting habitat has the potential to occur along the Welland River, Warren Creek, Grassy Brook Creek, and Lyons Creek where sand or gravel substrates are present. There were no turtle nests observed during the field investigations, although targeted surveys were not completed.
- **Amphibian Breeding Habitat (Woodland)** – Amphibian call surveys were completed within the study area and identified SWH in the woodland associated with the Baden-Powel Grassy Brook Park located south of the CPR, north side of Montrose Road (survey station A-7). Other notable woodland and swamp communities with at least two species documented (unless a station was only surveyed once) but that didn't meet the criteria for significance (e.g., two species with at least 20 individuals or at call codes of 3) included survey stations A-1, A-9, A-10, and A-13 to A-17 (only one survey at these stations). These areas are identified as candidate SWH and considered in terms of generalized wildlife habitat.

Habitat for Species of Conservation Concern

- **Marsh Bird Breeding Habitat** – The meadow marsh communities within the study area have the potential to support marsh bird nesting habitat. NDMNRF noted Green Heron in the Welland River East PSW and Lyons Creek North PSW.
- **Terrestrial Crayfish** – The marsh and swamp communities in the study area have the potential to provide habitat for terrestrial crayfish. One terrestrial crayfish burrow of an unknown species was incidentally observed along Warren Creek. To be considered SWH, only one individual or burrow of a listed species is required.
- **Other Rare Species** – SoCC were documented during the field investigations and included bats (Eastern Red Bat and Hoary Bat; assessed under bat maternity colonies), Monarch (observed throughout the study area) and birds (American Woodcock, Eastern Kingbird, Field Sparrow, Killdeer, Northern Flicker, Savannah Sparrow, Spotted Sandpiper, and Vesper Sparrow). All of the birds are conservation priority species which are recognized as declining in the Bird Conservation Strategy for Bird Conservation Region (BCR) 13 in Ontario Region: Lower Great Lakes/St. Lawrence Plain (Environment Canada 2014).

Animal Movement Corridors

- **Amphibian Movement Corridors** – The natural areas and watercourses surrounding areas identified as amphibian breeding habitat (woodland) are considered as amphibian movement corridors.

4.4 Aquatic Environment

4.4.1 AQUATIC HABITAT ASSESSMENT

Of the eight culverts and one bridge present within the study area, five crossings were determined to convey watercourses which support fish or provide fish habitat and are anticipated to require in-water work, as shown in **Appendix A, Figure 6**. One additional watercourse, Lyons Creek, which was identified to support fish and provide fish habitat was identified to be within 30m of the proposed works, and as such was assessed and documented in this report. No in-water work is anticipated to be required within Lyons Creek. Detailed aquatic habitat assessments were completed to document existing conditions and identify the presence of fish habitat for these watercourses within the study area. A summary of existing fish habitat conditions for each watercourse is provided in **Table 5**.

Unnamed Tributary of Warren Creek

The Unnamed Tributary of Warren Creek is an intermittent warmwater watercourse which originates west of the study area and flows east through the Montrose Road and QEW crossings. On the east side of the QEW crossing, the watercourse turned south and flowed as a roadside ditchline to its confluence with Warren Creek. The channel was dry the field investigations and heavily overgrown. Upstream of Montrose Road, the channel meandered within a narrow grassy meadow within a deciduous woodlot. The banks and bed of the channel were vegetated with grasses, vascular plants and cattails. The streambed consisted of saturated muck at near the culvert inlet and a hard dry streambed within the upstream channel. Substrates were comprised primarily of muck and silt. Instream habitat consisted entirely of instream and overhanging vegetation.

The downstream reach was considered a short section of channel approximately 10 m in length between Montrose Road and the QEW. Roadside ditchlines between the QEW and Montrose Road entered the channel in the downstream section. The downstream section consisted of a poorly defined channel which was dry field investigations with a dense patch of Common Reed growth immediately downstream of the outlet. The substrates within the channel consisted of saturated muck at the outlet with dry hard muck further downstream. The downstream channel flowed within a disturbed roadside meadow area vegetated with grasses and vascular plants and scattered small deciduous shrubs.

Warren Creek

Warren Creek is a permanent warmwater watercourse which originates in a deciduous woodlot west of Montrose Road associated with the Warren Creek wetland complex. The watercourse exited the woodlot approximately 180 north of the culvert and flowed south parallel to Montrose Road as a roadside ditchline to the culvert inlet. Within the upstream reach the watercourse was channelized and straight. There was deep pooled water with little noticeable flow for approximately 30 m upstream of the inlet which transitioned to a narrow channel with trickle flow upstream further upstream within the ditchline. Substrates within the channel were soft and deep, approximately 30 -40 cm in depth in areas and composed of silt and muck overlying hardpack clay. The channel contained dense submergent consisting of milfoil which was limited to the area immediately upstream of the inlet, further upstream within the ditchline, aquatic vegetation consisted of emergent vegetation, primarily cattails, grasses and sedges. The riparian zone associated with the upstream channel consisted of a disturbed roadside meadow vegetated with grasses, vascular plants and small scattered deciduous trees and shrubs to provide riparian cover. Instream habitat opportunities were provided mainly by instream and overhanging vegetation with small amounts of instream and overhanging woody debris and areas with undercut banks. The slow moving run habitat with dense aquatic vegetation within the upstream reach provides potential habitat, including spawning habitat for Grass Pickerel.

The downstream reach consisted of a short section of channel approximately 8 m in length between the Montrose Road culvert outlet and the QEW centerline culvert inlet. Downstream of the QEW, Warren Creek flowed under Oakwood Drive through another culvert and eventually discharges to the hydro canal channel approximately 400 m downstream of Oakwood Drive. The channel downstream of the Montrose Road culvert was considered dry with no observed flow. A roadside ditchline which flowed between Montrose Road and the QEW entered the channel from the south at the inlet to the centerline culvert under the QEW. A large amount of angular cobble was present within the channel which resulted in subsurface flow through the cobble. This angular cobble which had been placed as scour protection appears to function as a seasonal barrier to fish migration during periods of low flow. The channel contained emergent vegetation with a dense patch of cattails immediately downstream of the outlet and vascular plants comprised mainly of mint and purple loosestrife which had overgrown the angular scour protection. Substrates within the channel consisted entirely of cobble and boulder. Instream habitat within the downstream channel was provided by instream vegetation and cover provided by the boulder and cobble substrates.

The water quality parameters measured within the upstream channel at the time of the summer survey included a water temperature of 18.2 °C, a pH of 8.38 and a dissolved oxygen of 4.1 mg/L and a conductivity of 661 µS/cm. Water was considered turbid during the survey and the air temperature at the time of the investigation was 24.0 °C.

A fish community survey conducted using back electrofishing and resulted in the capture of 5 species considered bait/forage fish including Central Mudminnow, Green Sunfish, Johnny Darter and Yellow Bullhead and 1 piscivorous

species: Largemouth Bass. No live mussels, fresh or weathered mussel shells or middens were observed during field investigations.

Welland River

The Montrose Road study area crosses the section of the Welland River known as Welland River East, a portion of the river located between the Welland Canals to the west and the Chippewa Channel to the east, a 7 km long stretch of modified and channelized river channel where flows have been reversed to allow the Niagara River to flow towards the Power Canal. The Montrose Road crossing is located approximately 600 m upstream of the Welland River/Power Canal/Chippewa Channel confluence. The Welland River is a permanent warmwater watercourse and is a wide, slow flowing river within the study area. A flooded cattail marsh area was present along the north bank approximately 70 m upstream of the Montrose Road bridge. A second flooded cattail marsh area was present along the north bank approximately 10 m downstream of the existing bridge location. Shallow clay shelves were present along the nearshore areas of both banks. These dropped off steeply approximately 8-10 m from the banks to a deep central channel. Channel width within the study area was relatively uniform and varied from 70 m near the existing bridge location to approximately 80 m wide upstream and downstream of the existing bridge. The shallow nearshore shelves contained dense submergent and floating vegetation with scattered emergent vegetation along the shorelines. Submergent vegetation consisted of Canada Waterweed, Coontail, Wild Celery, and Narrow-leaved Pondweed, Floating vegetation was comprised primarily of Fragrant White Water Lily and mats of floating algae. Emergent vegetation along the shorelines consisted of aquatic grasses and cattails. The banks of the river upstream and downstream of the bridge were lined with overhanging shrubs and large deciduous trees with thick Wild Grapevine growth providing shade and cover for the nearshore area. Substrates within the shallow nearshore area were soft and deep, approximately 15-30 cm in depth and consisted of silt, muck and detritus overlying hardpack clay. Due to the depth of the central channel area, substrates were not assessed however it is assumed these are clay due to the underlying substrates in the nearshore and the general characteristics of the Haldimand Clay Plain physiographic region. The substrates of the nearshore area under the bridge and immediately upstream and downstream included angular cobble and boulder scour protection. Former bridge piers or dock piers were noted along the shallow shelf on the north side of the river upstream and downstream of the bridge.

The water quality parameters measured at the existing bridge during the summer survey included a water temperature of 27.0°C, a pH of 8.27 and a dissolved oxygen of 8.8 mg/L and a conductivity of 332 µS/cm. Water was considered blue/green and turbid during the survey and the air temperature at the time of the investigation was 29.0°C.

Due to the substantial fish community information available for the Welland River, a fish community survey was not completed. Fish salvages completed approximately 80 m downstream of Montrose Road by Parsons biologists in 2019 and 2020 as part of the Ministry of Transportation (MTO) QEW/Welland Bridge Replacement project resulted in the capture of the 10 bait/forage fish species: Banded Killifish, Pumpkinseed, Common Carp, Green Sunfish, Bluntnose Minnow, Brown Bullhead, Tadpole Madtom, Golden Shiner, Round Goby and Johnny Darter, as well as 2 piscivorous species including Largemouth Bass and Bowfin.

No migratory obstructions to fish passage were noted within the Welland River during field investigations. No live mussels, fresh or weathered mussel shells or middens were observed during field investigations, several dead Zebra Mussels were noted along the nearshore area.

Grassy Brook Creek

Grassy Brook Creek is a permanent warmwater watercourse which originates west of the study area and flowed through a golf course upstream of the Montrose Road crossing. Within the study area the creek flowed within a natural wooded valley corridor, on the east side of Montrose Road the forested area is part of the Lower Grassy Brook Wetland Complex which is connected to the Welland River East Wetland Complex near the confluence with the Welland River. In the study area, Grassy Brook Creek flowed from west to east through a double concrete box culvert under Montrose Road. Upstream of the culvert the watercourse channel meandered through a natural forest area as a defined channel. The deciduous forest area provided a well vegetated riparian zone with grasses and vascular plants for ground cover, deciduous shrubs in the understory and large willows and Manitoba Maples for overhead cover and shade. Channel

morphology within the reach was classified as flat with variable depths and mean depth of 0.53 m and widths ranging from 4.1 – 5.2 m. Substrates within the upstream section were dominated by silt overlying clay throughout with some cobble and gravel concentrated at the culvert inlet. In stream aquatic macrophyte growth consisted of submergent and emergent vegetation with dense submergent vegetation comprised of Canada Waterweed and Water-milfoil present for approximately 15 m upstream of the inlet. Emergent vegetation was concentrated along the shallow areas along both banks and consisted of grasses, Awl-fruited Sedge and Soft-stemmed Bulrush. A variety of quality instream habitat was observed throughout the reach which consisted of overhanging and instream vegetation, overhanging and instream woody debris and undercut banks. The presence of warm slow moving water with dense aquatic vegetation within the upstream reach provides potential habitat, including spawning and rearing habitat for Grass Pickerel.

Downstream of Montrose Road the watercourse flowed through a grassland floodplain adjacent to deciduous woodlands. The watercourse contained a slight meander pattern for approximately 100 m and then turned to flow north as a relatively straight channel parallel to the QEW for approximately 150 m and then turned and flowed east under the QEW. Channel morphology observed within the downstream reach consisted of a slow moving run of variable depths and a mean depth of 0.6 m. Channel width ranged from 3.4 m to 5.5 m. Substrates consisted primarily of silt overlying clay streambed with piles of cobble and boulder for approximately 5-8 m downstream of the culvert outlet. In stream aquatic macrophyte growth was dominated by submergent vegetation throughout the channel which consisted of water-milfoil, Canada Waterweed and algae. Emergent vegetation was present along the channel margins and concentrated within the channel near the outlet. Emergent vegetation consisted of aquatic grasses, Arrowhead, Awl-fruited Sedge and Soft-stemmed Bulrush. The riparian zone was well vegetated with tall grasses and vascular plants which overhung the channel throughout the reach. Diverse and quality habitat was observed throughout the reach and consisted of undercut banks with overhanging vegetation, instream woody debris, instream vegetation and cobble piles and overhanging vegetation (grasses and small shrubs) which lined both banks throughout the reach.

The water quality parameters measured within the upstream channel at the time of the summer survey included a water temperature of 22.6°C, a pH of 7.97 and a dissolved oxygen of 5.2 mg/L and a conductivity of 941 µS/cm. Water was considered turbid during the survey and the air temperature at the time of the investigation was 27.0°C.

A fish community survey conducted using back electrofishing and resulted in the capture of 5 species considered bait/forage fish including Central Mudminnow, Green Sunfish, Pumpkinseed, Bluegill and Brown Bullhead and 1 piscivorous species: Bowfin. No migratory barriers to fish movement were noted with the study area and no live mussels, fresh or weathered mussel shells or middens were observed during field investigations.

Unnamed Tributary of Lyons Creek

The Unnamed Tributary of Lyons Creek is an intermittent warmwater watercourse originates southwest of the study area and flows within a narrow tree line between a gold course and agricultural field towards Montrose Road. The watercourse flows east under Montrose Road through a concrete box culvert and then turned and flowed south under Reixinger Road within the study area. Downstream of Reixinger Road, the watercourse flows through primarily forested areas to its confluence with Lyons Creek south of Lyons Creek Road.

The watercourse upstream of Montrose Road consisted of a defined meandering channel through an open grassy meadow area with scattered clumps of small deciduous trees. The channel was dry during the summer investigation with a dry hardpack streambed. The channel contained flowing water during an additional site visit conducted in spring 2021. Substrates consisted of dried mud and silt with some cobble present at the inlet. In stream vegetation within the dry channel consisted of mainly grasses with some sedges and cattails present approximately 40 m upstream of the inlet near the limit of the upstream survey area. In stream habitat in the upstream reach was homogenous and consisted mainly of overhanging and instream vegetation with a small amount of cover provided by cobble at the inlet.

The downstream reach flowed for approximately 75 m through a small deciduous woodlot to the Reixinger Road crossing. The downstream channel was dry and contained dense growth of Common Reed and cattails for approximately 20 m before the channel entered the wooded area. The streambed consisted of dry hardpack muck and silt with some angular cobble present at the culvert outlet. Instream vegetation consisted of grasses, cattails and Common Reed. The riparian zone was well vegetated with grasses and vascular plants overhanging the channel along the banks and large deciduous

trees to provided overhead cover and shade for the channel within the woodlot. Instream habitat was homogenous and limited primarily to instream and overhanging vegetation with a small amount of cover provided by the cobble at the outlet.

No fish community sampling was undertaken during the summer investigations as the channel was dry. A fish community sampling undertaken in the spring resulted in no capture, however it is likely that fish access this reach of the watercourse periodically due to its connection to wetland pond areas within the forested areas downstream of Reixinger Road and its connection to Lyons Creek. The cobble at the inlet and outlet as well as the intermittent nature of the watercourse would be seasonal barriers to fish movement within the system. Due to the intermittent nature of the watercourse, it is unlikely that suitable habitat for SAR mussels is present within the study area.

Lyons Creek

Lyons Creek is a permanent warmwater watercourse which originates southwest of the study area at the Welland Canal and flow is augmented with water from the canal. Prior to canal construction, the Lyons Creek headwaters began at Wainfleet Bog. Lyons Creek now begins at the Welland Canal and flows for 19.5 km to its confluence with the Chippewa Canal. The study area is located in the lower portion of the Lyons Creek watershed. Upstream of the study area Lyons Creek is bordered by agricultural fields and a golf course. Downstream of the study area, the creek flows through primarily rural residential and some agricultural areas.

The watercourse upstream of the QEW off-ramp to Lyons Creek Road consisted of a gentle meander that flowed through disturbed roadside meadow area and under the QEW. The watercourse had a narrow floodplain area along both banks with a narrow band of deciduous trees along the top of bankfull banks. Channel morphology within the reach was classified as a slow moving flat, water was turbid during the site visit due to recent heavy rains. Substrates within the reach consisted primarily of silt and muck overlying clay with angular cobble and boulder present along the banks under the bridge. Instream aquatic macrophyte growth was present along the nearshore margins of both banks and dominated by emergent vegetation comprised of cattails, grasses and sedges with some scattered floating Fragrant White Water Lily and submergent Coontail. The Riparian zone was well vegetated with grasses, vascular plants and woody shrubs within the floodplain and large deciduous trees along the top of the bankfull bank. Instream habitat and cover consisted primarily of instream and overhanging vegetation with overhanging woody debris and large cobble and boulder to provide additional cover opportunities.

Within the downstream reach, the watercourse flowed as a defined channel with a gentle meander pattern within a wide floodplain area. The floodplain of both banks consisted of cattail marsh which was flooded during the site visit. Large deciduous trees were present along the banks of the bankfull channel at the edge of the cattail marsh areas. A small CSP culvert contributed roadside drainage to the watercourse approximately 10 m downstream of the existing bridge. A large deposit of gravel and sand was present within the floodplain at the outlet of the CSP culvert. Channel morphology within the reach was classified as a slow moving run with noticeable flow. Substrates within the reach were soft and comprised of silt and muck overlying clay. Some angular cobble and boulder were present along the banks and within the channel under the bridge. Dense aquatic macrophyte growth was observed along the nearshore margins of both banks and consisted primarily of emergent vegetation comprised of Swamp Smartweed, cattails, sedges and grasses. Some floating vegetation consisting of Fragrant White Water lily and Duckweed and submergent vegetation comprised of Coontail was present along the banks near the bridge. The riparian zone was well vegetated with hydrophilic vascular plants and grasses with some woody shrubs and large deciduous trees along the edges of the cattail marsh areas within the floodplain. Instream habitat and cover was dominated by instream and overhanging vegetation with additional cover provided by overhanging woody debris and large instream cobble and boulder.

Due to the substantial fish community information available during background review for Lyons Creek, a fish community survey was not completed.

TABLE 5 – SUMMARY OF EXISTING FISH AND FISH HABITAT WITHIN WATERCOURSES

Watercourse ID	Location	Flow	Thermal Regime	Fish Species Present	Substrate	Vegetation	Fish Habitat	Important/Exceptional Habitat	SAR Habitat
Unnamed Tributary of Warren Creek	Upstream and downstream of Montrose Road UTM (17T 652843 4768978)	Intermittent	Warmwater	None	Dominant – Silt, Muck	Emergent: cattails, Common Reed, grasses Submergent: none Floating: none Riparian: grasses, vascular plants	Indirect	None	None
Warren Creek	Upstream and downstream of Montrose Road UTM (17T 652862 4768570)	Permanent	Warmwater	Largemouth Bass, Central Mudminnow, Green Sunfish, Johnny Darter, Yellow Bullhead	Dominant – Silt, Clay, Muck Scattered cobble	Emergent: cattails, sedges, grasses Submergent: Water-milfoil Floating: none Riparian: grasses, vascular plants	Direct	Bait/forage fish spawning habitat Warmwater sportfish rearing/nursery habitat	Fish – Grass Pickerel (SC)
Welland River	Upstream and downstream of Montrose Road UTM (17T 652875 4767664)	Permanent	Warmwater	Banded Killifish, Pumpkinseed, Common Carp, Green Sunfish, Bluntnose Minnow, Brown Bullhead, Tadpole Madtom, Golden Shiner, Round Goby and Johnny Darter Bowfin, White Sucker, Shorthead Redhorse, Greater Redhorse, Central Mudminnow, Brown Bullhead, Brindled Madtom, Channel Catfish, Brook Stickleback, Johnny Darter, Logperch, Brook Silverside, Golden Shiner, Emerald Shiner, Spottail Shiner, Mimic Shiner, Bluntnose Minnow, Striped Shiner, Creek Chub, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Smallmouth Bass, Largemouth Bass, White Crappie, Black Crappie, Northern Pike, Muskellunge, Yellow Perch, Alewife, Gizzard Shad, Round Goby, Banded Killifish, Goldfish, Rudd and Common Carp	Dominant – Silt, Clay, Muck Detritus Minor amounts - boulder, cobble	Emergent: cattails, grasses, sedges, Mint Submergent: Canada Waterweed, Coontail, Wild Celery, Narrow-leaved Pondweed Floating: Fragrant White Water-lily, Algae Riparian: grasses, trees	Direct	Warmwater sportfish habitat SAR mussel habitat SAR fish habitat	Fish- Grass Pickerel (SC) and Spotted Sucker (SC) Freshwater Mussel - Round Hickorynut (SC) and Kidneyshell (SC)
Grassy Brook Creek	Upstream and downstream of Montrose Road UTM (17T 652893 4767126)	Permanent	Warmwater	Bowfin, Grass Pickerel, Central Mudminnow, White Sucker, Shorthead Redhorse, Brown Bullhead, Tadpole Madtom, Trout-perch, Johnny Darter, Logperch, Brook Stickleback, Golden Shiner, Emerald Shiner, Spottail Shiner, Bluntnose Minnow, Fathead Minnow, Creek Chub, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Northern Pike, Muskellunge, Largemouth Bass, White Crappie, Yellow Perch, GizzaRoad Shad and Common Carp	Dominant – Silt, Clay, Minor amounts – cobble, gravel, boulder	Emergent: cattails, grasses, Awl-fruited Sedge, Soft-stemmed Bulrush, Arrowhead Submergent: Canada Waterweed, Water-milfoil Floating: Fragrant White Water Lily Riparian: grasses, vascular plants, trees	Direct	Bait/forage fish spawning habitat Warmwater sportfish rearing/nursery habitat	Fish – Grass Pickerel (SC) Freshwater Mussel - Round Hickorynut (END) and Kidneyshell (END)
Unnamed Tributary of Lyons Creek	Upstream and downstream of Montrose Road UTM (17T 652906 4766678)	Intermittent	Warmwater	Potential for Bowfin, Grass Pickerel, Central Mudminnow, White Sucker, Shorthead Redhorse, Greater Redhorse, Brown Bullhead, Tadpole Madtom, Channel Catfish, Johnny Darter, Logperch, Freshwater Drum, Golden Shiner, Emerald Shiner, Common Shiner, Spottail Shiner, Bluntnose Minnow, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Smallmouth Bass, Largemouth Bass, White Crappie, Black Crappie, Northern Pike, Yellow Perch, Goldfish, Round Goby, Rudd and Common Carp	Dominant – Silt, Clay, Muck Scattered cobble, gravel	Emergent: cattails, Common Reed, grasses, sedges Submergent: none Floating: none Riparian: grasses, trees	Direct	None	None
Lyons Creek	QEW Northbound off ramp to Lyons Creek Road UTM (17T 653983 4766030)	Permanent	Warmwater	Bowfin, Grass Pickerel, Central Mudminnow, White Sucker, Shorthead Redhorse, Greater Redhorse, Brown Bullhead, Tadpole Madtom, Channel Catfish, Johnny Darter, Logperch, Freshwater Drum, Golden Shiner, Emerald Shiner, Common Shiner, Spottail Shiner, Bluntnose Minnow, Rock Bass, Green Sunfish, Pumpkinseed, Bluegill, Smallmouth Bass, Largemouth Bass, White Crappie, Black Crappie, Northern Pike, Yellow Perch, Goldfish, Round Goby, Rudd and Common Carp	Dominant – Silt, Clay, Muck Scattered cobble, gravel	Emergent: cattails, sedges, Arrowhead, Swamp Smartweed Submergent: Coontail Floating: Fragrant White Water Lily, Duckweed	Direct	Bait/forage fish spawning habitat Coolwater & warmwater sportfish rearing/nursery, feeding habitat SAR fish habitat	Fish – Grass Pickerel (SC)

4.5 Species at Risk

4.5.1 TERRESTRIAL SPECIES AT RISK

The background review identified several SAR that have the potential to occur within the study area. A SAR screening assessment was completed to determine the potential for SAR to occur within the study area. The results of the screening are provided in **Appendix G** and summarized in **Table 6**.

TABLE 6 – SUMMARY OF POTENTIAL TERRESTRIAL SPECIES AT RISK WITHIN THE STUDY AREA

Common Name	Scientific Name	SARA	ESA	Legal Protection	Assessment
MAMMALS					
Eastern Small-footed Myotis	<i>Myotis leibii</i>		END	ESA	All woodlands within the study area have the potential to provide habitat for bats. Direct impacts to potential SAR habitat is expected. Consultation with MECP was initiated and an Information Gathering Form (IGF) submitted will be submitted to determine permitting and compensation requirements. Acoustic surveys to confirm SAR potential is not currently anticipated based on initial consultation. Implementing timing restrictions to avoid tree removal during the active period (April 1 to September 30) is recommended, along with the installation of bat boxes to mitigate impacts due to construction.
Little Brown Myotis	<i>Myotis lucifugus</i>	END, Schedule 1	END	ESA	
Northern Myotis	<i>Myotis septentrionalis</i>	END, Schedule 1	END	ESA	
Tri-colored Bat	<i>Perimyotis subflavus</i>	END, Schedule 1	END	ESA	
BIRDS					
Barn Swallow	<i>Hirundo rustica</i>	THR, Schedule 1	THR	ESA, SARA, MBCA	The structural culverts and Welland River bridge have the potential to provide habitat for Barn Swallows. Registration under O. Reg. 242/08 of the ESA may be required if Barn Swallow nests are confirmed and may be impacted by the proposed works. A survey for Barn Swallows is recommended prior to construction. If the proposed culvert and bridge works occur during the breeding bird window (April 1 to August 30), exclusionary measures should be installed on these structures by April 1 to prevent nesting.
Bobolink	<i>Dolichonyx oryzivorus</i>	THR, Schedule 1	THR	ESA, SARA, MBCA	This species was documented by Parsons during breeding bird surveys on June 17, 2020. This species was not recorded during the July 3, 2020 survey. It is possible this species is nesting in the agricultural field, although not confirmed. The proposed design would encroach edge habitat only. It is not expected that a permit will be required. The confirmed sighting of this species will be included in the IGF (along with bats) and submitted to MECP to determine permitting requirements.
PLANTS					
Deerberry	<i>Vaccinium stamineum</i>	THR, Schedule 1	THR	ESA	There are records of Deerberry in the City of Niagara Falls. There are no records within the study area, however, suitable habitat may be present in the oak woodlands. In the Niagara Region, this species is found in open oak woodlands dominated by Red Oak, White Oak, Sugar Maple, Ash species, Ironwood, Sassafras, Witch-hazel and Gray Dogwood (National Deerberry Recovery Team, 2010). If direct impacts to open oak wooded areas is required, a targeted survey for this species is recommended.
Round-leaved Greenbrier	<i>Smilax rotundifolia</i>	THR, Schedule 1	THR	ESA	There are records of this species in the City of Niagara Falls in Lyons Creek North. This species is found in open wet to moist woodlands, typically red maple and oak communities. The woodlands along Biggar Road / Lyons Creek Road in particular may provide suitable habitat. A targeted survey for this species is recommended where direct impacts to these communities are expected.

4.5.2 AQUATIC SPECIES AT RISK

A screening of SAR records was undertaken to identify which of the reported species have the potential to occur within the study area. The screening identified potential species and spatial distributions collected through agency consultation and literature review. Available information regarding preferred habitat was compared to existing habitat identified within the study area during field assessments to determine if suitable habitat was present. A summary of aquatic SAR identified from the background review with potential to be found within the study area are provided in **Table 7** and discussed further in the sections below. Note that the table below also includes species of Special Concern which are not protected under the ESA or SARA but do receive enhanced protection under the *Fisheries Act*.

TABLE 7 – SUMMARY OF POTENTIAL AQUATIC SPECIES AT RISK AND OTHER PROTECTED SPECIES WITHIN THE STUDY AREA

Common Name	Scientific Name	SARA	ESA	Legal Protection	Assessment
MUSSELS					
Kidneyshell ³	<i>Ptychobranchnus fasciolaris</i>	Endangered	Endangered	ESA, SARA, Fisheries Act	Kidneyshell are usually found in small to medium rivers in shallow swift moving areas with firmly packed coarse sand and gravel. Known fish hosts in Canada include Blackside Darter (<i>Percina maculata</i>), Fantail Darter (<i>Etheostoma flabellare</i>) and Johnny Darter. There is potential for Kidneyshell within the Welland River and Grassy Brook Creek, due to direct in-water impacts a mussel salvage may be required prior to construction at these locations.
Round Hickorynut ^{1,3}	<i>Obovaria subrotunda</i>	Endangered	Endangered	ESA, SARA, Fisheries Act	They prefer medium to large rivers with clay, sand or gravel substrates in areas with moderately swift moving water. They have also been found in shallow areas of lakes with firm sand. In Ontario it has been found in turbid low-gradient rivers with clay/sand or clay/gravel substrates. Known fish hosts in Canada have not been confirmed but may include Greenside Darter (<i>Etheostoma blennioides</i>) and Eastern Sand Darter (<i>Ammocrypta pellucida</i>). There is potential for Round Hickorynut within the Welland River and Grassy Brook Creek, due to direct in-water impacts a mussel salvage may be required prior to construction at these locations.
Eastern Pondmussel ¹	<i>Ligumia nasuta</i>	Special Concern	Special Concern	Fisheries Act	Eastern Pondmussel prefers sheltered areas of lakes and in slow-moving areas of rivers and canals with substrates composed of clay, silt/organics and sand/gravel. Fish hosts have not yet been confirmed, in Canada hosts likely include Brook Stickleback, Largemouth Bass, Pumpkinseed and Yellow Perch, but still need to be verified. There is potential for Eastern Pondmussel within the Welland River and Grassy Brook Creek, due to direct in-water impacts a mussel salvage may be required prior to construction at these locations. Species not protected under the ESA or SARA but receives enhanced protection under the Fisheries Act.
FISH					
Grass Pickerel ³	<i>Esox americanus</i>	Special Concern	Special Concern	Fisheries Act	Grass Pickerel are found in wetlands, slow moving areas of streams and bays of lakes. They prefer shallow, warm, relatively clear water with dense submergent vegetation. Substrates are usually mud, but it has been found over rocks and gravel. Suitable habitat for Grass Pickerel was observed within Warren Creek, Grassy Brook Creek and the Welland River. Species not protected under the ESA or SARA but receives enhanced protection under the Fisheries Act.
Spotted Sucker ³	<i>Minytrema melanops</i>	Special Concern	Special Concern	Fisheries Act	They are found in slow moving areas of streams and typically prefer clear water with low suspended solids. In

Canada they have been found in turbid river systems where turbidity is considered moderate to heavy. Substrates are usually sand, gravel or hard-clay bottoms and normally free of silt. Spotted Sucker has been confirmed within the Welland River in the vicinity of the study area. Species not protected under the ESA or SARA but receives enhanced protection under the Fisheries Act.

References:

¹ NHIC database

² MECP (2020)

³ DFO Online SAR mapping

5. Preferred Alternative Description

The preferred alternative design is to widen Montrose Road to four lanes along the centreline except from Canadian Drive to Chippewa Creek Road which is proposed to be widened to the west and from Chippewa Creek Road to Grassy Brook Road which is proposed to be widened to the east. The following sections include a summary of key features of the preferred preliminary design which were used to assess potential impacts on the natural environment.

5.1 Road Widening

5.1.1 TYPICAL CROSS SECTIONS AND COMPLETE STREETS

The road right-of-way (ROW) is nominally 30m throughout the study area, except at certain locations where up to 37m of road ROW width is required to accommodate additional turning lanes. The typical cross section for Montrose Road/Lyons Creek Road/Biggar Road is shown in **Figure 2** and includes:

- 4 x 3.5m driving lanes
- 2.0m median OR 4.0m centre left turning lane (where appropriate)
- 4.0m Multi-Use Path on the west side of Montrose Road and north side of Lyons Creek Road/Biggar Road
- 1.8m sidewalk on the east side of Montrose Road, as appropriate.

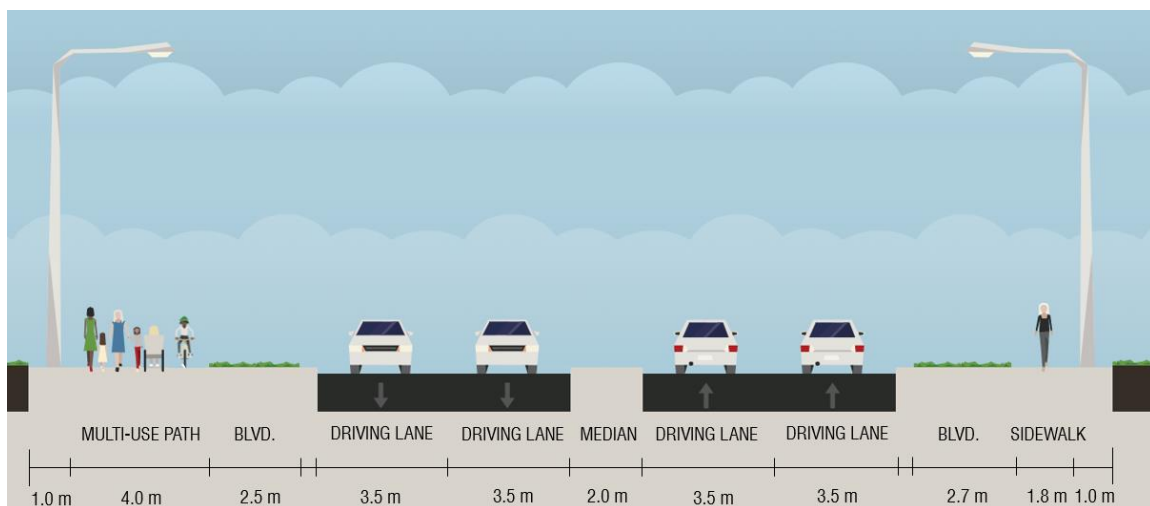


FIGURE 2 – TYPICAL RIGHT-OF-WAY CROSS SECTION

5.1.2 HORIZONTAL / VERTICAL ROAD ALIGNMENT

As the road will be widened, there will be changes to the horizontal alignment of the road. On Montrose Road, from Canadian Drive to Chippewa Creek Road, widening will primarily occur to the west of the existing roadway. On Montrose Road from Chippewa Creek Road to Grassy Brook Road, widening will primarily occur to the east of the existing roadway. On all other remaining road sections being widened, widening will occur generally equally from the centreline, i.e., on both sides of the road. In addition to the additional through lanes, further widening is required through certain areas to accommodate auxiliary lanes, such as left and right turn lanes.

Generally, the vertical alignment of the road will largely remain at the same elevation/grade as the existing roadway throughout the study area. Specific locations may require a slight raise in road profile to provide sufficient cover over other roadway features, such as culverts and storm sewers. The exact raise in road profile will be confirmed during detailed design.

5.2 Montrose Bridge over the Welland River

To accommodate the future widening of Montrose Road to four through lanes, the existing Montrose Road bridge over the Welland River will be widened exclusively to the west with new piers in the water that match the existing bridge. The proposed widening will incorporate the following elements:

- 4 x 3.5m driving lanes
- 1.5m shoulders in both directions
- 5.5m raised median
- 3.5m Multi-Use Path (MUP) on the west side of Montrose Road
- 0.5m buffer between the MUP and the parapet wall
- 1.0m buffer between the MUP and the curb at the driving lanes
- 0.39m parapet walls

5.3 Intersection Improvements and Accesses

The Class EA reviewed opportunities to make improvements to existing and new intersections based on traffic needs or needs of the property owner. A summary of intersection improvements is provided in **Table 8** below:

TABLE 8 – SUMMARY OF PROPOSED INTERSECTION IMPROVEMENTS

Intersection	Proposed Changes
Niagara Square Drive	Replace existing signals with a three-legged roundabout
Brown Road	Potential Future Signals
Oakwood Drive	Potential Future Signals
Grassy Brook Road	Potential Future Signals
Reixinger Road	New signalized intersection and extension of Reixinger Road west of Montrose Road to allow for a northern connection into the South Niagara Hospital site. This extension also supports a future local road to access the Grand Niagara Secondary Plan area.
Hospital access on Montrose Road	New signalized intersection
Montrose Road and Lyons Creek Road	Existing traffic signals will be maintained and upgraded to suit the widened roads.
Hospital access on Biggar Road	New signalized intersection
Willodell Road	Left turn lane added on Lyons Creek Road, physical barrier restricting left turns from Willodell Road onto Lyons Creek Road, slight realignment to the west
QEW Fort Erie-bound Off-ramp	New signalized intersection warranted by 2026
QEW Toronto-bound Off-ramp	New signalized intersection not warranted but will be included based on excessive delays to the northbound left turn and discussion with MTO

5.4 Drainage Improvements

As part of the road improvements for the study area, the new roads will be widened and constructed as an urban cross section, meaning that road drainage will be collected via curbs and gutters, directed into catchbasins, where storm sewers will direct water to outlets throughout the study.

As the road is being widened, the length of the centreline culverts, which convey drainage across the road, also need to be increased to accommodate the widened road cross section. All existing rigid frame box culverts except the tributary of Lyons Creek culvert are in good condition and meet the hydraulic requirements.

Based on this recommendation, this undertaking provided an opportunity to replace the tributary of Lyons Creek culvert with twin 3000 x 1500 mm box culverts. This improves its structural condition and service life and provides an opportunity to increase the size of the culvert to improve hydraulic capacity. In reviewing the watercourse channel, the

design also recommends skewing the culvert to improve the tie-in angles at both ends of the culvert (i.e. changing the angle from a 90-degree turn to a smoother transition). This also provides an opportunity to replace the culvert offline, meaning one cell of the new twin-cell culvert can be constructed first while the existing conditions stay as is. Once the first cell of the new culvert is prepared, the creek can be realigned to flow into the first cell of the new culvert. Once the creek has been realigned, construction can begin on the second cell of the culvert, located immediately adjacent to the first cell of the culvert. The culvert should also be designed with a low flow channel to address fish passage concerns as the watercourse is identified as an important fish habitat by NPCA.

In addition to the rigid frame box culverts, there are three existing pipe culverts that are proposed to be replaced as they are either eroded or do not meet the minimum size requirement.

Table 9 provides a summary of the design recommendations at each culvert. For fisheries impacts related to works at the culverts, refer to Section 6.4.

TABLE 9 – SUMMARY OF CULVERT RECOMMENDATIONS

No.	Name	Span x Rise (mm)	Proposed Length (m)	Embedment (mm)	Proposed Action
1	Tributary of Warren Creek Culvert	1200 x 1500	44.6	-	Extension
2	Warren Creek Culvert	4600 x 2100	43.6	-	Extension
3	Drainage (north of Chippewa Creek Rd)	1200 x 1200	42.8	-	Extension
4	Drainage (South of Welland River)	800	39.9	-	Replacement
5	Grassy Brook Culvert	3000 x 2100 2400 x 1800	41.4	300	Extension
6	Lyons Creek Tributary Culvert	3000 x 1500 3000 x 1500	45.1	300	Offline Culvert Replacement with twin box culverts
7	Drainage (on Biggar Road)	800	35.0	200	Replacement and upsize, embed to avoid cover issues
8	Drainage (South of Lyons Creek Road)	800	23.0	350	Replacement and upsize, embed to avoid cover issues
9	Lyons Creek				No works proposed

6. Potential Impacts and Mitigation Measures

The analysis of potential impacts was determined by reviewing proposed plans for the preferred alternative design to determine the extent of impacts on natural features within the study area. The outcome of this process was based primarily on the significance and sensitivity of the natural features and on the anticipated disturbances as a result of design, construction and operation required to complete the road improvements.

Potential impacts were classified in two categories outlined below:

- Direct Impacts – are those impacts associated with the disruption or displacement of natural features caused by the actual increased ‘footprint’ area of the undertaking or activity; and
- Indirect Impacts – are those impacts associated with changes in site conditions such as surface drainage, water quality/quantity, increased noise, increased edge habitat etc.

Impacts and net effects on natural heritage features were assessed based on the following criteria:

- Duration - long or short term
- Extent - localized or expansive
- Timeframe - permanent or temporary
- Severity - positive or negative.

Most direct impacts occur during the construction phase of a project and contain localized, negative effects that can be reduced through avoidance and proper construction practices. After construction, there may be more long term, indirect impacts while the site recovers, and successional vegetation growth takes place. Typically, after the site re-vegetates, there is either a neutral or positive impact due to the placement of intentional native plantings, improved sediment control and surface drainage runoff control. The following sections detail the potential impacts and mitigation measures to terrestrial and aquatic resources during construction activities. A summary of potential impacts and mitigation measures is provided in Section 6.5, **Table 10** (terrestrial resources) and **Table 11** (aquatic resources).

6.1 Designated Areas

Road widening and structure works will encroach designated areas. These designated areas are associated with woodlands and PSWs and include candidate and confirmed SWH types and provide general habitat for wildlife. Potential impacts and mitigation measures related to the function of these designated areas are captured in the following sections.

6.2 Vegetation and Vegetation Communities

Vegetation clearing and encroachment of vegetation communities, including the PSWs (Warren Creek, Welland River East, Lower Grassy Brook, Lyons Creek North and Lyons Creek) and significant woodlands will be required for the new road alignment, intersection improvements and drainage improvements. It is recommended that the extent of encroachment of natural features is quantified once the design is finalized and where compensation may be required. Delineation of wetlands that extend into the Project limits may also be required to quantify impacts.

The design has been selected to minimize encroachment of natural features, where possible, or is limited to edge habitat only. Key constraints that limited the ability to avoid encroachment of significant vegetation communities such as PSWs and significant woodlands included:

- The majority of PSWs and significant woodlands abut the existing roads or are within the existing ROW of Montrose Road, Lyons Creek Road and Biggar Road. As a result, avoiding encroachment of natural features is not possible in some areas.
- The area between Canadian Drive to Chippawa Creek Road is constrained by the QEW which restricts the ability to widen to the east or centreline. As a result, widening in this area is limited to the west which requires realignment of Warren Creek and encroachment of the Warren Creek PSW and associated significant woodland.

- The preferred design alternative for the alignment of the Montrose Road bridge over the Welland River is restricted to the east side of the existing bridge due to the proposed new Niagara Region sanitary sewer trunk main that is planned to be constructed along the west side of the existing Welland River bridge crossing. The west side of Montrose Road also limits the design due to properties and buildings which would require frontage and physical impacts to buildings if widening occurred to the west. As a result of bridge works, construction would result in direct impacts to the Welland River East PSW.
- The future South Niagara Hospital at the northwest quadrant of Montrose Road and Biggar Road restricts the ability to widen north only. As the Lyons Creek North PSW and associated significant woodland is located on the south side of Biggar Road, widening from the centreline minimizes the extent of encroachment compared to widening entirely from the south.
- Proposed changes to Willodell Road at Lyons Creek Road include implementing a westbound left turn lane on Lyons Creek Road into Willodell Road, restricting left turns out from Willodell Road, and shifting the intersection by approximately 20m to the west in order to accommodate revised turning radii. This results in direct encroachment and permanent loss of a portion of the Lyons Creek PSW and associated significant woodland. A previous recommendation included implementing a median on Lyons Creek Road that would restrict the Willodell Road intersection to a right-in right-out only configuration which would have limited the extent of encroachment. However, through considerable feedback from the public and in consultation with MTO and the City of Niagara Falls, the current recommendation was developed to balance access, safety, and transportation needs.

Potential impacts to vegetation and vegetation communities include:

- Permanent and temporary loss of vegetation and vegetation communities due to infrastructure (permanent) or temporary construction activities (e.g., staging areas);
- Alteration of vegetation communities due to soil compaction which can affect growing conditions if replanting is proposed in those areas following construction or through changes in hydrology and moisture regime if flow quantities and pathways are not maintained at existing conditions.
- Injury or loss of trees outside of the construction limits if the proposed works occur within the root zones;
- Edge tree effects within woodlands where tree removal occurs. This may cause stress or injury to trees that were otherwise sheltered but now form the new woodland edge;
- Damage to vegetation due to fugitive dust suppression, salt spray effects, sedimentation, and accidental spills (e.g., fuel, oil, other hazardous materials); and,
- Changes in community structure due to the introduction and spread of invasive species.

The following recommendations are provided to minimize potential effects to vegetation and vegetation communities:

- Maintain existing drainage pathways and flow regimes during and post-construction;
- Maintain vegetated buffers within and surrounding natural features to be retained. Where possible, minimum vegetated buffers include 30 m from PSWs, 15 m from non-PSWs and 10 m from woodlands. Consultation with NPCA is recommended to confirm buffers and requirements where encroachment of wetlands occurs;
- Revegetate disturbed areas with native vegetation appropriate to site conditions following construction;
- Implement timing restrictions with removals to occur outside of sensitive periods (e.g., winter months);
- Install surface protection measures to minimize soil compaction;
- Demarcate the work zones to ensure work remains within the construction limits;
- Implement an invasive species management plan and follow the Best Management Practices (BMPs) developed by NDMNRF, Ontario Invasive Plant Council (OIPC) and the Clean Equipment Protocol for Industry (Halloran et al., 2013). It is also recommended that prior to construction, areas with Phragmites should be treated to prevent the spread of seeds;
- Implement dust control measures for the suppression of fugitive dust;
- Implement standard BMPs for erosion and sediment control; and,
- Implement an emergency and response management plan to address the potential for spills.

6.3 Wildlife and Wildlife Habitat

Encroachment of natural features is expected to be limited to edge habitat only but may result in permanent and temporary loss of SAR habitat (i.e., bats), candidate and confirmed SWH and generalized wildlife habitat. Temporary disruption and avoidance of habitat may also occur during construction due to construction noise, lighting and increased human presence. While most wildlife that occur along highway corridors are likely adapted, to some extent, to anthropogenic disturbances such as traffic noise and artificial light, excess or prolonged disturbances can cause impacts beyond tolerance levels. For example, increased noise or the proximity of workers could cause nesting birds to temporarily vacate or completely abandon a nest in progress. Injury and incidental take of wildlife also has the potential to occur during construction and operation with increased traffic. Wildlife that utilize road surfaces and shoulders as part of their habitat (e.g., snakes basking on the warm asphalt surface) or that cross the highway to access habitats, may be particularly susceptible to harm associated with road construction projects. Construction lighting may attract bats, including SAR to the area due to increased foraging potential, which may result in incidental take of individuals through collisions with vehicles or physical barriers.

The following recommendations are provided to minimize potential effects to wildlife and wildlife habitat:

- Implement timing restrictions with activities to occur outside of sensitive period. To avoid impacts to breeding birds and bats protected under the *Migratory Birds Convention Act* and/or *Endangered Species Act*, vegetation removal should occur between October 1 and March 31 in any given year.
- Where vegetation removal is required during the breeding bird window (April 1 to August 31), a nest sweep is required to confirm there are no nests. If nests of a species protected under the MBCA, SARA or ESA (i.e., SAR) are present, works will not be permitted until the young have fledged and/or approval is provided by MECP for SAR. A setback from the nest (e.g., 30 m) should be determined by a qualified biologist and the area demarcated to ensure work does not occur within the setback limits
- Removal of potential bat roosting trees is not permitted during the active season (i.e., April 1 to September 30) unless authorized by MECP.
- Installation of bat boxes is also recommended to minimize impacts to bats during construction, specifically in areas where bat habitat was identified;
- Exclusionary measures should be installed at all structural culverts prior to April 1 to prevent bird nesting;
- With respect to bird nests/residence, particularly those protected under the ESA, SARA and MBCA, if active nests are encountered during construction, it is recommended that work not continue in the location of the nest until after the young birds have fledged or the nest is otherwise abandoned. A setback from the nest (e.g., 30 m) should be determined by a qualified biologist and the area demarcated to ensure work does not occur within the setback limits;
- If Barn Swallow nests are observed at any of the culverts and work has the potential to impact the species or the nest, the activity will need to be registered under O. Reg. 242/08 and a mitigation plan prepared.
- If turtles or snakes are encountered during construction (including hibernacula), work should be temporarily suspended until the species is out of harm's way. If a hibernacula site is discovered, all work must cease and a Qualified Biologist should be contacted to discuss mitigation options.
- If necessary, visual inspections and wildlife monitoring will be required where exclusionary measures have been installed and where wildlife activity has been noted.
- Wildlife protocols should also be developed to educate workers of potential wildlife occurrences, including SAR, and measures to take in the event of potential encounters. Preventative measures to minimize encounters, injury and incidental take should also be provided;
- Where feasible, minimize the extent and duration of construction noise and lighting between April 1 to September 30;
- Restrict construction activities to work areas;
- Avoid idling and ensure construction vehicles and machinery are kept in good repair.

6.4 Aquatic Features and Fish Habitat

6.4.1 DIRECT IMPACTS

Wherever possible, construction activities with potential for direct impacts to fish habitat including works associated with in-water pier construction, culvert replacements, culvert extensions and related channel works should be conducted in dry conditions in order to minimize impacts to aquatic resources and fish habitat. These works should be completed within the appropriate in-water timing window for construction activities of July 1st – February 28/29th as provided by NDMNRF to avoid the critical spawning, rearing and migration periods for fish. To accommodate the widening of Montrose Road to four lanes, the existing culverts within the corridor will require extensions to allow for the additional lanes and embankment grading. Proposed works are not anticipated to result in the death of fish, however there is potential that some construction activities may result in the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat. Project works deemed to likely result in a HADD of fish habitat may require submission to DFO for further project review under the Fisheries Protection Provisions of the *Fisheries Act*.

Unnamed Tributary of Warren Creek

The proposed works which have potential to impact fish and fish habitat include culvert extensions, culvert replacements, channel realignments and bridge works including construction of new in-water piers. The existing 26.8 m long 1200 mm x 1300 mm Non-Rigid Frame Open Footing culvert which conveys the Unnamed Tributary of Warren Creek is proposed to be extended 17 m with non-rigid frame open foot culvert extensions with 1200 mm span and 1300 mm rise for a new total culvert length of 43.8 m. The proposed culvert extensions to the east and west of the existing culvert will result in direct impacts to the watercourse through the increase in culvert footprint area and the permanent alteration of fish habitat from open stream habitat to closed habitat. However, the watercourse has been identified as indirect fish habitat and it is anticipated that the proposed works should have negligible effect on the habitat and the contributions to fish habitat downstream provided appropriate environmental protection and sediment/erosion controls outlined below and in Section 6.5, **Table 11** are implemented, continually monitored, and used effectively during construction. As the watercourse is considered intermittent, in water works should be conducted during the in-water timing window of July 1st to February 28/29th in dry conditions to minimize potential impacts to habitat.

Warren Creek

Proposed works for the Warren Creek culvert include the installation of a 19.7 m long 4600 mm x 2100 mm non-rigid frame open foot culvert extensions on the west end of the existing 23.9 m long 4600 mm x 2100 mm non-rigid frame open foot culvert. Proposed works will result in a new total culvert length of 43.6 m. Warren Creek currently flows parallel to Montrose Road on the west side of the road and functions as the roadside ditch for approximately 220 m north of the culvert. To accommodate the additional lanes and grading for the widening, the Warren Creek channel will need to be realigned to the west. The proposed culvert extension for the Warren Creek culvert will result in the permanent alteration of direct fish habitat which supports a warmwater bait/forage fish community including Grass Pickerel and contributes to potential SAR mussel habitat downstream. The Warren Creek channel west of Montrose Road will be realigned further west to accommodate widening and embankment works. These works will result in the destruction of fish habitat due to the removal of the existing channel and the creation of new fish habitat at the new realigned channel location. It is recommended that the new channel be designed and constructed following natural channel design principles including low flow channel and natural substrates and incorporate fish habitat features. The proposed culvert extension work and channel realignment work will impact slow moving areas of the watercourse with submergent vegetation which provides suitable spawning and nursery/rearing habitat for Grass Pickerel. To mitigate potential impacts, in-water works shall be conducted within the appropriate in-water timing, in isolation from the watercourse with proper ESC measures implemented as described in Section 6.5, **Table 11**. The proposed culvert extension and channel realignment works have the potential to result in a HADD of fish habitat and may be subject to approval under the federal *Fisheries Act*.

Welland River

Proposed works with potential to impact the Welland River include the construction of a new bridge adjacent to the existing Montrose Road Bridge over the Welland River on the east side. The construction of the new bridge will include to construction of in-water piers similar to the configuration of the existing bridge. The construction of in-water piers will result in the permanent destruction of fish habitat within the Welland River which supports a diverse warmwater fish assemblage including potential SAR mussel habitat due to the footprint area associated with the new piers. The pier construction work may negatively impact SAR mussel habitat and as well as areas which provide suitable spawning, nursery/rearing habitat for Grass Pickerel. Prior to construction of in-water piers, the area should be isolated from the watercourse and a fish and mussel salvage should be undertaken within isolated areas. In-water work, including site isolation, fish and mussel salvages and temporary dewatering should occur within the appropriate in-water timing window of July 1st to February 28/29th. Additional measures to protect fish and fish habitat as outlined in Section 6.5, **Table 11** should be implemented prior to construction and monitored throughout to avoid impacts to the Welland River.

Grassy Brook Creek

The existing culvert which conveys Grassy Brook Creek is a two cell box culvert. The north box has a span of 3000 mm and rise of 2100 mm and the south box has a span of 2400 mm and a rise of 1800 mm. The proposed works include the installation of two cell box culvert extensions to the east and west of the existing culvert with matching spans and rise to the existing two cell box culvert. The proposed culvert extension for the Grassy Brook Creek culvert will result in the permanent alteration of direct fish habitat which supports a warmwater bait/forage fish community including Grass Pickerel and has potential to provide SAR mussel habitat. These works will result in the permanent alteration of fish habitat from open stream habitat to closed habitat. The habitat within Grassy Brook Creek to be impacted by the culvert extensions includes slow moving run areas with submergent vegetation which provides suitable spawning, nursery/rearing habitat for Grass Pickerel. It is recommended that the new culvert extensions be properly embedded and include the placement of streambed material with the inclusion of a low flow to facilitate fish passage through the culvert. To mitigate potential impacts, in-water works shall be conducted within the appropriate in-water timing, in isolation from the watercourse with proper ESC measures implemented as described in Section 6.5, **Table 11**. The proposed culvert extension works have the potential to result in a HADD of fish habitat and may subject to approval under the federal *Fisheries Act*.

Unnamed Tributary of Lyons Creek

The existing 15.3 m long 4300 mm x 1200 mm reinforced open footing culvert which conveys the Unnamed Tributary of Lyons Creek is proposed to be replaced and extended with a 45.2 m long 4300 mm x 1200 mm reinforced open footing culvert at a new location immediately adjacent to the existing culvert on a slightly shifted alignment to better align with the watercourse channel. The proposed culvert replacement and extension to the east and west of the existing culvert at a new location will result in an increase in culvert length from 15.3 m to 45.2 m. These works will result in the destruction of fish habitat due to the removal of the existing culvert and the creation of new fish habitat at the new culvert location adjacent to the existing. The increased culvert length will result in an overall net change in habitat from open stream habitat to closed stream habitat. It is recommended that the new channel tie-in be designed and constructed following natural channel design principles including low flow channel, natural substrates and incorporates fish habitat features. As the watercourse is considered intermittent, in water works should be conducted during the in-water timing window of July 1st to February 28/29th in dry conditions and additional mitigation measures outlined in Section 6.5, **Table 11** should be implemented and monitored throughout construction to minimize potential impacts to habitat. The proposed culvert replacement/extension work and new channel tie-in work have the potential to result in a HADD of fish habitat and may subject to approval under the federal *Fisheries Act*.

Lyons Creek

No works are proposed for Lyons Creek. Road works associated with the QEW off-ramp to Lyons Creek Road may occur within 30 m of Lyons Creek. It is anticipated that these works can be fully mitigated through the implementation of appropriate ESC measures and measures to protect fish and fish habitat.

6.4.2 INDIRECT IMPACTS

Construction activities associated with culvert and bridge works may cause temporary, localized disturbances while removing and replacing culverts, installing extensions and constructing new bridge piers to fish bearing watercourse which provide direct and indirect fish habitat. These works should be completed within the appropriate in-water timing window for construction activities of July 1st – February 28/29th as provided by NDMNRF to avoid the critical spawning, rearing and migration periods for fish. Due to the potential presence of SAR mussels within several of the watercourses in-water construction timing should be discussed further with DFO and MECP and additional timing restrictions may apply.

Temporary disturbance of habitat (substrates, vegetation etc.) is anticipated to occur within the vicinity of proposed works. During in-water construction there is potential for fish to exhibit avoidance behaviour of the construction zone and actively disturbed areas which may result in the temporary displacement of fish during the construction phase. Fish passage within watercourses may also be restricted and disrupted for a short period of time as a result of construction activities as a result of the placement of cofferdams for site isolation to ensure construction in isolation of flowing water. Site isolation may also require temporary dewatering and bypass pumping if water is present within the watercourses at the time of in-water works. Due to construction activities along the banks (i.e. clearing, grubbing, excavation etc.) as well as in-water works there is potential for the disruption of sediments. With this disruption, there is an increased potential for sedimentation of habitats within the project area as well as downstream habitats. Works along banks and in-water works should be isolated from the watercourse and scheduled when flows are low or absent and avoid seasonally wet periods (i.e. spring) and high volume storm events. Indirect impacts to watercourses and downstream habitats may occur from faulty equipment and machinery. Equipment should arrive on site in clean and working condition and be checked and maintained throughout construction. A spill response plan shall be developed prior to commencement of construction activities which outlines an appropriate response system and contingency measures in the event a spill occurs.

Standard environmental controls and measures to protect fish and fish habitat including the use of cofferdams, installation of appropriate ESC measures and salvage of fish from work areas should be implemented prior to construction activities. A detailed list of measures to protect fish and fish habitat within the watercourse during all phases of construction activities is provided in Section 6.5, **Table 11**.

6.5 Summary of Potential Impacts and Mitigation Measures

A summary of potential impacts and mitigation measures are provided in **Table 10** (terrestrial resources) and **Table 11** (aquatic and fish habitat).

TABLE 10 – SUMMARY OF POTENTIAL IMPACTS TO TERRESTRIAL RESOURCES AND RECOMMENDED MITIGATION MEASURES

Project Activities	Feature	Potential Environmental Effects	Mitigation Measures
Permanent and Temporary Habitat Loss and Alteration			
<ul style="list-style-type: none"> Vegetation removal Excavation and grading Culvert and bridge works 	<ul style="list-style-type: none"> Wetlands (PSWs and unevaluated) Significant Woodlands SAR SWH Migratory Birds General wildlife General vegetation communities 	<p>Permanent and temporary habitat loss through vegetation removal and encroachment of natural areas related to road widening and culvert/structure works</p> <p>Temporary habitat loss and alteration associated with changes in community structure, composition, physical and chemical properties and edge effects etc.</p> <ul style="list-style-type: none"> Loss of ecological buffers Changes in hydrological regime, including physical and chemical properties Soil compaction Fugitive dust Introduction and spread of invasive species Erosion and sedimentation Accidental spills (e.g., deleterious substances) 	<ul style="list-style-type: none"> Limit the extent of encroachment through design. Time vegetation removals, where feasible, to occur during the late fall / winter months (October – March) which is outside of the following active period for most species. If vegetation removal is required during the active period, a preconstruction survey for wildlife shall be completed (see mitigation for injury and incidental take). Birds – April 1 – August 31 Reptiles (Turtles and Snakes) – April – October (migration is April-May and September-October) Bats – April 1 – September 30 If Barn Swallow nests are observed at any of the culverts and work has the potential to impact the species or the nest, the activity will need to be registered under O. Reg. 242/08 and a mitigation plan prepared. Tree removal in SAR bat habitat shall not occur during the active period which extends between April 1 to September 30, unless authorized by MECP. Develop and implement a compensation plan for the loss of wetlands and wildlife habitat. Time vegetation removals, where feasible, to occur during the late fall / winter months (October – March) which is outside of the active period for most species Install bat boxes in areas where bat habitat has been identified. Bat boxes shall be installed by April 1 or prior to vegetation removal. Maintain vegetated buffers between natural features, where possible. If this is not possible, time removal of these vegetated areas to occur after spring and summer. Minimum vegetated buffers include 30 m from PSWs, 15 m from non-PSWs and 10 m from woodlands; Re-vegetate disturbed areas with native vegetation following construction Maintain pre-construction drainage patterns, flow volumes and rates of discharge to protect the ecological functions of natural features. Restrict work to the construction zone and demarcate the limits to protect adjacent sensitive features and minimize soil compaction. Install tree protection fencing at the dripline to protect rooting zones for trees adjacent to the work zone. Implement measures for the suppression of fugitive dust (e.g., water sprays, mud tracking mats, cover exposed soils) Develop and implement an invasive species management measures that includes measures for the removal, storage and treatment of invasive species. Implement the Clean Equipment Protocol for Industry (Halloran et al., 2013) to minimize the introduction and spread of invasive species. Minimize the extent and duration of exposed soil to prevent sedimentation due to wind and rainfall erosion. Develop and implement an erosion and sediment control (ESC) plan to prevent erosion and off-site sedimentation. Construction monitoring should be completed to ensure ESC measures are in place and working effectively. ESC measures should be checked daily and before, during and after major rain events (>10 mm) to ensure it is installed and functioning properly. Any deficiencies should be repaired immediately. A construction monitoring log should be maintained to ensure any deficiencies and corrective actions are documented. Develop and implement an emergency response and control measures to address the potential for accidental spills. Ensure heavy equipment and all storage materials (hazardous and non-hazardous) are properly stored and all handling and refueling activities are located at least 30 m away from watercourses, wetlands and other sensitive features. Spill kits should be kept on-site and accessible at all times. All on-site materials should be self-contained, maintained according to manufacturer's instructions and disposed of appropriately. All waste resulting from construction should be removed from the site and disposed of at an appropriate facility. This includes packaging (bags, wraps, boxes, ties, etc.), waste materials (excess fill, cement, grout, asphalt, or other substances), and ESC structures (silt fencing, flow checks, etc.) once permanent vegetation has established and ESC measures are no longer required. Report any spills to the Ontario Ministry of the Environment, Conservation and Parks (MECP) Spills Action Centre (SAC) hotline (1-800-268-6060) and the Department of Fisheries and Oceans Canada (DFO).
HABITAT DISTURBANCE / AVOIDANCE AND CHANGES IN BEHAVIOUR			
<ul style="list-style-type: none"> Vegetation removal Excavation and grading Culvert and bridge works 	<ul style="list-style-type: none"> SAR SWH Migratory Birds General wildlife 	<ul style="list-style-type: none"> Construction Zone / Exclusionary Measures Human presence Noise Lighting Vibration 	<ul style="list-style-type: none"> Maintain connectivity between habitats to allow wildlife to access areas and movement corridors that may be impeded during construction. Where feasible, minimize the extent and duration of construction noise and lighting during sensitive seasons and to daylight hours. Avoid idling and ensure construction vehicles and machinery are kept in good repair. Direct artificial light away from natural areas and wildlife habitat.
INCIDENTAL TAKE AND INJURY			
<ul style="list-style-type: none"> Vegetation removal Excavation and grading Culvert and bridge works 	<ul style="list-style-type: none"> SAR SWH Migratory Birds General wildlife 	<ul style="list-style-type: none"> Accidental removal of nests/eggs Collisions with vehicles/machinery Discovery of overwintering/hibernacula 	<ul style="list-style-type: none"> Preventative measures (e.g., tarps) shall be installed on structural culverts and the Welland River Bridge, as necessary and if works occur during the active period (i.e., April 1 to August 31). The exclusionary measures shall be installed by April 1 to inhibit birds from nesting within the structures and monitored regularly for effectiveness. Restrict work to the construction zone and install exclusionary measures, as necessary, to prevent wildlife from accessing the work zone. Exclusionary measures shall not prohibit access to nearby habitats and should redirect wildlife to areas that allow safe passage to habitat. A pre-construction survey for bird nests shall be completed by a Qualified Biologist where vegetation removal occurs during the active breeding bird window, which generally extends between April 1 to August 31. Vegetation clearing shall take place within 24 to 48 hrs of the nest survey. If an active nest is found within the work area at any time (including outside of the typical nesting season), construction in the vicinity must cease until the young birds have fledged or the nest is otherwise abandoned. A setback from the nest (e.g., 30 m) should be identified and the area demarcated to ensure work does not occur within the setback limits. A Qualified Biologist shall be consulted to determine the setback limits. Conduct visual inspections for wildlife prior to the start of construction each day and regularly throughout the day during the active season. This will include a thorough walk-through of the work area and searching any vegetated areas, brush piles, logs or rock piles and equipment. Install in-water exclusionary measures in the Welland Canal by September 1 to prevent overwintering during bridge works. Overwintering turtles and snakes should not be relocated. If overwintering turtles or snakes are discovered during construction activities, work shall cease and NDMNRF or MECP shall be contacted. Implement speed limits to 30 km/hr in the construction zone to minimize the potential for incidental take of transient species.

Project Activities	Feature	Potential Environmental Effects	Mitigation Measures
			<ul style="list-style-type: none"> • If feasible, avoid storing stockpiles of soil or vegetation on site as wildlife may be attracted to these areas. • Review shoulder substrate for options that won't encourage turtle nesting near the road. This may include incorporating vegetated shoulders with low-lying native ground cover to limit habitat potential. • If potential turtle nest sites (i.e., areas of fresh digging in loose gravel or sandy material) are found within the work areas, all work in that area shall cease. The nests should be left undisturbed, flagged and a setback applied to protect against construction activities. If avoidance is not possible, egg salvage may be completed by a Qualified Biologist. • Immediately upon observation of an actively nesting female turtle, personnel and vehicles should clear the area within the turtle's line of sight as much as possible to allow the female to finish laying. Startling a nesting female could lead to abandonment of the partially laid nest before the eggs are concealed. • Wildlife protocols shall be developed to educate workers of potential wildlife occurrences and measures to take in the event of potential encounters. SAR training shall be provided to contractors and species information sheets will be provided to assist with identification and measures to take if encountered. • Wildlife relocations will only be performed as part of wildlife salvage or if an animal is in danger and field staff can do so safely. Relocations will be completed by a Qualified Biologist following the techniques outlined in the NDMNRF's Ontario Species at Risk Handling Manual: For <i>Endangered Species Act</i> Authorization Holders. The manual includes measures for safe handling, relocation, and transportation of live, injured, and dead animals. Injured wildlife will be captured and relocated to the nearest appropriate authorized wildlife rehabilitator (https://learningcompass.learmflex.net/Upload/Public/WildlifeRehabilitatorsPublicList.htm). • Wildlife should be relocated within 50 m of the capture location toward the direction they were heading and outside of the construction zone. • All injured wildlife (SAR or non-SAR) will be transported to an authorized wildlife rehabilitator. Euthanasia of injured wildlife is not permitted unless conducted by an authorized wildlife rehabilitator. If an animal is unable or unwilling to flee from human presence, it may be injured. Signs of wildlife injury include obvious wounds, broken limbs, lethargy, lameness, and difficulty standing or breathing. Injured wildlife experience high levels of stress and pain, and their behaviour is usually unpredictable and defensive, posing an increased risk to handlers. Always use extreme caution when handling injured wildlife, wear thick gloves, and limit handling as much as possible. Avoid aggravating any obvious injuries such as wounds or broken bones. Transport injured wildlife in accordance with the NDMNRF Species at Risk Handling Manual. • Any SAR observed must be reported to MECP within 24 hours. • A monitoring plan should be developed to ensure mitigation and contingency measures are implemented and performance objectives are being met.

TABLE 11 – SUMMARY OF POTENTIAL IMPACTS TO AQUATIC AND FISH HABITAT AND RECOMMENDED MITIGATION MEASURES

Project Phase and Activity	Impact Type	Potential Environmental Effects	Mitigation Measures
PERMANENT HABITAT LOSS AND ALTERATION			
<ul style="list-style-type: none"> Warren Creek and Grassy Brook Creek Culvert extensions Warren Creek Channel Realignment In-water pier construction for new Welland River bridge Replacement and extension at new location for Unnamed Tributary of Lyons Creek culvert 	Direct	<p>Permanent alteration of habitat (open stream habitat to closed stream habitat) from culvert extensions at Warren Creek and Grassy Brook Creek</p> <p>Potential permanent alteration of habitat due to Warren Channel realignment and</p> <p>Potential permanent loss of habitat due to construction of in-water bridge piers</p> <p>Potential permanent habitat loss through culvert replacement at a new location of culvert which conveys Unnamed Tributary of Lyons Creek</p> <p>Potential alteration to riparian habitat</p> <ul style="list-style-type: none"> Soil compaction Changes in moisture regime Spills (e.g., fuel) Sedimentation 	<ul style="list-style-type: none"> Ensure the appropriate in-water timing window is adhered to (July 1st – February 28/29th) Schedule work to avoid wet and rainy periods that may increase erosion and sedimentation and to avoid the input of contaminated run-off from entering the watercourse. Ensure that all in-water activities do not interfere with fish passage, constrict the channel width, or reduce flows. Contain all in-water works with use of a coffer dam designed and installed according to relevant Contract Specifications. Minimize duration of in-water work and conduct instream work during periods of low flow to further reduce the risk to fish and their habitat and to allow work in water to be contained. At no time can the channel be constricted fully during construction. Flow shall be maintained downstream at all times when cofferdams are in place, in order to maintain fish passage and habitats downstream. Retain a qualified environmental professional to ensure applicable permits for relocating fish from within the contained work area (i.e. cofferdams) are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site. Regular inspection, removal, and disposal of waste materials and sediment. No stockpiles of material within 30 m of the watercourse. Restore channel, watercourse banks, bed substrate and instream cover to pre-existing or better condition and seed to establish vegetative cover. Use of properly installed silt fencing or similar erosion control measures to prevent contaminated/sediment laden run-off water from entering either watercourse. Minimize vegetation removal where possible and proper clearing and grubbing techniques will be utilized. All retained vegetation will be delineated and protected. Install silt fence around disturbed area. Top soil and seed disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur. Develop and implement a riparian planting plan to ensure that cleared areas are restored to pre-construction conditions or better through planting of native trees and vegetation.
HABITAT DISTURBANCE/DISRUPTION			
<ul style="list-style-type: none"> Vegetation Removal 	Indirect	<ul style="list-style-type: none"> Bank instability and exposed soils Removal of shade Change in cover and habitat Increased erosion potential and potential for increased sedimentation Change in nutrient and contaminant concentration from runoff 	<p>In addition to the mitigation measures provided above the following measures should be implemented to avoid impacts to bank vegetation and stability include :</p> <ul style="list-style-type: none"> When practicable, prune or top the vegetation instead of grubbing/uprooting. Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the watercourse below the normal high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed. Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation through re-vegetation with native species (seed) suitable for the site. Restore bed and banks of the watercourse to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage must be restored. If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment. Banks disturbed by construction access and staging shall be re-graded to re-establish low banks to increase bank stability and make less susceptible to erosion.
<ul style="list-style-type: none"> Excavation/Grading 	Indirect	<ul style="list-style-type: none"> Bank instability and exposed soils Changes in slope and drainage Increased erosion potential Increased sedimentation 	<p>In addition to the mitigation measures provided above, the following erosion and sediment control measures shall also be implemented:</p> <ul style="list-style-type: none"> Use of effective erosion control measures including topsoil and seed, silt fence barriers, and erosion control blankets Design and implement erosion and sediment controls to contain/isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into either watercourse at all stages of the project using details outlined in OPSS 805. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the watercourse. Site isolation/containment measures (i.e. cofferdams) shall be implemented to isolate areas where in-water work is required. Cofferdams shall be designed according to relevant Contract Specifications. Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, uprooted or cut aquatic plants, accumulated debris) above the high water mark of either watercourse to prevent re-entry. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction. Repairs to erosion and sediment control measures and structures if damage occurs. Removal of non-biodegradable erosion and sediment control materials once site is stabilized
<ul style="list-style-type: none"> Operation of Machinery 	Indirect	<ul style="list-style-type: none"> Oil, grease and fuel leaks from equipment Increased contaminant concentrations Avoidance of habitats due to noise and disturbance 	<p>In addition to the mitigation measures provided above:</p> <ul style="list-style-type: none"> Machinery should arrive on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds for the duration of construction. Heavy machinery access will be limited to pre-defined areas within the existing ROW and along the banks of the watercourse above the normal high water mark. The watercourse will not be crossed (i.e. forded) or treated as machinery staging at any time. Whenever possible, operate machinery on land above the high water mark in a manner that minimizes disturbance to the banks and bed of the waterbody. Use temporary crossing structures or other practices to cross the watercourse. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording. Wash, refuel and service machinery and store fuel and other materials for the machinery a minimum of 30 m from any surface water features to prevent any deleterious substances from entering the water. Have spill kits onsite and drip pans under all non-mobile machinery. A Spill Prevention and Response Contingency Plan shall be prepared prior to commencement of construction operations A Spills Containment Kit (comprising, at the very least, absorbent materials to initially contain a spill, protective gear for the handling of hazardous materials, and the number (1-800-268-6060) for the Ministry of the Environment and Climate Change (MOECC) Spills Action Centre) shall be stored in proximity to each working area and clearly marked and accessible should a spill occur. Materials such as paint, primers, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.

Project Phase and Activity	Impact Type	Potential Environmental Effects	Mitigation Measures
			<ul style="list-style-type: none"> Ensure that building material to be used above or in proximity to the watercourse is handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
AVOIDANCE/CHANGES IN BEHAVIOUR			
<ul style="list-style-type: none"> In-water construction activities Site isolation Operation of Machinery 	Indirect	<ul style="list-style-type: none"> Restricted migration and access to habitats Displacement and/or stranding of fish Oil, grease and fuel leaks from equipment Increased contaminant concentrations Avoidance of habitats due to noise and disturbance 	<p>In addition to the mitigation measures provided above:</p> <ul style="list-style-type: none"> Ensure all in-water construction works are completed within the appropriate timing window of July 1st – February 28/29th Site isolation/containment measures (i.e. cofferdams) shall be implemented to isolate areas where in-water work is required. Cofferdams shall be designed according to relevant Contract Specifications When using a pump, the intake shall be controlled to prevent entry of fish and other aquatic wildlife. Intakes and outtakes shall be screened in accordance with the DFO Interim code of practice: end-of-pipe fish protection screens for small water intakes in freshwater to prevent the entrainment or impingement of fish Dewatering operations shall be directed to a sediment control device or natural attenuation area prior to discharge to the watercourse, if a natural attenuation area is used, a minimum 30 m setback shall be maintained from the watercourse; and When water is discharged to the watercourse, the water discharged shall be done in a manner that does not cause erosion or other damage to adjacent lands.
INCIDENTAL TAKE AND INJURY			
<ul style="list-style-type: none"> Fish and Mussel salvages 	Direct	<ul style="list-style-type: none"> Increased stress from handling Potential for limited mortality during salvage activities 	<p>In addition to the mitigation measures listed above:</p> <ul style="list-style-type: none"> Qualified biologists should be retained to complete fish salvages and mussel relocations. Ensure fish salvages are completed within the in-water timing window for construction of July 1st – February 28/29th outside the critical spawning and nursery/rearing periods Minimize time out of water during salvage activities Develop and implement mussel relocation plan. Ensure mussel relocation work is completed after June 15th or when water temperatures are above 16°C. Any SAR observed should be reported to DFO and MECP within 24 hours. Species should not be handled unless by a Qualified Biologist.

7. Permitting and Approvals

7.1 Fisheries Act

As some project activities associated with the Montrose Road improvements including new bridge construction, culvert replacements, channel realignment and culvert extensions may have the potential to result in a HADD of fish habitat and prohibited effects on SAR, the project will likely need to be referred to DFO, requesting a project review under the Fisheries Protection Provisions of the *Fisheries Act*. Should DFO determine that the project will not result in the death of fish, a HADD of fish habitat or prohibited effects on SAR the project may proceed without a *Fisheries Act* Authorization. Alternatively, should DFO determine that the project will result in the death of fish, a HADD of fish habitat or prohibited effects on SAR, a *Fisheries Act* Authorization will be required which will require the development of an associated offsetting plan to compensate for the impacts to existing fish and fish habitat likely to result from project works. A Request for Review application should be prepared and submitted to DFO during the detailed design process for project review.

7.2 Conservation Authorities Act

The study area is within the jurisdiction of the of the NPCA and overlaps areas within the “Approximate Regulation Lands”. Under O. Reg. 155/06: *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*, a permit will be required for works within the NPCA Approximate Regulation Lands. This includes regulated watercourses and wetlands, such as Warren Creek, an Unnamed Tributary of Warren Creek, Warren Creek PSW, Welland River, Welland River East PSW, Grassy Brook Creek, Lower Grassy Brook PSW, Unnamed Tributary of Lyons Creek, Lyons Creek North PSW and Lyons Creek PSW. Consultation with NPCA is currently underway to discuss permitting requirements.

7.3 Endangered Species Act

7.3.1 TERRESTRIAL SPECIES AT RISK

Potential habitat for SAR bats has been identified throughout the study area which may require a permit under the ESA. Initial consultation with MECP was conducted during this Environmental Assessment for a preliminary review of potential SAR bat habitat and next steps. Additional consultation with MECP is required for potential SAR impacts and an Information Gathering Form (IGF) should be submitted to MECP for review to determine if a permit or additional studies are required.

Barn Swallow has the potential to occur within structural culverts and the Welland River bridge. There were no Barn Swallow nests observed in the culverts; however, a targeted survey under the Welland River bridge was not completed. It is recommended that targeted surveys for Barn Swallow be completed prior to construction. If Barn Swallow nests are observed and may be impacted by the Project, the activities will need to be registered under O. Reg. 242/08 of the ESA.

7.3.2 AQUATIC SPECIES AT RISK

Species listed as Endangered or Threatened under the ESA receive species and habitat protections under these pieces of legislation. Species listed as Special Concern do not receive the protections afforded by these acts however DFO and MECP consider watercourses which contain these species to be of higher sensitivity. Both DFO and MECP may provide additional recommendations for measures to protect fish and fish habitat for watercourses which support Special Concern species.

Both Round Hickorynut and Kidneyshell, which are listed as ‘Endangered’ and protected provincially under the ESA, were identified as potentially present within the Welland River and Grassy Brook Creek in the Montrose Road study area.

Authorization under the ESA is required for construction activities which have the potential to impact these species or their habitat. Further consultation should be undertaken with MECP during the detailed design process to identify potential permitting requirements under the ESA for these species.

Round Hickorynut and Kidneyshell are also listed as 'Endangered' and protected federally on Schedule 1 of the SARA. Construction works which have the potential to impact these species or their habitat, including critical habitat are in contravention of the prohibitions of the SARA. Project works which are identified to potentially impact federally protected SAR and result in prohibited effects on SAR must be referred to DFO for further project review under the SARA. A request for review form should be completed and submitted to DFO to assess the proposed works with potential to impact federally protected SAR resulting in prohibited effects to SAR. Approval for these works can take the form of a SARA permit and Letter of Advice (LOA) outlining additional mitigation measures to protect SAR and/or a SARA Compliant *Fisheries Act* Authorization.

Grass Pickerel, listed as Special Concern under the ESA and on Schedule 1 of the SARA has been identified as potentially present in Warren Creek, the Welland River, Grassy Brook Creek, Lyons Creek and the Unnamed Tributary of Lyons Creek. As noted above, watercourses which provide habitat for these species may be considered of higher sensitivity and enhanced measures to protect fish and fish habitat may be recommended by DFO and MECP. Further consultation with DFO and MECP should be undertaken during detail design to determine whether enhanced measures to protect fish habitat should be implemented at these locations.

8. Opportunities and Constraints

8.1 TERRESTRIAL ENVIRONMENT

The proposed Project will encroach within natural heritage features as a result of road widening and culvert works. This includes direct impacts to wetlands (including PSWs), woodlands (including significant woodlands), meadow and thicket communities and candidate and confirmed SWH. Impacts to SAR, specifically bats, is also anticipated and may require a permit under the ESA; discussions with MECP are currently underway.

As part of the detailed design component of the Project from Grassy Brook Road to Biggar Road / Lyons Creek Road, consideration has been made to minimize the extent of encroachment, where possible. Where avoidance is not possible, compensation for the loss of habitat is recommended. Opportunities for compensation include:

- Revegetate disturbed areas following construction with native species and a focus on enhancing wildlife habitat.
- Compensate for the loss of wetlands by enhancing existing PSWs, if possible. This may include plantings in existing PSWs or creating habitat in surrounding areas.
- Enhance connectivity and habitat between vegetation communities through plantings.
- Installation of rocket-style bat boxes to mitigate the loss of candidate SWH. Requirements for permitting and compensation for impacts to SAR bats will be determined through consultation with MECP.

8.2 AQUATIC ENVIRONMENT

A number of biological constraints, as they relate to fish and fish habitat and SAR habitat exist within the study area. All structure locations have been previously disturbed however, the extent of the replacement and rehabilitation works are currently unknown, therefore it is unclear if there will be any significant impacts to watercourse within the study area.

Background research and field studies coupled with agency consultation were used in the determination of habitat function and significance, including:

- Significant fish and fish habitat;
- Important and exceptional habitat features;
- Aquatic resources and hydrology;
- Groundwater recharge, discharge and high groundwater table areas; and
- SAR habitat.

The Welland River and Grassy Brook Creek are considered Type 1 Critical Fish habitat. Type 1 habitat areas require a high degree of protection and are those areas identified to limit the overall productivity of the fish community which if altered would reduce the productive capacity. Sensitive species and/or habitats are usually present but do not need to be present. This designation also pertains to springs, seeps and upwelling areas, seasonally inundated spawning habitats, refugia, nursery areas, over wintering areas, ephemeral pools and other areas sensitive species depend on to fulfill life cycle requirements. Both the Welland River and Grassy Brook Creek have the potential to support SAR mussels as suitable habitat was observed during field investigations.

Warren Creek and the Unnamed Tributary of Lyons Creek are considered Type 2 Important Fish Habitat. Type 2 habitat is important to the resident fish community but is below its productive capacity. Sensitive species may or not be present at certain times of the year and these areas are linked/contribute to areas known to support sensitive species. Type 2 fish habitat areas have been identified as ideal for enhancement and restoration opportunities. Within Warren Creek potential SAR mussel habitat has been identified downstream of the QEW approximately 75 m downstream of the Montrose Road crossing. Due to the intermittent nature of the Unnamed Tributary of Lyons Creek, it is unlikely it provides suitable habitat or supports SAR mussels within the study area.

To avoid potential negative impacts to fish habitat as a result of road improvement works, it is recommended that in-water work be avoided and/or minimized where possible. Open foot culvert extensions at the Warren Creek and the Unnamed Tributary of Lyons Creek should include the placement of natural streambed material within them and a shaped low flow channel to ensure fish passage. The dual box culvert extensions at Grassy Brook Creek should be

properly embedded and include the placement of natural stream bed material with a defined low flow channel to facilitate fish migration during low flow periods. The realignment of the Warren Creek channel on the west side of Montrose Road should be designed and constructed following natural channel design principles including a meandering channel, diverse channel morphological features, defined low flow channel and incorporate fish habitat features (i.e. rootwads, boulder clusters, anchored log structures) where possible. In addition, a landscape plan and planting plan should be developed to re-vegetate and enhance the riparian zone along all watercourse banks disturbed by construction activities.

Drainage and Stormwater Management (SWM) improvements should be designed to meet applicable regional and provincial criteria and guidelines and incorporate appropriate Low Impact Development (LIDs) and other at-source and end-of-pipe controls so that proposed road and drainage/SWM improvements will not adversely impact adjacent watercourse and fish habitat.

Should further consultation with DFO and MECP identify high potential for SAR mussels or SAR fish to be present, additional surveys may be warranted to determine the specific habitat to be impacted by proposed in-water works in these areas to ensure no critical habitat areas are lost as a result of construction.

The sensitivity and significance of aquatic resources as well as aquatic constraints within the study area are shown in **Appendix A, Figure 6**.

9. References

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Appendix A

Project Maps

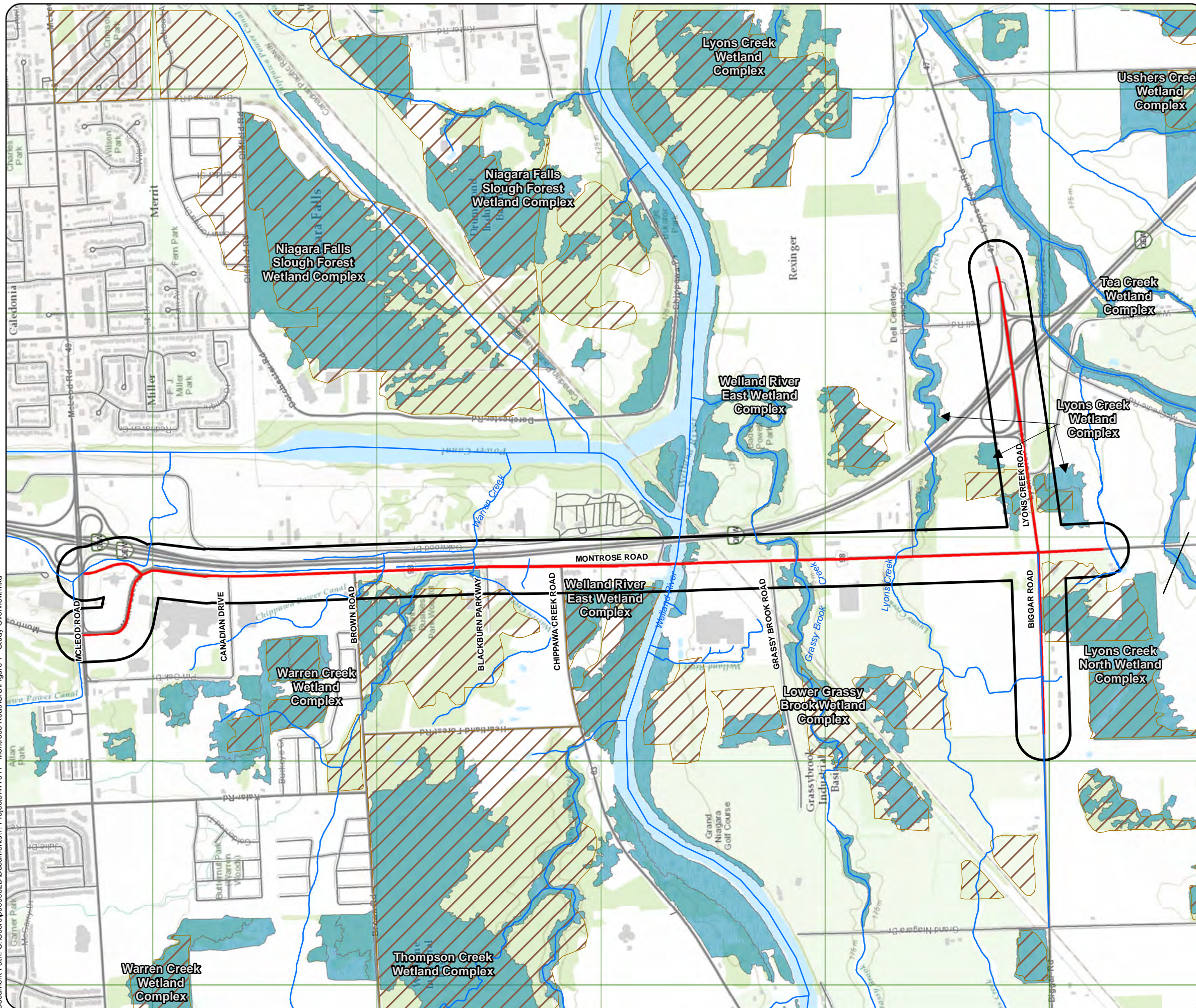


Figure 1 - Study Area Overview



LEGEND

- Road
- Watercourse
- Project Limits (Approximate)
- Study Area (120-m)
- Deer Wintering Area (Stratum 2)
- Provincially Significant Wetland (PSW)

1:17,000 Kilometers
0 0.5 1

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/20/2021	PREPARED BY: M.E.
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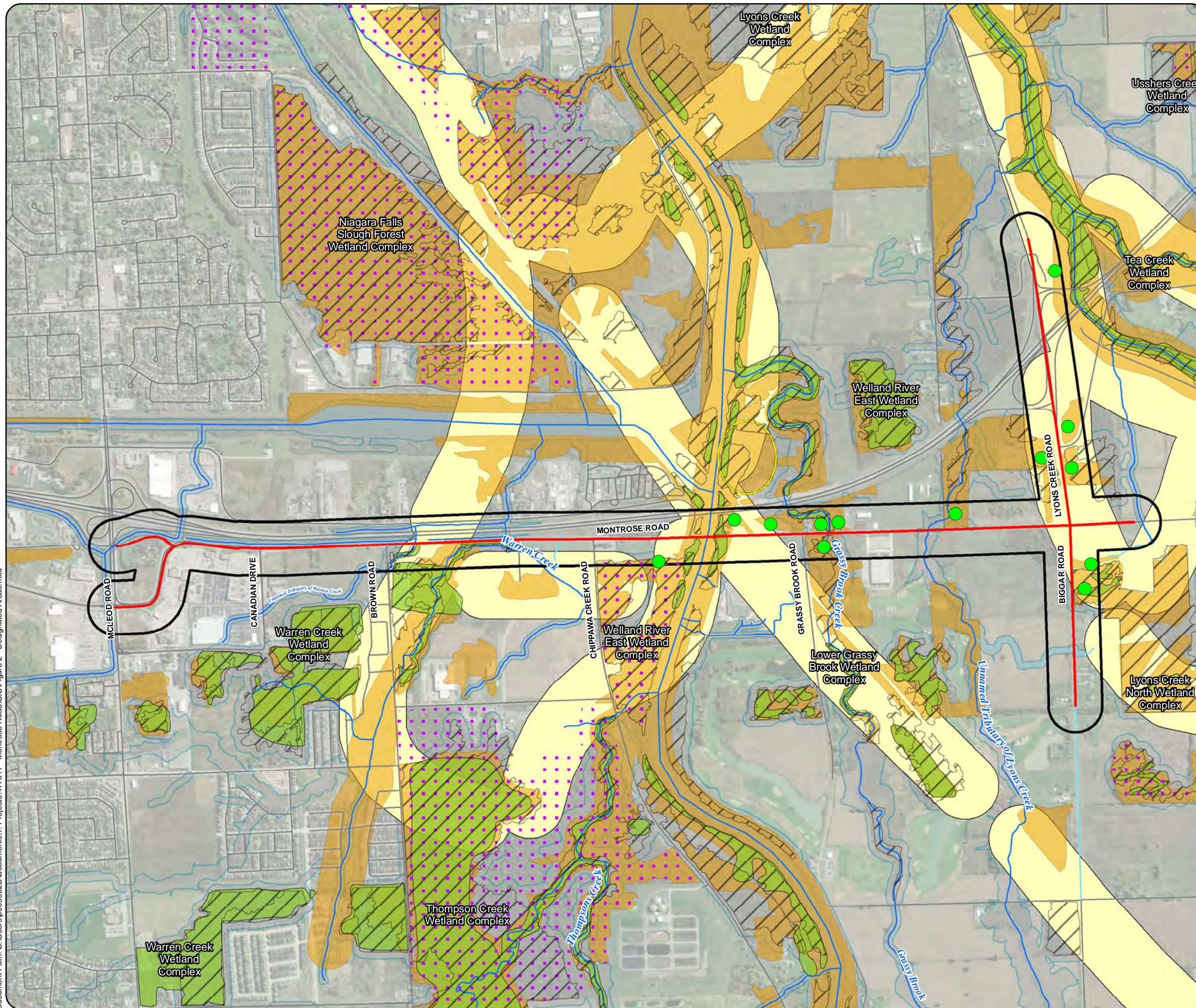
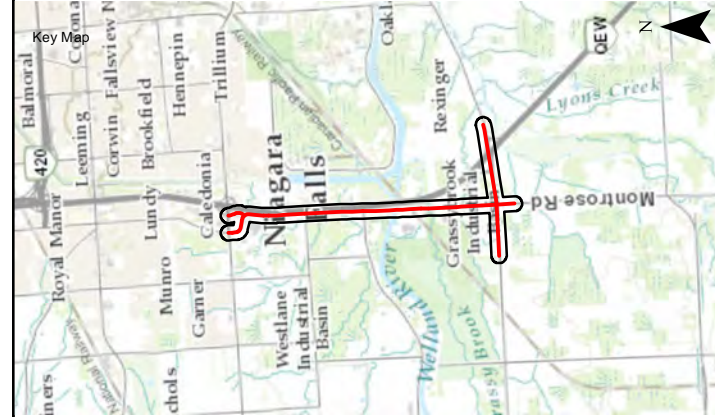


Figure 2 - Designated Areas



LEGEND

- Road
- Watercourse
- Project Limits (Approximate)
- Study Area (120-m)
- Provincially Significant Wetland (PSW)

Niagara Region

- Significant Woodland
- Environmental Conservation Area (ECA)
- Environmental Protection Area (EPA)
- Potential Natural Heritage Corridor
- Significant Prairie Savannah

Niagara Peninsula Conservation Authority (NPCA)

- NPCA Approximate Regulation Lands
- Environmental Sensitive Area (Unofficial)

1:17,000 Kilometers
0 0.5 1

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

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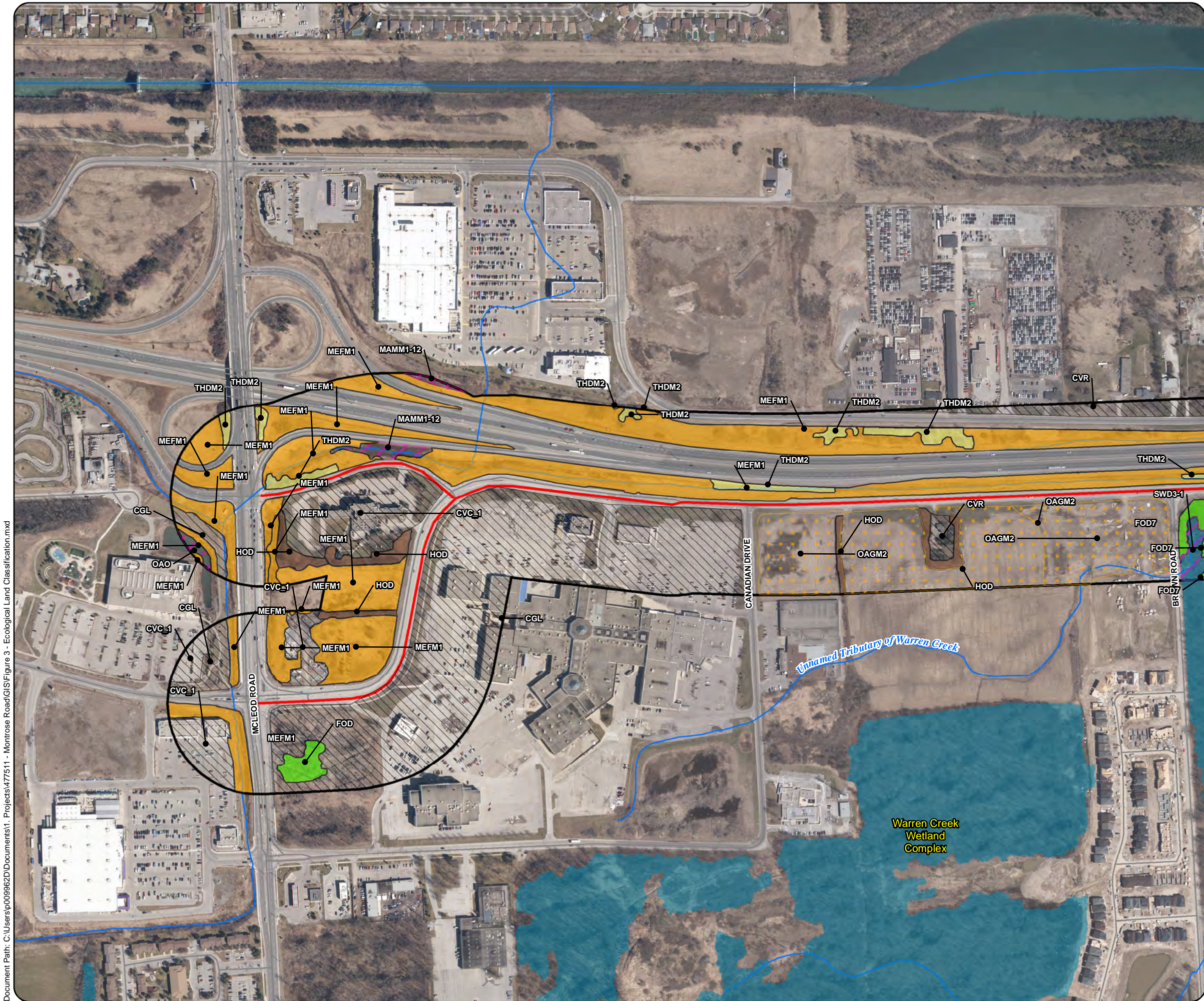
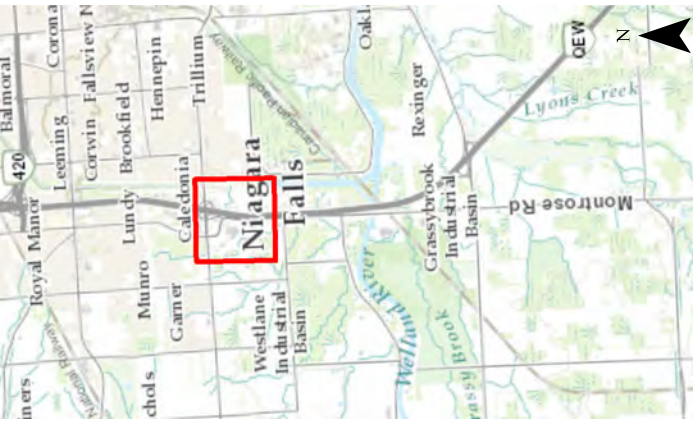


Figure 3 (Map 1 of 5) - Ecological Land Classification



- LEGEND**
- Road
 - Watercourse
 - Project Limits (Approximate)
 - ▭ Study Area (120-m)
 - ▭ Provincially Significant Wetland (PSW)
 - ▭ Woodland Removed (Future Niagara Hospital)

- Ecological Land Classification (ELC)**
- ▭ Agriculture
 - ▭ Meadow
 - ▭ Woodland
 - ▭ Constructed
 - ▭ Thicket
 - ▭ Wetland
 - ▭ Hedgerow

Agriculture	Woodland
OAGM Perennial Cover Crop (Meadow)	CUW Cultural Woodland Ecosite
OAGM1 Annual Row Crops (Soybean)	FOC Coniferous Forest Ecosite
OAGM2 Perennial Cover Crop (Meadow)	FOD Deciduous Forest Ecosite
Constructed	FOD2-4 Dry - Fresh Oak - Hardwood Deciduous Forest Type
CGL Manicured Lawn	FOD7 Fresh - Moist Lowland Deciduous Forest Ecosite
CGL_1 Golf Course	FOD9 Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
CVC Commercial and Institutional	Wetland
CVC_1 Business Sector	MAM Meadow Marsh Ecosite
CVR Residential Property	MAM2-2 Reed-cannary Grass Mineral Meadow Marsh Type
CVS_2 Hospital (to be constructed)	MAMM1-12 Common Reed Graminoid Mineral Meadow Marsh Type
Meadow	MAMM1-2 Cattail Graminoid Mineral Meadow Marsh Type
MEFM1 Dry - Fresh Forb Meadow Ecosite	MAS Mineral Shallow Marsh Ecosite
MEGM3 Dry - Fresh Graminoid Meadow Ecosite	MAS2-1 Cattail Mineral Shallow Marsh Type
Hedgerow and Thicket	OAO Open Aquatic
HOD Deciduous Hedgerow	SWD Deciduous Swamp Ecosite
THDM2 Dry - Fresh Deciduous Shrub Thicket Ecosite	SWD1-3 Pin Oak Mineral Deciduous Swamp Type
THDM2-4 Gray Dogwood Deciduous Shrub Thicket Type	SWD2-2 Green Ash Mineral Deciduous Swamp Type
	SWD4-2 White Elm Mineral Deciduous Swamp Type
	SWT2-5 Red-osier Mineral Thicket Swamp Type
	SWT2-9 Gray Dogwood Mineral Thicket Swamp Type

1:5,000 Kilometers
DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment
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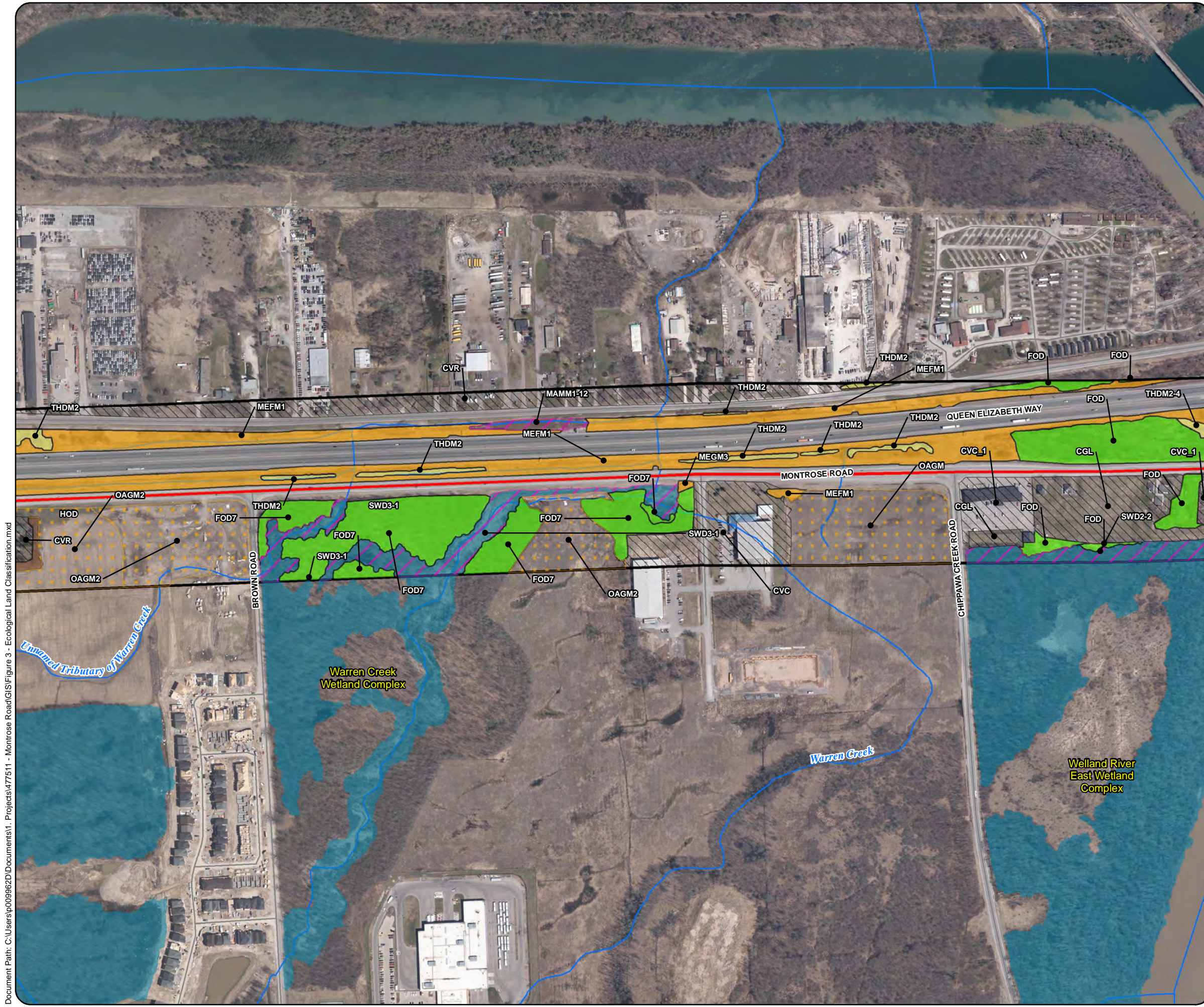
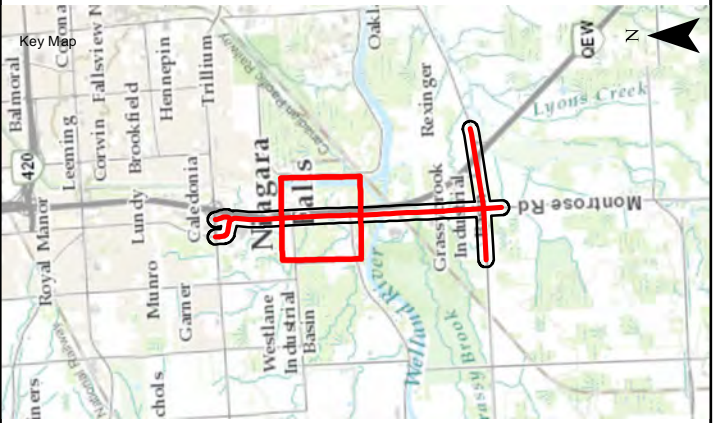


Figure 3 (Map 2 of 5) - Ecological Land Classification



- LEGEND**
- Road
 - Watercourse
 - Project Limits (Approximate)
 - Study Area (120-m)
 - Provincially Significant Wetland (PSW)
 - ▨ Woodland Removed (Future Niagara Hospital)

- Ecological Land Classification (ELC)**
- Agriculture
 - Meadow
 - Woodland
 - ▨ Constructed
 - Thicket
 - Hedgerow
 - ▨ Wetland

Agriculture	Woodland
OAGM Perennial Cover Crop (Meadow)	CUW Cultural Woodland Ecosite
OAGM1 Annual Row Crops (Soybean)	FOC Coniferous Forest Ecosite
OAGM2 Perennial Cover Crop (Meadow)	FOD Deciduous Forest Ecosite
Constructed	FOD2-4 Dry - Fresh Oak - Hardwood Deciduous Forest Type
CGL Manicured Lawn	FOD7 Fresh - Moist Lowland Deciduous Forest Ecosite
CGL_1 Golf Course	FOD9 Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
CVC Commercial and Institutional	Wetland
CVC_1 Business Sector	MAM Meadow Marsh Ecosite
CVR Residential Property	MAM2-2 Reed-canary Grass Mineral Meadow Marsh Type
CVS_2 Hospital (to be constructed)	MAMM1-12 Common Reed Graminoid Mineral Meadow Marsh Type
Meadow	MAMM1-2 Cattail Graminoid Mineral Meadow Marsh Type
MEFM1 Dry - Fresh Forb Meadow Ecosite	MAS Mineral Shallow Marsh Ecosite
MEGM3 Dry - Fresh Graminoid Meadow Ecosite	MAS2-1 Cattail Mineral Shallow Marsh Type
Hedgerow and Thicket	OAO Open Aquatic
HOD Deciduous Hedgerow	SWD Deciduous Swamp Ecosite
THDM2 Dry - Fresh Deciduous Shrub Thicket Ecosite	SWD1-3 Pin Oak Mineral Deciduous Swamp Type
THDM2-4 Gray Dogwood Deciduous Shrub Thicket Type	SWD2-2 Green Ash Mineral Deciduous Swamp Type
	SWD4-2 White Elm Mineral Deciduous Swamp Type
	SWT2-5 Red-osier Mineral Thicket Swamp Type
	SWT2-9 Gray Dogwood Mineral Thicket Swamp Type

1:5,000 Kilometers
DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment
 Montrose Road and Lyons Creek Road/Biggar Road
 Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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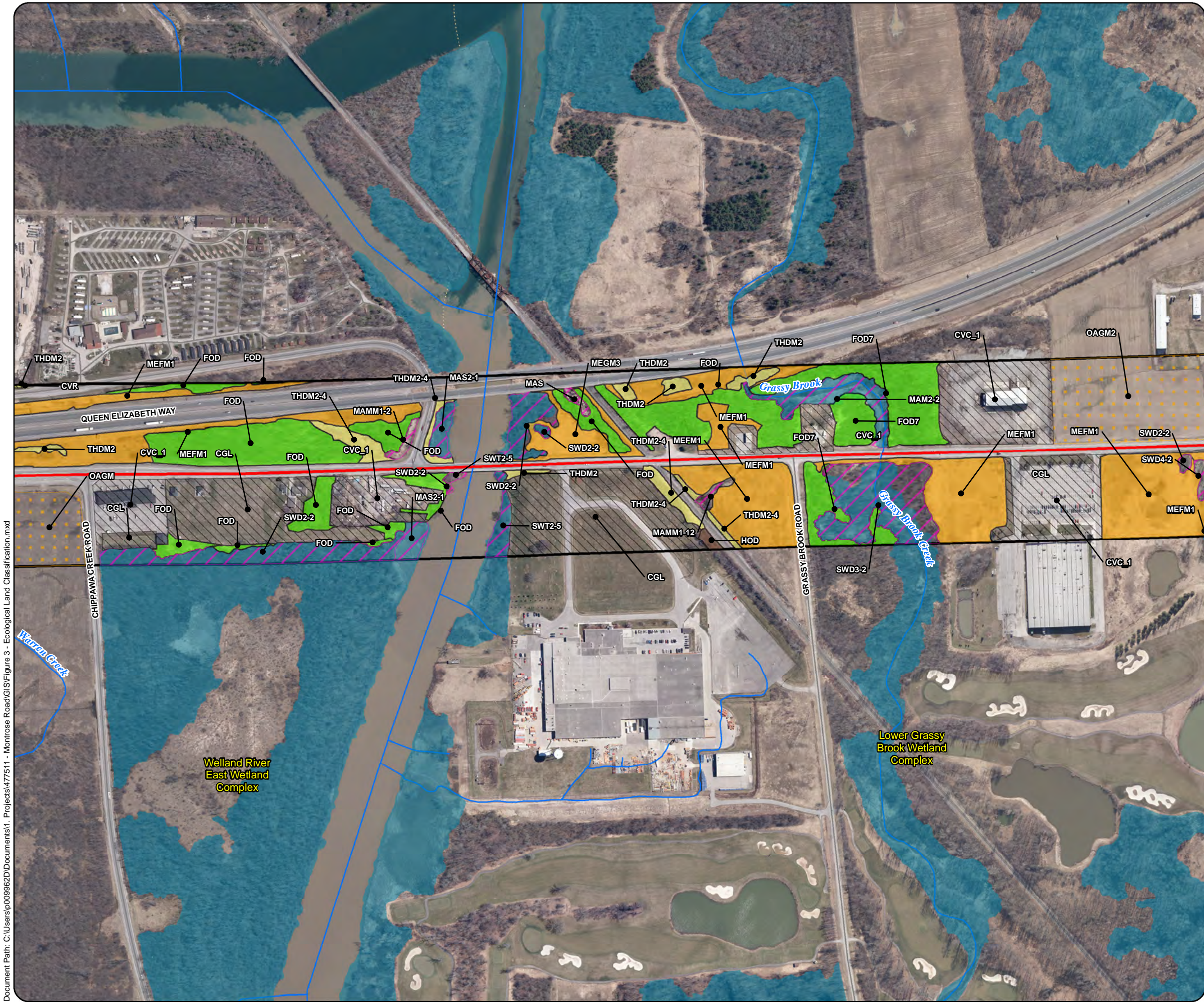


Figure 3 (Map 3 of 5) - Ecological Land Classification



- LEGEND**
- Road
 - Watercourse
 - Project Limits (Approximate)
 - ▭ Study Area (120-m)
 - ▭ Provincially Significant Wetland (PSW)
 - ▭ Woodland Removed (Future Niagara Hospital)

- Ecological Land Classification (ELC)**
- ▭ Agriculture
 - ▭ Meadow
 - ▭ Woodland
 - ▭ Constructed
 - ▭ Thicket
 - ▭ Hedgerow
 - ▭ Wetland

Agriculture	Woodland
OAGM Perennial Cover Crop (Meadow)	CUW Cultural Woodland Ecosite
OAGM1 Annual Row Crops (Soybean)	FOC Coniferous Forest Ecosite
OAGM2 Perennial Cover Crop (Meadow)	FOD Deciduous Forest Ecosite
Constructed	FOD2-4 Dry - Fresh Oak - Hardwood Deciduous Forest Type
CGL Manicured Lawn	FOD7 Fresh - Moist Lowland Deciduous Forest Ecosite
CGL_1 Golf Course	FOD9 Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
CVC Commercial and Institutional	Wetland
CVC_1 Business Sector	MAM Meadow Marsh Ecosite
CVR Residential Property	MAM2-2 Reed-canary Grass Mineral Meadow Marsh Type
CVS_2 Hospital (to be constructed)	MAMM1-12 Common Reed Graminoid Mineral Meadow Marsh Type
Meadow	MAMM1-2 Cattail Graminoid Mineral Meadow Marsh Type
MEFM1 Dry - Fresh Forb Meadow Ecosite	MAS Mineral Shallow Marsh Ecosite
MEGM3 Dry - Fresh Graminoid Meadow Ecosite	MAS2-1 Cattail Mineral Shallow Marsh Type
Hedgerow and Thicket	OAO Open Aquatic
HOD Deciduous Hedgerow	SWD Deciduous Swamp Ecosite
THDM2 Dry - Fresh Deciduous Shrub Thicket Ecosite	SWD1-3 Pin Oak Mineral Deciduous Swamp Type
THDM2-4 Gray Dogwood Deciduous Shrub Thicket Type	SWD2-2 Green Ash Mineral Deciduous Swamp Type
	SWD4-2 White Elm Mineral Deciduous Swamp Type
	SWT2-5 Red-osier Mineral Thicket Swamp Type
	SWT2-9 Gray Dogwood Mineral Thicket Swamp Type

1:5,000 Kilometers

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment
 Montrose Road and Lyons Creek Road/Biggar Road
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PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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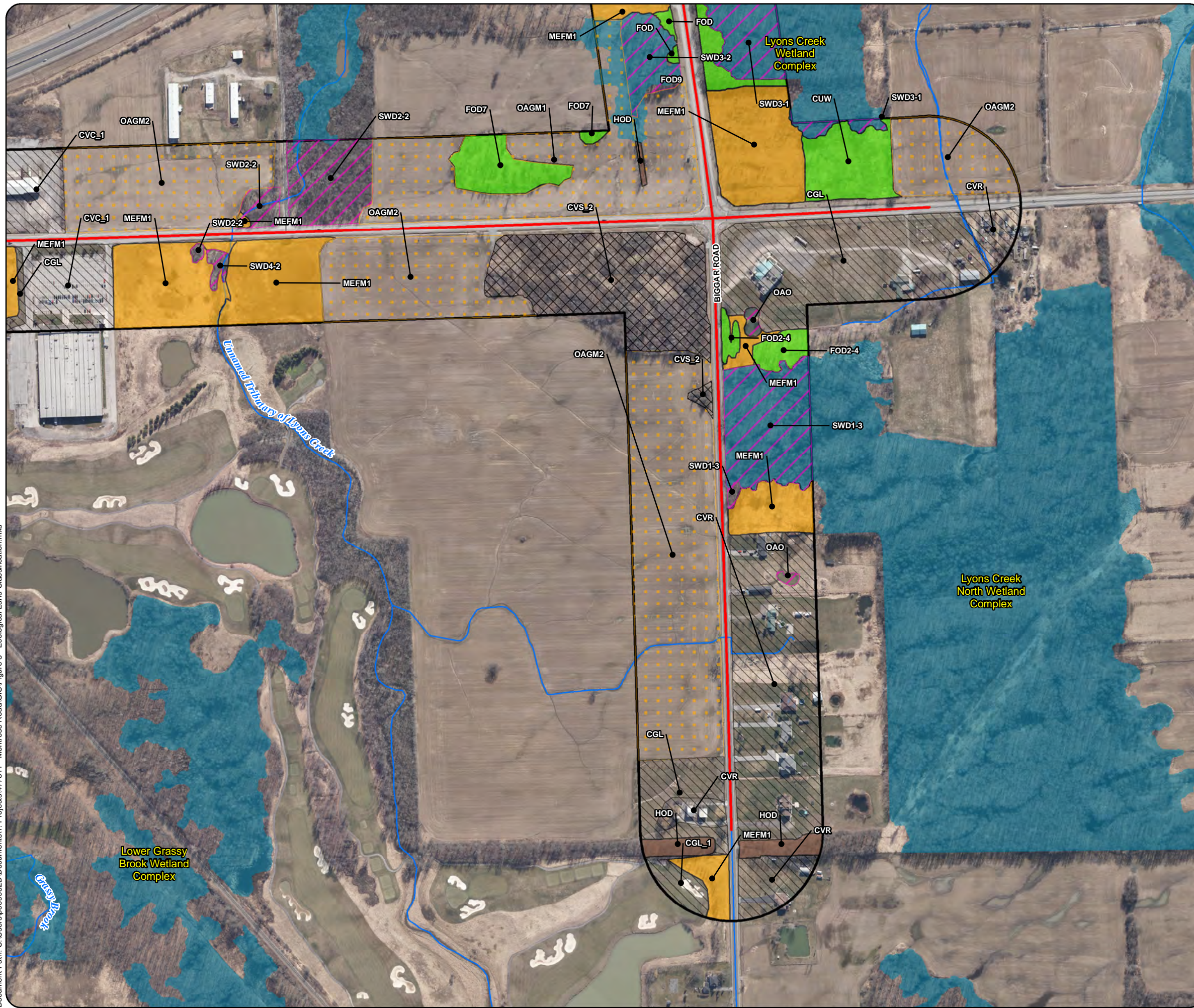
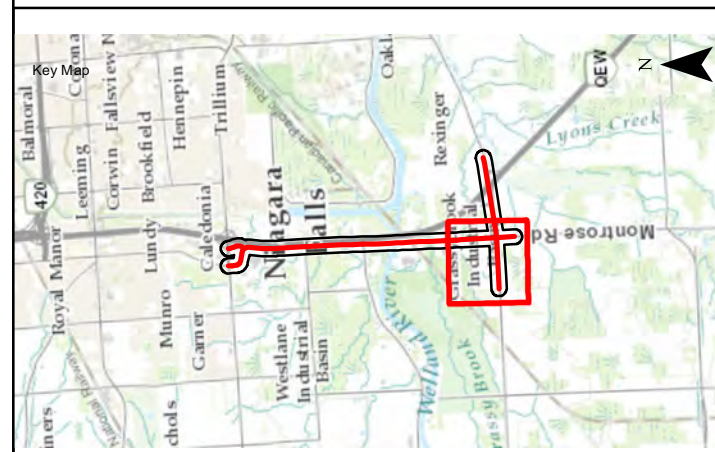


Figure 3 (Map 4 of 5) - Ecological Land Classification



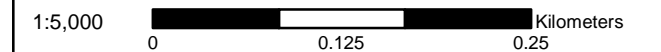
LEGEND

- Road
- Watercourse
- Project Limits (Approximate)
- Study Area (120-m)
- Provincially Significant Wetland (PSW)
- Woodland Removed (Future Niagara Hospital)

Ecological Land Classification (ELC)

- Agriculture
- Meadow
- Woodland
- Constructed
- Thicket
- Wetland
- Hedgerow

Agriculture	Woodland
OAGM Perennial Cover Crop (Meadow)	CUW Cultural Woodland Ecosite
OAGM1 Annual Row Crops (Soybean)	FDC Coniferous Forest Ecosite
OAGM2 Perennial Cover Crop (Meadow)	FOD Deciduous Forest Ecosite
Constructed	Wetland
CGL Manicured Lawn	FOD2-4 Dry - Fresh Oak - Hardwood Deciduous Forest Type
CGL_1 Golf Course	FOD7 Fresh - Moist Lowland Deciduous Forest Ecosite
CVC Commercial and Institutional	FOD9 Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
CVC_1 Business Sector	Meadow
CVR Residential Property	MAM Meadow Marsh Ecosite
CVR_2 Hospital (to be constructed)	MAM2-2 Reed-cannary Grass Mineral Meadow Marsh Type
Meadow	MAMM1-12 Common Reed Graminoid Mineral Meadow Marsh Type
MEFM1 Dry - Fresh Forb Meadow Ecosite	MAMM1-2 Cattail Graminoid Mineral Meadow Marsh Type
MEGM3 Dry - Fresh Graminoid Meadow Ecosite	MAS Mineral Shallow Marsh Ecosite
Hedgerow and Thicket	MAS2-1 Cattail Mineral Shallow Marsh Type
HOD Deciduous Hedgerow	OAO Open Aquatic
THDM2 Dry - Fresh Deciduous Shrub Thicket Ecosite	SWD Deciduous Swamp Ecosite
THDM2-4 Gray Dogwood Deciduous Shrub Thicket Type	SWD1-3 Pin Oak Mineral Deciduous Swamp Type
	SWD2-2 Green Ash Mineral Deciduous Swamp Type
	SWD4-2 White Elm Mineral Deciduous Swamp Type
	SWT2-5 Red-osier Mineral Thicket Swamp Type
	SWT2-9 Gray Dogwood Mineral Thicket Swamp Type



DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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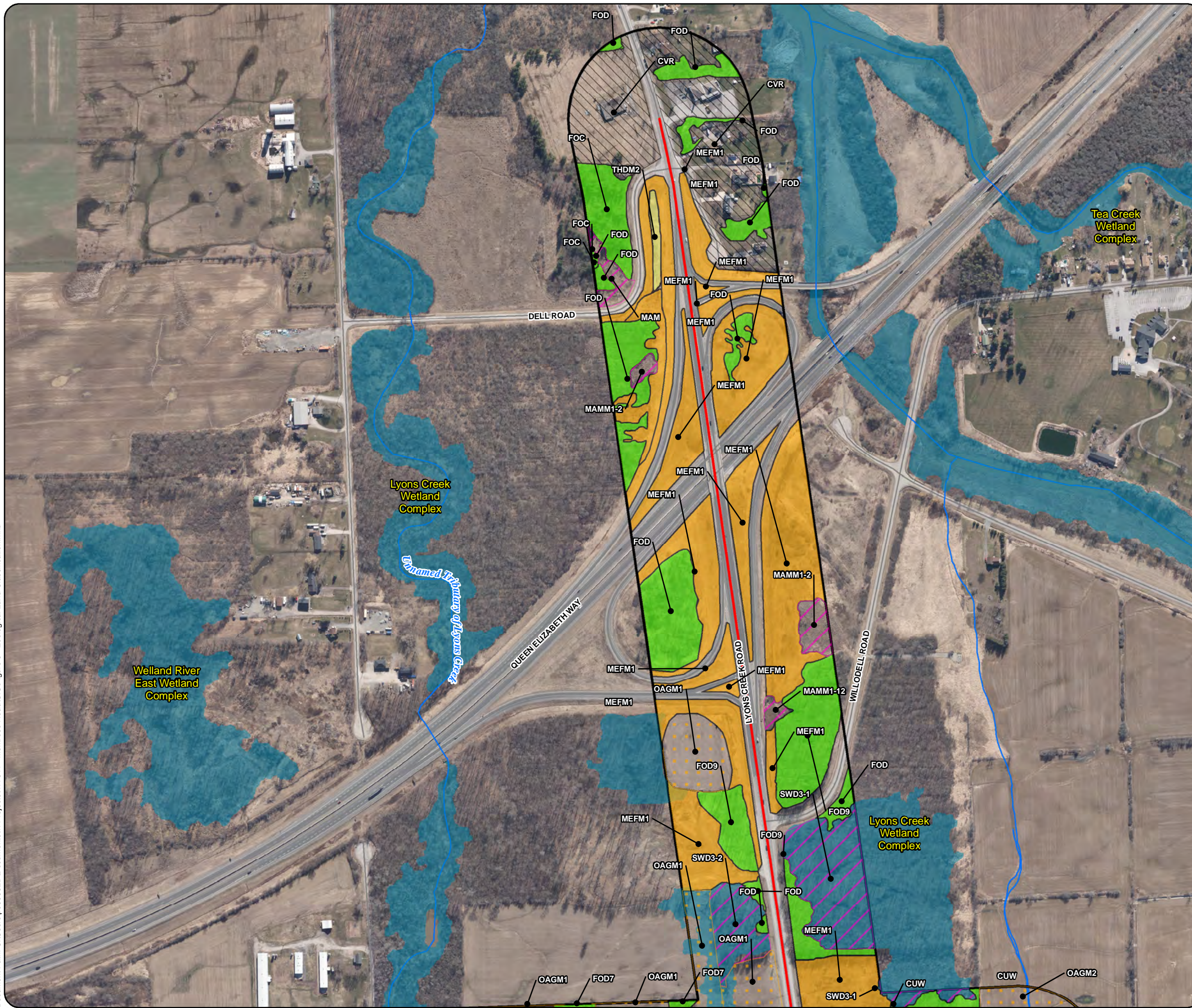


Figure 3 (Map 5 of 5) - Ecological Land Classification



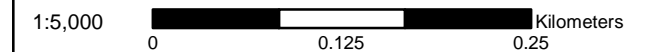
LEGEND

- Road
- Watercourse
- Project Limits (Approximate)
- ▭ Study Area (120-m)
- ▭ Provincially Significant Wetland (PSW)
- ▭ Woodland Removed (Future Niagara Hospital)

Ecological Land Classification (ELC)

- ▭ Agriculture
- ▭ Meadow
- ▭ Woodland
- ▭ Constructed
- ▭ Thicket
- ▭ Wetland
- ▭ Hedgerow

Agriculture	Woodland
OAGM Perennial Cover Crop (Meadow)	CUW Cultural Woodland Ecosite
OAGM1 Annual Row Crops (Soybean)	FOC Coniferous Forest Ecosite
OAGM2 Perennial Cover Crop (Meadow)	FOD Deciduous Forest Ecosite
Constructed	FOD2-4 Dry - Fresh Oak - Hardwood Deciduous Forest Type
CGL Manicured Lawn	FOD7 Fresh - Moist Lowland Deciduous Forest Ecosite
CGL_1 Golf Course	FOD9 Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
CVC Commercial and Institutional	Wetland
CVC_1 Business Sector	MAM Meadow Marsh Ecosite
CVR Residential Property	MAM2-2 Reed-cannary Grass Mineral Meadow Marsh Type
CVS_2 Hospital (to be constructed)	MAMM1-12 Common Reed Graminoid Mineral Meadow Marsh Type
Meadow	MAMM1-2 Cattail Graminoid Mineral Meadow Marsh Type
MEFM1 Dry - Fresh Forb Meadow Ecosite	MAS Mineral Shallow Marsh Ecosite
MEGM3 Dry - Fresh Graminoid Meadow Ecosite	MAS2-1 Cattail Mineral Shallow Marsh Type
Hedgerow and Thicket	OAD Open Aquatic
HOD Deciduous Hedgerow	SWD Deciduous Swamp Ecosite
THDM2 Dry - Fresh Deciduous Shrub Thicket Ecosite	SWD1-3 Pin Oak Mineral Deciduous Swamp Type
THDM2-4 Gray Dogwood Deciduous Shrub Thicket Type	SWD2-2 Green Ash Mineral Deciduous Swamp Type
	SWD4-2 White Elm Mineral Deciduous Swamp Type
	SWT2-5 Red-osier Mineral Thicket Swamp Type
	SWT2-9 Gray Dogwood Mineral Thicket Swamp Type



DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

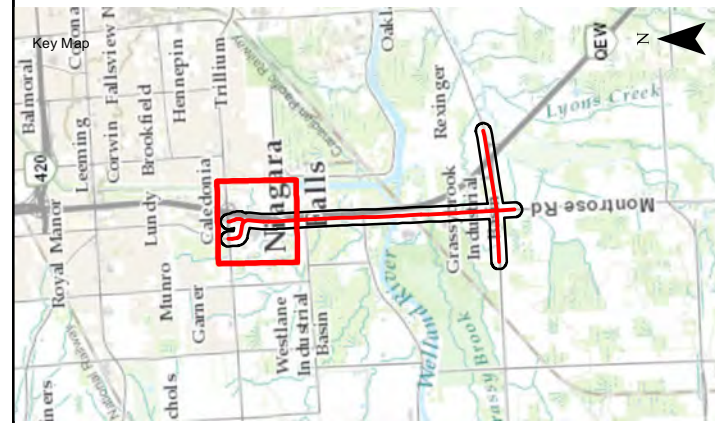
Montrose Road and Lyons Creek Road/Biggar Road
Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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Figure 4 (Map 1 of 5) - Wetlands and Woodlands



LEGEND

- Significant Woodland (Niagara Region)
 - Road
 - Watercourse
 - Project Limits (Approximate)
 - ▭ Study Area (120-m)
 - ▭ NPCA Approximate Regulation Lands
 - ▭ Provincially Significant Wetland (PSW)
- Ecological Land Classification**
- ▨ Wetland
 - ▭ Woodland
 - ▨ Woodland Removed (Future Niagara Hospital)

1:5,000 Kilometers
 0 0.125 0.25

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
 Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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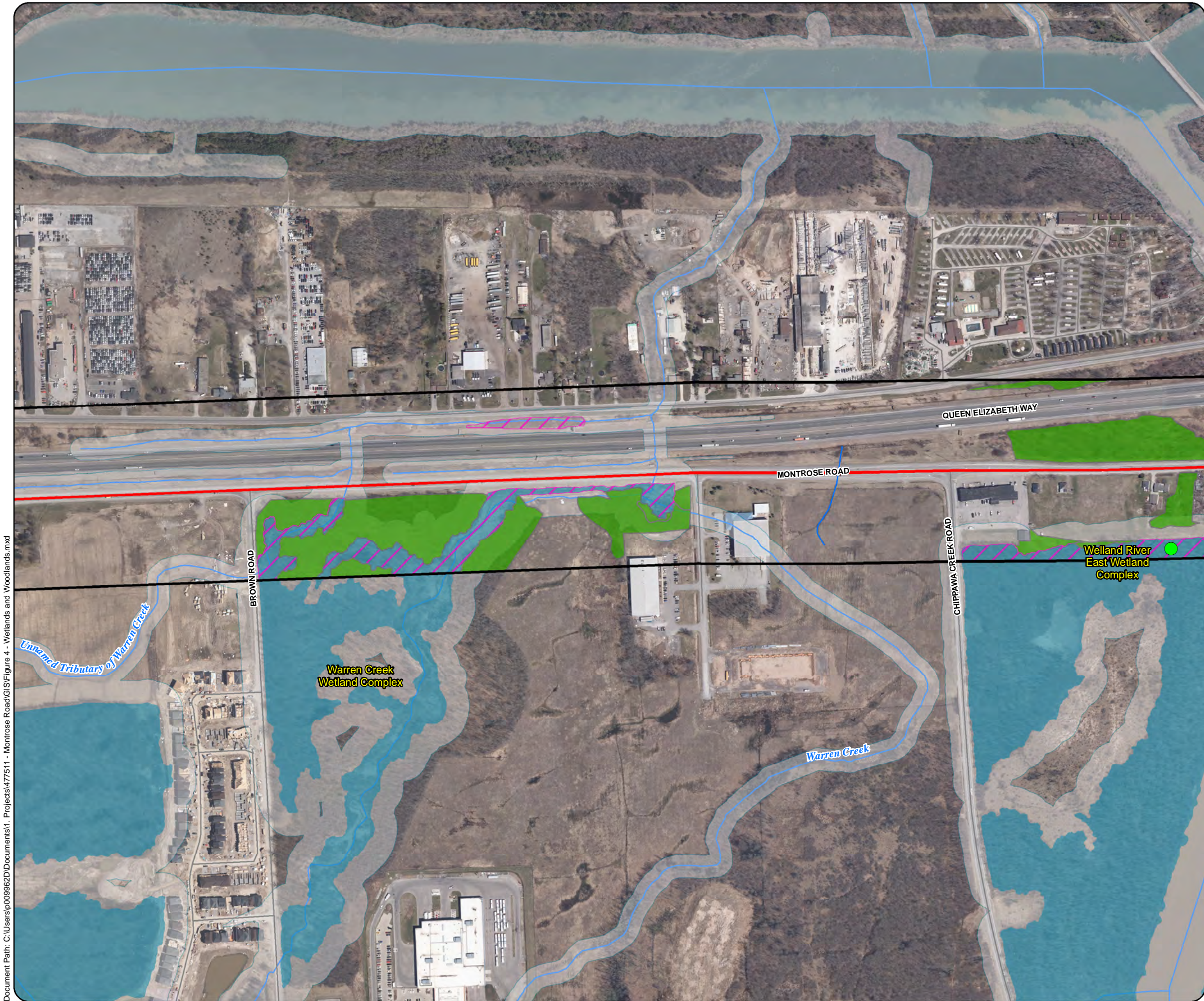
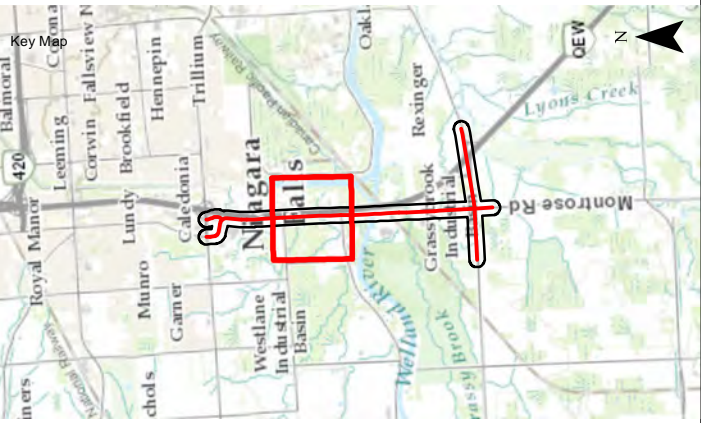
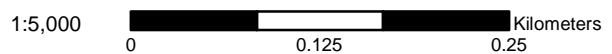


Figure 4 (Map 2 of 5) - Wetlands and Woodlands



LEGEND

- Significant Woodland (Niagara Region)
 - Road
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DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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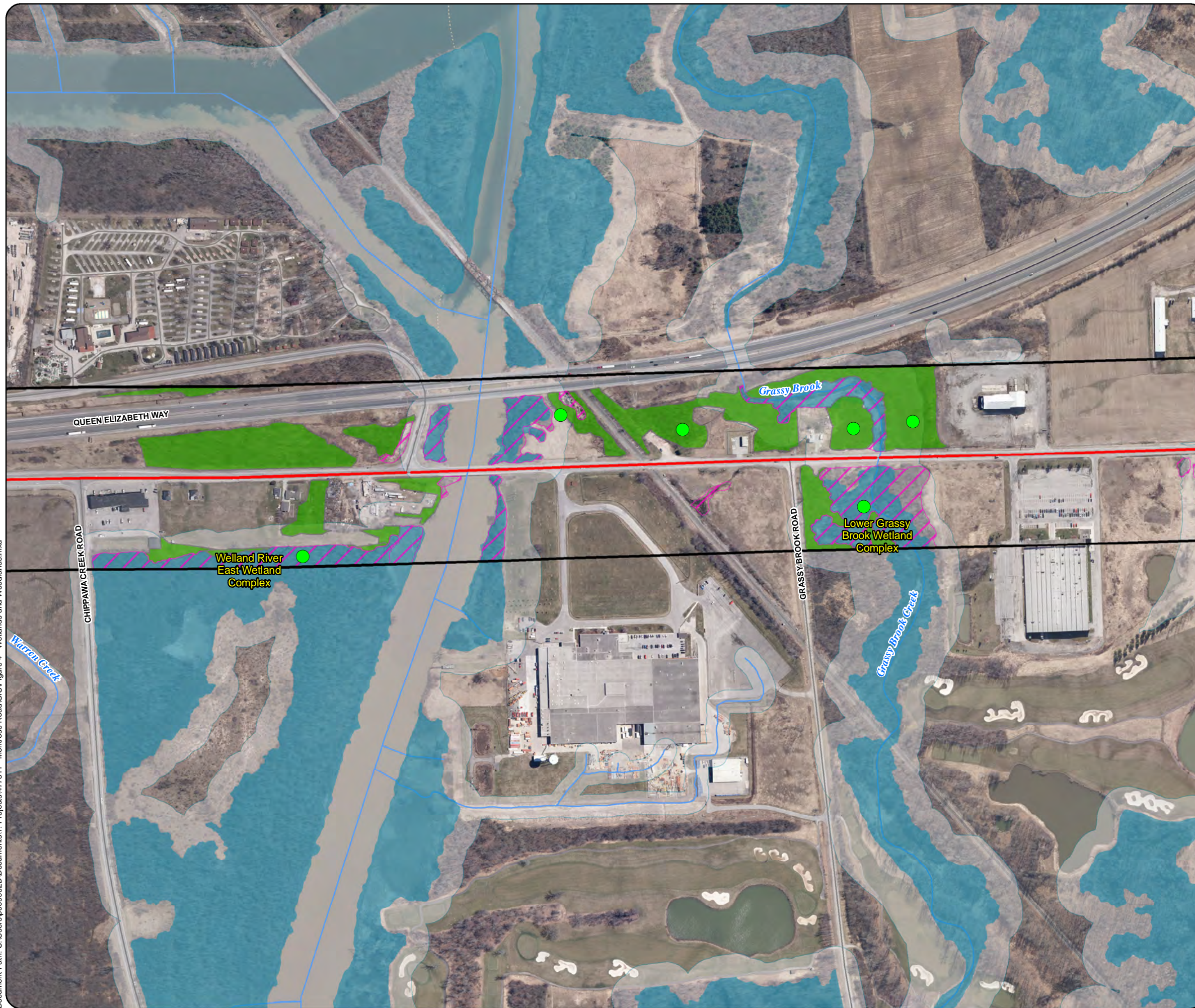
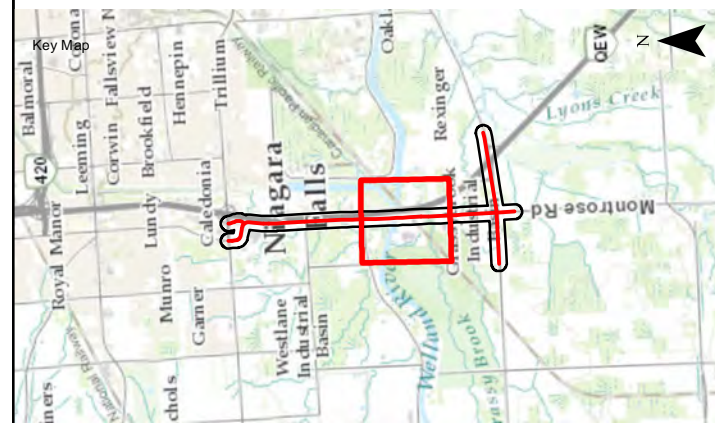
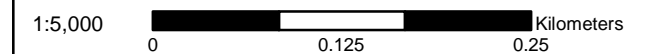


Figure 4 (Map 3 of 5) - Wetlands and Woodlands



LEGEND

- Significant Woodland (Niagara Region)
 - Road
 - Watercourse
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DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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PARSONS



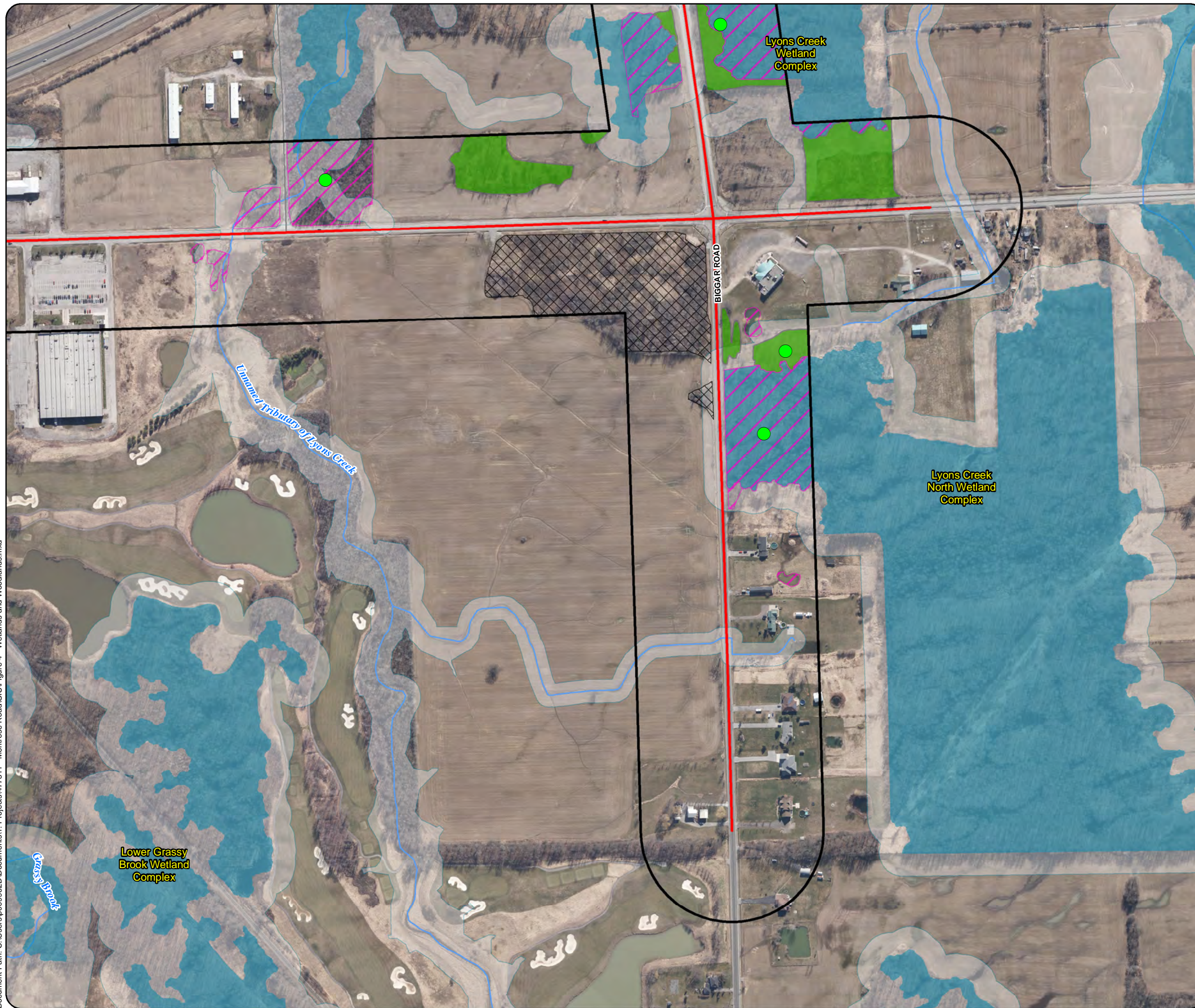
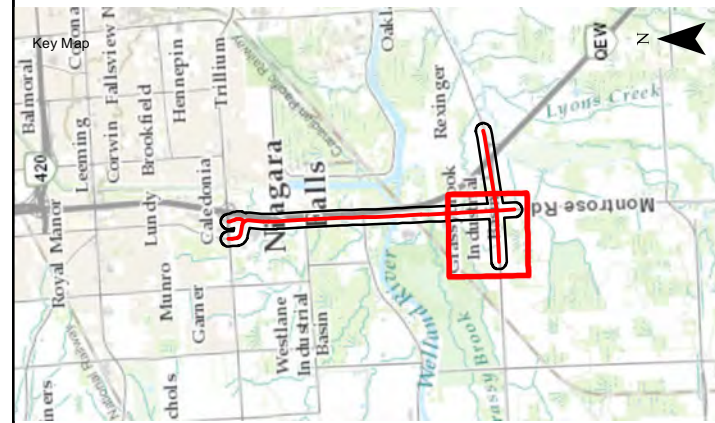


Figure 4 (Map 4 of 5) - Wetlands and Woodlands



LEGEND

- Significant Woodland (Niagara Region)
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 - Watercourse
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- Ecological Land Classification**
- ▨ Wetland
 - ▭ Woodland
 - ▨ Woodland Removed (Future Niagara Hospital)

1:5,000 Kilometers
 0 0.125 0.25

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
 Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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PARSONS



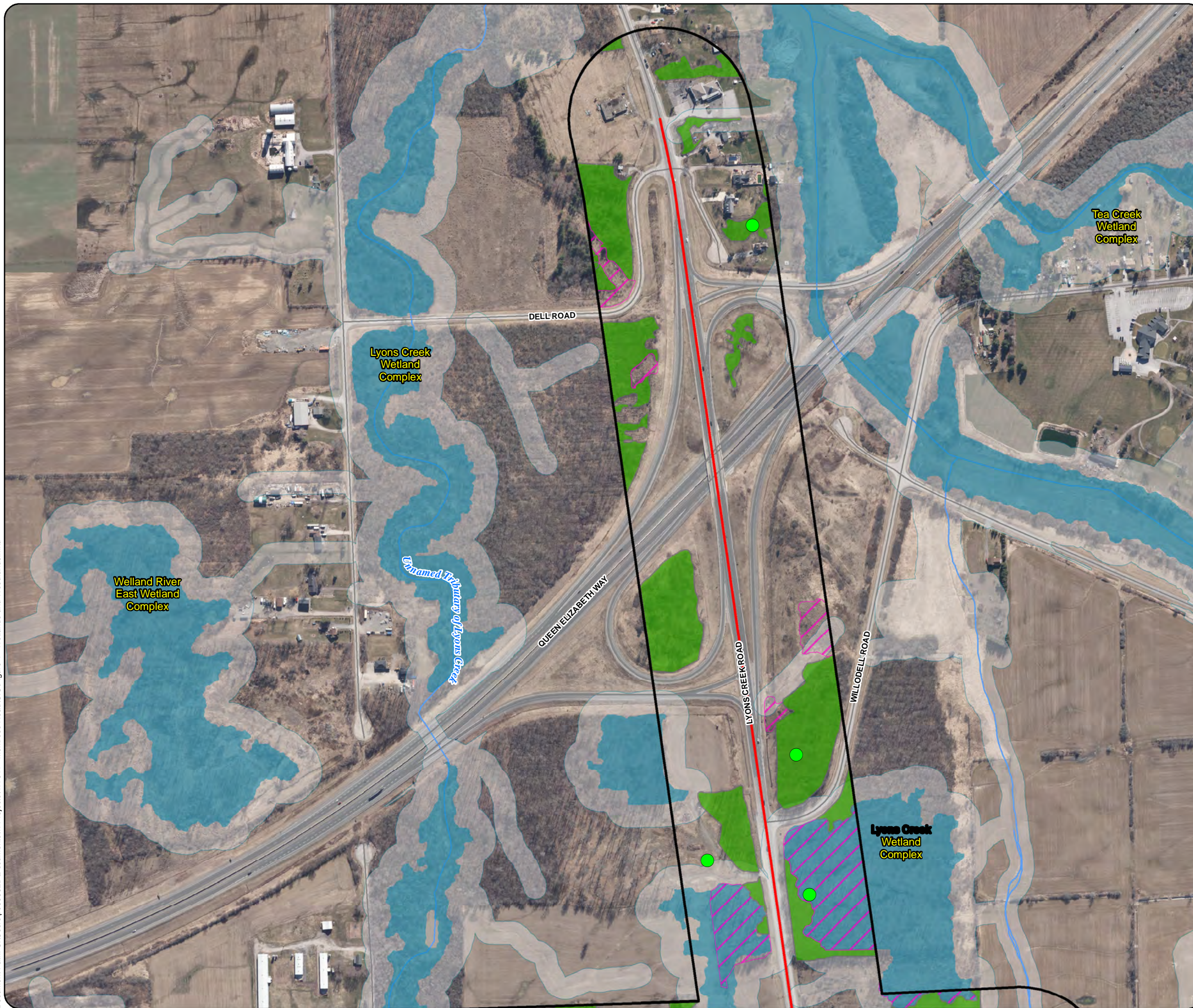
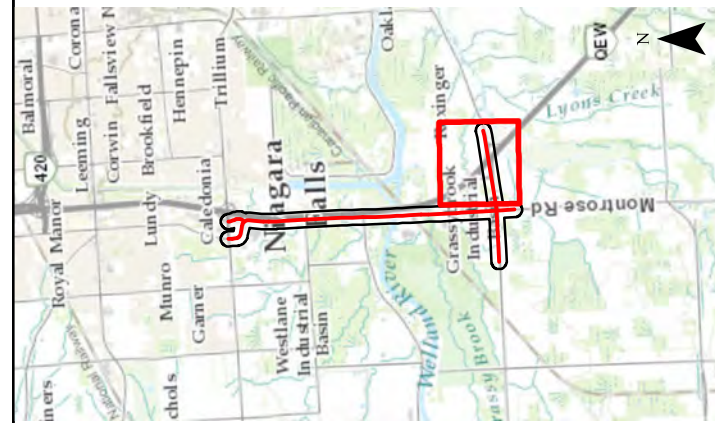


Figure 4 (Map 5 of 5) - Wetlands and Woodlands



LEGEND

- Significant Woodland (Niagara Region)
 - Road
 - Watercourse
 - Project Limits (Approximate)
 - ▭ Study Area (120-m)
 - ▭ NPCA Approximate Regulation Lands
 - ▭ Provincially Significant Wetland (PSW)
- Ecological Land Classification**
- ▨ Wetland
 - ▭ Woodland
 - ▨ Woodland Removed (Future Niagara Hospital)

1:5,000 Kilometers
 0 0.125 0.25

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
 Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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PARSONS



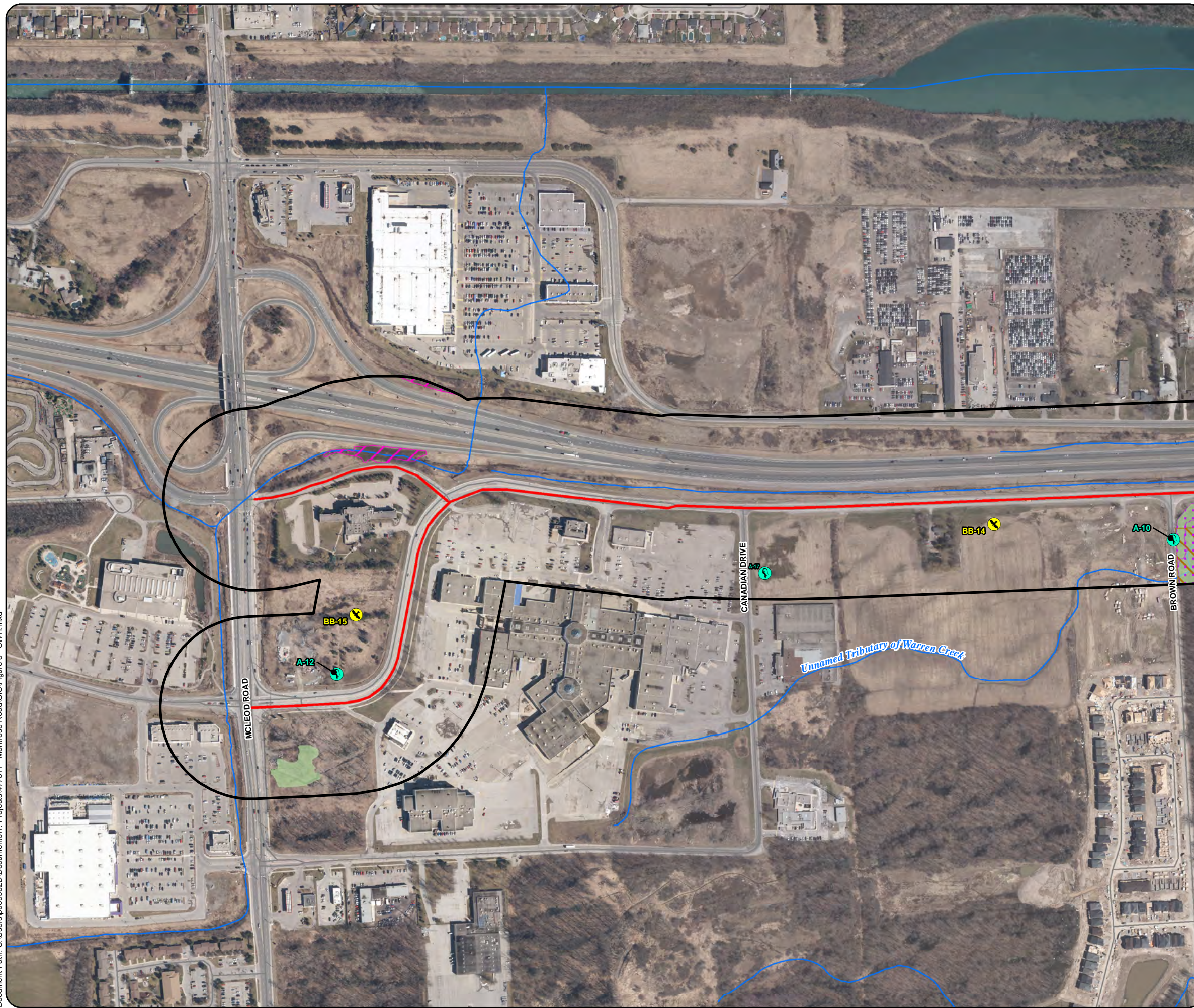
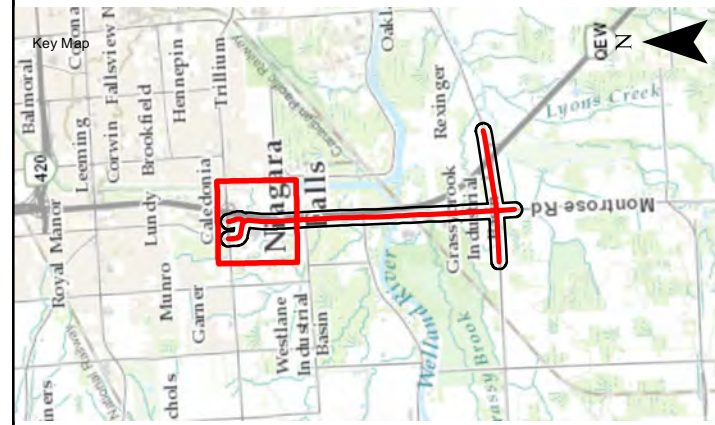


Figure 5 (Map 1 of 5) - Significant Wildlife Habitat



LEGEND

- Amphibian Call Survey Station
- Breeding Bird Survey Station
- Road
- Watercourse
- Project Limits (Approximate)
- Study Area (120-m)
- Woodland Removed (Future Niagara Hospital)

Confirmed Significant Wildlife Habitat

- Terrestrial Crayfish
- Amphibian Breeding Habitat (Woodland)
- Deer Wintering Area (Stratum 2)

Candidate Significant Wildlife Habitat

- Bat (Incidental Record)
- Turtle Nesting Area
- Bat Roost Tree (Potential)
- Amphibian Breeding Habitat (Woodland)
- Bat Maternity Colonies
- Waterfowl Nesting & Marsh Bird Breeding Habitat
- Waterfowl Staging Area (Aquatic) & Turtle Wintering Area

1:5,000 Kilometers

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

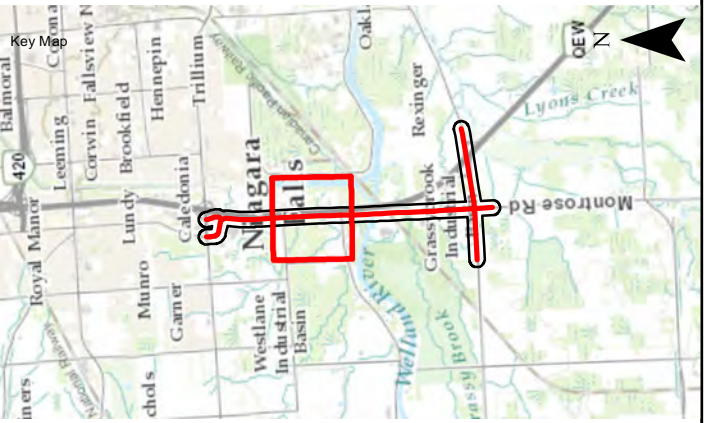
Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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Figure 5 (Map 2 of 5) - Significant Wildlife Habitat



LEGEND

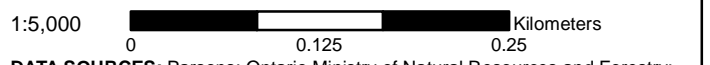
- Amphibian Call Survey Station
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DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment
 Montrose Road and Lyons Creek Road/Biggar Road
 Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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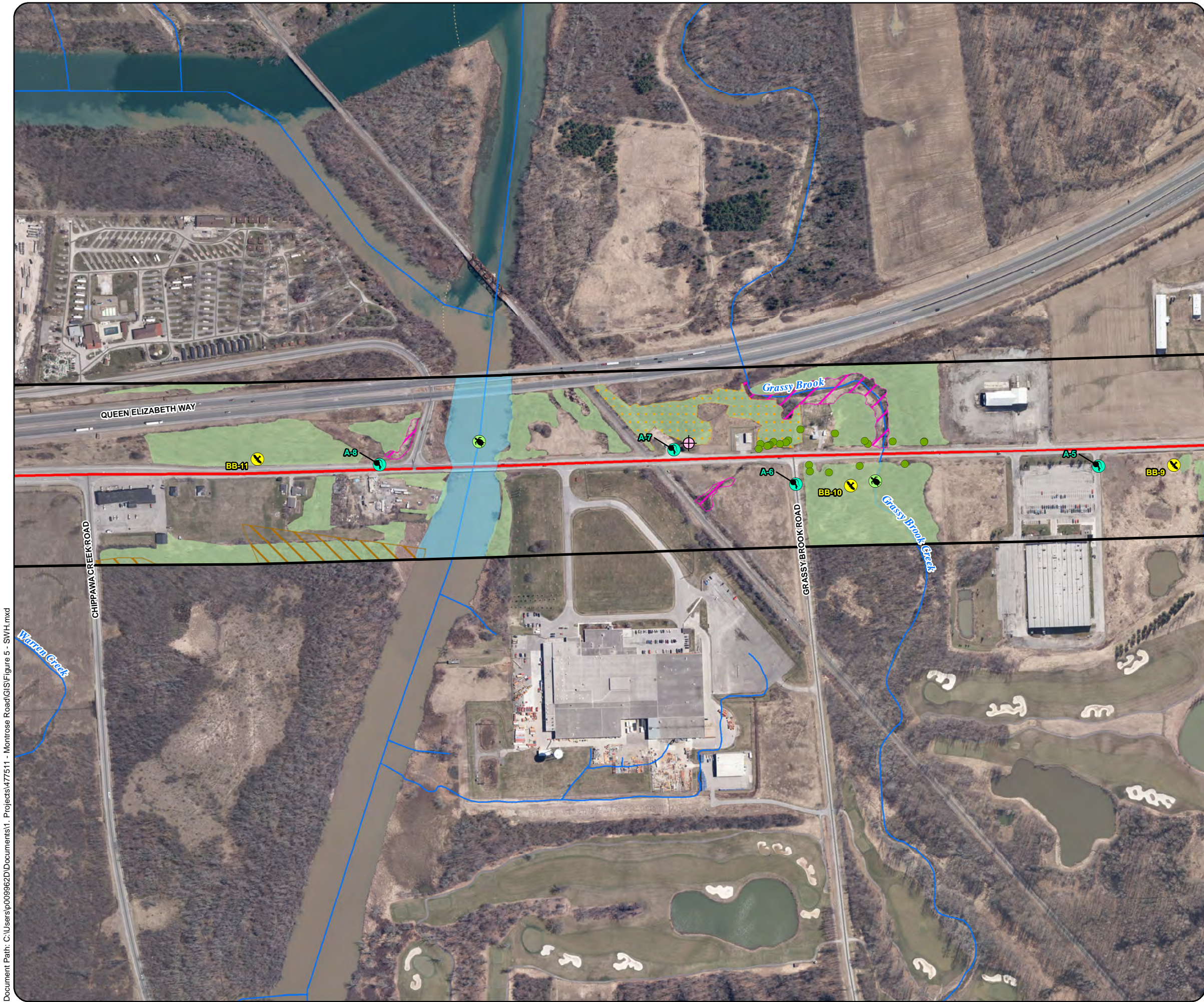
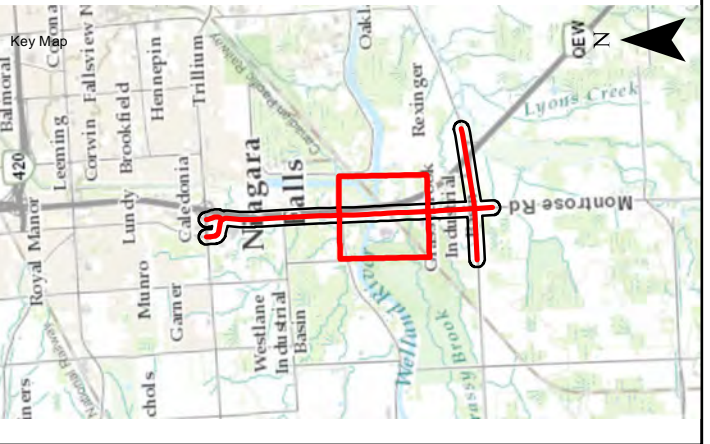


Figure 5 (Map 3 of 5) - Significant Wildlife Habitat



LEGEND

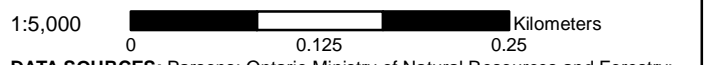
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- Road
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DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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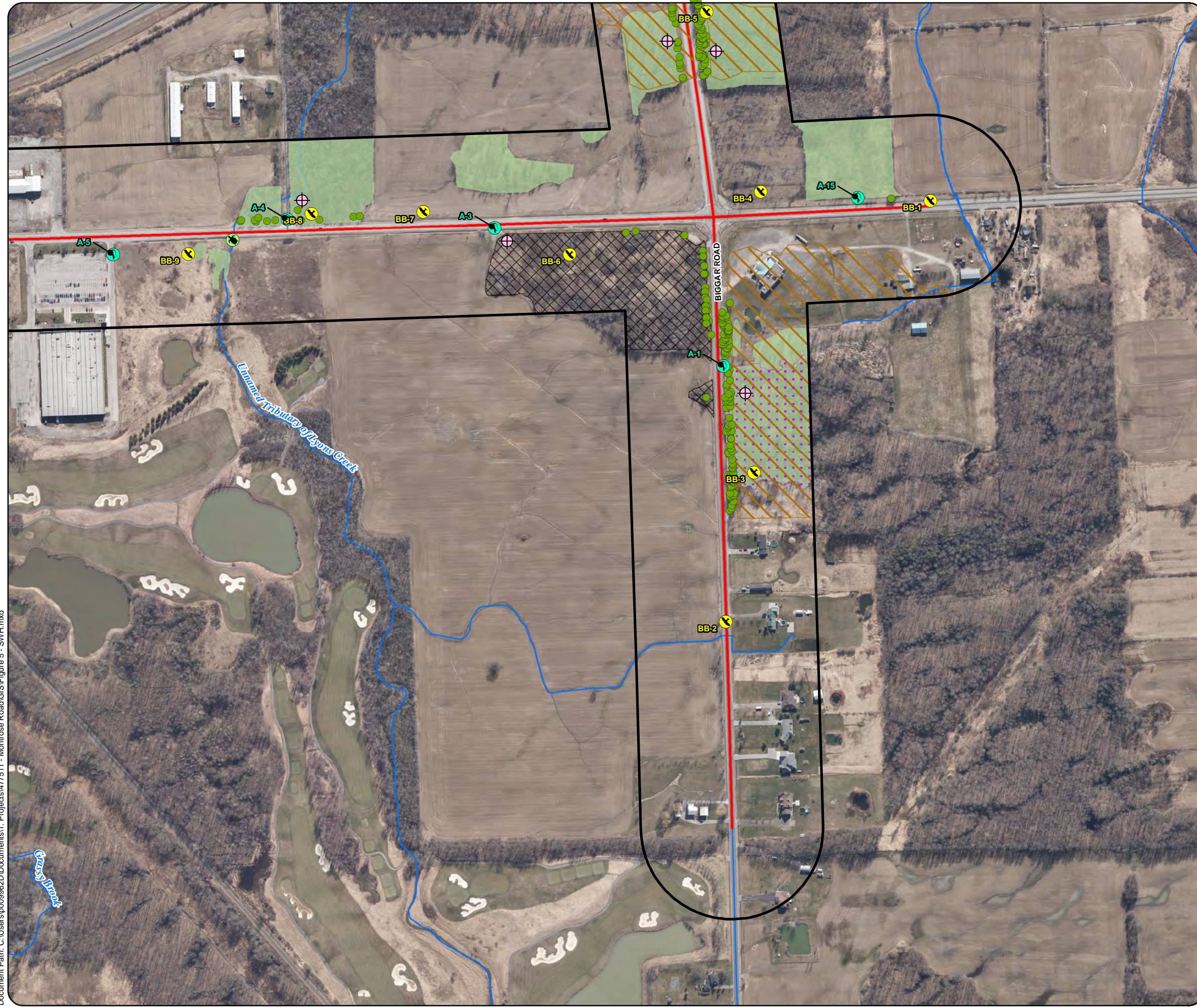


Figure 5 (Map 4 of 5) - Significant Wildlife Habitat

LEGEND

- Amphibian Call Survey Station
- Breeding Bird Survey Station
- Road
- Watercourse
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- Waterfowl Nesting & Marsh Bird Breeding Habitat
- Waterfowl Staging Area (Aquatic) & Turtle Wintering Area

1:5,000 Kilometers

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

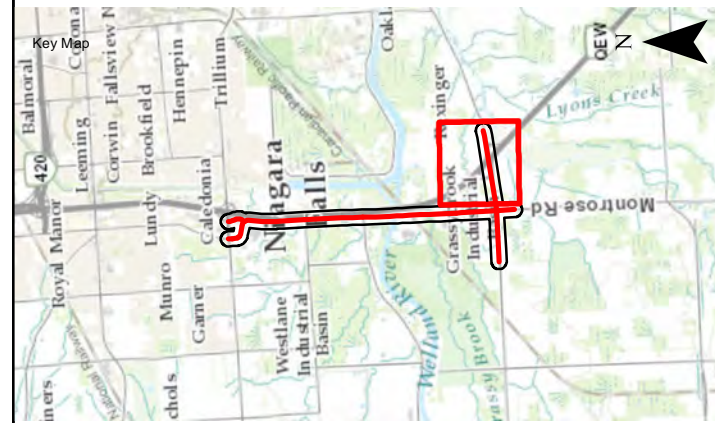
Existing Conditions and Impact Assessment
 Montrose Road and Lyons Creek Road/Biggar Road
 Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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Figure 5 (Map 5 of 5) - Significant Wildlife Habitat



LEGEND

- Amphibian Call Survey Station
- Breeding Bird Survey Station
- Road
- Watercourse
- Project Limits (Approximate)
- Study Area (120-m)
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- Amphibian Breeding Habitat (Woodland)
- Bat Maternity Colonies
- Waterfowl Nesting & Marsh Bird Breeding Habitat
- Waterfowl Staging Area (Aquatic) & Turtle Wintering Area

1:5,000 Kilometers

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/23/2021	PREPARED BY: M.E.
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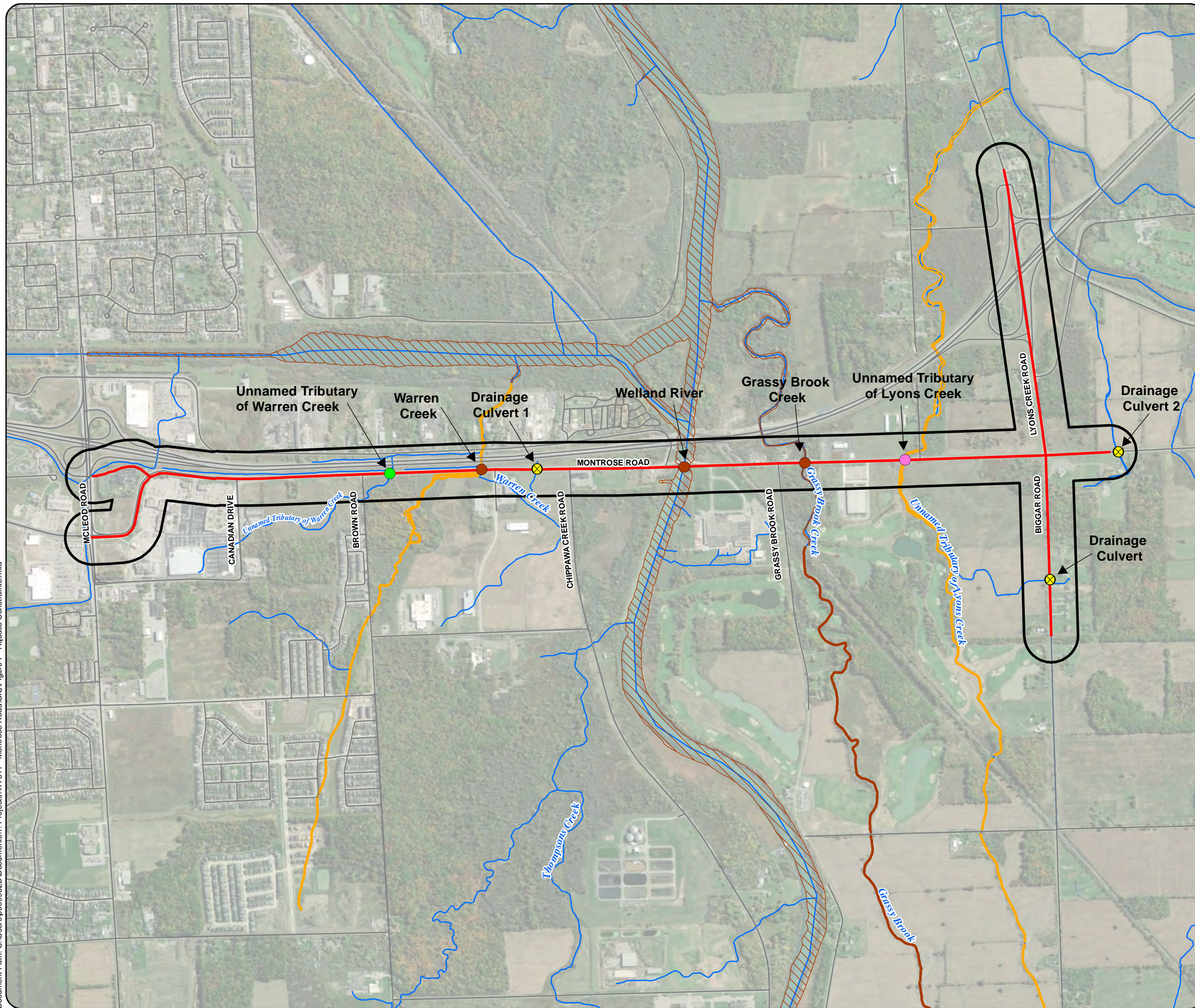


Figure 6 - Aquatic Constraints



LEGEND

- Road
- Watercourse
- Project Limits (Approximate)
- ▭ Study Area (120-m)

Fish Habitat

- ⊗ Not Fish Habitat
- Permanent, Direct, Warmwater Fish Habitat
- Intermittent, Direct, Warmwater Fish Habitat
- Intermittent, Indirect Fish Habitat

Fish Habitat Sensitivity

- ▨ Type 1 Critical Fish Habitat & Potential SAR Habitat
- ▨ Type 2 Important Fish Habitat & Potential SAR Habitat

1:17,000 Kilometers

DATA SOURCES: Parsons; Ontario Ministry of Natural Resources and Forestry; Ontario Ministry of Transportation; Esri, LIO open data, NPCA open data, Niagara Region data

Existing Conditions and Impact Assessment

Montrose Road and Lyons Creek Road/Biggar Road
Municipal Class Environmental Assessment

PROJECT NO. 477511	DATE: 7/20/2021	PREPARED BY: M.E.
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Appendix B

Agency Consultation

Esraelian, Martine

From: Denyes, David (MNRF) <David.Denyas@ontario.ca>
Sent: Wednesday, September 16, 2020 2:28 PM
To: MacVeigh, Brydon
Subject: [EXTERNAL] RE: Montrose Rd Natural Heritage request and LCFSP application
Attachments: NHGuide_MNRF_2019-04-01.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hello Brydon,

Thank you for your request for information on natural heritage features. In order to provide the most efficient service possible, the attached Natural Heritage Information Request Guide has been developed to assist you with accessing natural heritage data and values from convenient online sources.

It remains the proponent's responsibility to complete a preliminary screening for each project, to obtain available information from multiple sources, to conduct any necessary field studies, and to consider any potential environmental impacts that may result from an activity. We wish to emphasize the need for the proponents of development activities to complete screenings prior to contacting the Ministry or other agencies for more detailed technical information and advice.

The Ministry continues to work on updating data housed by Lands Information Ontario and the Natural Heritage Information Centre, and ensuring this information is accessible through online resources. Species at risk data is regularly being updated. To ensure access to reliable and up to date information, please contact SAROntario@ontario.ca.

This information will assist in scoping the necessary field assessments for an area if development or site alteration is proposed. This information is not meant to replace the responsibility of the proponent to undertake species and / or habitat surveys. Surveys or additional site level assessment are often required to confirm presence or absence of natural heritage features and values. Environmental consulting firms have the professional and technical expertise to assess sites for natural heritage features and can gauge the potential for such features to exist.

Absence or lack of information for a given geographic area does not necessarily mean the absence of natural heritage features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. In addition, new species may be listed and new natural heritage features may be defined over time. For these reasons, the Ministry cannot provide a definitive statement on the presence, absence or condition of natural heritage features in all parts of Ontario.

I believe your team should already have the wetland evaluation records for Warren Creek PSW Complex, Welland River East PSW Complex, Lower Grassy Brook PSW Complex and Lyons Creek North PSW Complex. They were emailed to Megan Olson on September 3rd. If you need me to resend them, please let me know. I'll also send you the evaluation records for Lyons Creek, Thompsons Creek and Upper Grassy Brook Wetland Complex in a follow-up email due to the file size.

In addition to the Natural Heritage Features you listed, please note that many of the surrounding woodlots are also classified as White-tailed Deer Wintering Areas (Stratum 2). The Natural Heritage Guide should provide direction on how to acquire that information.

Fisheries Timing Restrictions:

Restricted activity timing windows are applied to protect fish from impacts of undertakings in and around water during critical life cycle stages. The recommended timing restrictions for the Welland River and its tributaries is March 1st to July 1st (Note: dates represent when work should be avoided). All five of the watercourses listed below would have that spring timing restriction of March 1st to July 1st.

- Warren Creek (UTM 17T 652862 4768567)
- Unnamed Tributary of Warren Creek (UTM 17T 652845 4768979)
- Welland River (UTM 17T 652878 4767659)
- Grassy Brook Creek (UTM 17T 652896 4767121)
- Unnamed Tributary of Lyon's Creek (UTM 17T 652906 4766681)

You should be able to access information on thermal regimes and fish community in Land Information Ontario (see guide for direction). I'm also providing you with a link to a local watershed fish community report, which should have additional fisheries information on some of the larger watercourses in the area (eg Welland River, Chippawa Channel, Grassy Brook Creek).

<http://ourniagarariver.ca/wp-content/uploads/2016/03/NIAGARA-RIVER-WATERSHED-FISH-COMMUNITY-FINAL-Aug-2013.pdf> [ourniagarariver.ca]

Please don't hesitate to contact me if you have any questions.

Best regards,

David

David Denyes

Management Biologist
Ministry of Natural Resources and Forestry
Vineland Field Office
4890 Victoria Avenue North
Vineland Station ON, L0R 2E0
Tel: 905 562-1196 Fax: 905 562-1154

david.denyas@ontario.ca

*Please note that I no longer have voicemail services for my direct line
To schedule an appointment or phone call, please contact me via email*

From: MacVeigh, Brydon
Sent: Friday, June 5, 2020 9:36 AM
To: Scientific Collection Permits Guelph (MNRF) <scp.guelph@ontario.ca>
Cc: Esraelian, Martine <martine.esraelian@parsons.com>
Subject: Montrose Rd Natural Heritage request and LCFSP application

Good morning,

Parsons Inc. has been retained by the Regional Municipality of Niagara to undertake a Schedule C Municipal Class Environmental Assessment, Detailed Design and Contract Document Preparation for Regional Road 98 (Montrose Road) from McLeod Road south to Biggar Road and Regional Road 47 (Lyons Creek Road)/Biggar Road from the interchange

with the QEW west to Crowland Avenue, in the City of Niagara Falls. Parsons is required to complete natural heritage assessments including identification of terrestrial sensitivities for the study area and spring and summer fisheries investigations for watercourses within the study area to inform the decision making process to identify the preferred alternative as well as identify and obtain required permits and approvals during detailed design.

Please note, Parsons biologists have consulted available online data sources following guidance outlined within the *Natural Heritage Information Request Guide* including DFO Online SAR Mapping, NHIC, Ontario Breeding Bird Atlas, Ontario Butterfly Atlas and inaturalist. The information collected is provided in the attached data request letter.

Fisheries Information Request

We are requesting any available fisheries information including fish community, thermal regime, in-water timing windows and important habitat features for the watercourses listed below and shown on the attached map:

- Warren Creek (UTM 17T 652862 4768567)
- Unnamed Tributary of Warren Creek (UTM 17T 652845 4768979)
- Welland River (UTM 17T 652878 4767659)
- Grassy Brook Creek (UTM 17T 652896 4767121)
- Unnamed Tributary of Lyon's Creek (UTM 17T 652906 4766681)

Terrestrial Sensitivities

We are requesting any available information MNRF can provide related to the features listed below.

- Significant Wildlife Habitat (SWH)
- Wetlands
- Provincially Significant Wetlands (PSW) evaluations for PSW's within the study area
- Species of Conservation Concern (SoCC) which may be present

Thank you in advance for your consideration of the request, should you have any questions or concerns please do not hesitate to contact me.

Kind regards,

Brydon MacVeigh

Fisheries Biologist

Suite 101, 540 Bingham Center Drive, Kitchener, ON N2B 3X9

Brydon.MacVeigh@parsons.com – M. 226-220-8918

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Esraelian, Martine

From: MacVeigh, Brydon
Sent: Friday, June 5, 2020 9:47 AM
To: sarontario@otario.ca
Cc: Esraelian, Martine
Subject: SAR Data Request - Montrose Rd & Lyons Creek Rd
Attachments: Montrose Rd & Lyons Creek Rd_Study Area.pdf; Montrose Rd SAR Data Request_MECF.docx

Good morning,

Parsons Inc. has been retained by the Regional Municipality of Niagara to undertake a Schedule C Municipal Class Environmental Assessment, Detailed Design and Contract Document Preparation for Regional Road 98 (Montrose Road) from McLeod Road south to Biggar Road and Regional Road 47 (Lyons Creek Road)/Biggar Road from the interchange with the QEW west to Crowland Avenue, in the City of Niagara Falls. Parsons is required to complete natural heritage assessments including identification of terrestrial sensitivities for the study area and fisheries investigations for watercourses within the study area to inform the decision making process to identify the preferred alternative, as well as identify and obtain required permits and approvals during detailed design.

Please review the information compiled from online data sources in the attached SAR Data Request Letter and study area mapping to confirm the attached the information. Parsons would like to request any additional SAR data MECF may have available for the Montrose Rd and Lyons Creek Rd Study Area.

Thank you for your time and consideration of this request. Should you have questions or concerns, please do not hesitate to contact me.

Kind regards,

Brydon MacVeigh
Fisheries Biologist

Suite 101, 540 Bingemans Center Drive, Kitchener, ON N2B 3X9
Brydon.MacVeigh@parsons.com – M. 226-220-8918

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Appendix C

Background Review

Species		SAR Status		Conservation Rank and Rarity Status						Sources									
Common Name	Scientific Name	National (SARA)	Provincial (ESA, 2007)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Conservation Priorities ¹	Regional Rarity Rank ²	Local Rarity Rank ³	MECP ⁴	WHC ⁵	Intermittent ⁶	E-linc ⁷	ORNA ⁸	OBBA ⁹	OBA ¹⁰	AMO ¹¹	Coville Consulting (2019) ¹²	Serenta (2017) ¹³
AMPHIBIANS																			
Allegheny Mountain Dusky Salamander	<i>Desmognathus ochrophaeus</i>	END, Schedule 1	END	END	G5	S1			SAR-Locally found					X					
American Bullfrog	<i>Lithobates catesbeianus</i>				G5	S4			Widespread					X					
American Toad	<i>Bufo americanus</i>				G5	S5			Widespread					X					
Blue-spotted Salamander	<i>Ambystoma laterale</i>				G5	S4			Regionally Significant					X					
Eastern Red-backed Salamander	<i>Plethodon cinereus</i>				G5	S5			Widespread					X					
Gray Treefrog	<i>Hyla versicolor</i>				G5	S5			Widespread					X					
Green Frog	<i>Rana clamitans</i>				G5	S5			Widespread					X					
Mudpuppy	<i>Necturus maculosus</i>				G5	S4			Widespread					X					
Northern Dusky Salamander	<i>Desmognathus fuscus</i>	END, Schedule 1	END	END	G5	S1			SAR-Locally found					X					
Northern Leopard Frog	<i>Rana pipiens</i>				G5	S5			Widespread					X					
Red-spotted Newt	<i>Notophthalmus viridescens</i>				G5T5	S5			Widespread					X					
Spotted Salamander	<i>Ambystoma maculatum</i>				G5	S4			Regionally Significant					X					
Spring Peeper	<i>Pseudacris crucifer</i>				G5	S5			Widespread					X					
Western Chorus Frog (Carolinian population)	<i>Pseudacris triseriata</i>				G5TNR	S4			Widespread					X					
Wood Frog	<i>Rana sylvatica</i>				G5	S5			Widespread					X					
REPTILES																			
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR, Schedule 1	THR	END	G4	S3			SAR-Locally found					X					
Dekay's Brownsnake	<i>Storeria dekayi</i>				G5	S5			Widespread					X					
Eastern Gartersnake	<i>Thamnophis sirtalis</i>				G5T5	S5			Widespread					X					
Eastern Milksnake	<i>Lampropeltis triangulum</i>	SC, Schedule 1		SC	G5	S4			SAR-Locally found					X					
Eastern Musk Turtle	<i>Sternotherus odoratus</i>		SC	SC	G5	S3			SAR-Locally found-DD					X					
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>		SC	SC	G5	S4			SAR-Locally found					X					
Midland Painted Turtle	<i>Chrysemys picta marginata</i>			SC	G5T5	S4			Widespread		X			X					
Northern Map Turtle	<i>Graptemys geographica</i>	SC, Schedule 1	SC	SC	G5	S3			SAR-Locally found		X			X					
Northern Watersnake	<i>Nerodia sipedon sipedon</i>				G5T5	S5			Widespread					X					
Red-bellied Snake	<i>Storeria occipitomaculata</i>				G5	S5			Regionally Significant					X					
Red-eared Slider	<i>Trachemys scripta elegans</i>				G6	SNA			Introduced					X					
Snapping Turtle	<i>Chelydra serpentina</i>	SC, Schedule 1	SC	SC	G5	S3			SAR-Locally found		X			X					
Timber Rattlesnake	<i>Crotalus horridus</i>	EXP, Schedule 1	EXP	EXP	G4	SX			Extirpated		X								
MAMMALS																			
Eastern Small-footed Myotis	<i>Myotis leibii</i>		END		G4	S2S3													X
Little Brown Myotis	<i>Myotis lucifugus</i>	END, Schedule 1	END	END	G3	S4													X
Northern Myotis	<i>Myotis septentrionalis</i>	END, Schedule 1	END	END	G1G2	S3													X
Tricolored Bat	<i>Perimyotis subflavus</i>	END, Schedule 1	END	END	G2G3	S3?													X
BIRDS																			
Acadian Flycatcher	<i>Empidonax virescens</i>	END, Schedule 1	END	END	G5	S2S3B	Recovery Objective							X					
Alder Flycatcher	<i>Empidonax alorum</i>				G5	S5B								X					
American Bittern	<i>Botaurus lentiginosus</i>				G5	S4B	Assess/Maintain							X					
American Black Duck	<i>Anas rubripes</i>				G5	S4	Maintain Current							X					
American Crow	<i>Corvus brachyrhynchos</i>				G5	S5B								X					
American Goldfinch	<i>Carduelis tristis</i>				G5	S5B								X					X
American Kestrel	<i>Falco sparverius</i>				G5	S4	Maintain Current							X					
American Redstart	<i>Setophaga ruticilla</i>				G5	S5B								X					
American Robin	<i>Turdus migratorius</i>				G5	S5B								X					X
American Wigeon	<i>Anas americana</i>				G5	S4								X					
American Woodcock	<i>Scolopax minor</i>				G5	S4B	Increase							X					X
Baltimore Oriole	<i>Icterus galbula</i>				G5	S4B	Maintain Current							X					X
Bank Swallow	<i>Riparia riparia</i>	THR, Schedule 1	THR	THR	G5	S4B	Increase							X					
Barn Owl	<i>Tyto alba</i>	END, Schedule 1	END	END	G5	S1	Recovery Objective							X					
Barn Swallow	<i>Hirundo rustica</i>	THR, Schedule 1	THR	THR	G5	S4B	Recovery Objective					X		X					X
Belted Kingfisher	<i>Ceryle alcyon</i>				G5	S4B	Increase							X					
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>				G5	S5B	Increase							X					
Black-capped Chickadee	<i>Parus atricapilla</i>				G5	S5								X					
Blue Jay	<i>Cyanocitta cristata</i>				G5	S5								X					X
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>				G5	S4B								X					
Blue-winged Warbler	<i>Vermivora cyanoptera</i>				G5	S4B	Maintain Current							X					

Species		SAR Status		Conservation Rank and Rarity Status						Sources									
Common Name	Scientific Name	National (SARA)	Provincial (ESA, 2007)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Conservation Priorities ¹	Regional Rarity Rank ²	Local Rarity Rank ³	MEEP ⁴	WHIC ⁵	Intermittent ⁶	E-Junc ⁷	ORAA ⁸	OBBA ⁹	OBA ¹⁰	AMO ¹¹	Coville Consulting (2019) ¹²	Serenta (2017) ¹³
Blue-winged Teal	<i>Anas discors</i>				G5	S4	Increase												
Bobolink	<i>Dolichonyx oryzivorus</i>	THR, Schedule 1	THR	THR	G5	S4B	Recovery Objective				X								
Brown Creeper	<i>Certhia americana</i>				G5	S5B									X				
Brown Thrasher	<i>Toxostoma rufum</i>				G5	S4B	Increase								X				
Brown-headed Cowbird	<i>Molothrus ater</i>				G5	S4B									X			X	
Canada Goose	<i>Branta canadensis</i>				G5	S5	Decrease								X				
Carolina Wren	<i>Tyrtothorus ludovicianus</i>				G5	S4									X				
Cedar Waxwing	<i>Bombycilla cedrorum</i>				G5	S5B									X			X	
Chimney Swift	<i>Chaerula pelagica</i>	THR, Schedule 1	THR	THR	G4G5	S4B, S4N	Recovery Objective								X				
Chipping Sparrow	<i>Spizella passerina</i>				G5	S5B									X			X	
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>				G5	S4B									X				
Common Grackle	<i>Quiscalus quiscula</i>				G5	S5B									X			X	
Common Nighthawk	<i>Chordeiles minor</i>	THR, Schedule 1	SC	SC	G5	S4B	Recovery Objective								X				
Common Tern	<i>Sterna hirundo</i>				G5	S4B	Increase								X				
Common Yellowthroat	<i>Geothlypis trichas</i>				G5	S5B									X			X	
Cooper's Hawk	<i>Accipiter cooperii</i>				G5	S4									X				
Downy Woodpecker	<i>Picoides pubescens</i>				G5	S5									X				
Eastern Bluebird	<i>Sialia sialis</i>				G5	S5B									X				
Eastern Kingbird	<i>Tyrannus tyrannus</i>				G5	S4B	Increase								X				
Eastern Meadowlark	<i>Sturnella magna</i>	THR, Schedule 1	THR	THR	G5	S4B	Recovery Objective				X				X				
Eastern Phoebe	<i>Sayornis phoebe</i>				G5	S5B									X				
Eastern Screech Owl	<i>Megascops asio</i>				G5	S4									X				
Eastern Towhee	<i>Pipilo erythrophthalmus</i>				G5	S4B	Increase								X				
Eastern Wood-Pewee	<i>Contopus virens</i>	SC, Schedule 1	SC	SC	G5	S4B	Increase				X				X				
European Starling	<i>Sturnus vulgaris</i>				G5	SNA									X			X	
Field Sparrow	<i>Spizella pusilla</i>				G5	S4B	Increase								X				
Gadwall	<i>Meruca strepera</i>				G5	S4									X				
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	SC, Schedule 1	SC	SC	G5	S4B	Increase								X				
Gray Catbird	<i>Dumetella carolinensis</i>				G5	S4B									X			X	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>				G5	S4B									X				
Great Horned Owl	<i>Bubo virginianus</i>				G5	S4									X				
Green Heron	<i>Butorides virescens</i>				G5	S4B	Increase								X				
Hairy Woodpecker	<i>Picoides villosus</i>				G5	S5									X				
Herring Gull	<i>Larus argentatus</i>				G5	S5B, S5N									X				
Henslow's Sparrow	<i>Ammodramus henslowii</i>	END, Schedule 1	END	END	G4	SHB	Recovery Objective				X				X				
Hooded Merganser	<i>Lophodytes cucullatus</i>				G5	S5B, S5N									X				
Hooded Warbler	<i>Setophaga citrina</i>				G5	S4B	Recovery Objective								X				
Horned Lark	<i>Eremophila alpestris</i>				G5	S5B									X				
House Finch	<i>Carpodacus mexicanus</i>				G5	SNA									X				
House Sparrow	<i>Passer domesticus</i>				G5	SNA									X			X	
House Wren	<i>Troglodytes aedon</i>				G5	S5B									X				
Indigo Bunting	<i>Passerina cyanea</i>				G5	S4B									X				
Killdeer	<i>Charadrius vociferus</i>				G5	S5B, S5N	Increase								X			X	
Least Flycatcher	<i>Empidonax minimus</i>				G5	S4B									X				
Magnolia Warbler	<i>Setophaga magnolia</i>				G5	S5B									X				
Mallard	<i>Anas platyrhynchos</i>				G5	S5	Maintain Current								X				
Mourning Dove	<i>Zenaidura macroura</i>				G5	S5									X				
Mourning Warbler	<i>Geothlypis philadelphia</i>				G5	S4B									X				
Mute Swan	<i>Cygnus olor</i>				G5	SNA	Decrease								X				
Nashville Warbler	<i>Oreothlypis ruficapilla</i>				G5	S5B									X				
Northern Bobwhite	<i>Colinus virginianus</i>	END, Schedule 1	END	END	G4G5	S1	Recovery Objective				X								
Northern Cardinal	<i>Cardinalis cardinalis</i>				G5	S5									X				
Northern Flicker	<i>Colaptes auratus</i>				G5	S4B	Increase								X			X	
Northern Harrier	<i>Circus cyaneus</i>				G5	S4B	Maintain Current								X				
Northern Mockingbird	<i>Mimus polyglottos</i>				G5	S4									X				
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>				G5	S4B	Increase								X				
Northern Shoveler	<i>Spatula clypeata</i>				G5	S4									X				
Northern Waterthrush	<i>Parkesia noveboracensis</i>				G5	S5B									X				
Orchard Oriole	<i>Icterus spurius</i>				G5	S4B									X				
Ovenbird	<i>Seiurus aurocapilla</i>				G5	S4B									X				
Peregrine Falcon	<i>Falco peregrinus</i>	SC, Schedule 1	SC		G4	S3B									X				
Pied-billed Grebe	<i>Podilymbus podiceps</i>				G5	S4B, S4N	Maintain Current								X				

Species		SAR Status		Conservation Rank and Rarity Status						Sources										
Common Name	Scientific Name	National (SARA)	Provincial (ESA, 2007)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Conservation Priorities ¹	Regional Rarity Rank ²	Local Rarity Rank ³	MECP ⁴	WHIC ⁵	Intermittent ⁶	E-Join ⁷	ORAA ⁸	OBBA ⁹	OBA ¹⁰	AMO ¹¹	Coville Consulting (2019) ¹²	Sereno (2017) ¹³	
Pileated Woodpecker	<i>Dryocopus pileatus</i>				G5	S5														X
Pine Siskin	<i>Spinus pinus</i>				G5	S4B														X
Pine Warbler	<i>Setophaga pinus</i>				G5	S5B														X
Purple Martin	<i>Progne subis</i>				G5	S4B	Increase													X
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>				G5	S4														X
Red-breasted Nuthatch	<i>Sitta canadensis</i>				G5	S5														X
Red-eyed Vireo	<i>Vireo olivaceus</i>				G5	S5B														X
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	THR, Schedule 1	SC	END	G5	S4B	Recovery Objective						X		X					
Red-necked Grebe	<i>Podiceps grisegena</i>				G5	S3B, S4N	Assess/Maintain								X					X
Red-tailed Hawk	<i>Buteo jamaicensis</i>				G5	S5									X					X
Red-winged Blackbird	<i>Agelaius phoeniceus</i>				G5	S4									X					X
Ring-billed Gull	<i>Larus delawarensis</i>				G5	S5B, S4N									X					X
Ring-necked Pheasant	<i>Phasianus colchicus</i>				G5	SNA									X					X
Rock Pigeon	<i>Columba livia</i>				G5	SNA									X					X
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>				G5	S4B	Maintain Current								X					X
Ruby-throated Hummingbird	<i>Archilochus colubris</i>				G5	S5B									X					X
Savannah Sparrow	<i>Passerculus sandwichensis</i>				G5	S4B	Increase								X					X
Scarlet Tanager	<i>Piranga olivacea</i>				G5	S4B									X					X
Sharp-shinned Hawk	<i>Accipiter striatus</i>				G5	S5									X					X
Song Sparrow	<i>Melospiza melodia</i>				G5	S5B									X					X
Sora	<i>Pezomachus carolinus</i>				G5	S4B	Assess/Maintain								X					X
Spotted Sandpiper	<i>Aythya macularia</i>				G5	S5	Increase								X					X
Swamp Sparrow	<i>Melospiza georgiana</i>				G5	S5B									X					X
Tree Swallow	<i>Tachycineta bicolor</i>				G5	S4B									X					X
Turkey Vulture	<i>Cathartes aura</i>				G5	S5B									X					X
Upland Sandpiper	<i>Bartramia longicauda</i>				G5	S4B	Increase								X					X
Veery	<i>Catharus fuscescens</i>				G5	S4B									X					X
Vesper Sparrow	<i>Pooecetes gramineus</i>				G5	S4B	Increase								X					X
Virginia Rail	<i>Rallus limicola</i>				G5	S5B	Maintain Current								X					X
Warbling Vireo	<i>Vireo gilvus</i>				G5	S5B									X					X
White-breasted Nuthatch	<i>Sitta carolinensis</i>				G5	S5									X					X
White-throated Sparrow	<i>Zonotrichia albicollis</i>				G5	S5B									X					X
Willow Flycatcher	<i>Empidonax traillii</i>				G5	S5B	Maintain Current								X					X
Winter Wren	<i>Troglodytes hiemalis</i>				G5	S5B									X					X
Wood Duck	<i>Aix sponsa</i>				G5	S5	Increase								X					X
Wood Thrush	<i>Hylocichla ustellina</i>	THR, Schedule 1	SC	THR	G4	S4B	Maintain Current					X		X	X					X
Yellow Warbler	<i>Dendroica petechia</i>				G5	S5B									X					X
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>				G5	S4B									X					X
Yellow-throated Vireo	<i>Vireo flavifrons</i>				G5	S4B									X					X
INVERTEBRATES																				
Monarch	<i>Danaus plexippus</i>	SC, Schedule 1	SC	END	G4	S2N, S4B														X
PLANTS																				
American Water-willow	<i>Justicia americana</i>	THR, Schedule 1	THR	THR	G5	S2				X	X									X
Biennial Gaura	<i>Oenothera gaura</i>				G5	S3									X					X
Black Gum	<i>Nyssa sylvatica</i>				G5	S3									X					X
Deerberry	<i>Vaccinium stamineum</i>	THR, Schedule 1	THR	THR	G5	S1						X	X							X
Flat-top White Aster	<i>Doellingeria umbellata</i>				G5	S5									U					X
Foxglove Beardtongue	<i>Penstemon digitalis</i>				G5	S4									U					X
Large Yellow Pond Lily	<i>Nuphar advena ssp. advena</i>				G5	S3									R					X
Northern Dewberry	<i>Rubus flagellaris</i>				G5	S4									U					X
Round-leaved Greenbrier	<i>Smilax rotundifolia</i>	THR, Schedule 1	THR	THR	G5	S2									X					X
Swamp Rose Mallow	<i>Hibiscus palustris</i>	SC, Schedule 1	SC	SC	G5	S3									X					X
Fish																				
Grass Pickerel																				
Greater Redhorse																				
Lake Chubsucker	<i>Erimyzon succetta</i>	END, Schedule 1	THR	END	G5	S2									X					
Mussels																				
Eastern Pondmussel	<i>Ligumia nasuta</i>	SC, Schedule 1	SC	SC	G4	S1									X					
Kidneyshell	<i>Pygostomus fasciolaris</i>	END, Schedule 1	END												X					
Round Hickorynut	<i>Obovata subrotunda</i>	END, Schedule 1	END	END	G4	S1									X					

Definitions, Acronyms and Symbols

Species of Conservation Concern (SoCC)

Species at Risk (SAR)

ORAA and OBBA 10km² Map Squares: 17PH56, 17PH57

NHIC 1km² Map Squares: 17PH5265, 5266, 5267, 5268, 5269, 5270, 5365, 5366, 5367, 5466

Global Rank

G1: Critically Imperiled (at very high risk of extinction)
G2: Imperiled (at high risk of extinction)
G3: Vulnerable (at moderate risk of extinction)
G4: Apparently Secure (Uncommon but not rare)
G5: Secure (common, widespread and abundant)
G#F: Range Rank (range of uncertainty about the status of a taxon or ecosystem type)
GU: Unrankable (currently unrankable due to lack of information)
GNR: Unranked (global rank not yet assessed)
GNNA: Not Applicable (species is not a suitable target for conservation activities)
T: Denotes that the rank applies to a subspecies or variety
B: Breeding
N: Non-breeding

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

ESA: Endangered Species Act

SARA: Species at Risk Act

SARO: Species at Risk in Ontario

SARA or ESA designation

EXT - Extinct
EXP - Extirpated
END - Endangered
THR - Threatened
SC - Special Concern
NAR - Not at Risk

Provincial Rank

S1: Critically Imperiled (i.e. fewer than 5 occurrences in the nation and/or province)
S2: Imperiled (i.e. fewer than 20 occurrences in the nation and/or province)
S3: Vulnerable (i.e. 20-80 occurrences in the nation and/or province)
S4: Apparently Secure (uncommon, but not rare in the nation and/or province)
S5: Secure (common, widespread and abundant in the nation and/or province)
SNA: Not Applicable (species is not a suitable target for conservation activities)
SHB: Breeding is not confirmed in Ontario
S#F: Range Rank (range of uncertainty about the status of the species or community)
S#P: Rank is Uncertain
ST: Not Ranked Yet
B: Breeding migrants/vagrants
N: Non-breeding migrants/vagrants

Conservation Priorities¹

Recovery Objective - Species at Risk

Increase - Population in decline

Maintain Current - Appears to be stable or increasing

Regional Rarity (Carolinian Canada)²

H - Historical
R - Rare
U - Unlikely

Local Rarity (NPCA)³

Widespread - Locally common

Regionally Significant - Species is significant in the region

SAR-Locally found - Species at Risk found locally

SAR-Locally found-DD - Species at Risk found locally - Data Deficient

Extirpated - Extirpated/ no longer found locally

Introduced - Not a local or Ontario species

References / Sources

¹ Bird Conservation Strategy for Bird Conservation Region (BCR) 13 in Ontario Region: Lower Great Lakes/St. Lawrence Plain (Environment Canada 2014)

² List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E) (Oldham, 2017).

³ Natural Areas Inventory 2006-2009 (NPCA, 2010) & Niagara NAI Area Reptile and Amphibian species and their National, Provincial and Local (study area) Significance (NPCA, 2010).

⁴ NHIC - Natural Heritage Information Centre (NHIC) Make-a-map Tool (Ministry of Natural Resources and Forestry, 2020)

⁵ Naturalist website available online at <https://www.inaturalist.org/> (all projects searched, including NHIC Rare Species of Ontario and Herps of Ontario Projects).

⁶ e-Bird website available online at <https://ebird.org/map/>

⁷ ORAA - Ontario Reptile and Amphibian Atlas (Ontario Nature, 2020) <https://www.ontarioinsects.org/herp/index.html?Sort=0&area2=squaresCounties&records=all&myZoom=5&Lat=46.58&Long=-85.81>

⁸ OBBA - Ontario Breeding Bird Atlas (Bird Studies Canada, 2005)

⁹ OBA - Ontario Butterfly Atlas - <https://www.ontarioinsects.org/atlas/>

¹⁰ Atlas of the Mammals of Ontario (Dobbyn, 1994)

¹¹ Natural Heritage Assessment South Niagara Hospital Project (Colville Consulting Inc. 2019)

Appendix D

Photographic Log

APPENDIX D – PHOTOGRAPHIC RECORD

Unnamed Tributary of Warren Creek, Sta. 1+540 (Montrose Road, Niagara Falls – August 12, 2020)



PHOTO 1 (LEFT): VIEW OF UPSTREAM REACH, LOOKING WEST FROM CULVERT INLET.
PHOTO 2 (RIGHT): VIEW OF CULVERT INLET LOOKING EAST TOWARDS MONTROSE ROAD.



PHOTO 3 (LEFT): DRY STREAMBED IN UPSTREAM REACH, HARDPACK MUCK SUBSTRATES.
PHOTO 4 (RIGHT): UPSTREAM CHANNEL FLOWING THROUGH NARROW GRASSY MEADOW WITHIN DECIDUOUS FOREST.



PHOTO 5 (LEFT): VIEW WITHIN CULVERT STRUCTURE SHOWING SHALLOW PONDED WATER.
PHOTO 6 (RIGHT): VIEW OF DOWNSTREAM REACH WITH DENSE COMMON REED GROWTH LOOKING EAST TOWARDS QEW.



PHOTO 7 (LEFT): VIEW SHOWING DITCHLINE BETWEEN MONTROSE ROAD AND QEW WITH DENSE COMMON REED, CATTAIL AND QEW RIGHT-OF-WAY FENCE.
PHOTO 8 (RIGHT): DRY CHANNEL IN DOWNSTREAM REACH WITH HARDPACK MUCK SUBSTRATES.

Warren Creek, 1+950 (Montrose Road, Niagara Falls – August 12, 2020)



PHOTO 9 (LEFT): LOOKING WEST FROM UPSTREAM END OF CULVERT – POOL AT CULVERT INLET WITHIN VIEW.
PHOTO 10 (RIGHT): FROM CULVERT LOOKING SOUTHEAST AT UPSTREAM WATERCOURSE.



PHOTO 11 (LEFT): FROM UPSTREAM POOL LOOKING NORTH AT TRIBUTARY CONFLUENCE.
PHOTO 12 (RIGHT): FROM UPSTREAM CONFLUENCE LOOKING SOUTHEAST AT UPSTREAM CHANNEL.



PHOTO 13 (LEFT): VIEW OF SHORT DOWNSTREAM REACH LOOKING EAST TOWARDS CULVERT INLET UNDER QEW.

PHOTO 14 (RIGHT): VIEW OF DENSE EMERGENT VEGETATION IN CHANNEL IMMEDIATELY DOWNSTREAM OF CULVERT OUTLET, LOOKING WEST TOWARDS MONTROSE ROAD.



PHOTO 15 (LEFT): VIEW OF ANGULAR SCOUR PROTECTION AT QEW CULVERT INLET WHICH POSES LOW FLOW BARRIER TO FISH MIGRATION.

PHOTO 16 (RIGHT): VIEW OF PONDED WATER IN QEW CULVERT IN DOWNSSTREAM REACH.

Welland River – 1+950 (Montrose Road, Niagara Falls – August 12, 2020)



PHOTO 17 (LEFT): VIEW OF WELLAND RIVER UPSTREAM (WEST) OF MONTROSE ROAD LOOKING WEST FROM EXISTING BRIDGE.

PHOTO 18 (RIGHT): SHALLOW CLAY SHELF ALONG SOUTH BANK WITH DENSE AQUATIC VEGETATION



PHOTO 19 (LEFT): VIEW OF SHALLOW CLAY SHELF ALONG NORTH BANK UPSTREAM OF BRIDGE WITH DENSE AQUATIC VEGETATION
PHOTO 20 (RIGHT): EXISTING BRIDGE IN-WATER PIERS, LOOKING DOWNSTREAM FROM SOUTH BANK

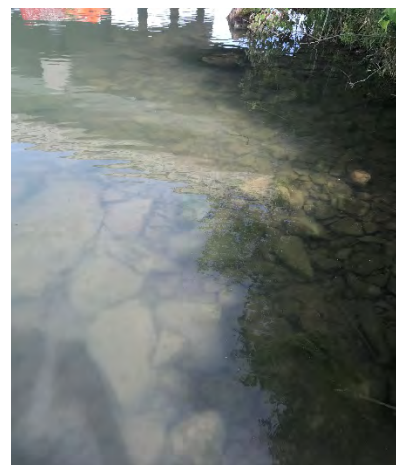


PHOTO 21 (LEFT): DENSE MATS OF AQUATIC VEGETATION IN NEARSHORE AREA AND OVERHANGING VEGETATION ALONG SOUTH BANK.
PHOTO 22 (RIGHT): BOULDER AND COBBLE SUBSTRATES ALONG BANK UNDER EXISTING BRIDGE.



PHOTO 23 (LEFT): DOWNSTREAM REACH LOOKING EAST FROM BRIDGE TOWARDS QEW BRIDGE.
PHOTO 24 (RIGHT): OVERHANGING VEGETATION AND INSTREAM AQUATIC VEGETATION ALONG SOUTH BANK.



PHOTO 25 (LEFT): SHALLOW SHELF WITH DENSE AQUATIC VEGETATION ALONG NEARSHORE AREA OF NORTH BANK, FLOODED CATTAIL AREA IN BACKGROUND.
PHOTO 26 (RIGHT): VIEW OF DOWNSTREAM REACH LOOKING NORTHEAST TOWARDS QEW FROM SOUTH BANK UNDER BRIDGE.



PHOTO 27 (LEFT): VIEW UNDER EXISTING BRIDGE LOOKING NORTH FROM SOUTH BANK.

Grassy Brook Creek, 3+394 (Montrose Road, Niagara Falls – August 12, 2020)



**PHOTO 28 (LEFT): VIEW OF UPSTREAM REACH LOOKING WEST FROM CULVERT INLET.
PHOTO 29 (RIGHT): VIEW OF DUAL BOX CULVERT INLET LOOKING DOWNSTREAM (WEST) TOWARDS MONTROSE ROAD.**



**PHOTO 30 (LEFT): WELL VEGETATED RIPARIAN ZONE ALONG NORTH BANK IN UPSTREAM REACH.
PHOTO 31 (RIGHT): OVERHANGING AND INSTREAM VEGETATION PRESENT ALONG SOUTH BANK IN UPSTREAM REACH.**



**PHOTO 32 (LEFT): INSTREAM AQUATIC VEGETATION CONSISTING OF WATER MILFOIL AND CANADA WATERWEED IN UPSTREAM CHANNEL.
PHOTO 33 (RIGHT): UPSTREAM CHANNEL NEAR UPPER LIMIT OF SURVEY AREA.**



PHOTO 34 (LEFT): DOWNSTREAM REACH LOOKING EAST FROM CULVERT OUTLET.
PHOTO 35 (RIGHT): VIEW OF DUAL BOX CULVERT OUTLET LOOKING UPSTREAM (WEST) TOWARDS MONTROSE ROAD.



PHOTO 36 (LEFT): ANGULAR COBBLE/BOULDER PRESENT WITHIN CHANNEL NEAR CULVERT OUTLET.
PHOTO 37 (RIGHT): INSTREAM AQUATIC VEGETATION CONSISTING OF WATER MILFOIL AND CANADA WATERWEED IN DOWNSTREAM CHANNEL.



PHOTO 38 (LEFT): OVERHANGING ALONG SOUTH BANK AND INSTREAM AQUATIC VEGETATION WITHIN DOWNSTREAM CHANNEL.
PHOTO 39 (RIGHT): DOWNSTREAM CHANNEL LOOKING UPSTREAM (EAST) TOWARDS MONTROSE ROAD.

Unnamed Tributary of Lyons Creek, Sta. 3+839 (Montrose Road, Niagara Falls – August 12, 2020)



PHOTO 40 (LEFT): VIEW OF UPSTREAM CHANNEL LOOKING WEST FROM CULVERT INLET.

PHOTO 41 (RIGHT): VIEW OF CULVERT INLET LOOKING DOWNSTREAM (EAST) TOWARDS MONTROSE ROAD.



PHOTO 42 (LEFT): OPEN MEADOW RIPARAIN AREA IN UPSTREAM REACH.

PHOTO 43 (RIGHT): VIEW OF DRY STREAMBED CHANNEL CONSISTING OF HARDPACK MUCK IN UPSTREAM REACH.



PHOTO 44 (LEFT): SCOUR PROTECTION AT INLET AND PONDED WATER WITHIN CULVERT STRUCTURE.

PHOTO 45 (RIGHT): VIEW OF DOWNSTREAM REACH LOOKING SOUTHEAST FROM CULVERT OUTLET.



PHOTO 46 (LEFT): SMALL DECIDUOUS WOODLOT CHANNEL FLOWS THROUGH IN DOWNSTREAM REACH.
PHOTO 47 (RIGHT): DRY CHANNEL IN DOWNSTREAM REACH.



PHOTO 48 (LEFT): VIEW OF CHANNEL UPSTREAM OF REXINGER ROAD.
PHOTO 49 (RIGHT): CULVERT INLET UNDER REXINGER ROAD.



PHOTO 50 (LEFT): DRY CHANNEL DOWNSTREAM OF REXINGER ROAD.
PHOTO 51 (RIGHT): CULVERT OUTLET DOWNSTREAM (SOUTH) OF REXINGER ROAD.



PHOTO 52 (LEFT): CHANNEL UPSTREAM OF REXINGER ROAD DURING SPRING 2021 FISH COMMUNITY SAMPLING VISIT.
PHOTO 53 (RIGHT): VIEW OF DOWNSTREAM REACH LOOKING NORTHWEST TOWARDS MONTROSE ROAD DURING SPRING 2021 FISH COMMUNITY VISIT.



PHOTO 54 (LEFT): VIEW OF CHANNEL DOWNSTREAM OF REXINGER ROAD DURING SPRING 2021 FISH COMMUNITY SITE VISIT.

Appendix E

Field Results

Wildlife Observations

Species		SAR Status		Conservation Rank and Rarity Status				Field Notes
Common Name	Scientific Name	National (SARA)	Provincial (ESA, 2007)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Conservation Priorities ¹	
AMPHIBIANS								
Gray Treefrog	<i>Hyla versicolor</i>				G5	S5		Heard calling (call codes 1)
Green Frog	<i>Rana clamitans</i>				G5	S5		Heard calling (call code 1)
Northern Leopard Frog	<i>Rana pipiens</i>				G5	S5		Observed on driveway.
Spring Peeper	<i>Pseudacris crucifer</i>				G5	S5		Heard calling (call codes 1 to 3)
Western Chorus Frog - Carolinian Population	<i>Pseudacris triseriata pop. 2</i>				G5TNR	S4		Heard calling (call codes 2 to 3)
Wood Frog	<i>Lithobates sylvaticus</i>				G5	S5		Heard calling (call code 1)
MAMMALS								
Big Brown Bat	<i>Eptesicus fuscus</i>				G5	S4		Recorded on handheld detector
Eastern Red Bat	<i>Lasiurus borealis</i>				G3G4	S4		Recorded on handheld detector
Hoary Bat	<i>Lasiurus cinereus</i>				G3G4	S4		Recorded on handheld detector
Muskrat	<i>Ondatra zibethicus</i>				G5	S5		Observed as roadkill.
Silver-haired Bat	<i>Lasionycteris noctivagans</i>				G3G4	S4		Recorded on handheld detector
BIRDS								
American Crow	<i>Corvus brachyrhynchos</i>				G5	S5B		Heard calling.
American Goldfinch	<i>Carduelis tristis</i>				G5	S5B		Pairs observed and heard calling.
American Robin	<i>Turdus migratorius</i>				G5	S5B		Heard calling.
American Woodcock	<i>Scolopax minor</i>				G5	S4B	Increase	
Barn Swallow	<i>Hirundo rustica</i>	THR, Schedule 1	THR	THR	G5	S4B	Recovery Objective	At least four individuals observed as fly overs and heard calling
Black-capped Chickadee	<i>Poecile atricapilla</i>				G5	S5		Heard calling.
Blue Jay	<i>Cyanocitta cristata</i>				G5	S5		Heard calling.
Bobolink	<i>Dolichonyx oryzivorus</i>	THR, Schedule 1	THR	THR	G5	S4B	Recovery Objective	Possible pair heard calling outside of the Project limits.
Brown-headed Cowbird	<i>Molothrus ater</i>				G5	S4B		Heard calling.
Cedar Waxwing	<i>Bombycilla cedrorum</i>				G5	S5B		Heard calling.
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>				G5	S5B		Heard calling.
Chipping Sparrow	<i>Spizella passerina</i>				G5	S5B		Heard calling.
Common Grackle	<i>Quiscalus quiscula</i>				G5	S5B		Heard calling.
Common Yellowthroat	<i>Geothlypis trichas</i>				G5	S5B		Heard calling.
Dark-eyed Junco	<i>Junco hyemalis</i>				G5	S5B		Heard calling.
Double-crested Cormorant	<i>Phalacrocorax auritus</i>				G5	S5B		One individual observed as fly over.
Eastern Kingbird	<i>Tyrannus tyrannus</i>				G5	S4B	Increase	Pairs observed and heard calling.
European Starling	<i>Sturnus vulgaris</i>				G5	SNA		Heard calling.
Field Sparrow	<i>Spizella pusilla</i>				G5	S4B	Increase	Heard calling.
Gray Catbird	<i>Dumetella carolinensis</i>				G5	S4B		Heard calling.
Great Blue Heron	<i>Ardea herodias</i>				G5	S4	Maintain Current	Two individuals observed as fly overs.
Great Egret	<i>Ardea herodias</i>				G5	S2B	Maintain Current	One individual observed as fly over.
House Sparrow	<i>Passer domesticus</i>				G5	SNA		Heard calling.
Killdeer	<i>Charadrius vociferus</i>				G5	S5B, S5N	Increase	Heard calling.
Mallard	<i>Anas platyrhynchos</i>				G5	S5	Maintain Current	Heard calling.
Mourning Dove	<i>Zenaidura macroura</i>				G5	S5		Heard calling.

Species		SAR Status		Conservation Rank and Rarity Status				Field Notes
Common Name	Scientific Name	National (SARA)	Provincial (ESA, 2007)	National (COSEWIC)	Global (G-rank)	Provincial (S-rank)	Conservation Priorities ¹	
Northern Cardinal	<i>Cardinalis cardinalis</i>				G5	S5		Heard calling.
Northern Flicker	<i>Colaptes auratus</i>				G5	S4B	Increase	Heard calling.
Red-winged Blackbird	<i>Agelaius phoeniceus</i>				G5	S4		Pairs observed and heard calling.
Ring-billed Gull	<i>Larus delawarensis</i>				G5	S5B,S4N		Heard calling.
Savannah Sparrow	<i>Passerculus sandwichensis</i>				G5	S4B	Increase	Pairs observed and heard calling.
Song Sparrow	<i>Melospiza melodia</i>				G5	S5B		Heard calling.
Spotted Sandpiper	<i>Actitis macularia</i>				G5	S5	Increase	One individual observed.
Vesper Sparrow	<i>Pooecetes gramineus</i>				G5	S4B	Increase	Heard calling.
Warbling Vireo	<i>Vireo gilvus</i>				G5	S5B		Heard calling.
Willow Flycatcher	<i>Empidonax traillii</i>				G5	S5B	Maintain Current	Heard calling.
Yellow Warbler	<i>Dendroica petechia</i>				G5	S5B		Heard calling.
INVERTEBRATES								
Monarch	<i>Danaus plexippus</i>	SC, Schedule 1	SC	END	G4	S2N, S4B		Two individuals observed.

Definitions, Acronyms and Symbols

Global G-rank

- G1:** Critically Imperiled (at very high risk of extinction)
- G2:** Imperiled (at high risk of extinction)
- G3:** Vulnerable (at moderate risk of extinction)
- G4:** Apparently Secure (Uncommon but not rare)
- G5:** Secure (common, widespread and abundant)
- G#G#:** Range Rank (range of uncertainty about the status of a taxon or ecosystem type)
- GU:** Unrankable (currently unrankable due to lack of information)
- GNR:** Unranked (global rank not yet assessed)
- GNA:** Not Applicable (species is not a suitable target for conservation activities)
- T:** Denotes that the rank applies to a subspecies or variety
- B:** Breeding
- N:** Non-breeding

Species of Conservation Concern (SoCC)

Species at Risk (SAR)

- COSEWIC:** Committee on the Status of Endangered Wildlife in Canada
- ESA:** Endangered Species Act
- SARA:** Species at Risk Act
- SARO:** Species at Risk in Ontario

SARA or ESA designation

- END** - Endangered
- THR** - Threatened
- SC** - Special Concern
- NAR** - Not at Risk

Provincial S-rank

- S1:** Critically Imperiled (i.e. fewer than 5 occurrences in the nation and/or province)
- S2:** Imperiled (i.e. fewer than 20 occurrences in the nation and/or province)
- S3:** Vulnerable (i.e. 20-80 occurrences in the nation and/or province)
- S4:** Apparently Secure (uncommon, but not rare in the nation and/or province)
- S5:** Secure (common, widespread and abundant in the nation and/or province)
- SNA:** Not Applicable (species is not a suitable target for conservation activities)
- SHB:** Breeding is not confirmed in Ontario
- S#S#:** Range Rank (range of uncertainty about the status of the species or community)
- S#?:** Rank is Uncertain
- S?:** Not Ranked Yet
- B:** Breeding migrants/vagrants
- N:** Non-breeding migrants/vagrants

Conservation Priorities¹

- Recovery** - Species at Risk
- Increase** - Population in decline
- Maintain Current** - Appears to be stable or increasing

Amphibian Call Survey Results

April 17, 2021

April 7, 2021

2

Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrock Road Project #: 477511 Surveyor(s): M.E

Station #: A1 GPS Unit ID: _____

Date: April 7, 2021 Start time: 22:34 End time: 22:37

Temp (°C): 14 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 10 Precipitation (mm): 0

Habitat Description:

woodland north was removed

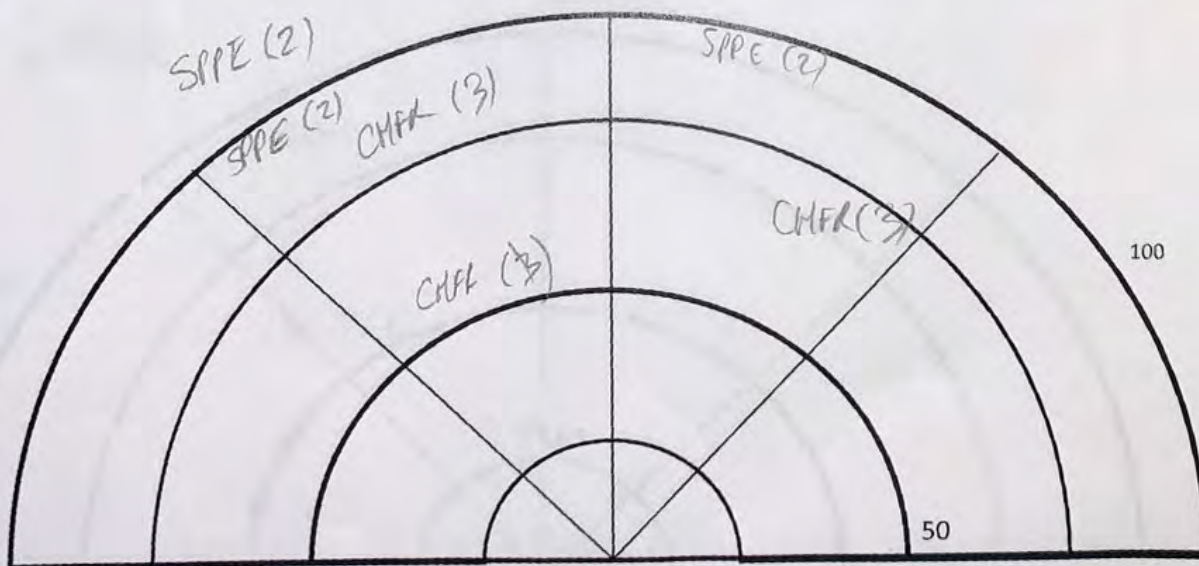
Incidental Wildlife:

Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3	3	3	3
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3	2	2	2
SPPE	1 2 3	1 2 3	1 2 3	2	2	2
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				2	Individuals do not overlap, can be counted		
B	Outside 100 m		3	Individuals sometimes overlap, abundance can be estimated			
C	Both Inside and Outside 100 m			Full chorus, not abundance estimate			

Heading: S



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: P2 GPS Unit ID: _____

Date: April 7, 2021 Start time: 22:40 End time: 22:43

Temp (°C): 14 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

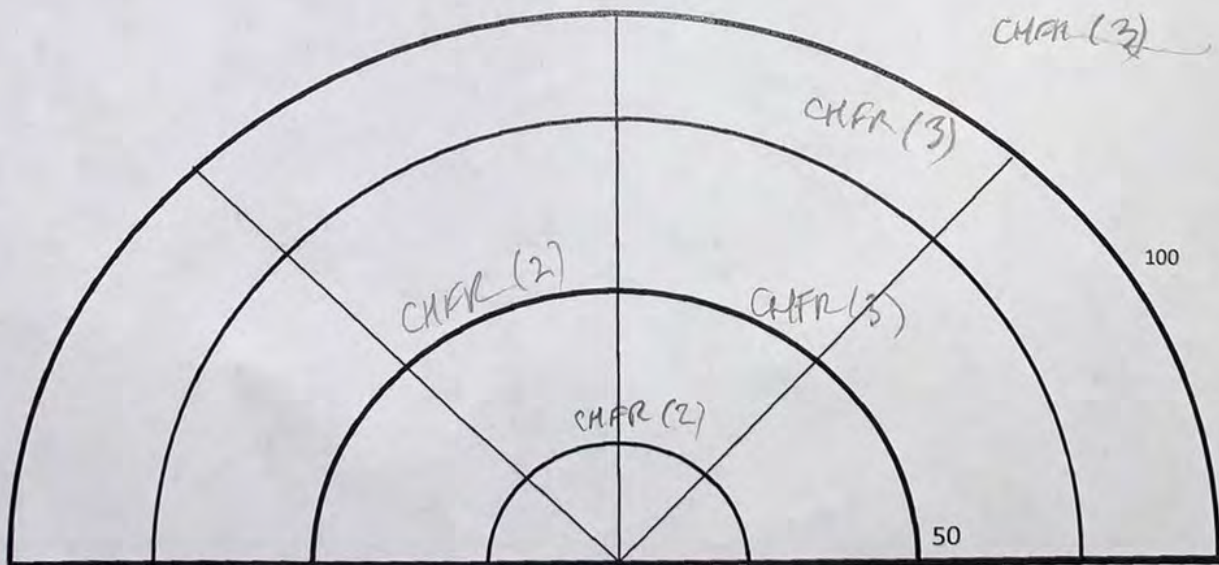
Incidental Wildlife: _____

Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3	1	2	3
BCFR	1	2	3	1	2	3	1	2	3
BULL	1	2	3	1	2	3	1	2	3
WCFR	1	2	(3)	1	2	(3)	1	2	(3)
GRTF	1	2	3	1	2	3	1	2	3
FOTO	1	2	3	1	2	3	1	2	3
GRFR	1	2	3	1	2	3	1	2	3
MIFR	1	2	3	1	2	3	1	2	3
NLFR	1	2	3	1	2	3	1	2	3
PIFR	1	2	3	1	2	3	1	2	3
SPPE	1	2	3	1	2	3	1	2	3
WOFO	1	2	3	1	2	3	1	2	3

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: S



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montezuma Road Project #: 477511 Surveyor(s): M.L.F

Station #: A3 GPS Unit ID: _____

Date: April 7, 2017 Start time: 21:26 End time: _____

Temp (°C): 14 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

woodland remaced

Incidental Wildlife:

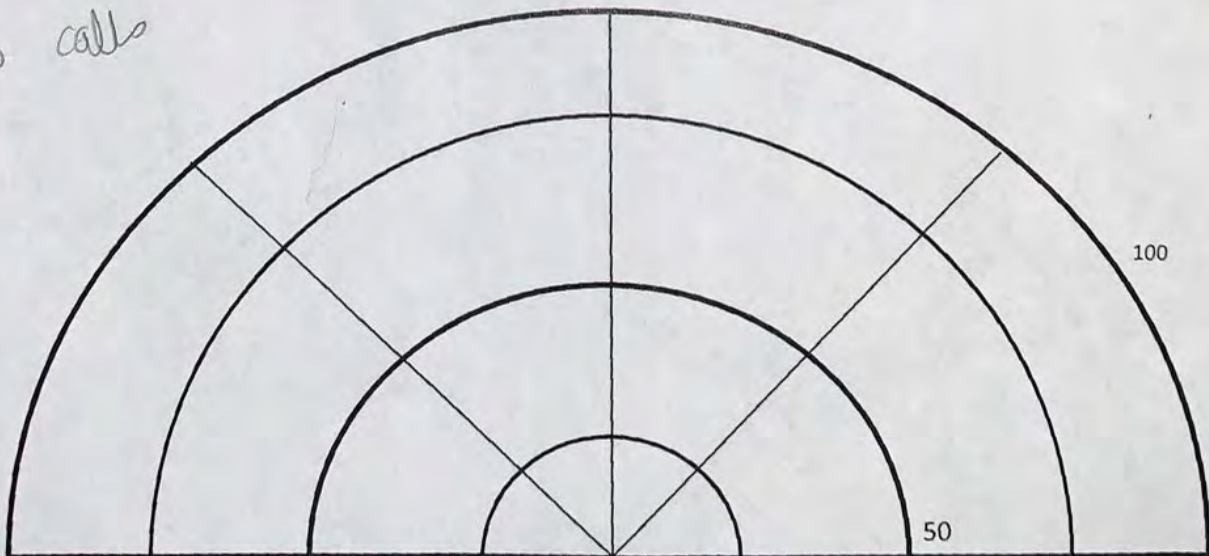
Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

Heading: E

No calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Monkrose Road Project #: 477511 Surveyor(s): M.E

Station #: A4 GPS Unit ID: _____

Date: April 21, 2021 Start time: 21:15 End time: 21:19

Temp (°C): 14 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

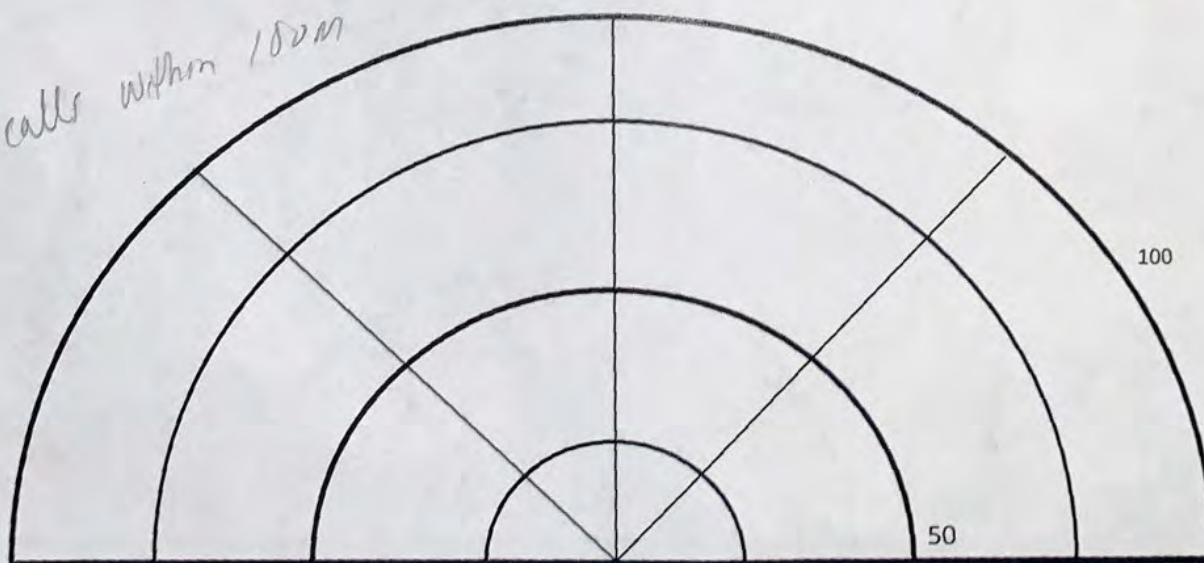
Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3	1	2	3
BCFR	1	2	3	1	2	3	1	2	3
BULL	1	2	3	1	2	3	1	2	3
WCFR	1	2	3	1	2	(3)	0	3	0
GRTF	1	2	3	1	2	3	1	2	3
FOTO	1	2	3	1	2	3	1	2	3
GRFR	1	2	3	1	2	3	1	2	3
MIFR	1	2	3	1	2	3	1	2	3
NLFR	1	2	3	1	2	3	1	2	3
PIFR	1	2	3	1	2	3	1	2	3
SPPE	1	2	3	1	(2)	3	0	2	0
WOFO	1	2	3	1	2	3	1	2	3

Incidental Wildlife: _____

Comments (other noises): _____

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				2	Individuals sometimes overlap, abundance can be estimated		
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate			

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.F

Station #: 45 GPS Unit ID: _____

Date: April 7, 2021 Start time: 21:20 End time: 21:23

Temp (°C): 19 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Field

Incidental Wildlife:

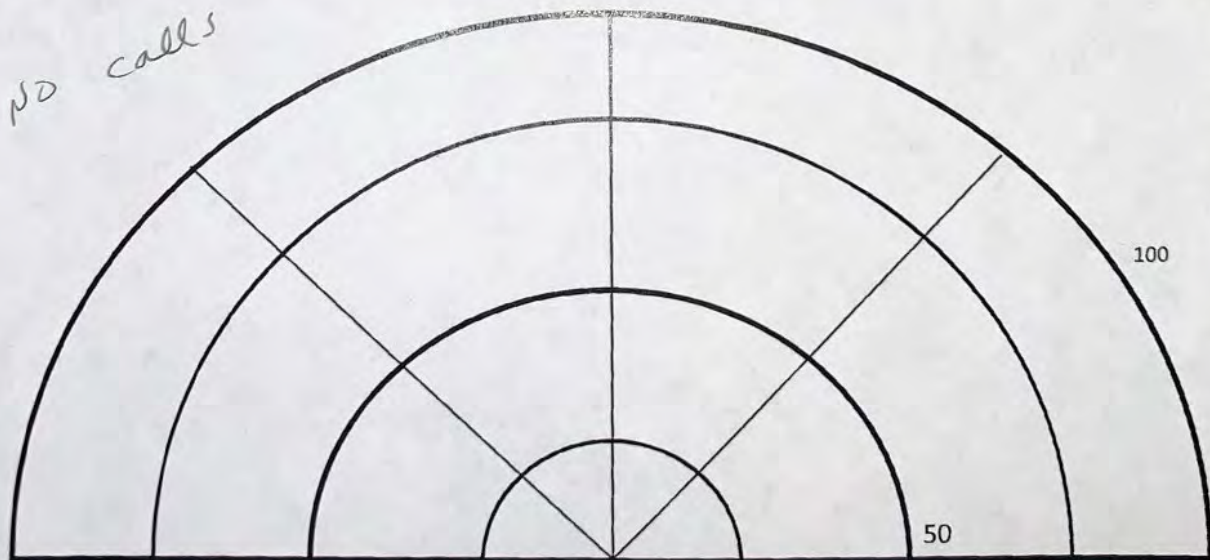
Comments (other noises):

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: S

NO calls



3

Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Project #: 477511 Surveyor(s): M.E

Station #: A6 GPS Unit ID: _____

Date: April 7, 2021 Start time: 22:56 End time: 22:09

Temp (°C): 19 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

*CHFR south of road
(near A7) Full chorus >100m
from road*

Incidental Wildlife:

Comments (other noises):

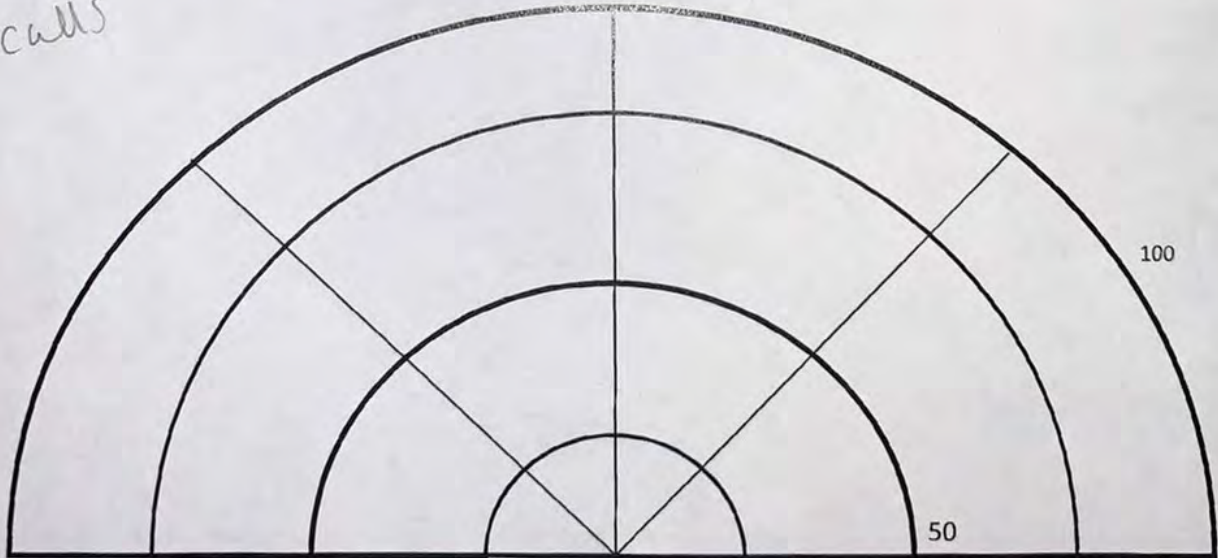
*construction lighting
illuminating woodland*

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate					

Heading: 2

NO calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Mimburo Project #: 477511 Surveyor(s): M.E

Station #: A7 GPS Unit ID: _____

Date: Apr 13, 2011 Start time: 22:00 End time: 22:03

Temp (°C): 14 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 (3)	1 2 (3)	1 2 (3)	3	3	3
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	(1) 2 3	1 2 3	1 2 3	1	0	0
WOFO	1 2 3	1 2 3	1 2 3			

Incidental Wildlife:

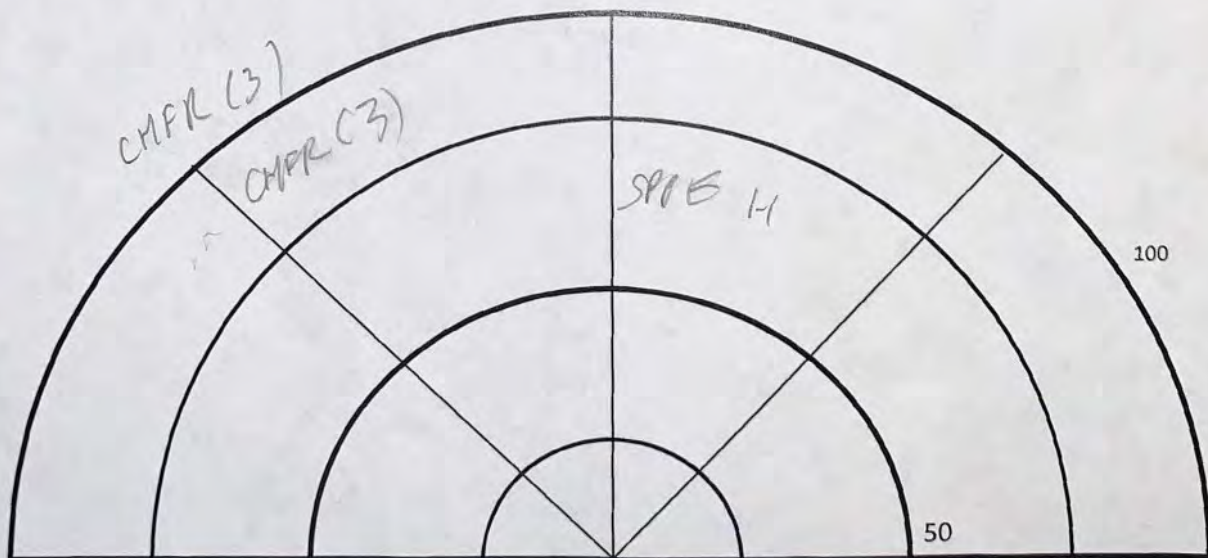
CHFR (3) nest in field

Comments (other noises):

light shining on woodland

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Monrose Road Project #: 477511 Surveyor(s): M.E

Station #: A8 GPS Unit ID: _____

Date: April 7, 2021 Start time: 21:52 End time: _____

Temp (°C): 17 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

no calls

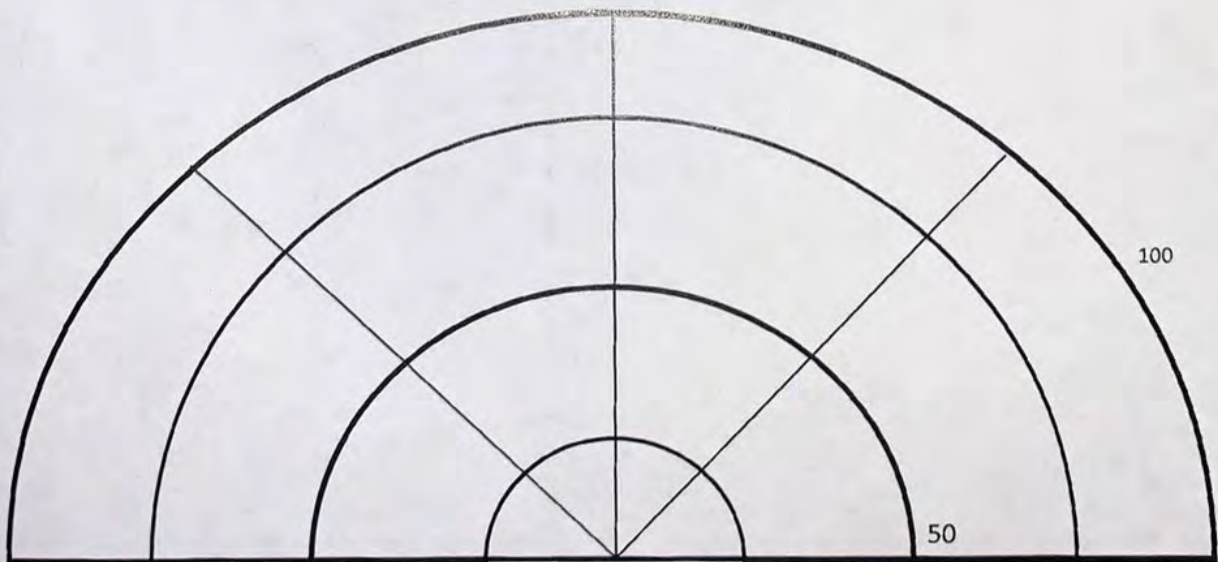
Incidental Wildlife:

Comments (other noises):

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				B			
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: 5



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Monhoso Road Project #: 477511 Surveyor(s): M.E

Station #: A9 GPS Unit ID: _____

Date: April 7, 2021 Start time: 21:40 End time: 21:43

Temp (°C): 14 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 (2) 3	1 2 3	0	2	0
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 (3)	1 2 3	0	3	0
WOFO	1 2 3	1 2 3	1 2 3			

Incidental Wildlife:

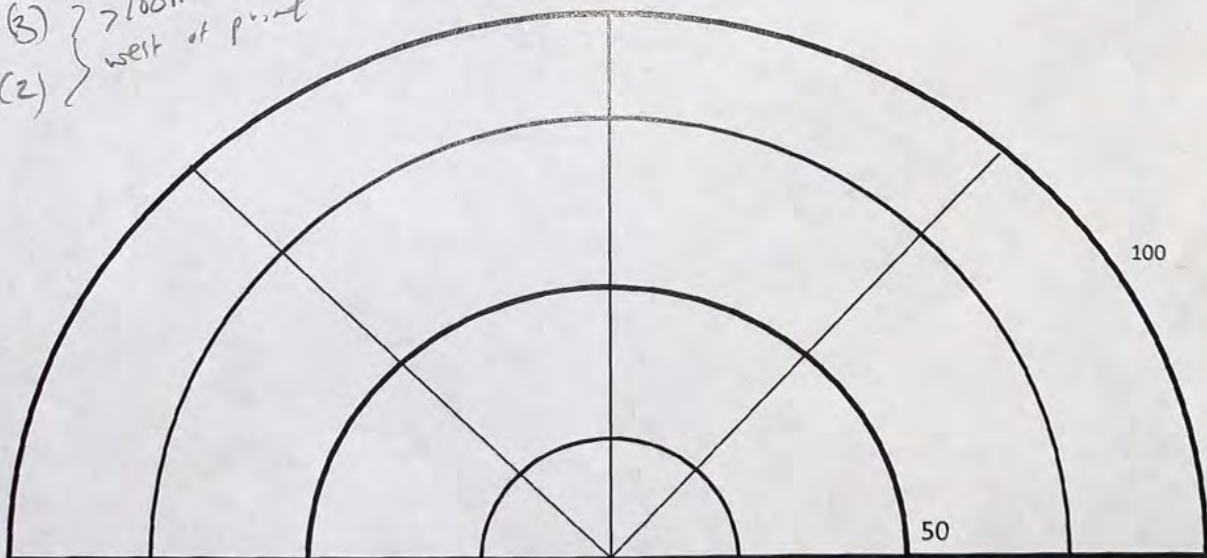
SPPE (FC) further west into wetland

Comments (other noises):

From Observer:	A	B	C	Call Levels:	1	2	3	Abundance	Any #	Individuals if counted or estimated
	Inside 100 m	Outside 100 m	Both Inside and Outside 100 m		Individuals do not overlap, can be counted	Individuals sometimes overlap, abundance can be estimated	Full chorus, not abundance estimate			

Heading: N

SPPE (3) } >100m west of point
CHFR (2) }



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Monhose Road Project #: 477511 Surveyor(s): M.E

Station #: A10 GPS Unit ID: _____

Date: Apr. 7, 2021 Start time: 20:30 End time: 21:33

Temp (°C): 15 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

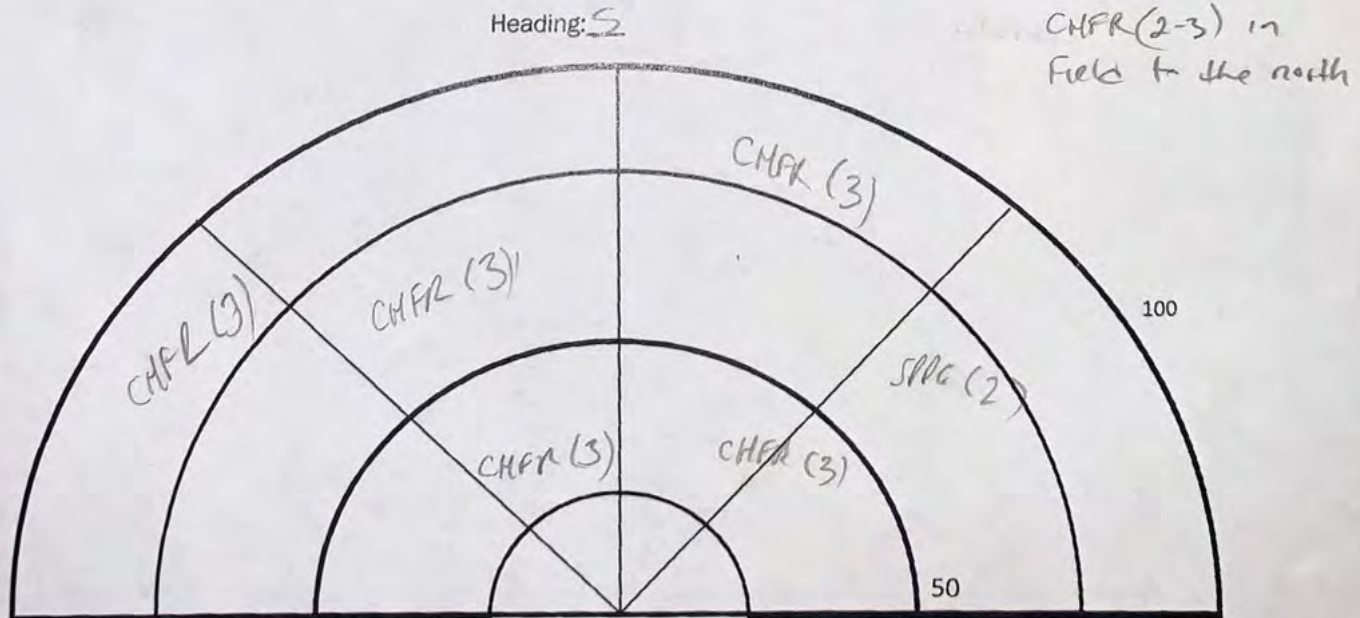
Swamp

Incidental Wildlife:

Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 (3)	1 2 (3)	1 2 (3)	3	3	3
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 (2) 3	1 2 3	0	2	0
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				B	Outside 100 m	2	Individuals sometimes overlap, abundance can be estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): MIE

Station #: A11 GPS Unit ID: _____

Date: April 7, 2021 Start time: 23:24 End time: 23:27

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

→ Swampy
→ 100m CMFR (3)

Incidental Wildlife:

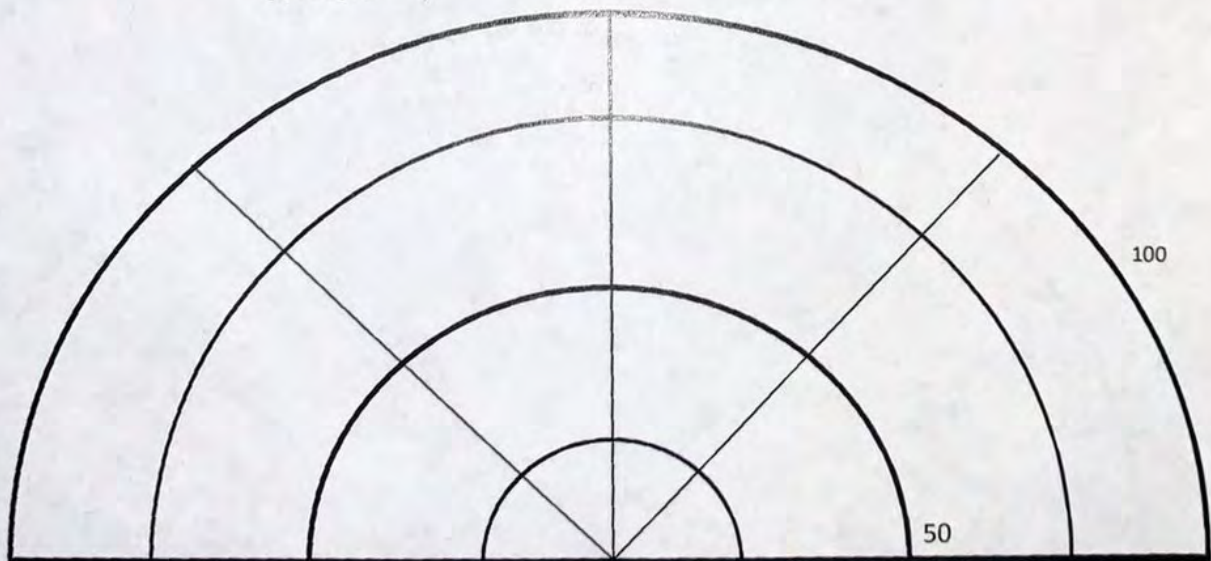
Comments (other noises):

noise

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 (3)	1 2 3	0	3	0
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate					

CMFR (3)
(woodland) Heading: W



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A12 GPS Unit ID: _____

Date: April 2, 2021 Start time: 23:52 End time: 23:55

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

field
American woodcock
call

Incidental Wildlife:

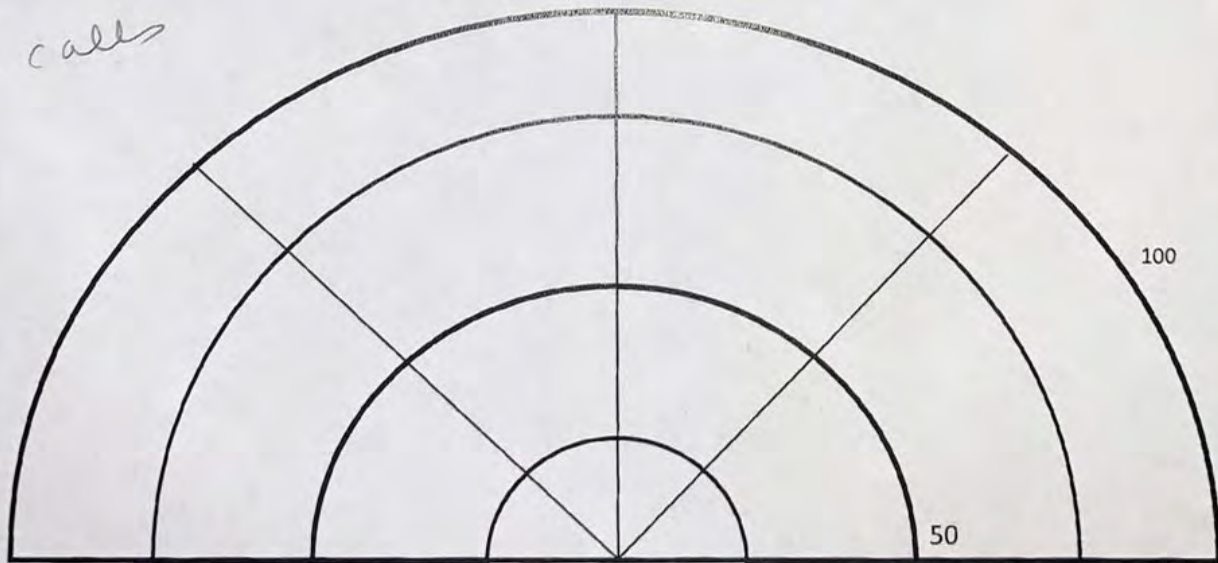
Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: S

No calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Mentose Road Project #: 477511 Surveyor(s): MJE

Station #: A13 GPS Unit ID: _____

Date: April 7 Start time: 22:54 End time: 22:59

Temp (°C): 13 Beaufort Wind Speed: _____ Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

SPPE 7100m north

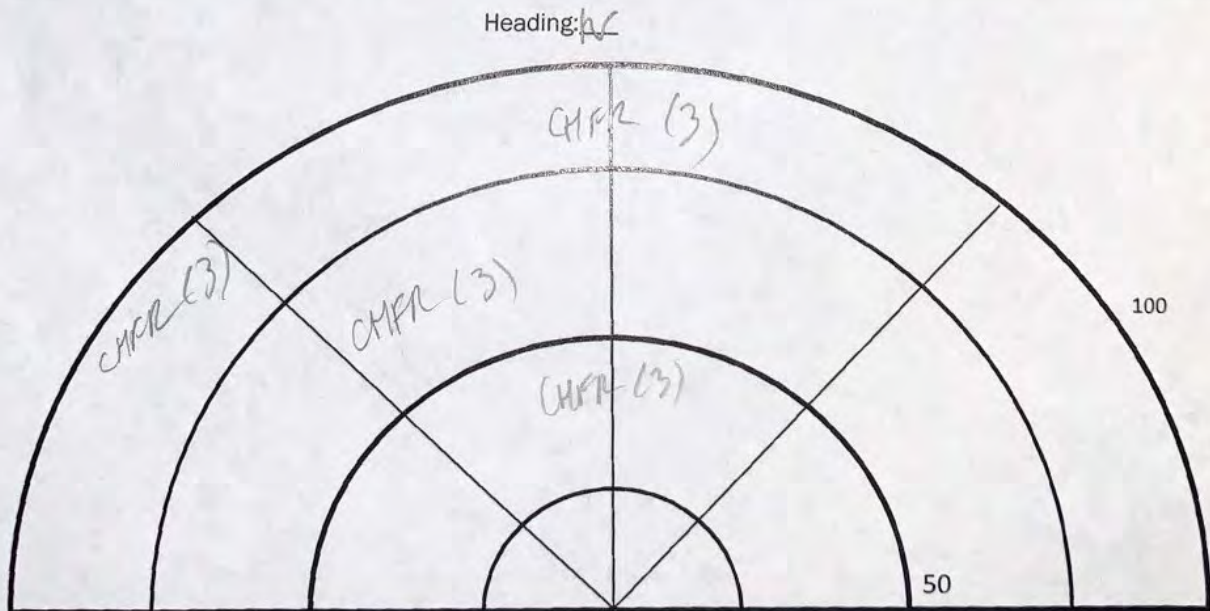
Incidental Wildlife:

coyote yipping
(east of road - north)

Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 <u>3</u>	1 2 <u>3</u>	1 2 <u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 <u>2</u> 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A14 GPS Unit ID: _____

Date: April 7, 2021 Start time: 23:00 End time: 23:03

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

700m² woodland

Incidental Wildlife:

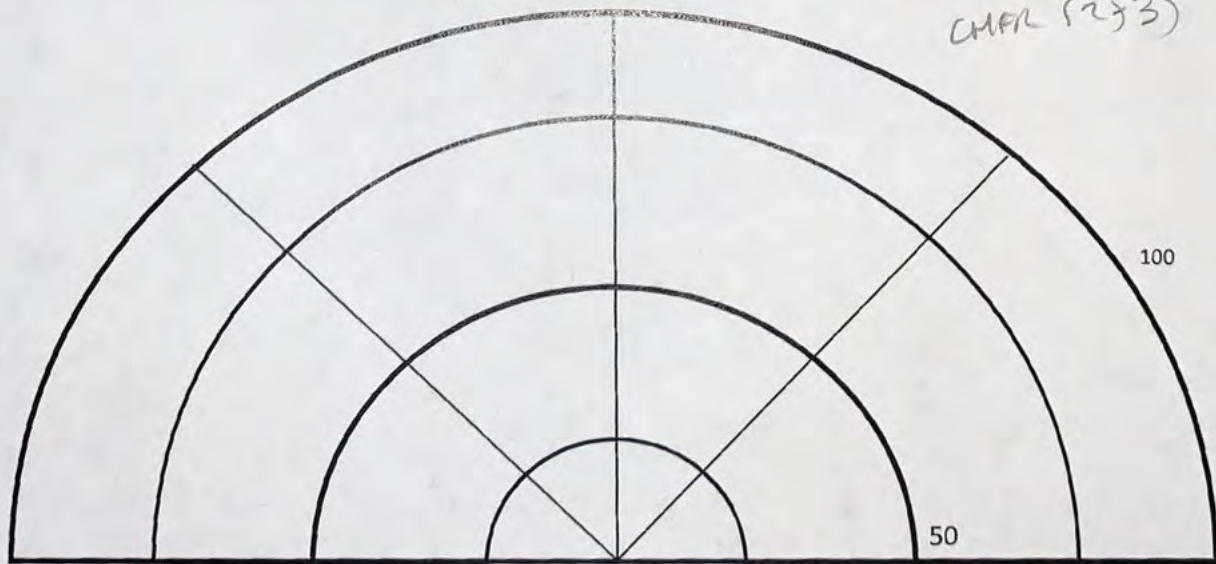
Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 (2) 3	1 2 3	0	2	0
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 (2) 3	1 2 3	0	2	0
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate					

Heading: N

SPPE (2)
WCFR (2 & 3)



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A145 GPS Unit ID: _____

Date: April 9, 2008 Start time: 23:10 End time: 23:13

Temp (°C): 13 Beaufort Wind Speed: _____ Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

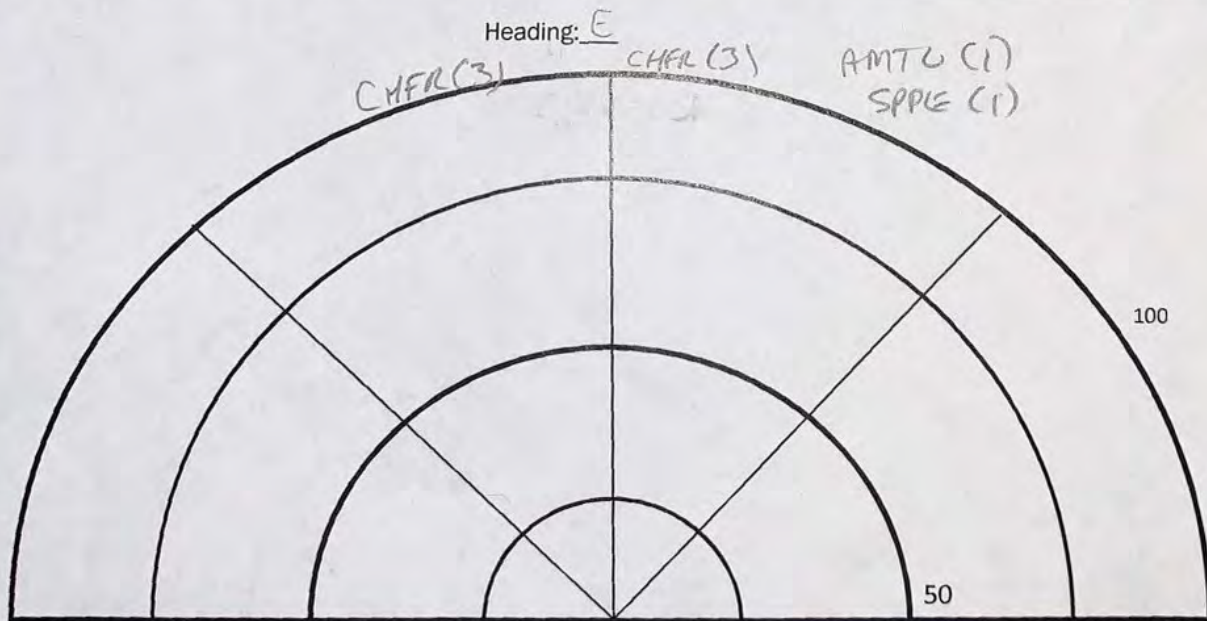
Habitat Description:

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	(1) 2 3	1 2 3	0	1	0
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 (3)	1 2 3	0	3	0
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	(1) 2 3	1 2 3	0	1	0
WOFO	1 2 3	1 2 3	1 2 3			

Incidental Wildlife:

Comments (other noises):

From Observer:	A	B	Call Levels:	1	2	3	Abundance	Any #	Individuals if counted or estimated
	Inside 100 m	Outside 100 m		Individuals do not overlap, can be counted	Individuals sometimes overlap, abundance can be estimated	Full chorus, not abundance estimate			
	Both Inside and Outside 100 m								



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): ME

Station #: A-16 GPS Unit ID: _____

Date: April 7, 2021 Start time: 21:30 End time: 21:53

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 (2) 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

Incidental Wildlife:

Comments (other noises):

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): ME

Station #: A17 GPS Unit ID: _____

Date: April 2, 2024 Start time: 23:30 End time: 23:33

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 5 Precipitation (mm): 0

Habitat Description:

Phrag patch in field

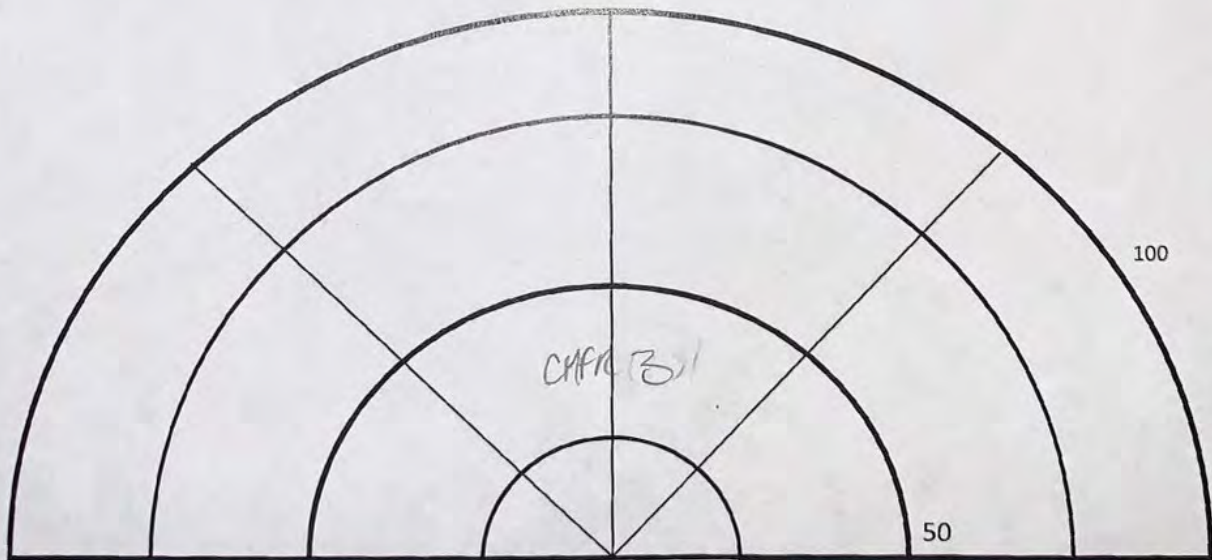
Incidental Wildlife:

Comments (other noises):

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3	1	2	3
BCFR	1	2	3	1	2	3	1	2	3
BULL	1	2	3	1	2	3	1	2	3
WCFR	1	2	(3)	1	2	3	3	0	0
GRTF	1	2	3	1	2	3	1	2	3
FOTO	1	2	3	1	2	3	1	2	3
GRFR	1	2	3	1	2	3	1	2	3
MIFR	1	2	3	1	2	3	1	2	3
NLFR	1	2	3	1	2	3	1	2	3
PIFR	1	2	3	1	2	3	1	2	3
SPPE	1	2	3	1	2	3	1	2	3
WOFO	1	2	3	1	2	3	1	2	3

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate					

Heading: 5



June 12, 2020

June 12, 2020

①

Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): ME

Station #: A-1 GPS Unit ID: _____

Date: June 12, 2020 Start time: 21:35 End time: 21:40

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	① 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	① 2 3	1 2 3	1 2 3			

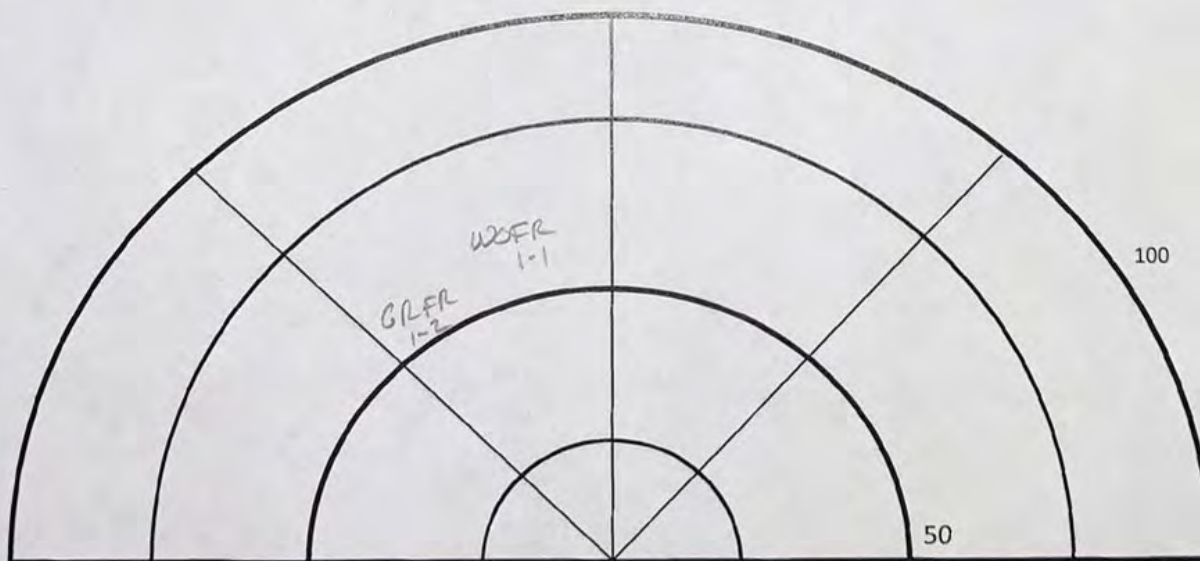
Incidental Wildlife:

Bats
- LASCIW
- LASBOR
- EPTFUS

Comments (other noises): _____

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

Heading: S



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 427511 Surveyor(s): M.E

Station #: A-2 GPS Unit ID: _____

Date: June 12, 2020 Start time: 22:00 End time: 22:05

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIER	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

Incidental Wildlife:

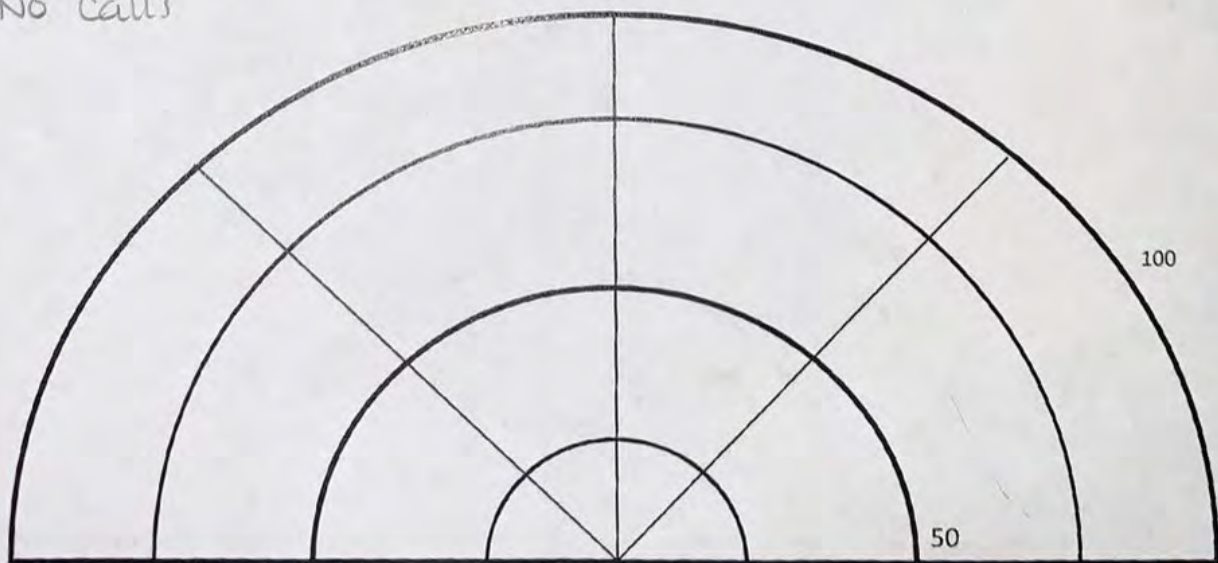
Bats
 - LASCIN (south side)
 - LASBOR
 - EPTFUS } north side

Comments (other noises): _____

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: S

No calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-3 GPS Unit ID: _____

Date: June 12, 2020 Start time: 22:38 End time: 22:43

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

Incidental Wildlife:

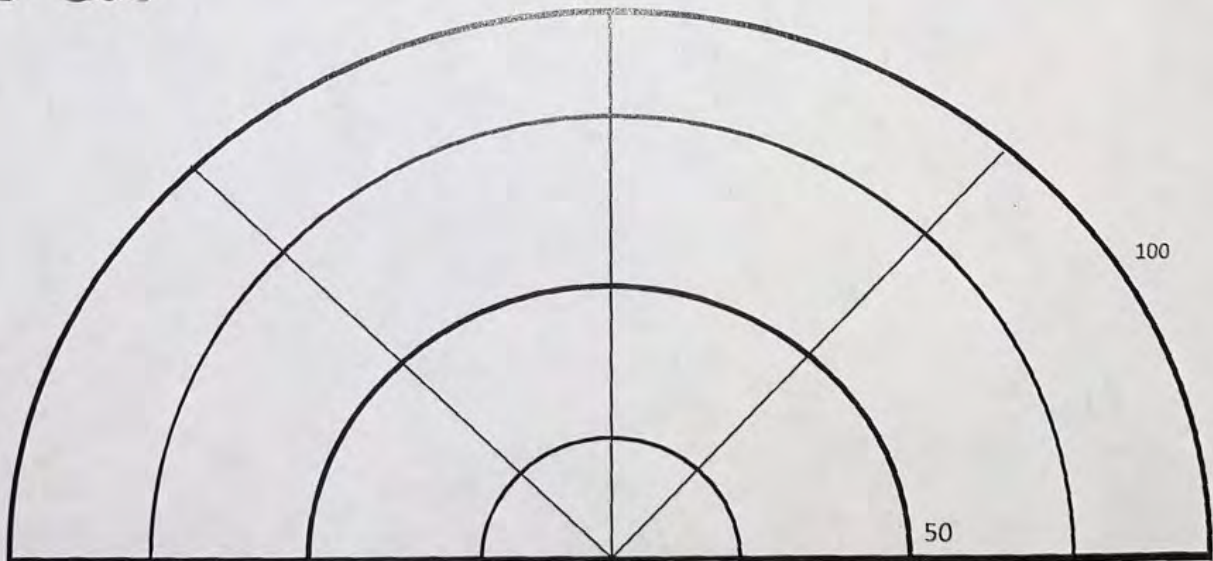
Bats
- EPTFUS

Comments (other noises):

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

NO calls

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-4 GPS Unit ID: _____

Date: June 12, 2020 Start time: 22:46 End time: 22:52

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Incidental Wildlife: _____

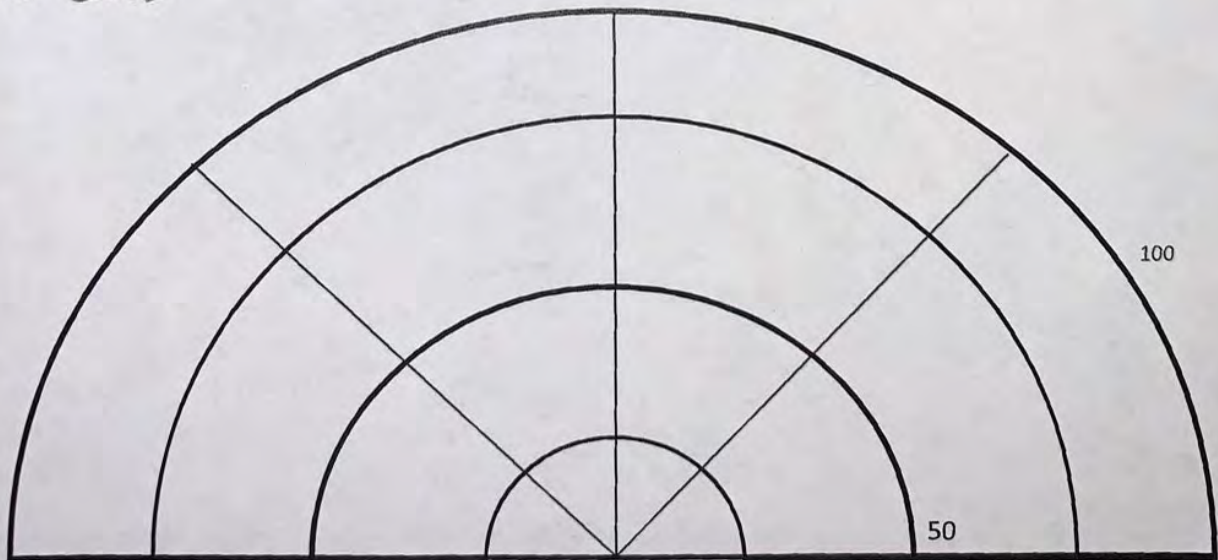
Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				B	Outside 100 m	2	Individuals sometimes overlap, abundance can be estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

NO calls

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-5 GPS Unit ID: _____

Date: June 12, 2020 Start time: 22:58 End time: 23:01

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 8 Precipitation (mm): 0

Habitat Description:

Incidental Wildlife:

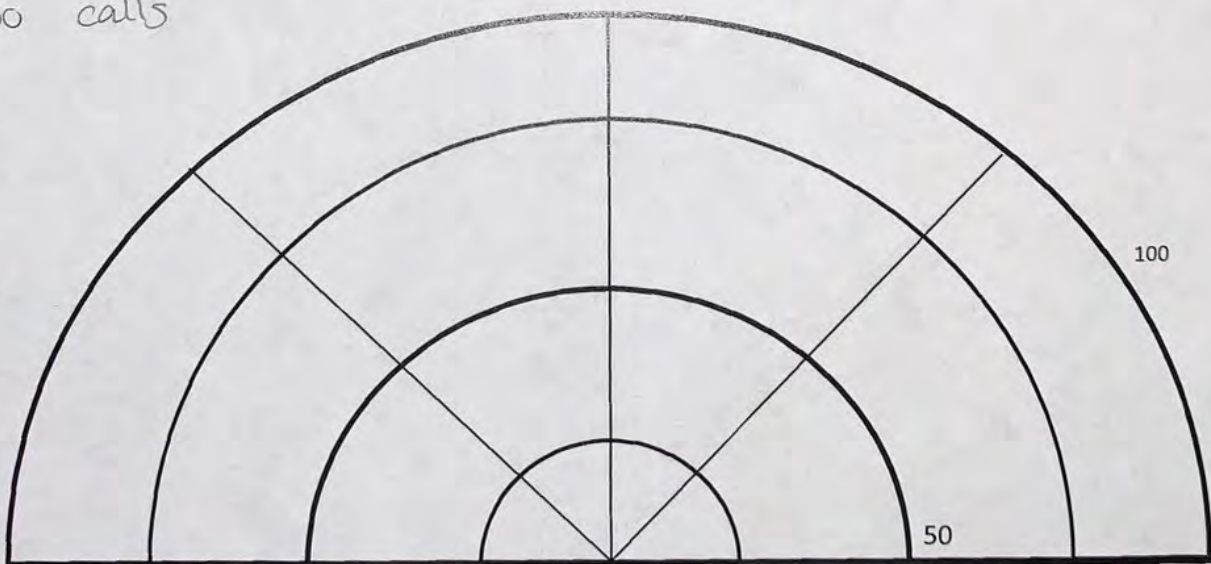
Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: S

NO calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A16 GPS Unit ID: _____

Date: June 12, 2020 Start time: 23:02 End time: 23:08

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

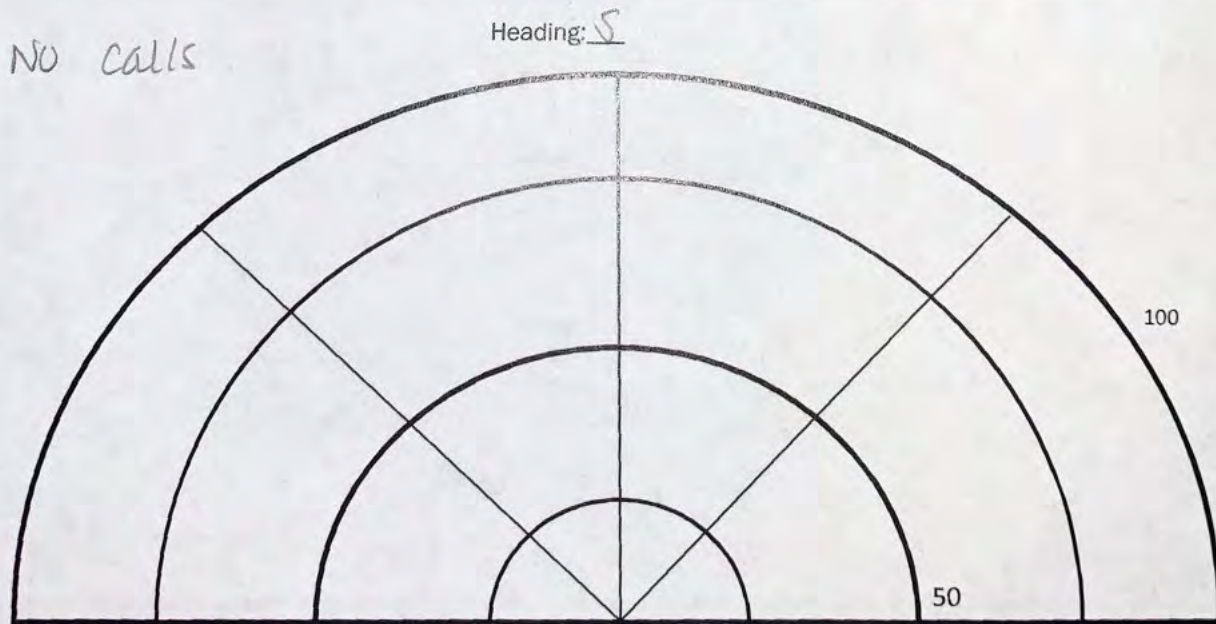
Incidental Wildlife: _____

Comments (other noises):

*Construction lighting
illuminating woodland*

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-7 GPS Unit ID: _____

Date: June 17, 2020 Start time: 23:15 End time: 23:20

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3	1	2	3
BCFR	1	2	3	1	2	3	1	2	3
BULL	1	2	3	1	2	3	1	2	3
WCFR	1	2	3	1	2	3	1	2	3
GRTF	1	2	3	1	2	3	1	2	3
FOTO	1	2	3	1	2	3	1	2	3
GRFR	(1)	2	3	1	2	3	1	2	3
MIFR	1	2	3	1	2	3	1	2	3
NLFR	1	2	3	1	2	3	1	2	3
PIFR	1	2	3	1	2	3	1	2	3
SPPE	1	2	3	1	2	3	1	2	3
WOFO	1	2	3	1	2	3	1	2	3

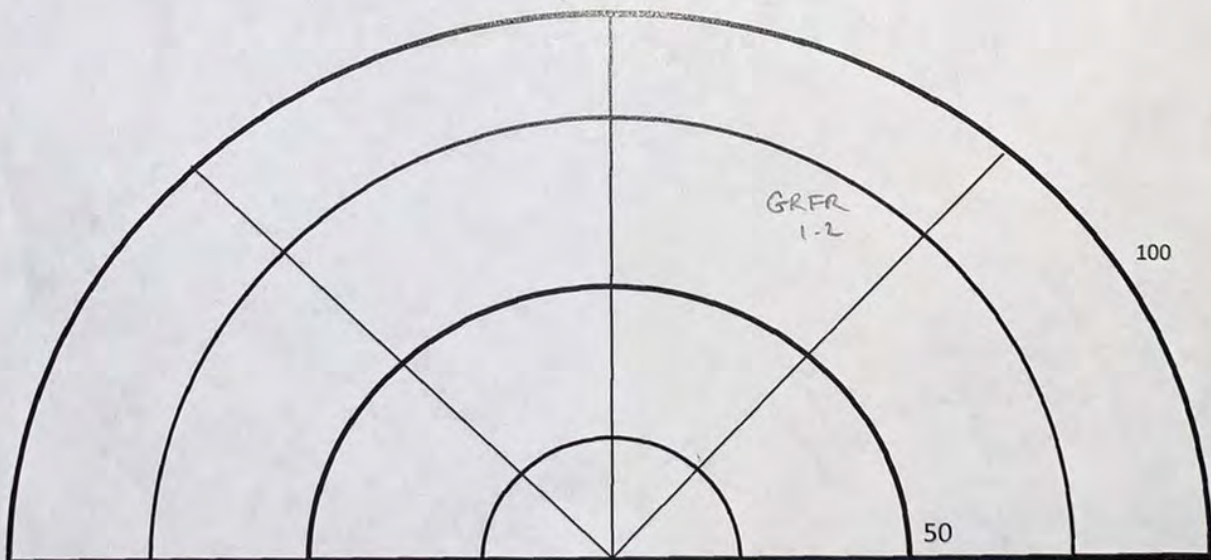
Incidental Wildlife:

Bats
- LASBOR
- LASNOC

Comments (other noises): _____

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E.

Station #: A-8 GPS Unit ID: _____

Date: June 12, 2020 Start time: 23:21 End time: 23:26

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

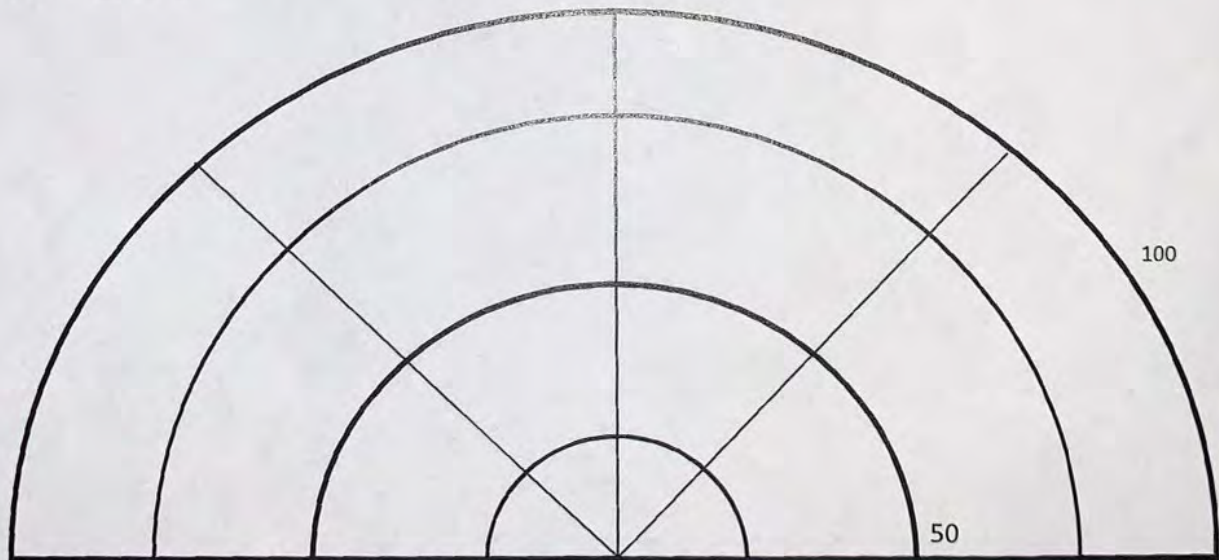
Incidental Wildlife:

Comments (other noises):

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate					

no calls

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-9 GPS Unit ID: _____

Date: June 12, 2020 Start time: 23:36 End time: 23:41

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

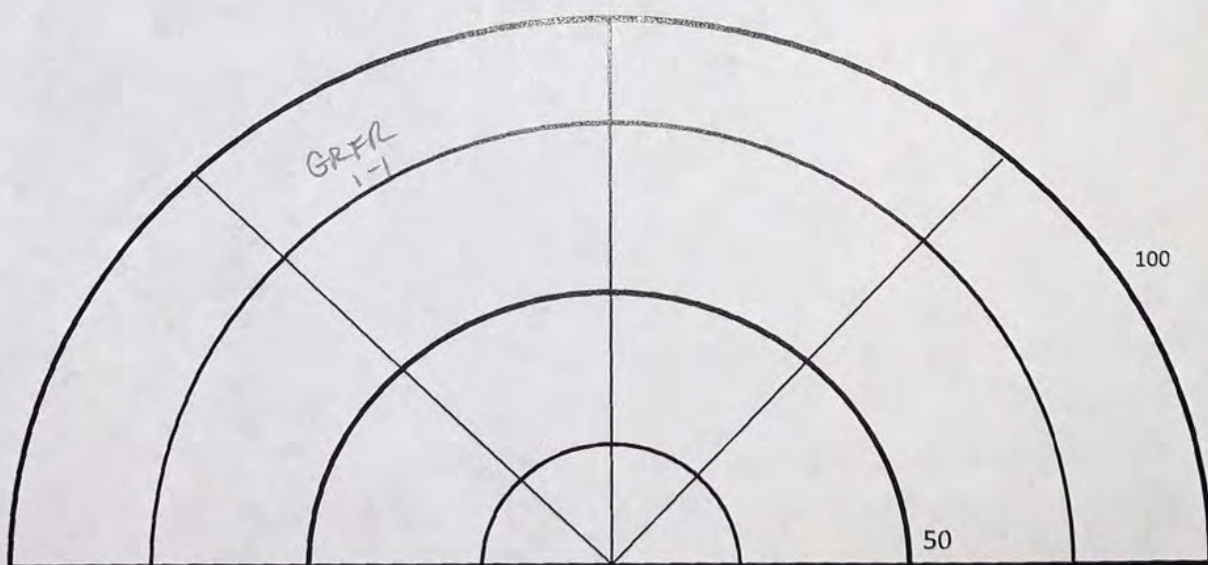
Incidental Wildlife: _____

Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3	1	2	3
BCFR	1	2	3	1	2	3	1	2	3
BULL	1	2	3	1	2	3	1	2	3
WCFR	1	2	3	1	2	3	1	2	3
GRTF	1	2	3	1	2	3	1	2	3
FOTO	1	2	3	1	2	3	1	2	3
GRFR	1	2	3	1	2	3	1	2	3
MIFR	1	2	3	1	2	3	1	2	3
NLFR	1	2	3	1	2	3	1	2	3
PIFR	1	2	3	1	2	3	1	2	3
SPPE	1	2	3	1	2	3	1	2	3
WOFO	1	2	3	1	2	3	1	2	3

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

Heading: N



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-10 GPS Unit ID: _____

Date: June 12, 2020 Start time: 23:43 End time: 23:48

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Incidental Wildlife: _____

Bats

LASBON @ corner near
guiderail

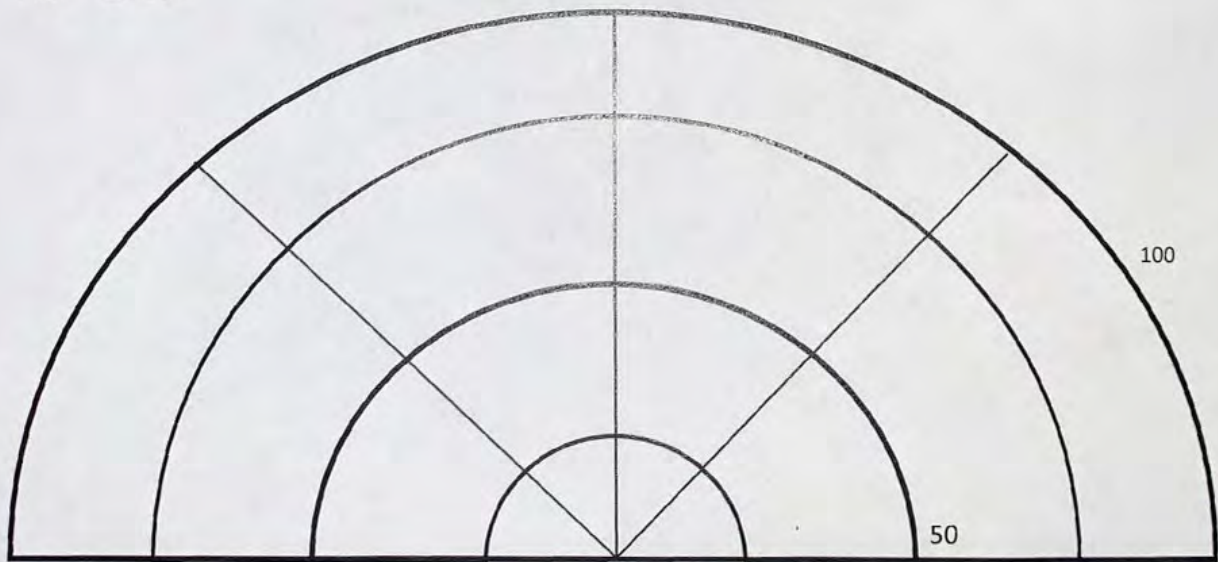
Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate					

NO calls

Heading: S



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 437511 Surveyor(s): M.E

Station #: A-11 GPS Unit ID: _____

Date: June 12, 2020 Start time: 23:49 End time: 23:53

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

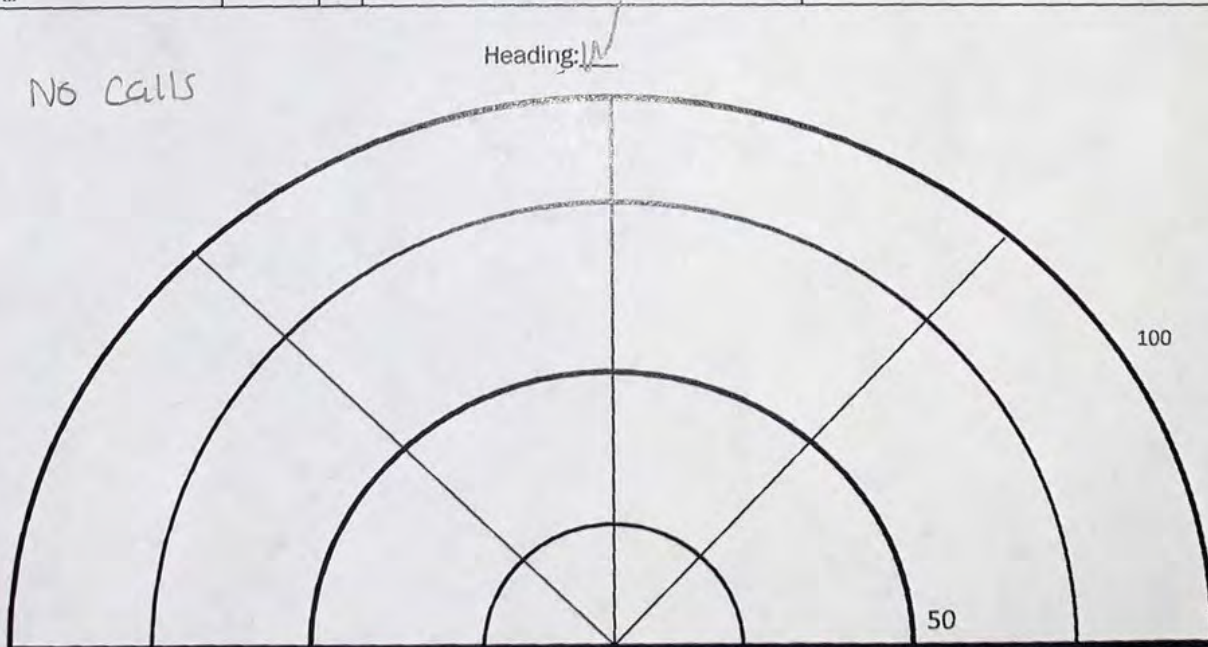
Habitat Description: _____

Incidental Wildlife: _____

Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-12 GPS Unit ID: _____

Date: June 12, 2020 Start time: 23:56 End time: 24:00

Temp (°C): 13 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Incidental Wildlife: _____

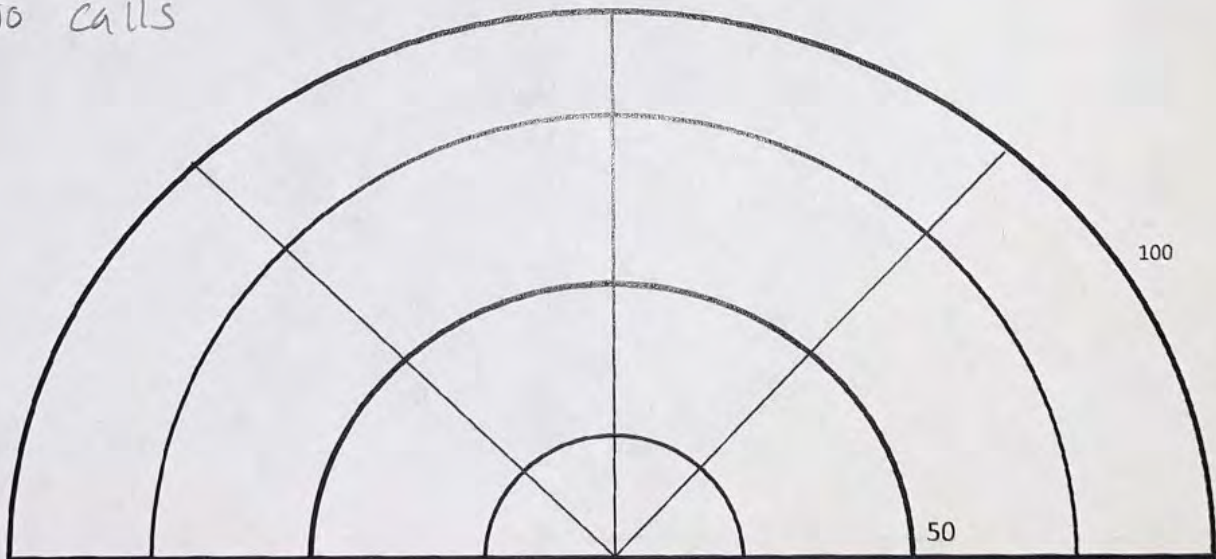
Comments (other noises): _____

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: S

NO CALLS



June 29, 2020

June 29, 2020

Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montross Road Project #: 477511 Surveyor(s): M.E

Station #: A-1 GPS Unit ID: _____

Date: June 29, 2020 Start time: 23:12 End time: 23:15

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): X Precipitation (mm): X

Habitat Description: _____

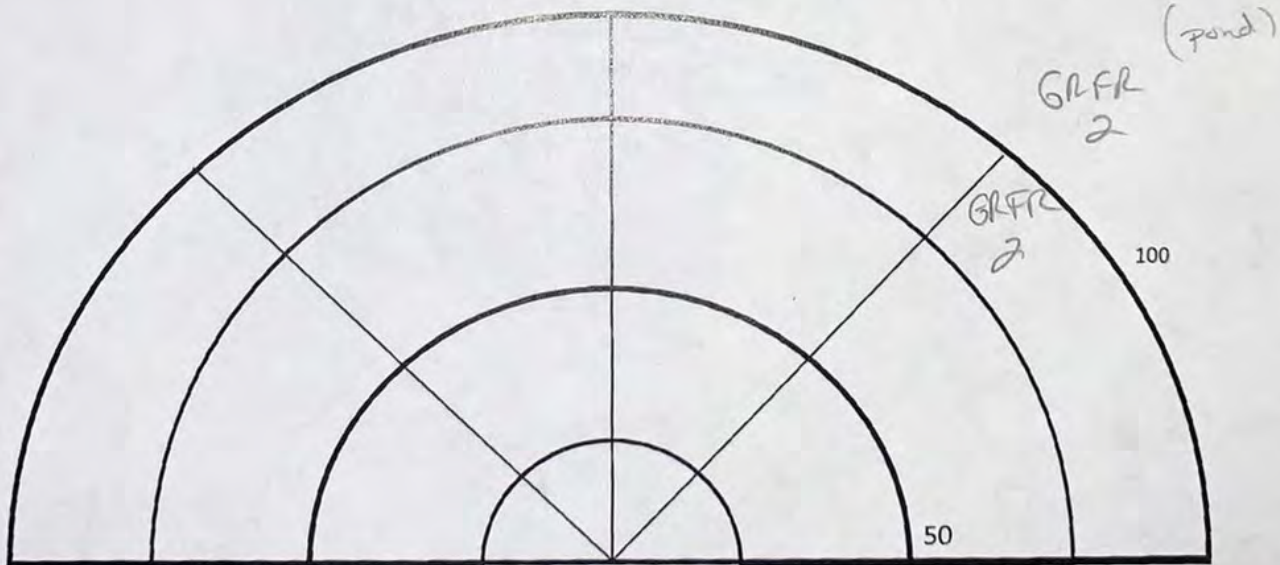
Incidental Wildlife: _____

Comments (other noises): _____

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 <u>2</u> 3	1 <u>2</u> 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	B	C	Call Levels:	1	2	3	Abundance	Any #	Individuals if counted or estimated
	Inside 100 m	Outside 100 m	Both Inside and Outside 100 m		Individuals do not overlap, can be counted	Individuals sometimes overlap, abundance can be estimated	Full chorus, not abundance estimate			

Heading: S



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 427511 Surveyor(s): M.E

Station #: A-2 GPS Unit ID: _____

Date: June 29, 2020 Start time: 23:22 End time: 23:25

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Incidental Wildlife: _____

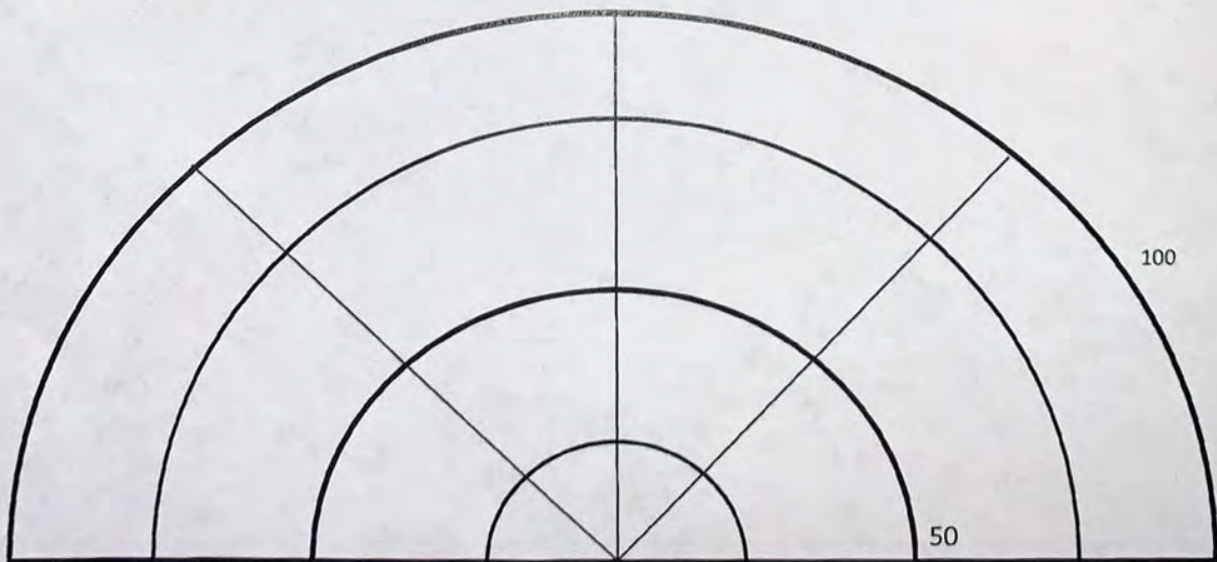
Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				B			
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

NO calls

Heading: S



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-3 GPS Unit ID: _____

Date: June 29, 2020 Start time: 23:07 End time: 23:10

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Species	From Observer									Abundance (FC=Full Chorus)		
	A (0<100 m)			B (>100m)			C (both)			A	B	C
AMTO	1	2	3	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3	1	2	3			
BULL	1	2	3	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3	1	2	3			

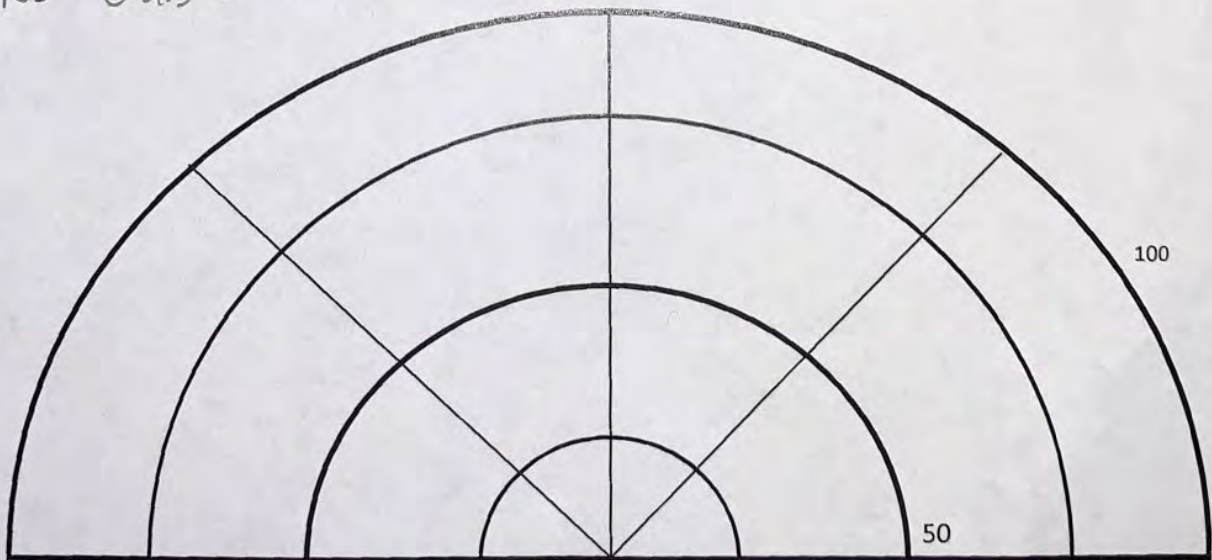
Incidental Wildlife:

Comments (other noises):

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

NO calls -

Heading: E



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-4 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:01 End time: 22:03

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Incidental Wildlife: _____

Bats
- Big Brown Bat

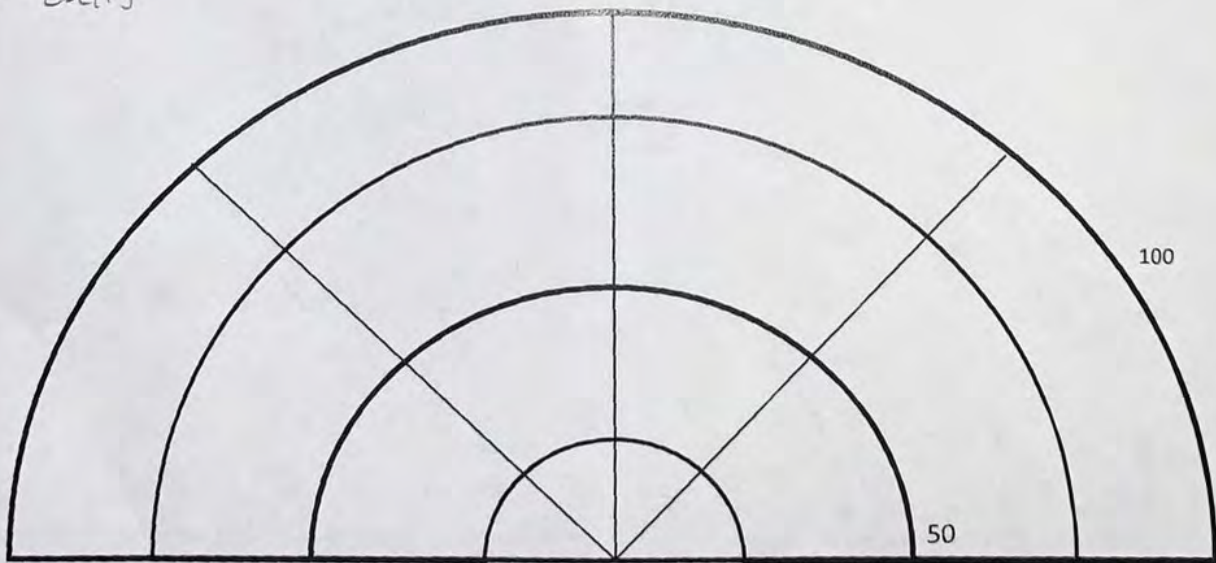
Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

NO calls

Heading: ←



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A5 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:57 End time: 23:00

Temp (°C): 26 Beaufort Wind Speed: _____ Wind Dir: 1 Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

Incidental Wildlife:

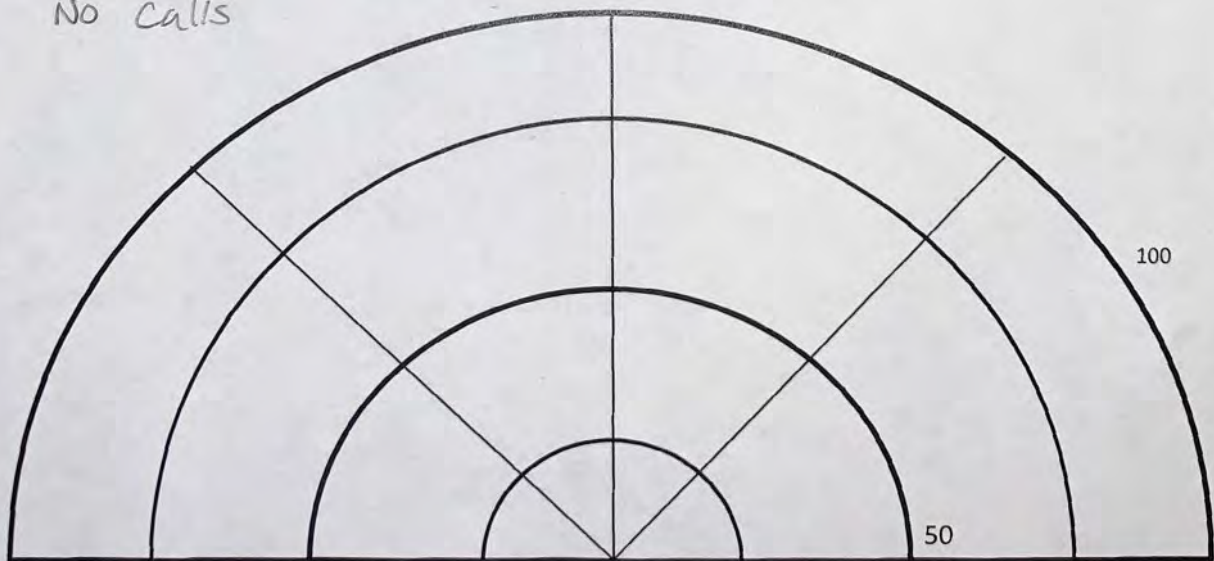
LEFR observed on driveway

Comments (other noises):

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			

Heading: 0

No calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-6 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:52 End time: 22:55

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Incidental Wildlife: _____

Comments (other noises):

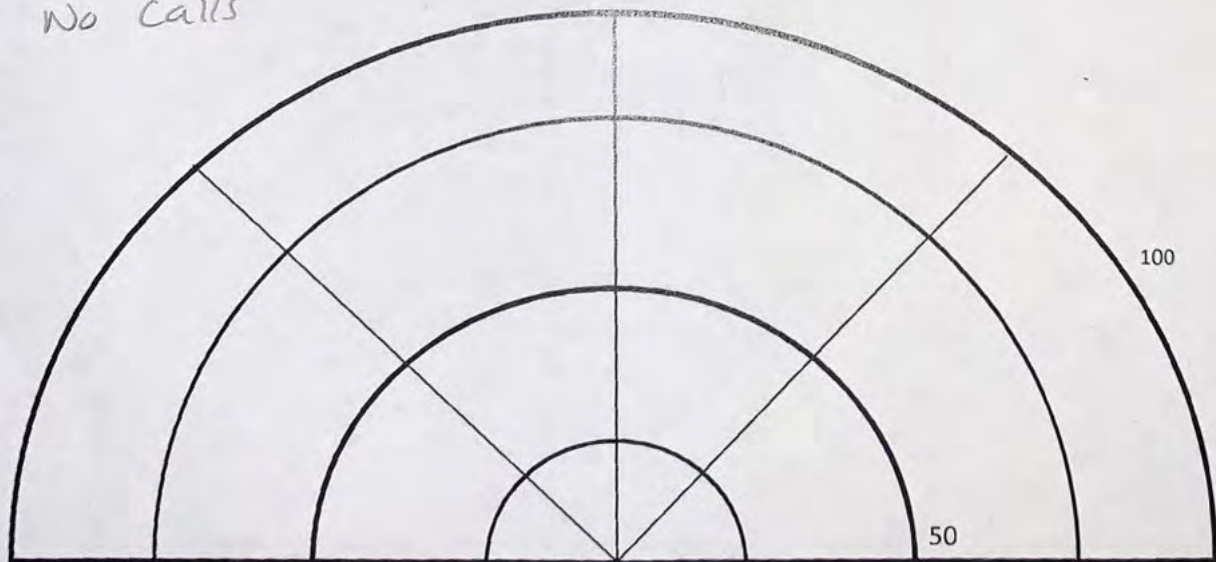
*construction lighting
illuminating woodland*

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	1 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				2	Individuals sometimes overlap, abundance can be estimated		
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate			

Heading: S

No calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 427511 Surveyor(s): MJE

Station #: A-7 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:46 End time: 22:50

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

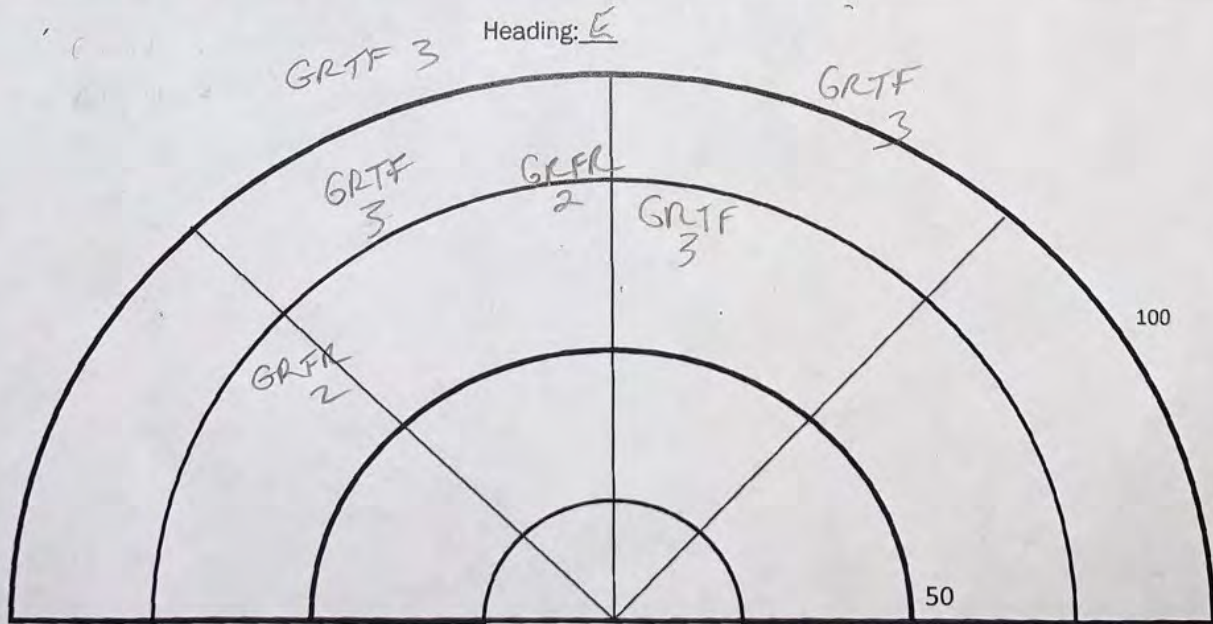
Habitat Description: _____

Incidental Wildlife: _____

Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3	1	2	3
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	(3)	1	2	(3)	3	3	3
FOTO	1	2	3	1	2	3			
GRFR	1	(2)	3	1	(2)	3	2	0	0
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-B GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:42 End time: 22:45

Temp (°C): 24 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

Incidental Wildlife: _____

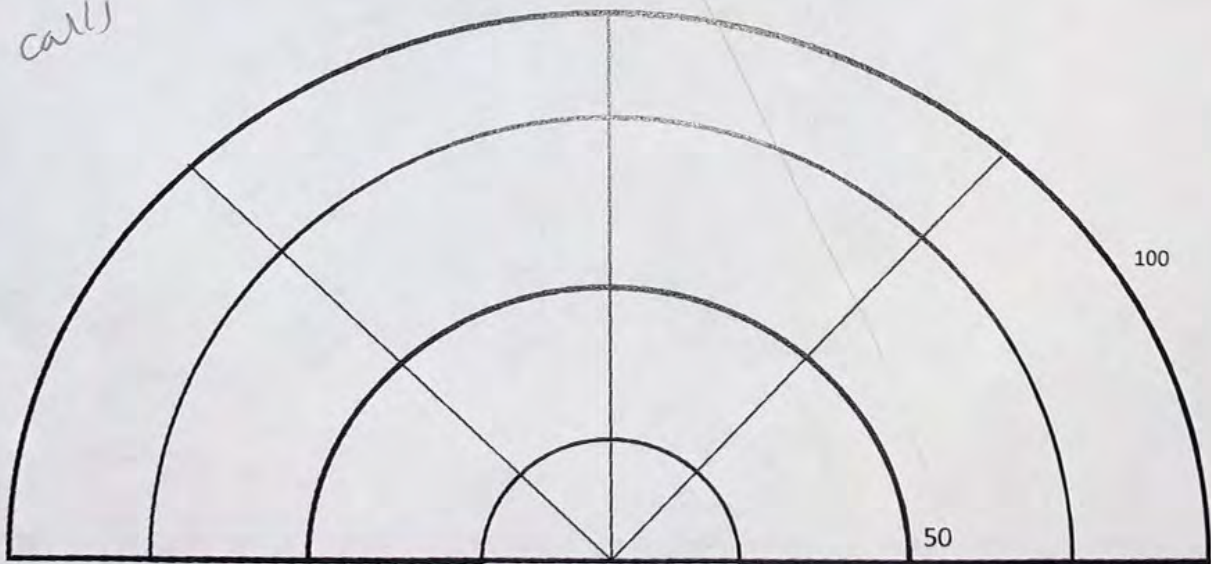
Comments (other noises): _____

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: E

No calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montroic Road Project #: 477511 Surveyor(s): M.E

Station #: A-9 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:37 End time: 22:40

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

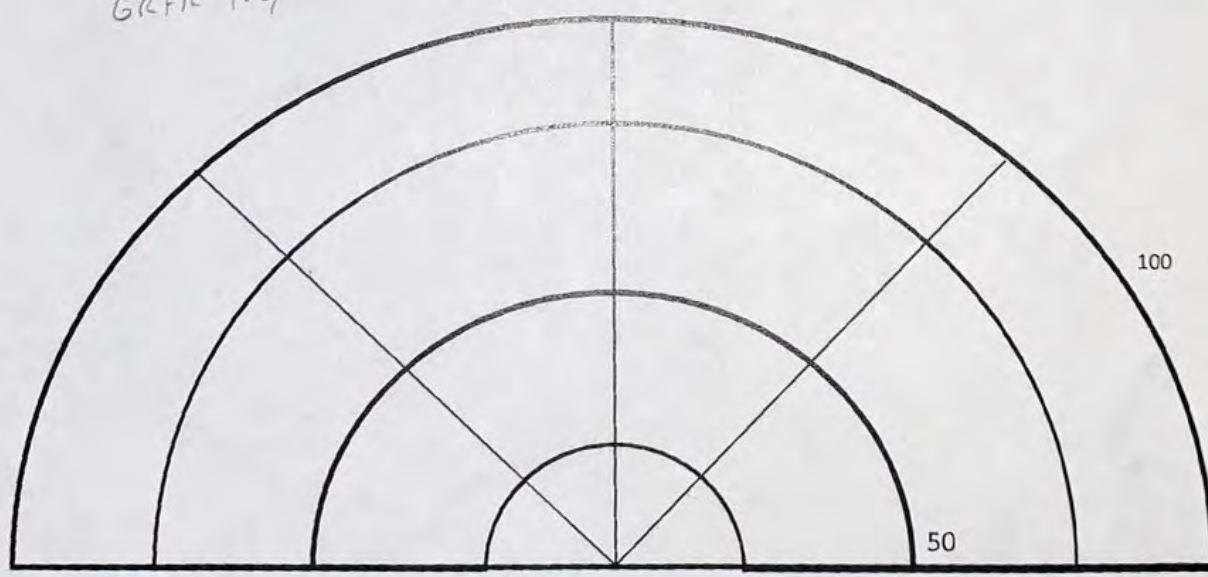
Incidental Wildlife:

Comments (other noises):

Species	From Observer			Abundance (FC=Full Chorus)		
	A (0<100 m)	B (>100m)	C (both)	A	B	C
AMTO	1 2 3	1 2 3	1 2 3			
BCFR	1 2 3	1 2 3	1 2 3			
BULL	1 2 3	1 2 3	1 2 3			
WCFR	1 2 3	1 2 3	1 2 3			
GRTF	1 2 3	1 2 3	1 2 3			
FOTO	1 2 3	1 2 3	1 2 3			
GRFR	(1) 2 3	1 2 3	1 2 3			
MIFR	1 2 3	1 2 3	1 2 3			
NLFR	1 2 3	1 2 3	1 2 3			
PIFR	1 2 3	1 2 3	1 2 3			
SPPE	1 2 3	1 2 3	1 2 3			
WOFO	1 2 3	1 2 3	1 2 3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: N



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Monhrose Road Project #: 497511 Surveyor(s): M.E

Station #: A-10 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:29 End time: 22:33

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description:

Incidental Wildlife:

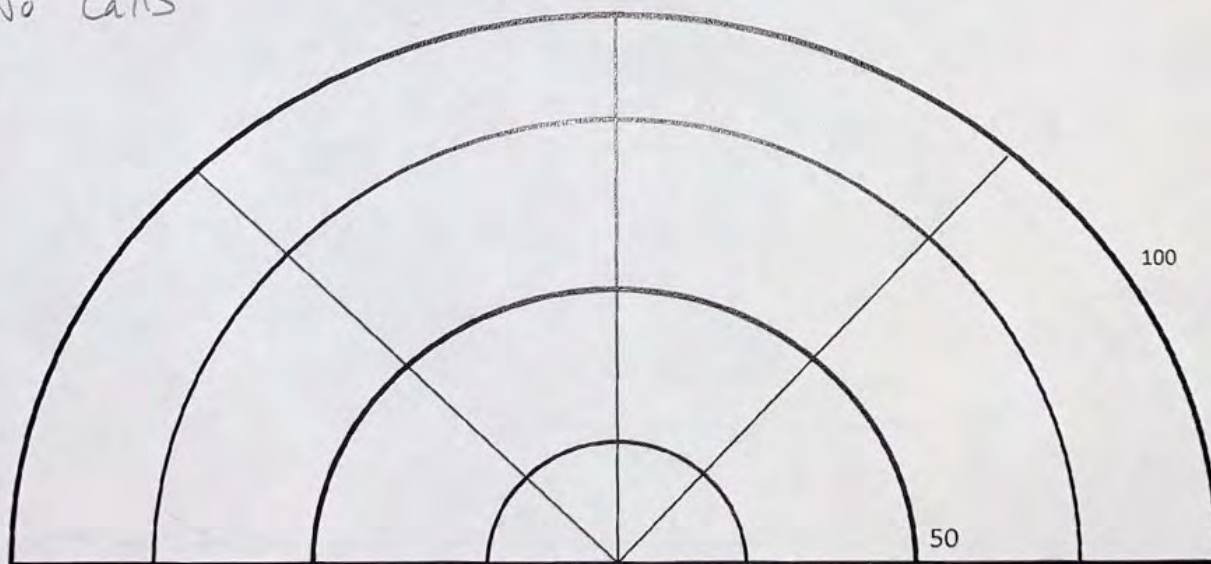
Comments (other noises):

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Abundance	Any #	Individuals if counted or estimated
				B	Outside 100 m	2	Individuals sometimes overlap, abundance can be estimated
C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				

Heading: S

No calls



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-11 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:33 End time: 22:36

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

Habitat Description: _____

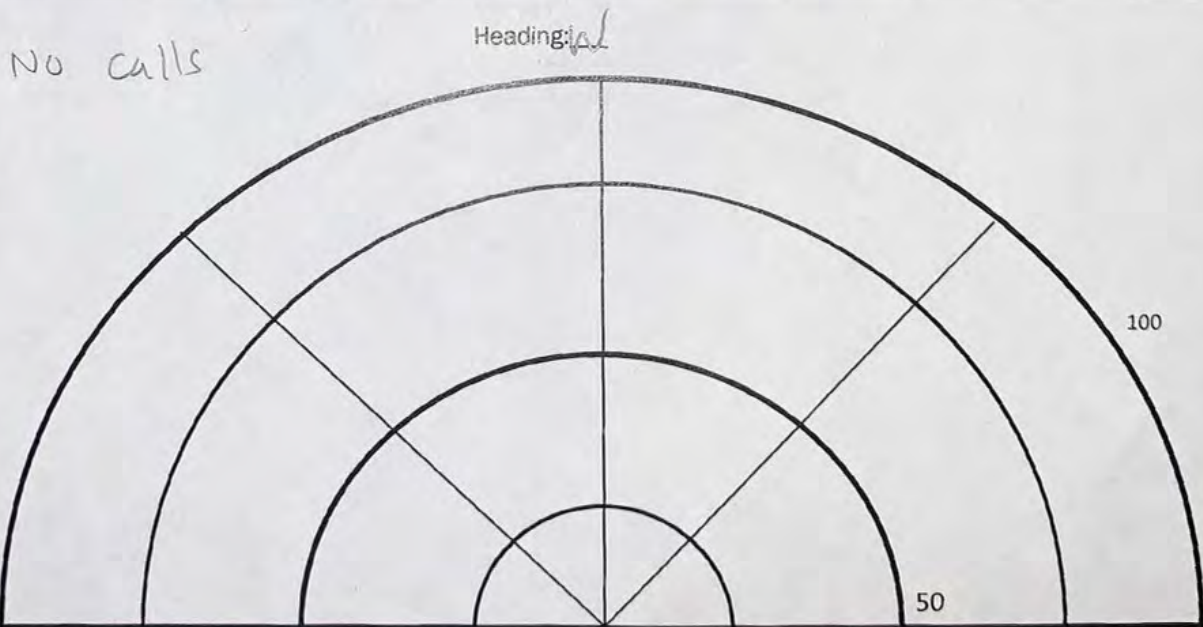
Incidental Wildlife: _____

Comments (other noises):

Loud ambient noise

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
		B		Outside 100 m	2			
	C	Both Inside and Outside 100 m	3	Full chorus, not abundance estimate				



Anuran Call Count Study – Fixed Point Observation Datasheet

Project Name: Montrose Road Project #: 477511 Surveyor(s): M.E

Station #: A-12 GPS Unit ID: _____

Date: June 29, 2020 Start time: 22:12 End time: 22:15

Temp (°C): 26 Beaufort Wind Speed: 1 Wind Dir: _____ Cloud Cover (%): 0 Precipitation (mm): 0

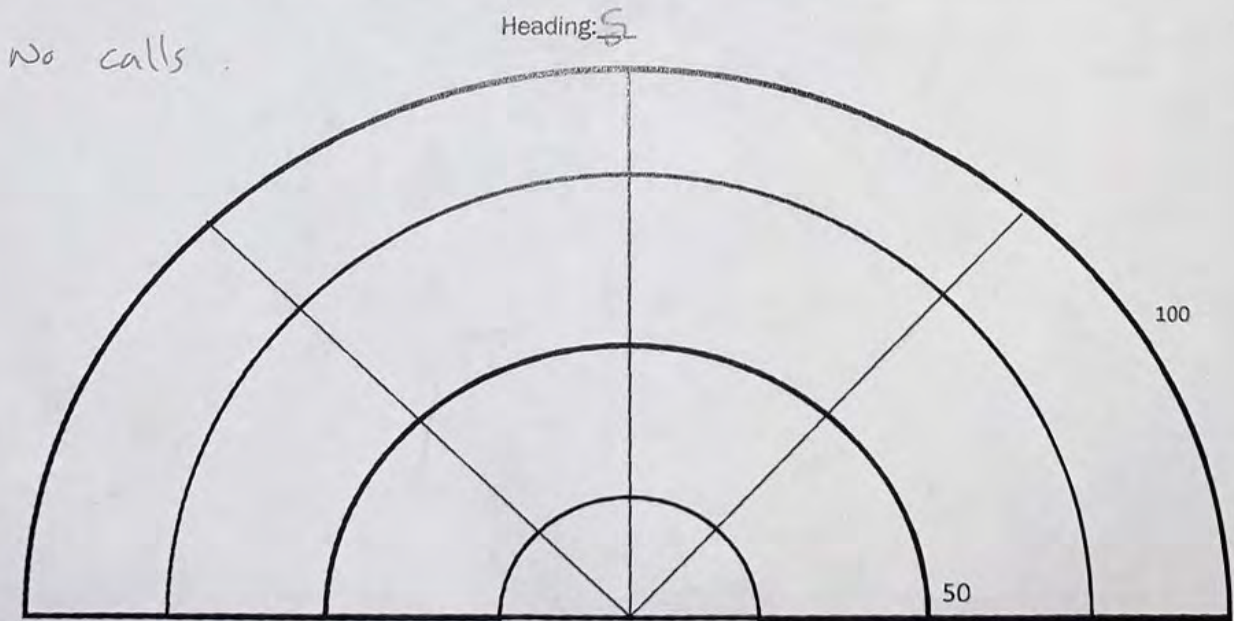
Habitat Description:

Incidental Wildlife:

Comments (other noises):

Species	From Observer						Abundance (FC=Full Chorus)		
	A (0<100 m)		B (>100m)		C (both)		A	B	C
AMTO	1	2	3	1	2	3			
BCFR	1	2	3	1	2	3			
BULL	1	2	3	1	2	3			
WCFR	1	2	3	1	2	3			
GRTF	1	2	3	1	2	3			
FOTO	1	2	3	1	2	3			
GRFR	1	2	3	1	2	3			
MIFR	1	2	3	1	2	3			
NLFR	1	2	3	1	2	3			
PIFR	1	2	3	1	2	3			
SPPE	1	2	3	1	2	3			
WOFO	1	2	3	1	2	3			

From Observer:	A	Inside 100 m	Call Levels:	1	Individuals do not overlap, can be counted	Abundance	Any #	Individuals if counted or estimated
	B	Outside 100 m		2	Individuals sometimes overlap, abundance can be estimated			
	C	Both Inside and Outside 100 m		3	Full chorus, not abundance estimate			



Breeding Bird Survey Results

Round 1
June 17, 2020

Point: 1

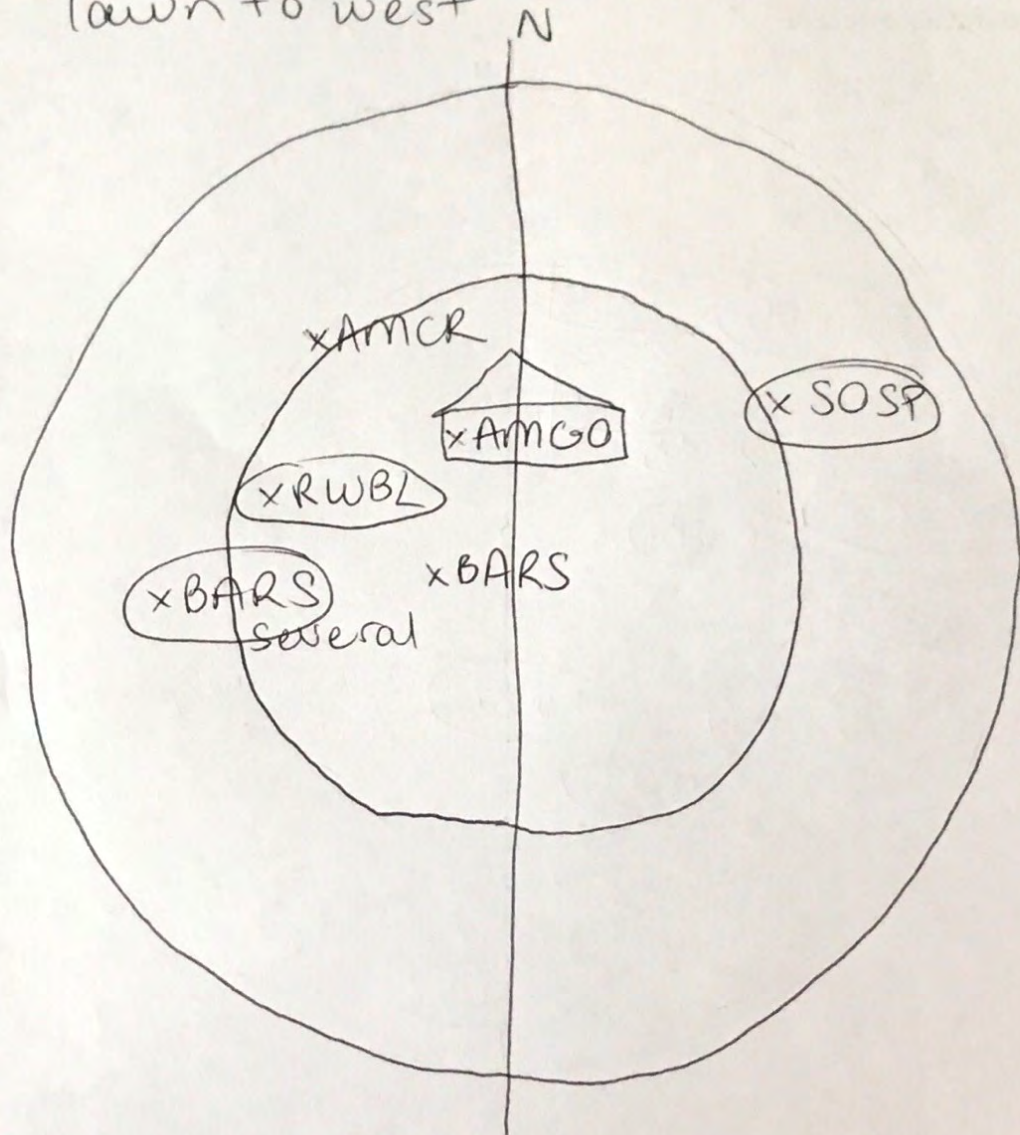
Start: 10:41

End: 10:46

Lat/long: 43.029107, -79.122629

Location: Wheatfield east of road, manicured lawn to west N

Flyovers:
EWST x 4



Notes:

Moderate to high background noise due to traffic

BARS: abandoned sheds w/ holes in roof are suitable BARS nesting habitat; several BARS observed foraging over manicured lawn in distance - at least 4 counted

Point # 2

Start: 10:18

End: 10:23

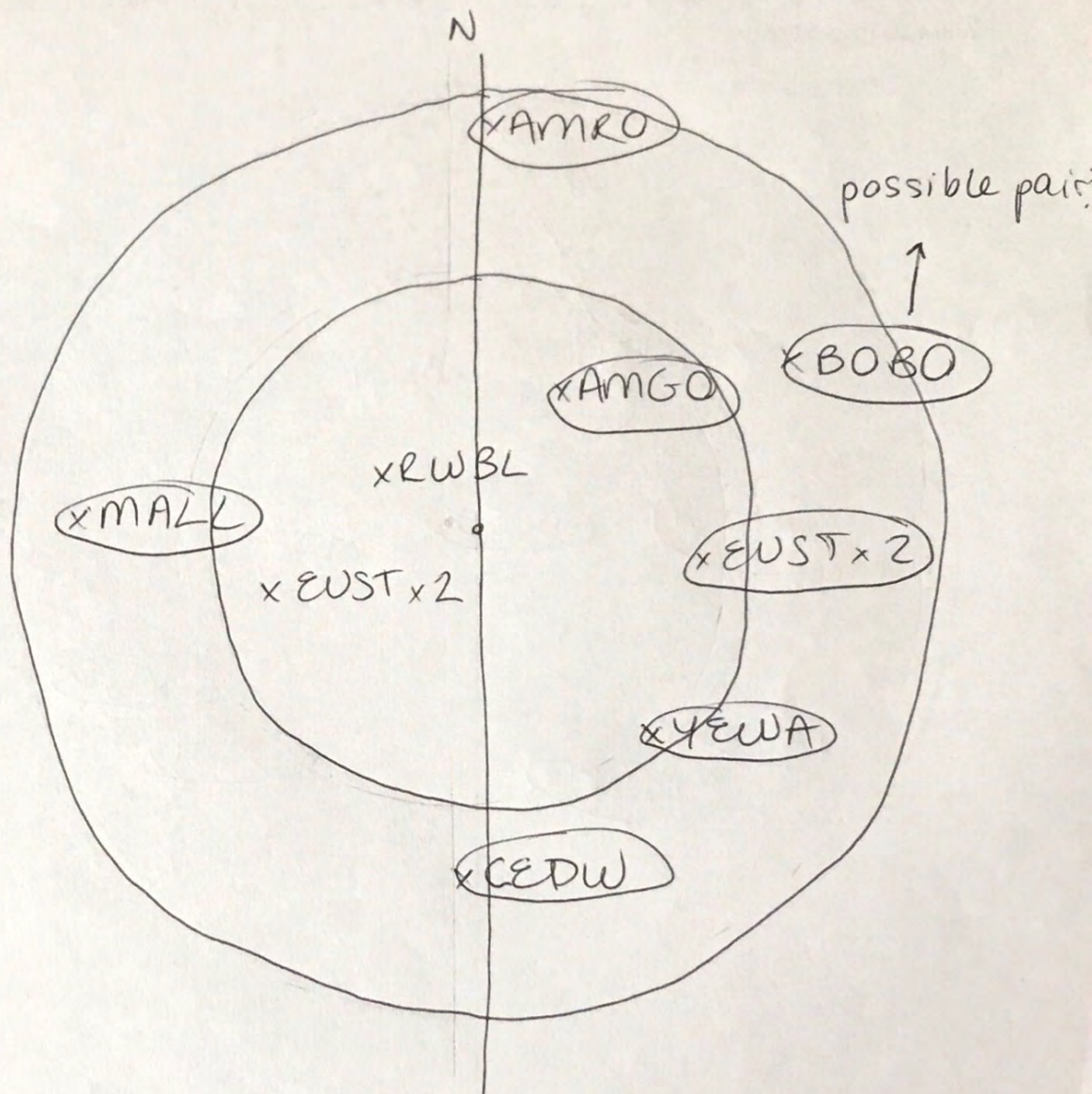
Lat/long: 43.031689, -79.129558

Location: wheat field to north

Movers

RWBL

RWBL



Notes

High background noise due to traffic & construction

BOBO → song heard faintly, saw two BOBO-sized birds flying together in distance; could not make out ID features due to sun glare

Point 3

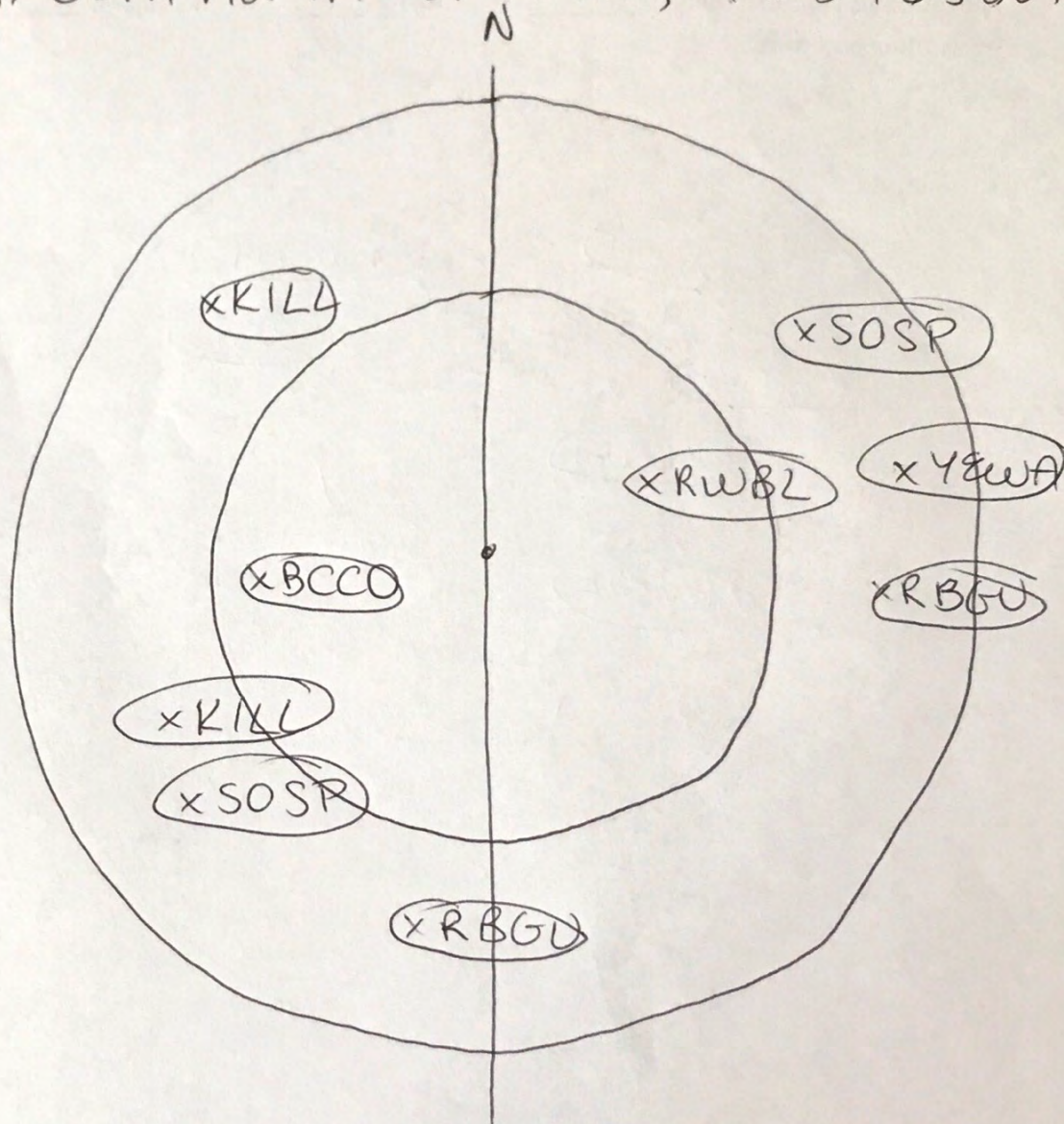
Start: 10:31

End: 10:36

Lat/long: 43.031566, -79.126982

Location: CUM north of road, FOD to south

Flyovers:



Notes:

Low to Moderate background noise due to traffic
Same BOBO as recorded at Point 4 heard prior to survey start; did not sing during survey

Point 4

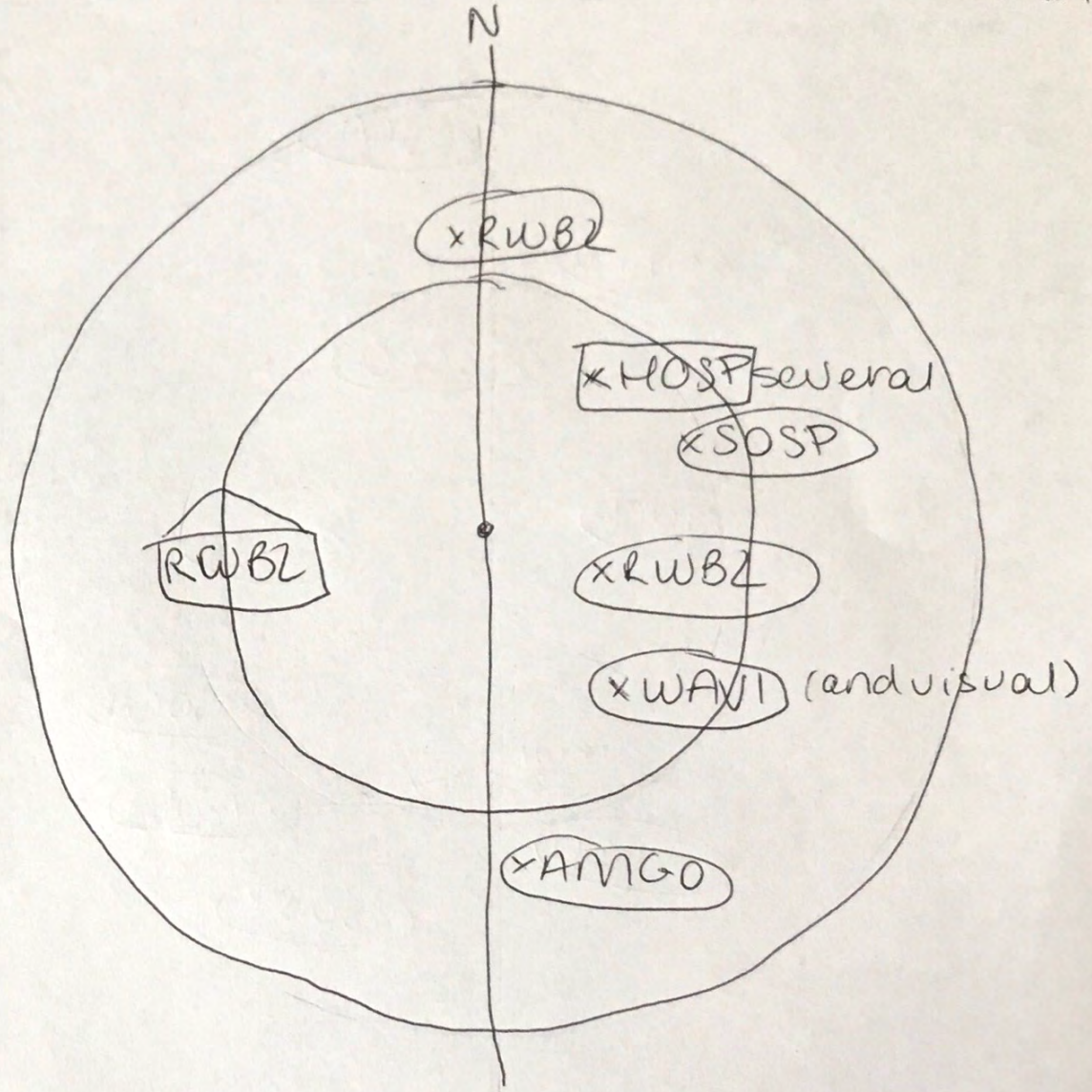
Start: ~~10:50~~ 10:57

End: 11:02

Lat/long: 43.0310677, -79.122327

Location: CUM w/MAS inclusion, FOD to east

Flyovers:
N/A



Notes:

Moderate background noise due to traffic

Point 5

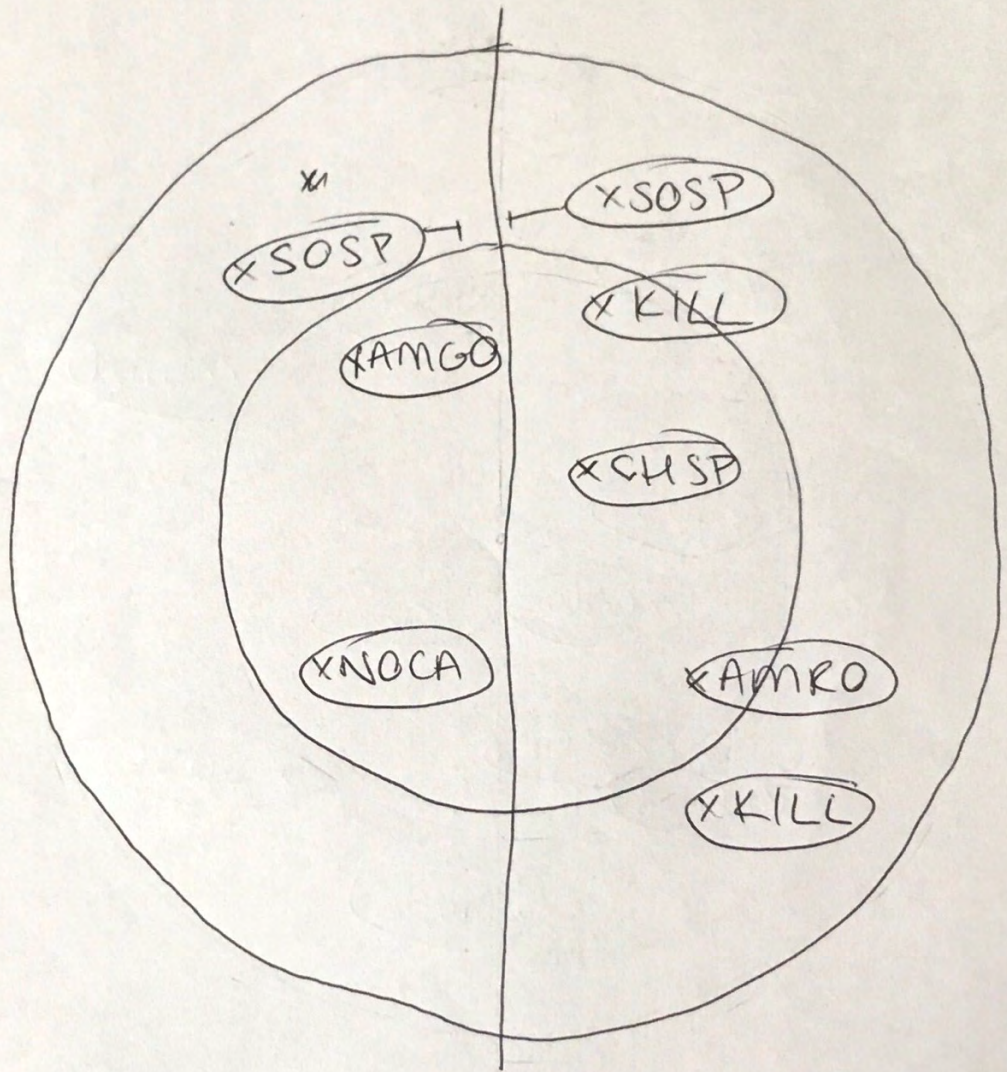
Start: 10:06

End: 10:11

Lat/long: 43.031903, -79.119480

Location: FOD south of roads CWM/CUH north

Flyovers:
EUST x 6



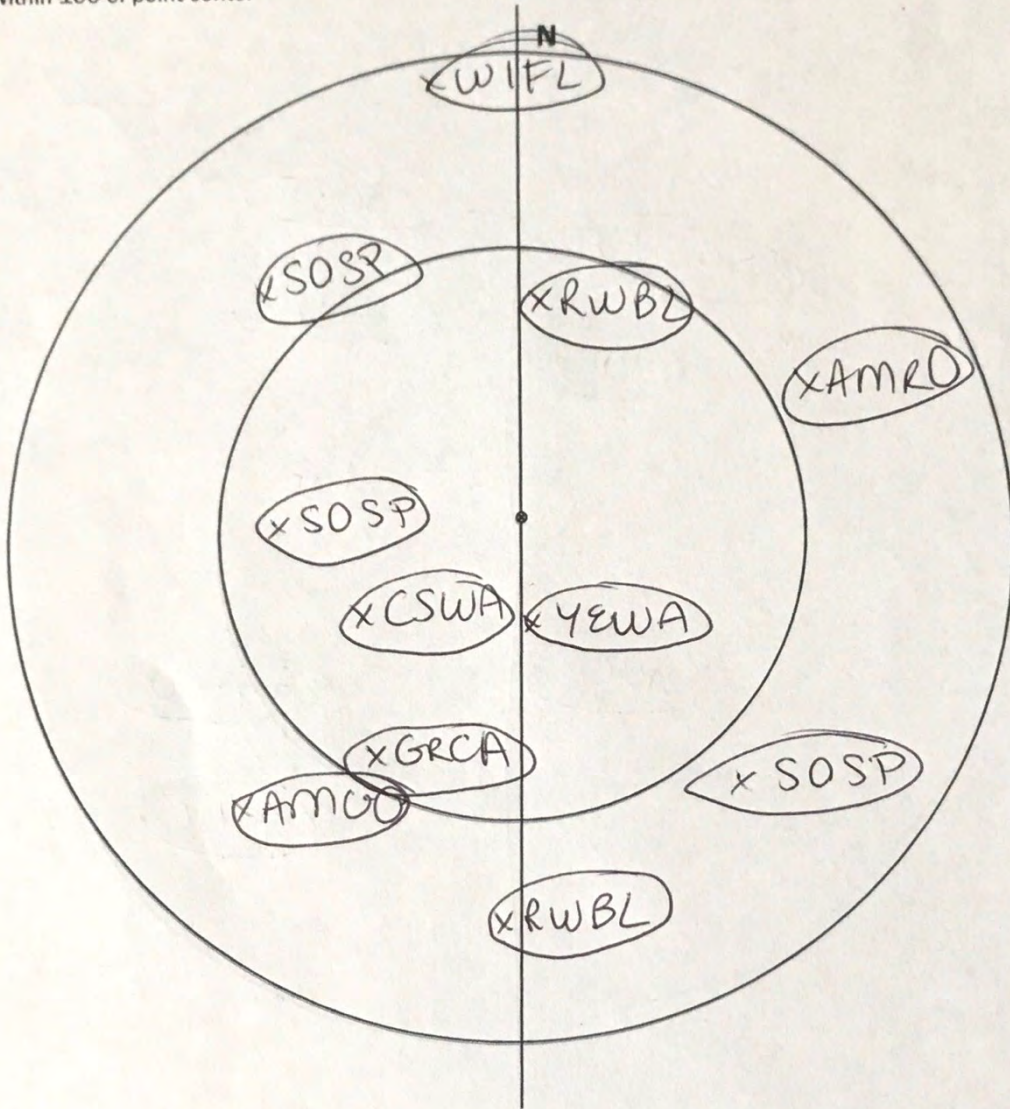
Notes:

high background noise due to traffic, near Q&W on-ramp

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 6 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 9:56 End Time: 10:01
 GPS file name: _____ UTM: E: 43,039195 N: -79,123094
 Temperature: 18 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: CWM/CUT
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
RWBL	



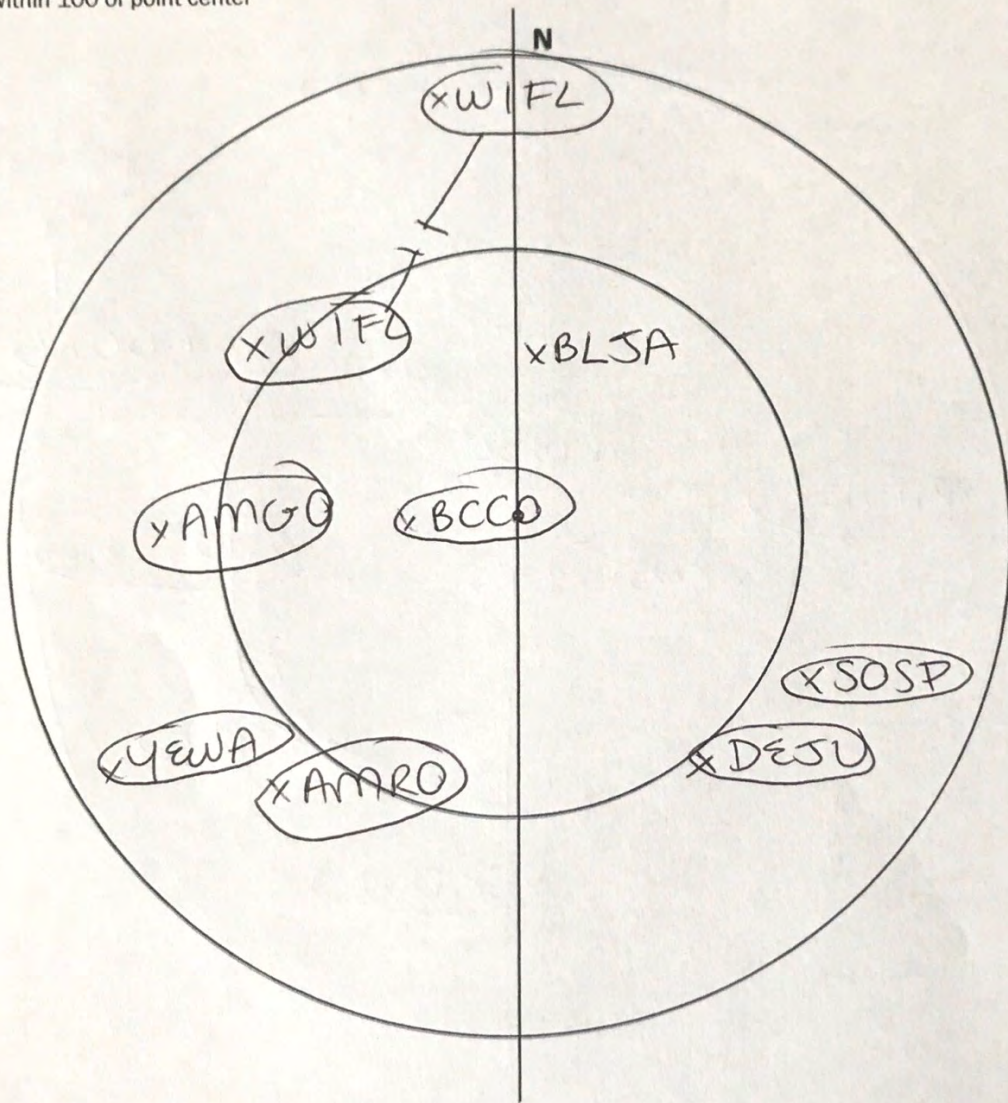
100

LEGEND	
	Single Bird, singing/calling
	Different Bird of same species
	Pair together
	Family group
	Observation, but not calling/singing
	Known change in position

Incidental Observations / Notes:
 moderate background noise due to traffic

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 7 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 9:45 End Time: 9:50
 GPS file name: _____ UTM: E: 43.035191 N: -79.122632
 Temperature: 18 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: ag field (no crop) to east, CWM on west
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
EWST	23

100

LEGEND

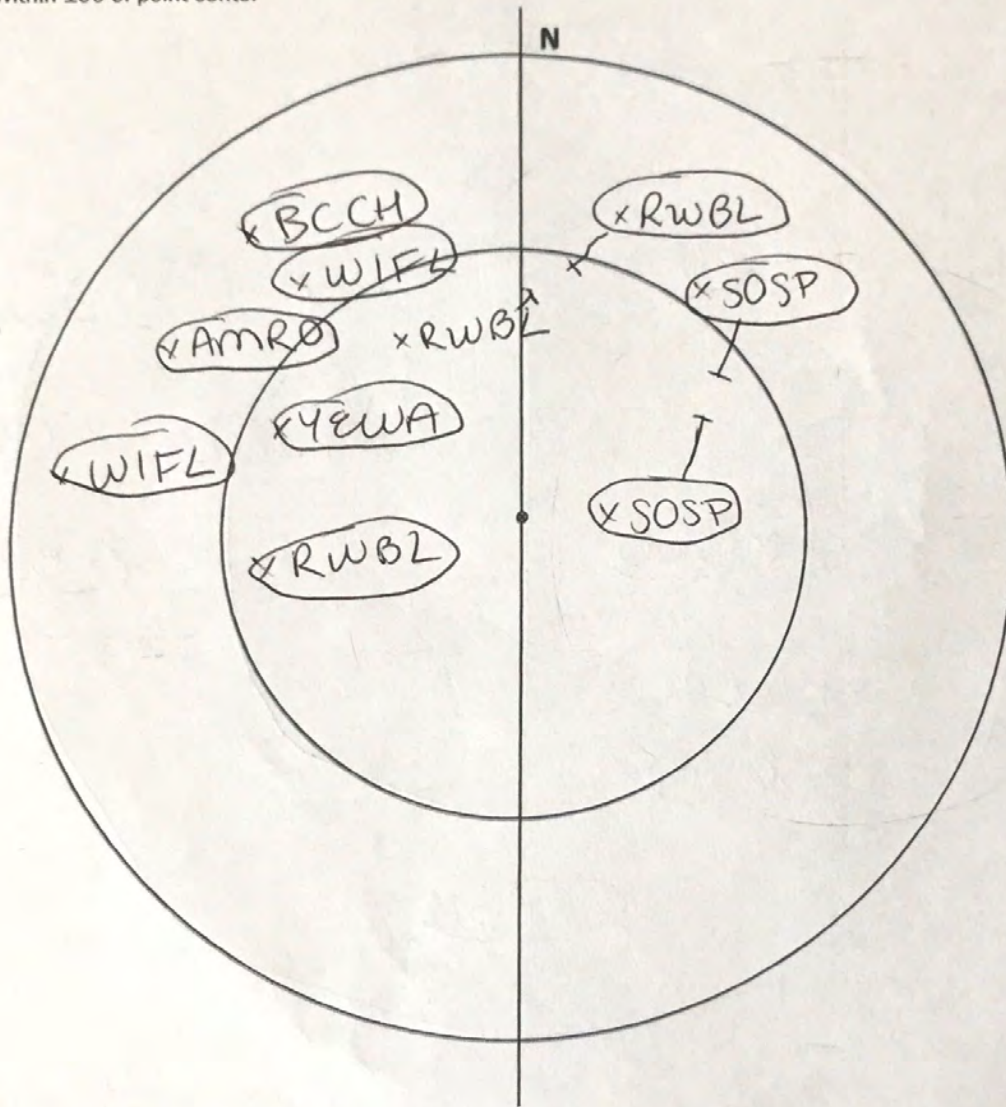
- Single bird, singing/calling
- Different bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background noise due to traffic

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 8 Observer(s): M Olson Date (dd/mon/yy): 17/06/20 Start Time: 9:36 End Time: 9:41
 GPS file name: _____ UTM: E: 43,036492 N: -79,122683
 Temperature: 17 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: FOD east of road, cum west of road
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
EWST	

100

LEGEND

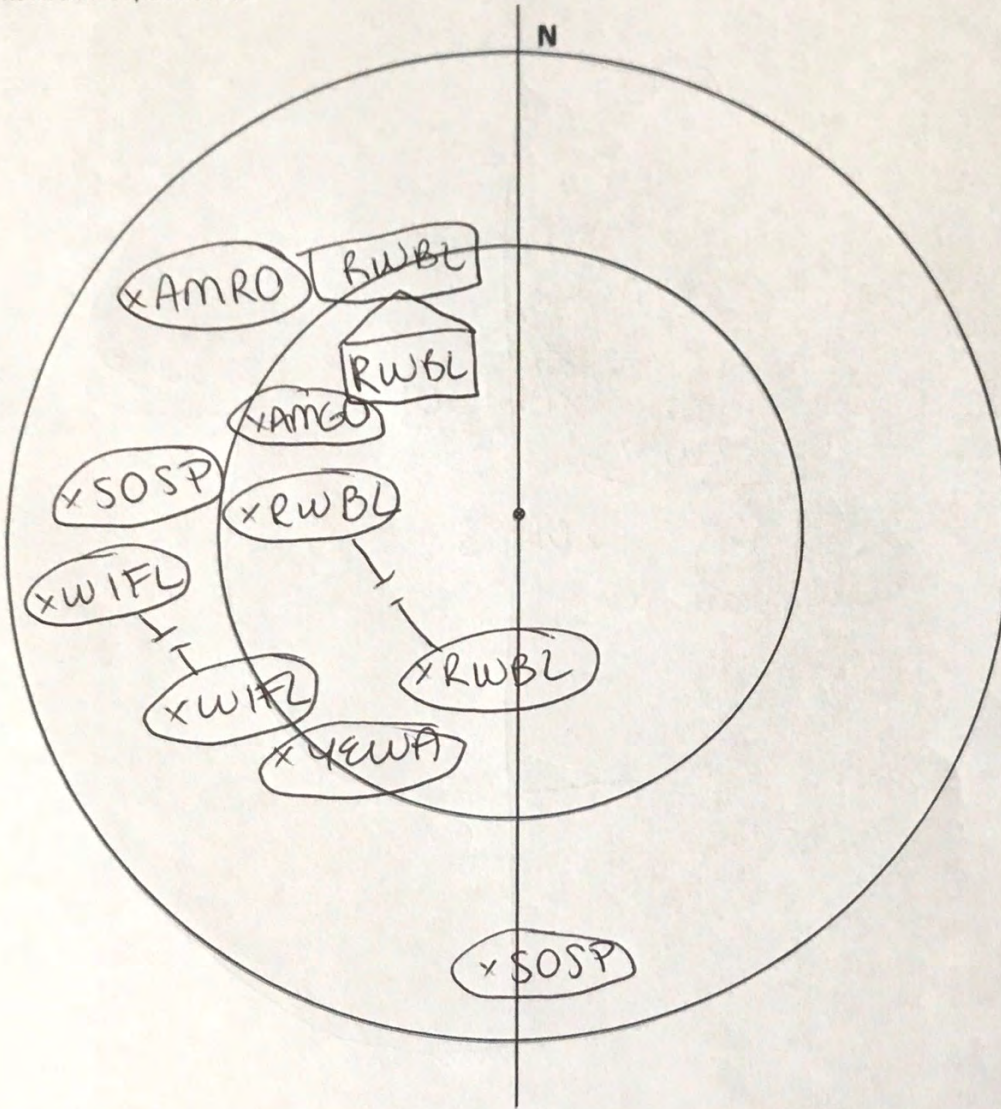
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background noise due to traffic

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 9 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 9:18 End Time: 9:23
 GPS file name: _____ UTM: E: 43.037971 N: -79.123152
 Temperature: 17 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: Cum w/ MAS & CWV inclusions
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#

100

LEGEND

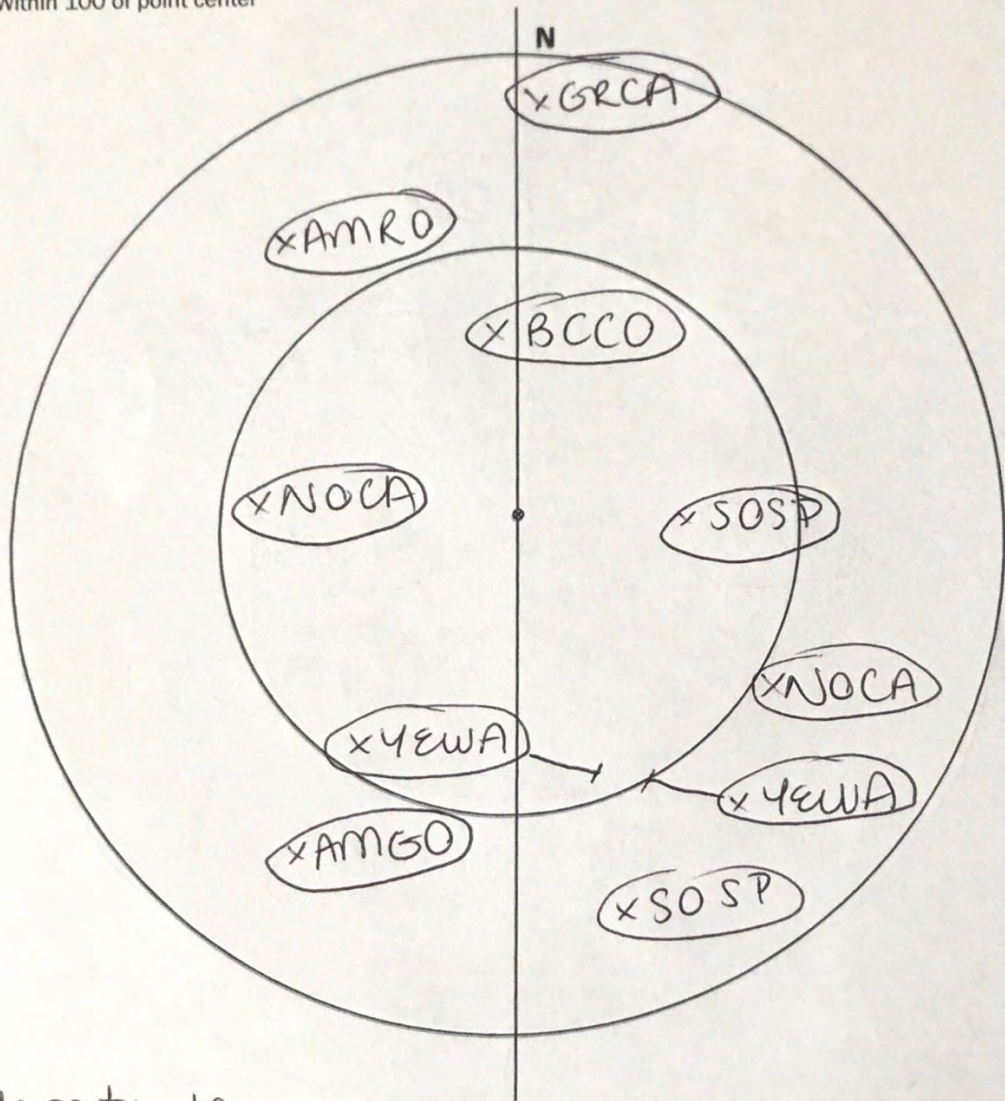
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background noise due to traffic

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 10 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 9:04 End Time: 9:09
 GPS file name: _____ UTM: E: 43.041799 N: -79.123192
 Temperature: 17 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: FOD/SWD
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#

LEGEND

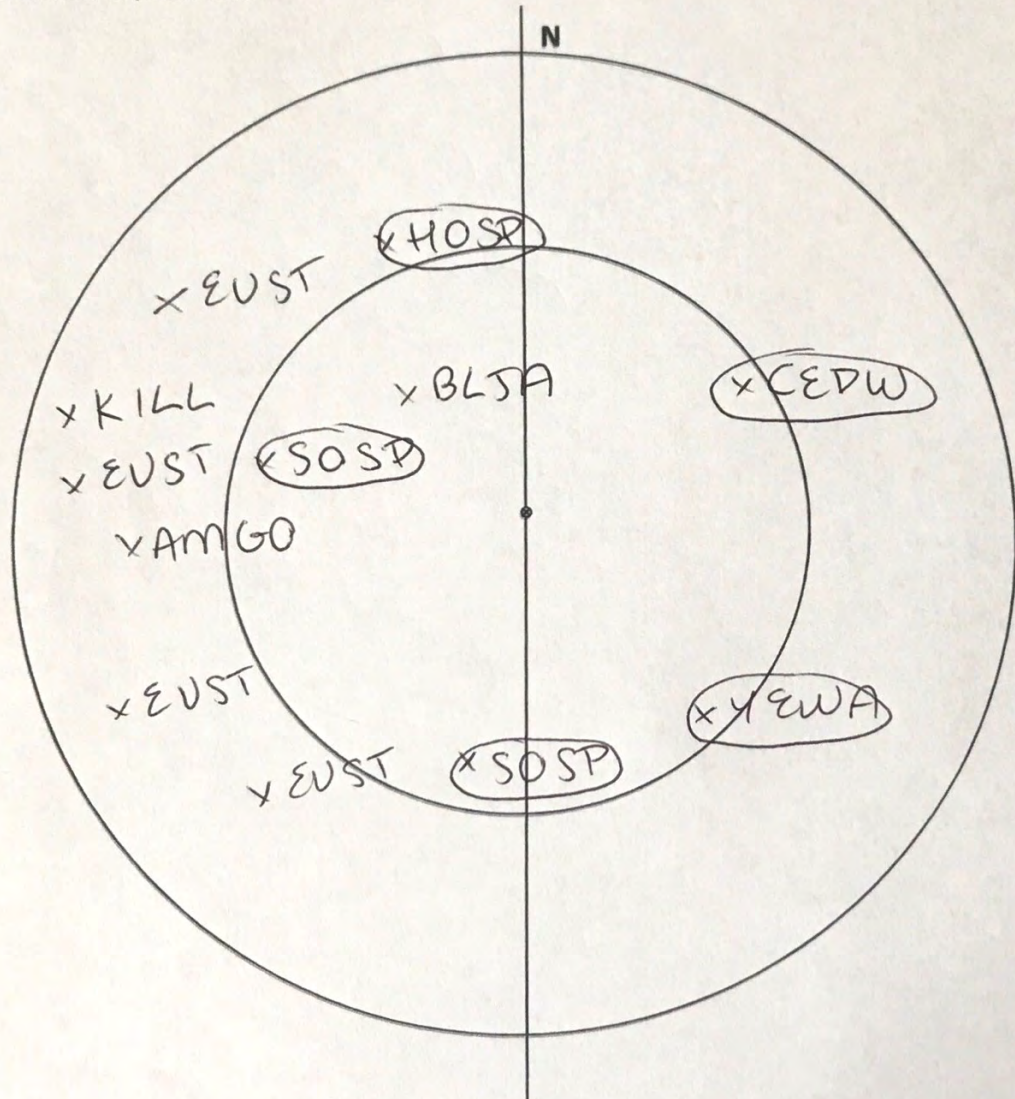
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

moderate to
 ^ Incidental Observations / Notes:
 high background noise due to mowing operations and traffic

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 11 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 8:48 End Time: 8:53
 GPS file name: _____ UTM: E: 43.048353 N: -79.122821
 Temperature: 17 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: FOD or CWW between Montrose & QEW
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
RWBL	3
AMRO	
GBHE	
MALL	2



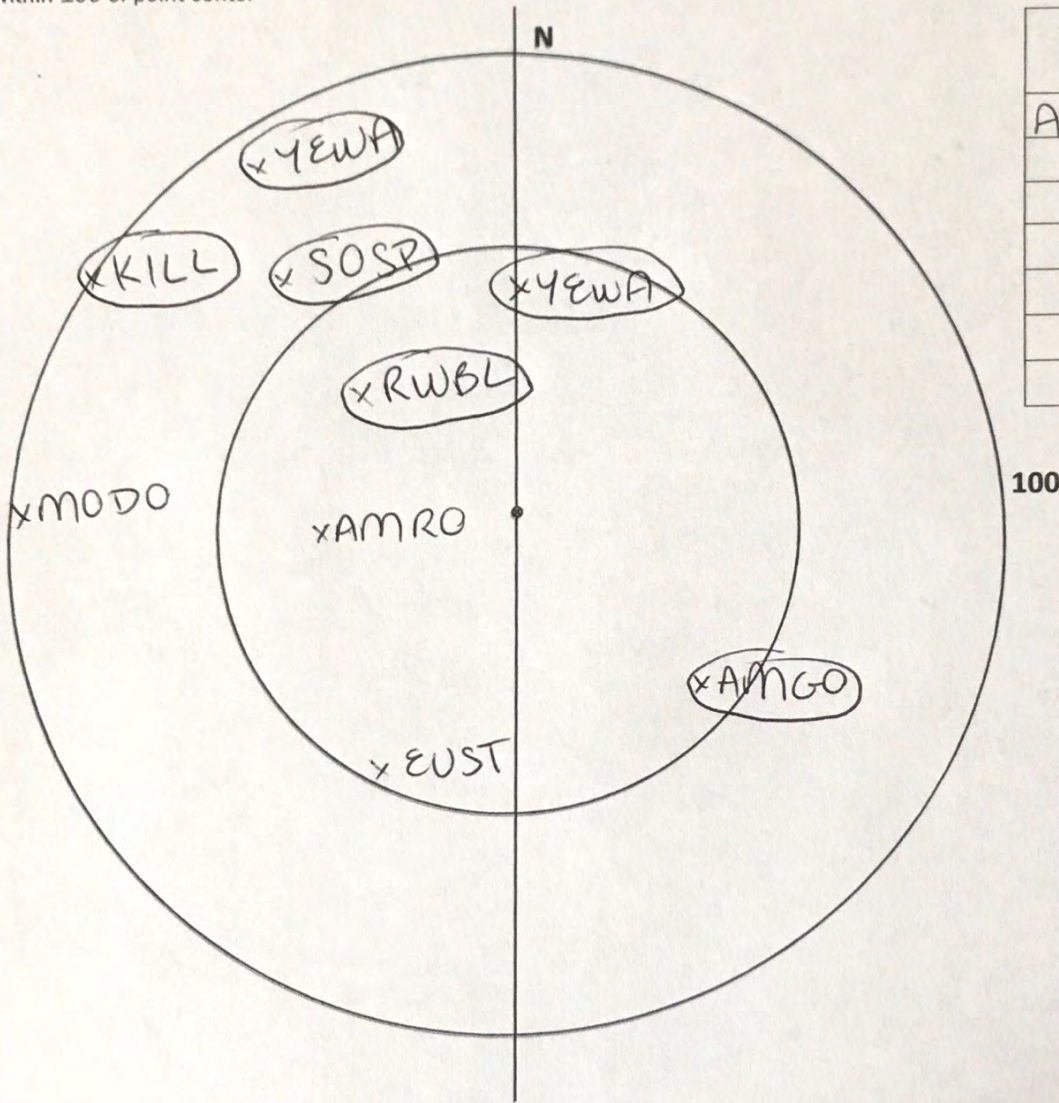
LEGEND

- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

high to moderate background noise due to traffic on both sides
 Incidental Observations / Notes:

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 12 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 8:28 End Time: 8:33
 GPS file name: _____ UTM: E: 43,054150 N: -80.79.123057
 Temperature: 14 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: MAS patch within CUT/CUW
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
AMGO	

LEGEND

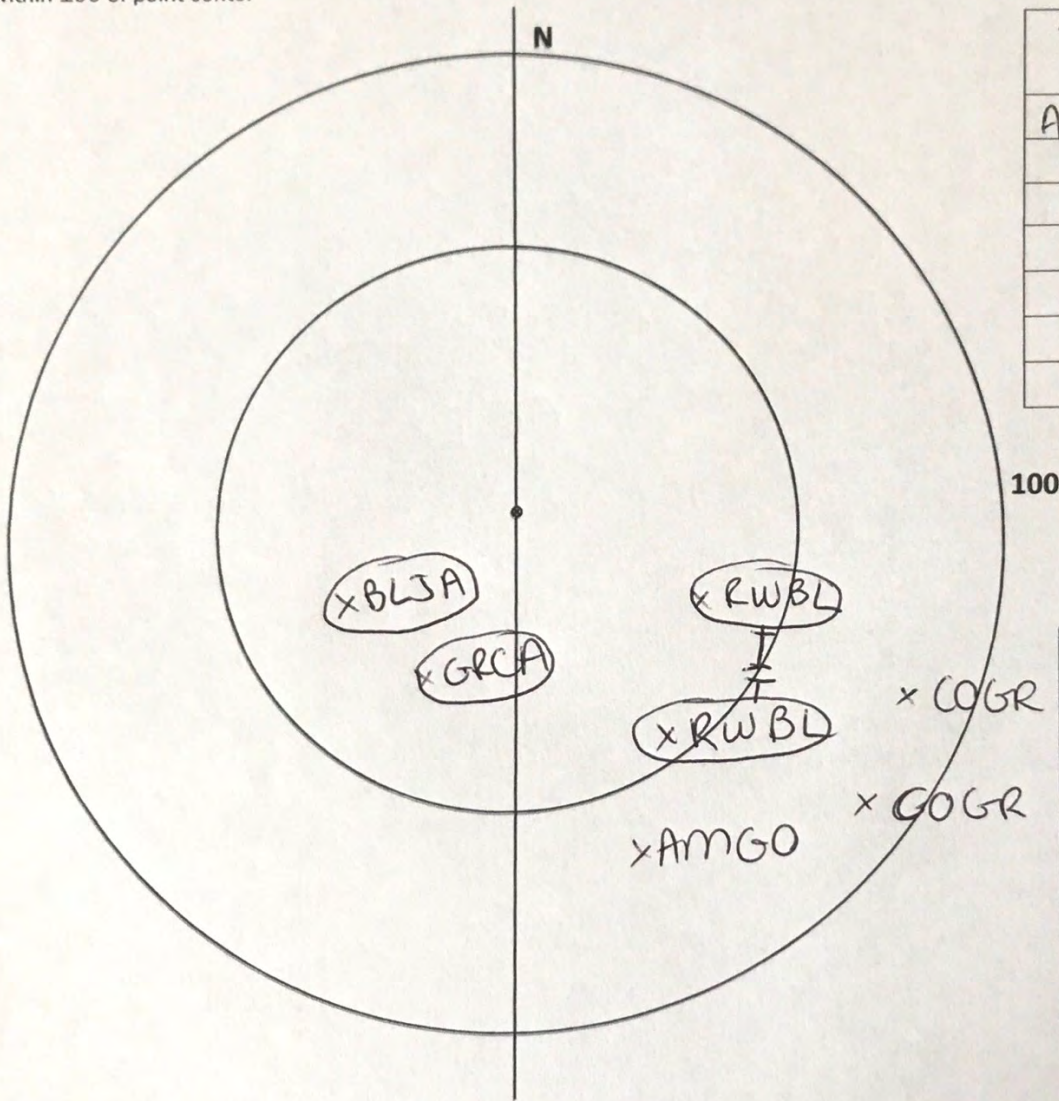
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background noise due to traffic

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 13 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 8:12 End Time: 8:17
 GPS file name: _____ UTM: E: 43.057843 N: -79.123230
 Temperature: 14 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: FOD^{SW} west of Montrose
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
AMGO	2

LEGEND	
	Single Bird, singing/calling
	Different Bird of same species
	Pair together
	Family group
	Observation, but not calling/singing
	Known change in position

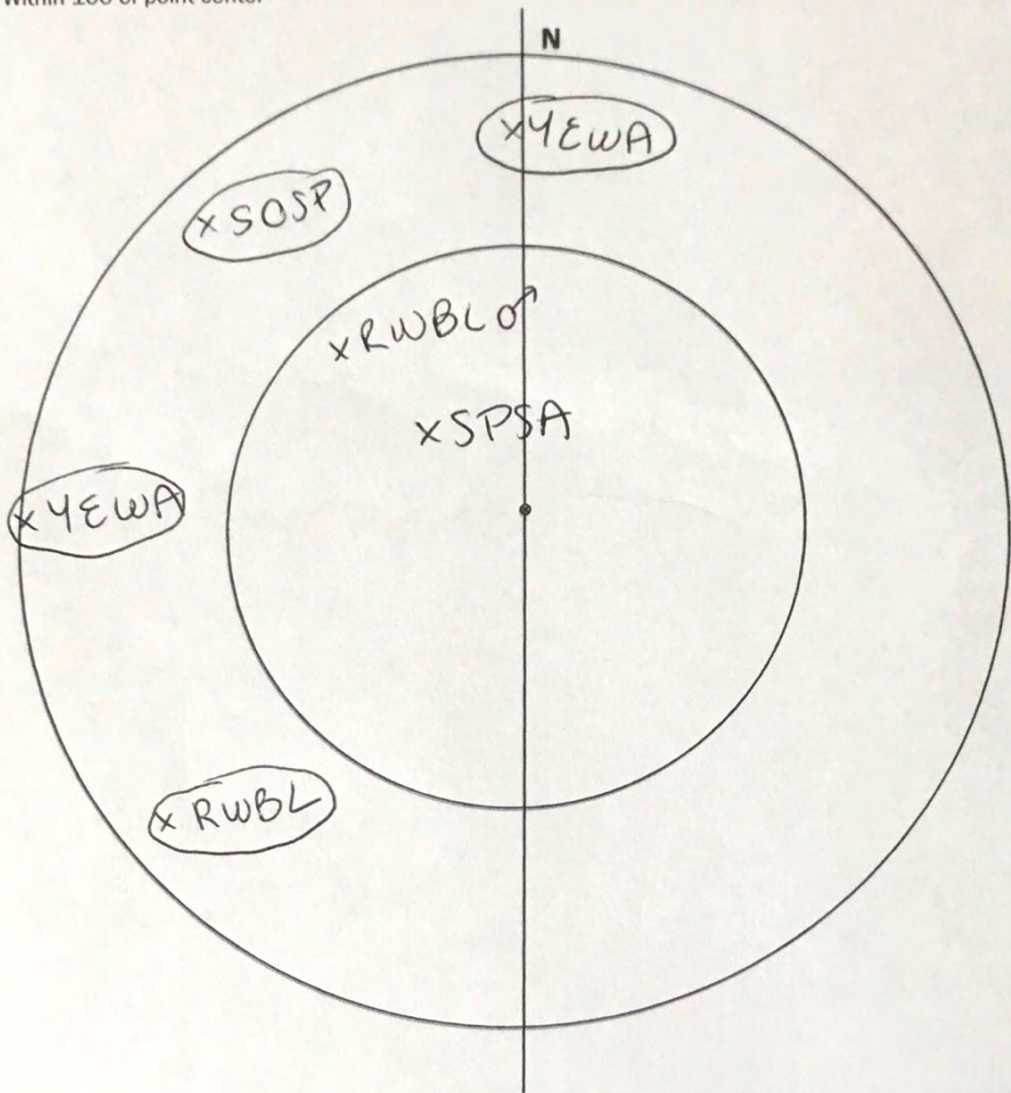
Incidental Observations / Notes:

CHFR calling from ditch between Montrose & QEW
 moderate background noise from traffic

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 14 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 8:01 End Time: 8:06
 GPS file name: _____ UTM: E: 43,061303 N: -79,123382
 Temperature: 14 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____
 Description of Location: Cum adjacent to roads, FOD on west side
 Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
AMGO	3
EVST	3
RWBL ♀	2



LEGEND

- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate levels of background traffic noise; difficult to hear at times

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____

Point #: 15 Observer(s): M. Olson Date (dd/mon/yy): 17/06/20 Start Time: 7:45 End Time: 7:50

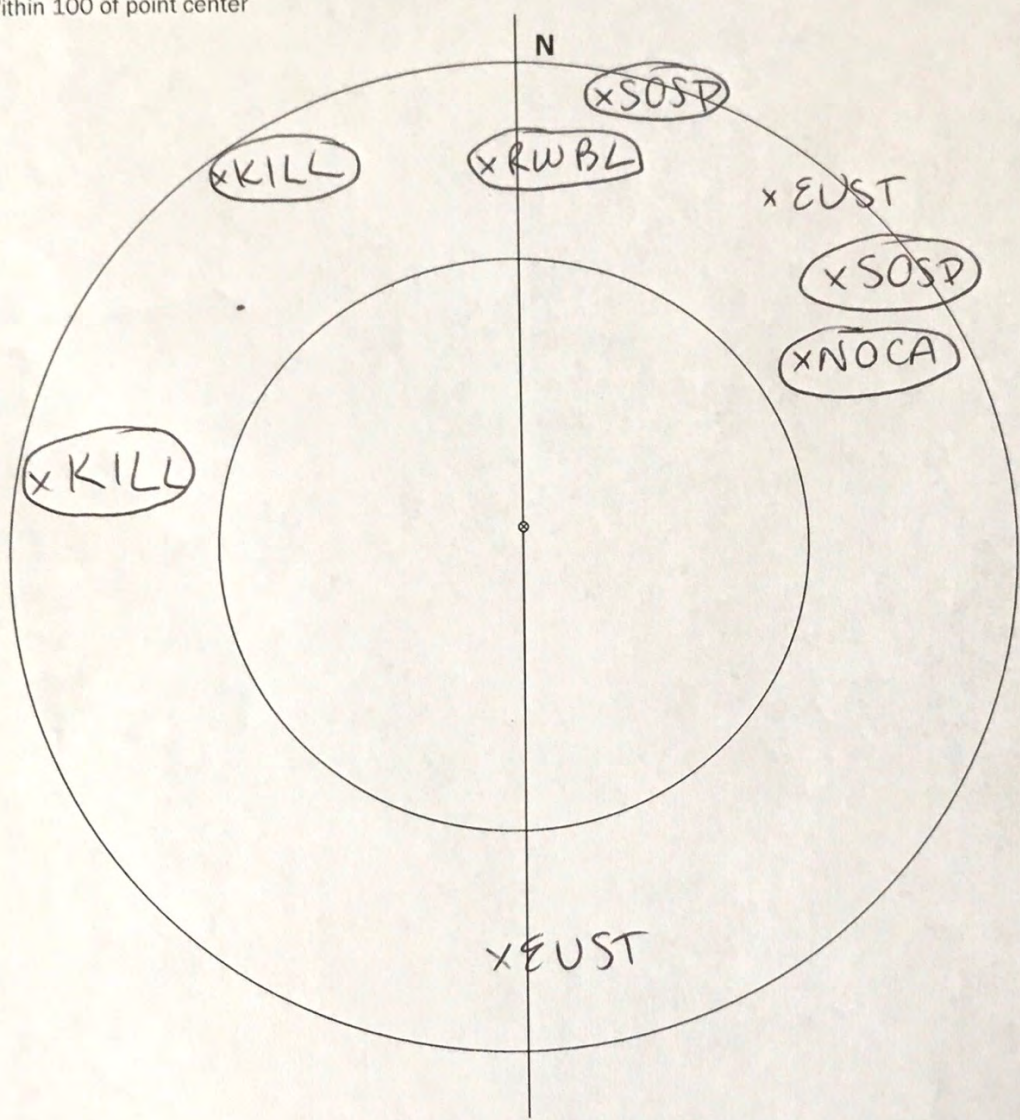
GPS file name: _____ UTM: E: 43.068866 N: -79.124720

Temperature: 14 Precip: 0 Wind speed: 0 Cloud cover: 0 Photo #: _____

Description of Location: CVM surrounded by road & commercial, ~~road~~ CVM

Habitat Codes (%) Hab 1: _____ () Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()

Within 100 of point center



Aerial Forager/Fly Thru Species	#
RWBL	
RBGU	
SOSP	3

LEGEND

- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:
 moderate background noise due to traffic & construction

Round 2
July 3, 2020

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 1 Observer(s): M. OLSON Date (dd/mon/yy): 03/07/20 Start Time: 9:33 End Time: 9:58
 GPS file name: _____ UTM: E: 43.029079 N: -79.122720
 Temperature: 25 Precip: 0 Wind speed: 17 Cloud cover: 5% Photo #: _____
 Description of Location: wheat field S of Lyons Creek Rd.
 Habitat Codes (%) Hab 1: AG 89 Hab 2: CUH 20 Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
EUST	11
BHCO	1



100

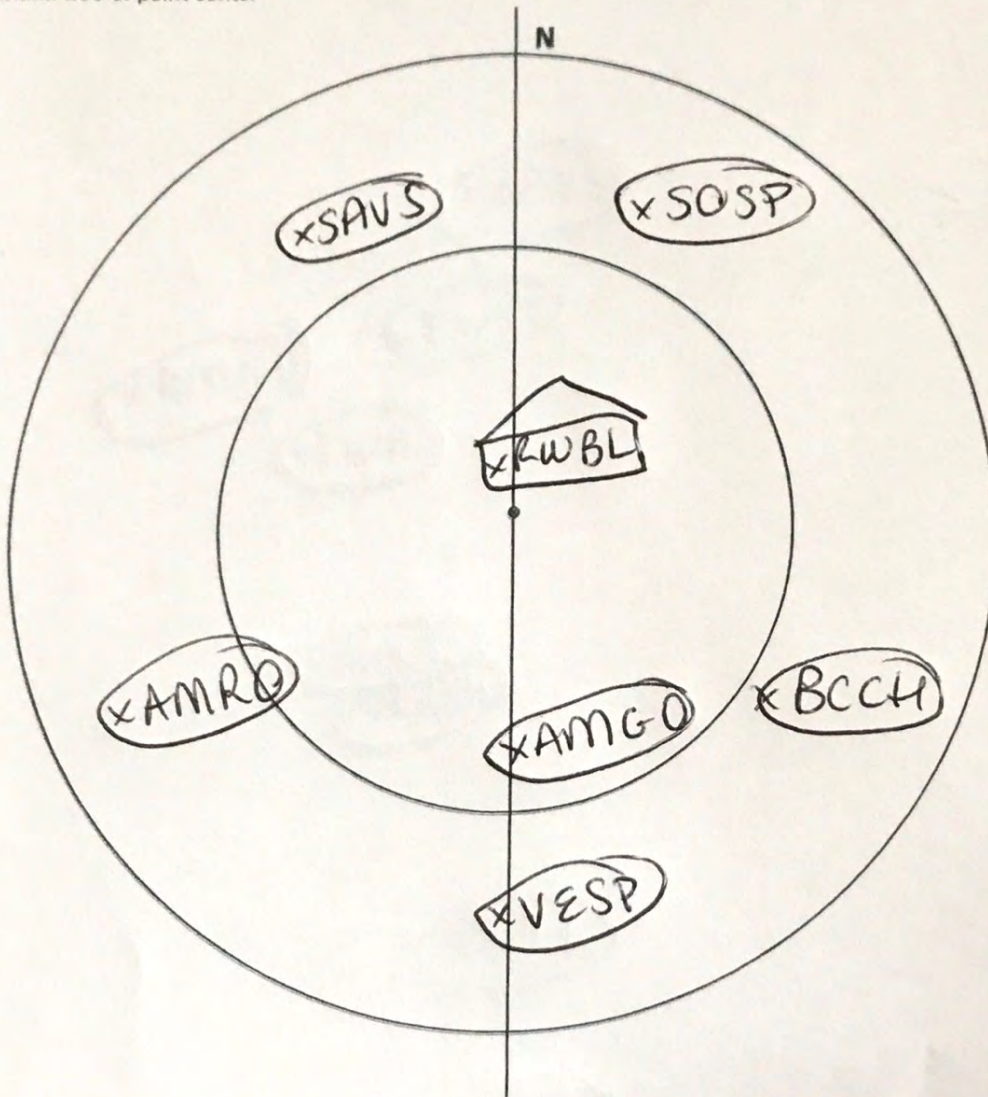
LEGEND	
	Single Bird, singing/calling
	Different Bird of same species
	Pair together
	Family group
	Observation, but not calling/singing
	Known change in position

Incidental Observations / Notes:

moderate-high background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 2 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 9:32 End Time: 9:37
 GPS file name: _____ UTM: E: 43.031569 N: -79.129413
 Temperature: 25 Precip: 0 Wind speed: 17 Cloud cover: 5% Photo #: _____
 Description of Location: wheat field N of Lyons Creek Rd
 Habitat Codes (%) Hab 1: 9 AG 100 Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
RWBL	1

LEGEND	
	Single bird, singing/calling
	Different bird of same species
	Pair together
	Family group
	Observation, but not calling/singing
	Known change in position

Incidental Observations / Notes:

low-moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

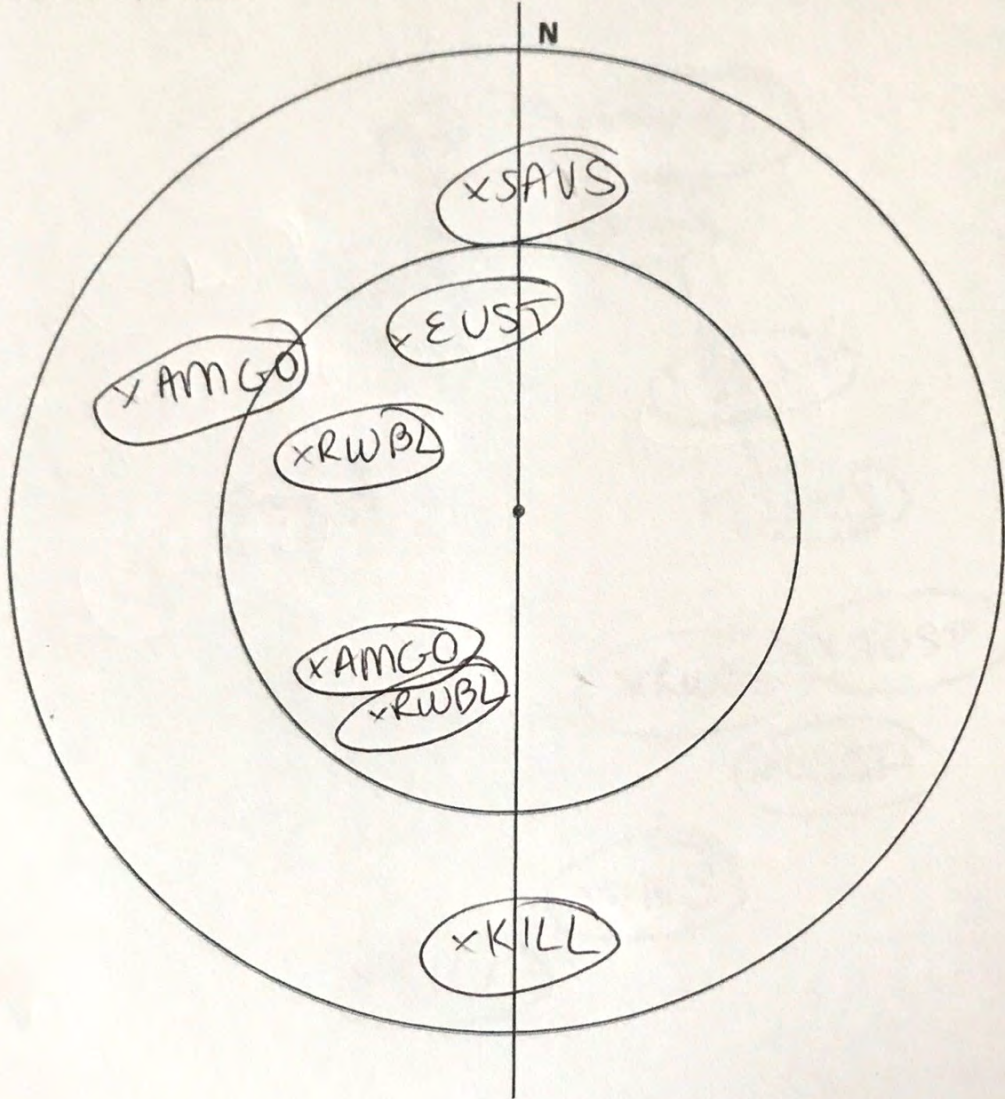
Project Name: Montrose Road Project Number: _____
 Point #: 3 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 9:42 End Time: 9:47
 GPS file name: _____ UTM: E: 43,031656 N: -79.127128
 Temperature: 25 Precip: 0 Wind speed: 17 Cloud cover: 5% Photo #: _____
 Description of Location: S. of Lyons Creek Rd @ FOD
 Habitat Codes (%) Hab 1: FOD50 Hab 2: WM50 Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
RWBL	1

100

LEGEND

- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

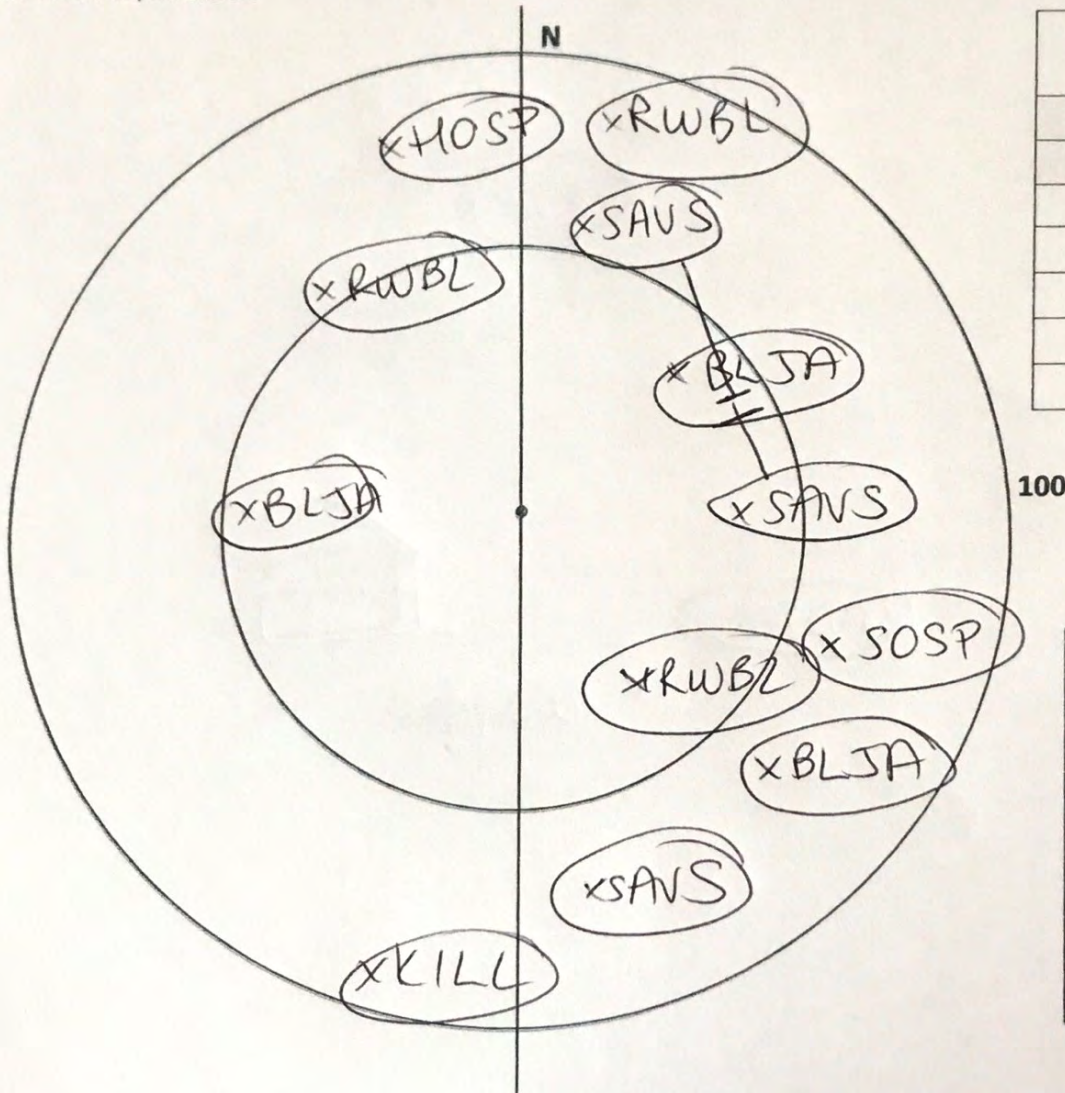


Incidental Observations / Notes:

moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 4 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 10:01 End Time: 10:06
 GPS file name: _____ UTM: E: 43.030971 N: -79.122262
 Temperature: 25 Precip: 0 Wind speed: 17 Cloud cover: 5% Photo #: _____
 Description of Location: CEM w/ MAS inclusion @ Lyons Creek
 Habitat Codes (%) Hab 1: CEM (70) Hab 2: FOD (20) Hab 3: MAS (10) Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#

LEGEND

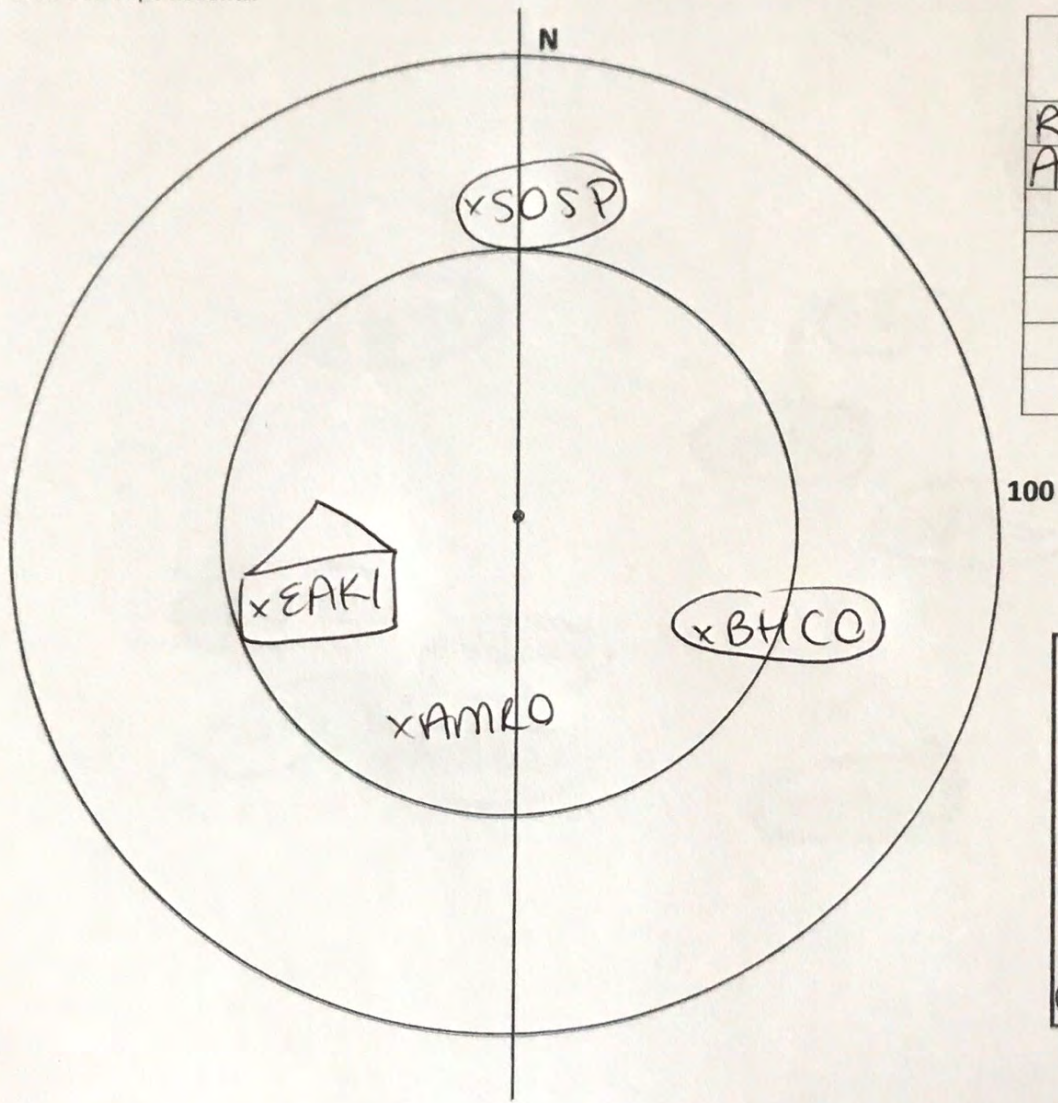
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:
moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 5 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 10:12 End Time: 10:17
 GPS file name: _____ UTM: E: 43.031766 N: -79.119517
 Temperature: 25 Precip: 0 Wind speed: 17 Cloud cover: 50% Photo #: _____
 Description of Location: FOD south of Lyons Creek Rd
 Habitat Codes (%) Hab 1: FOD (70) Hab 2: CUH (30) Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
RBCU	11
AMGO	1111



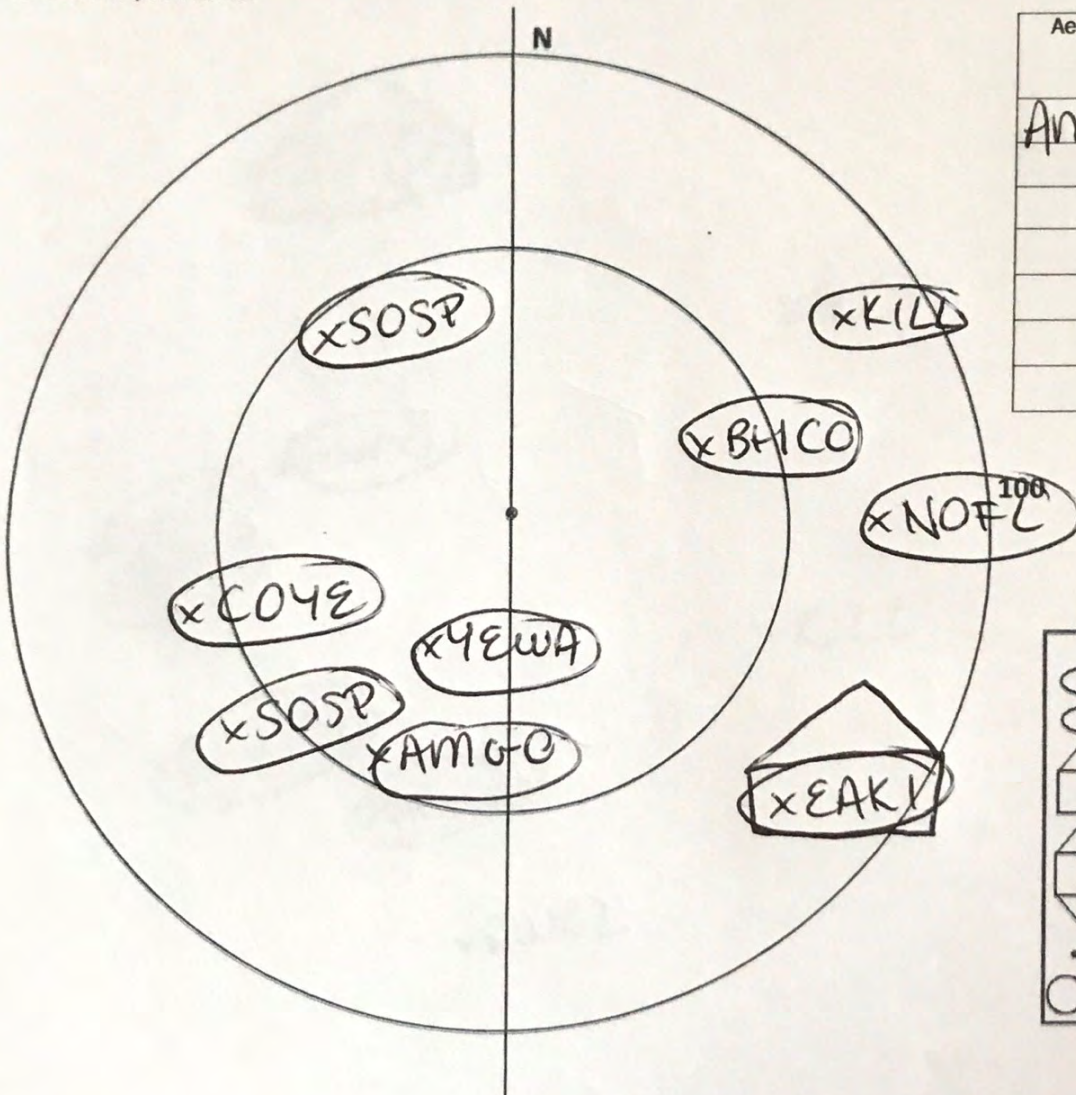
LEGEND

- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:
 moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 6 Observer(s): Molson Date (dd/mon/yy): 03/ Start Time: 9:22 End Time: 9:27
 GPS file name: _____ UTM: E: 43.033348 N: -79.123267
 Temperature: 25 Precip: 0 Wind speed: 17 Cloud cover: 5% Photo #: _____
 Description of Location: west of Montrose, N of Lyons Creek Rd.
 Habitat Codes (%) Hab 1: CUT (100) Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



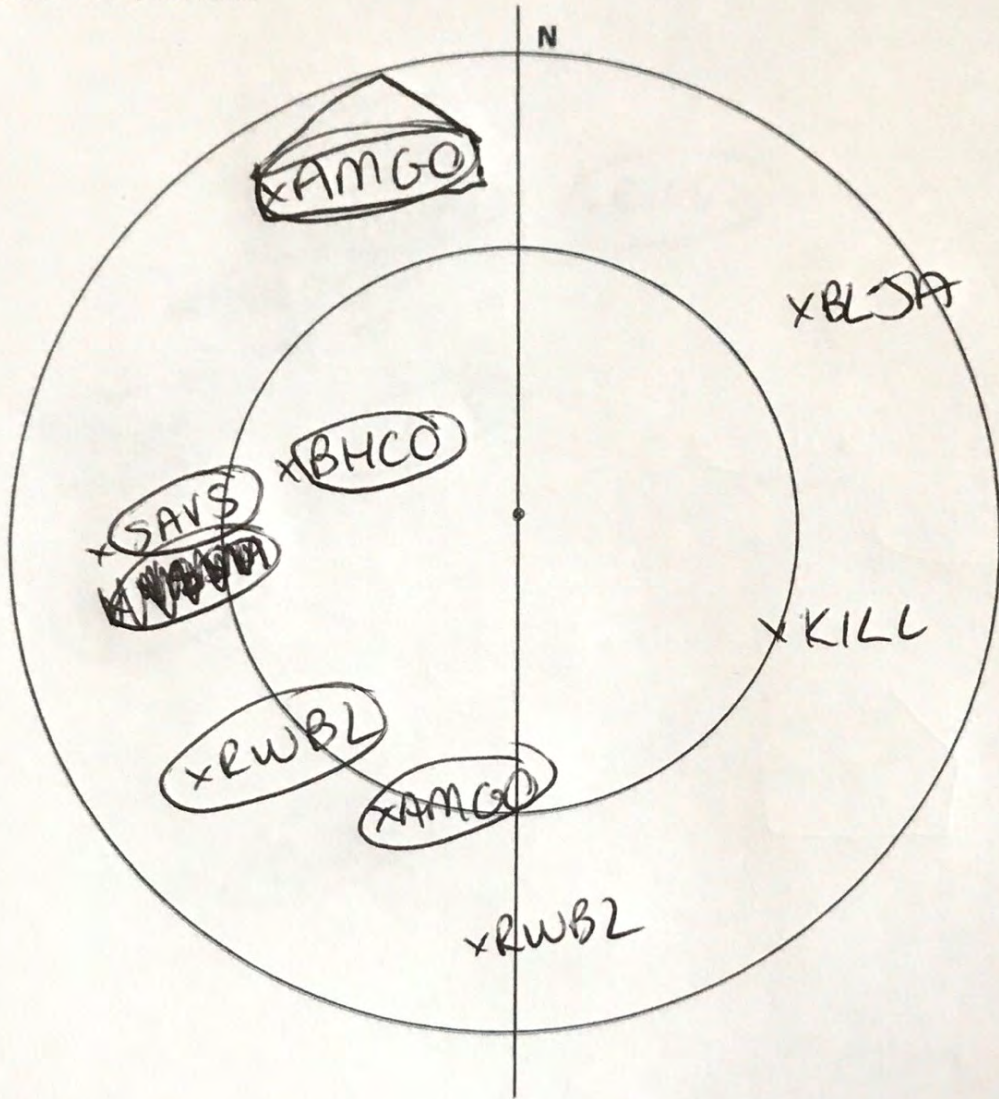
Aerial Forager/Fly Thru Species	#
AmGO	1

LEGEND	
	Single Bird, singing/calling
	Different Bird of same species
	Pair together
	Family group
	Observation, but not calling/singing
	Known change in position

Incidental Observations / Notes:
 moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose road Project Number: _____
 Point #: 7 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 9:12 End Time: 9:17
 GPS file name: _____ UTM: E: 43.035113 N: -79.122729
 Temperature: 25 Precip: 0 Wind speed: 17 Cloud cover: 5% Photo #: _____
 Description of Location: East side of Montrose, S of Lexington
 Habitat Codes (%) Hab 1: CUM100 Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#

LEGEND

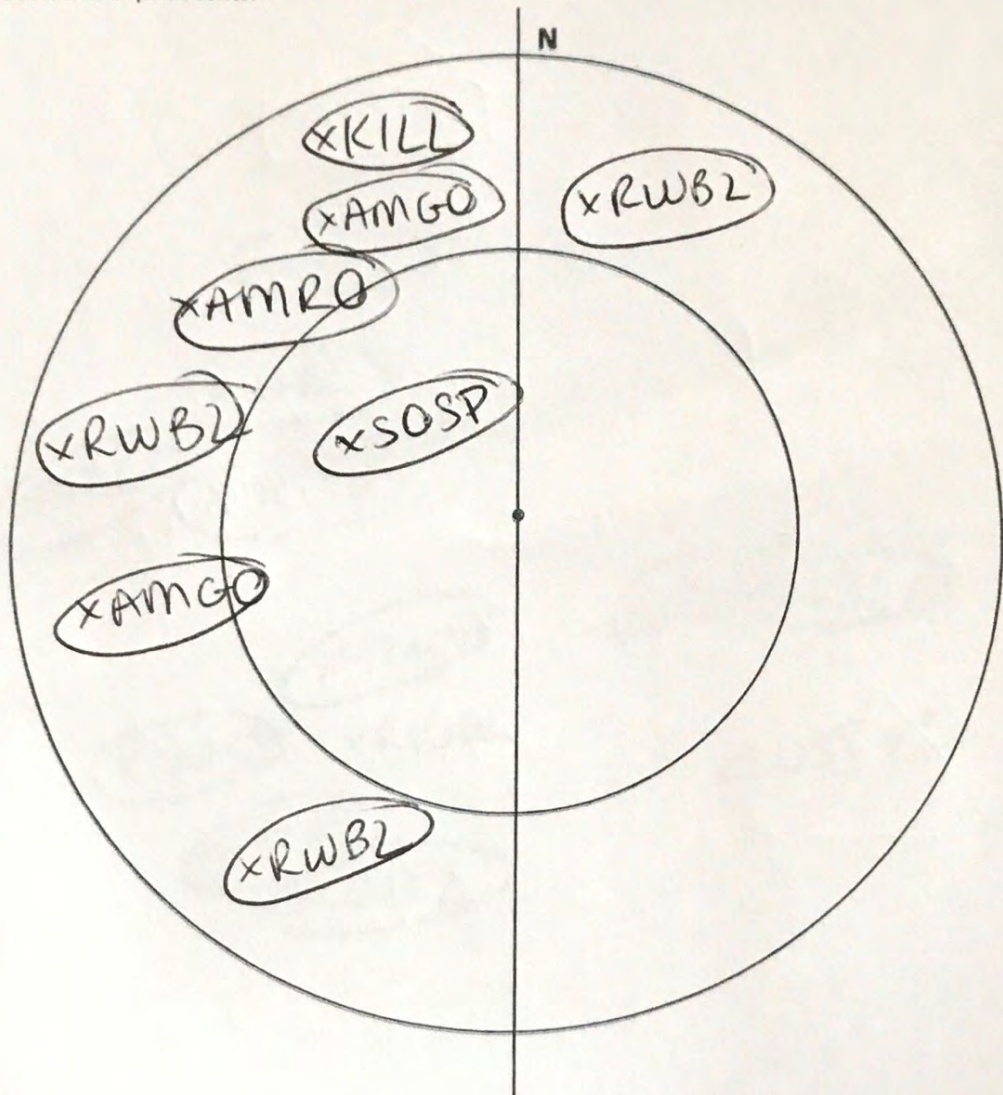
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 8 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 9:04 End Time: 9:06
 GPS file name: _____ UTM: E: 43.036489 N: -79.122891
 Temperature: 21 Precip: 0 Wind speed: 9 km/h cloud cover: 5% Photo #: _____
 Description of Location: W side of Montrose & Reisinger Rd
 Habitat Codes (%) Hab 1: CUMSO Hab 2: FODSO Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
EWST	111
AMGO	11
RWB2	4
GREG	1

100

LEGEND

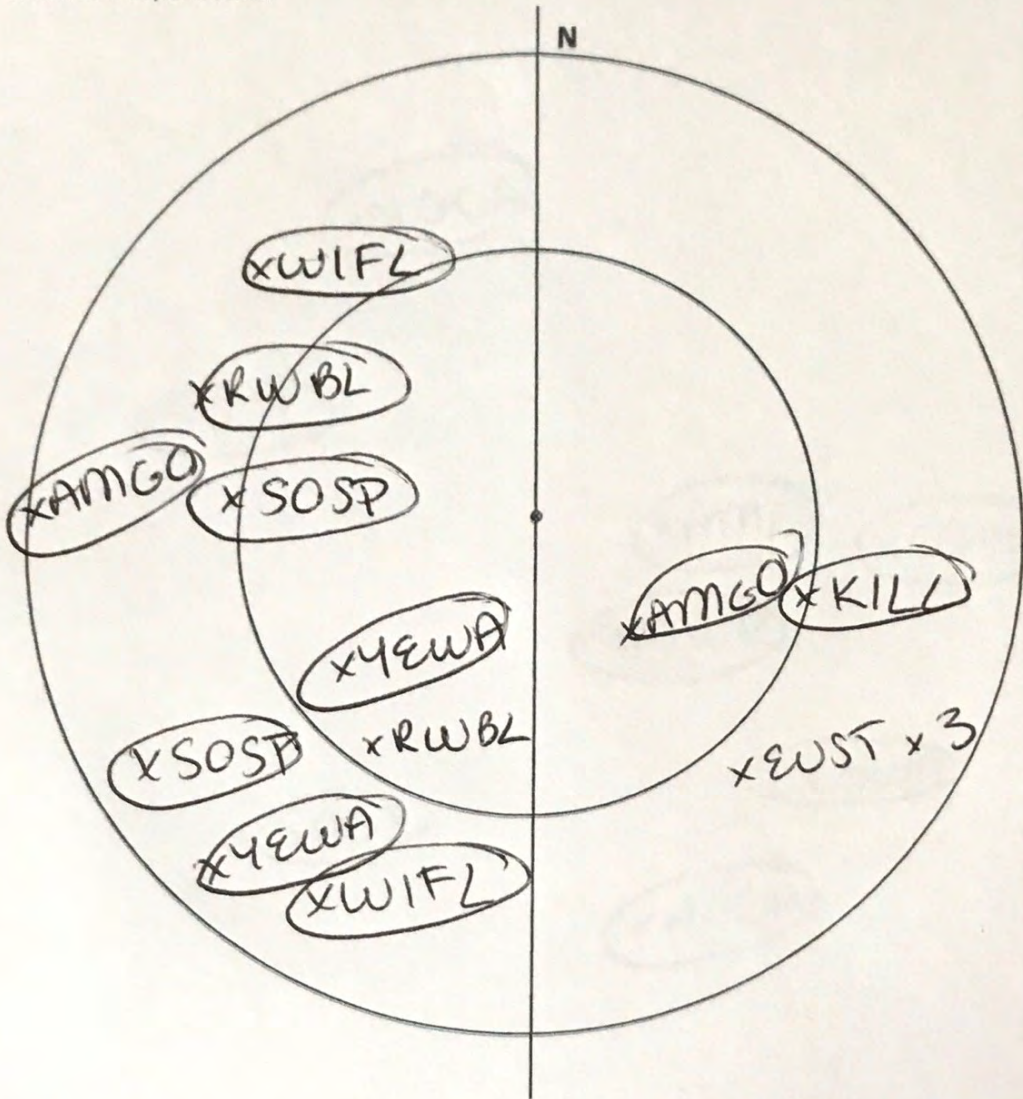
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 9 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 8:26 End Time: 8:31
 GPS file name: _____ UTM: E: A3.037983 N: -79.123020
 Temperature: 21 Precip: 0 Wind speed: 9km/h Cloud cover: 5% Photo #: _____
 Description of Location: Cum west of Montrose
 Habitat Codes (%) Hab 1: Cum⁹⁰ Hab 2: WT(10) Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
YQWA	1

LEGEND

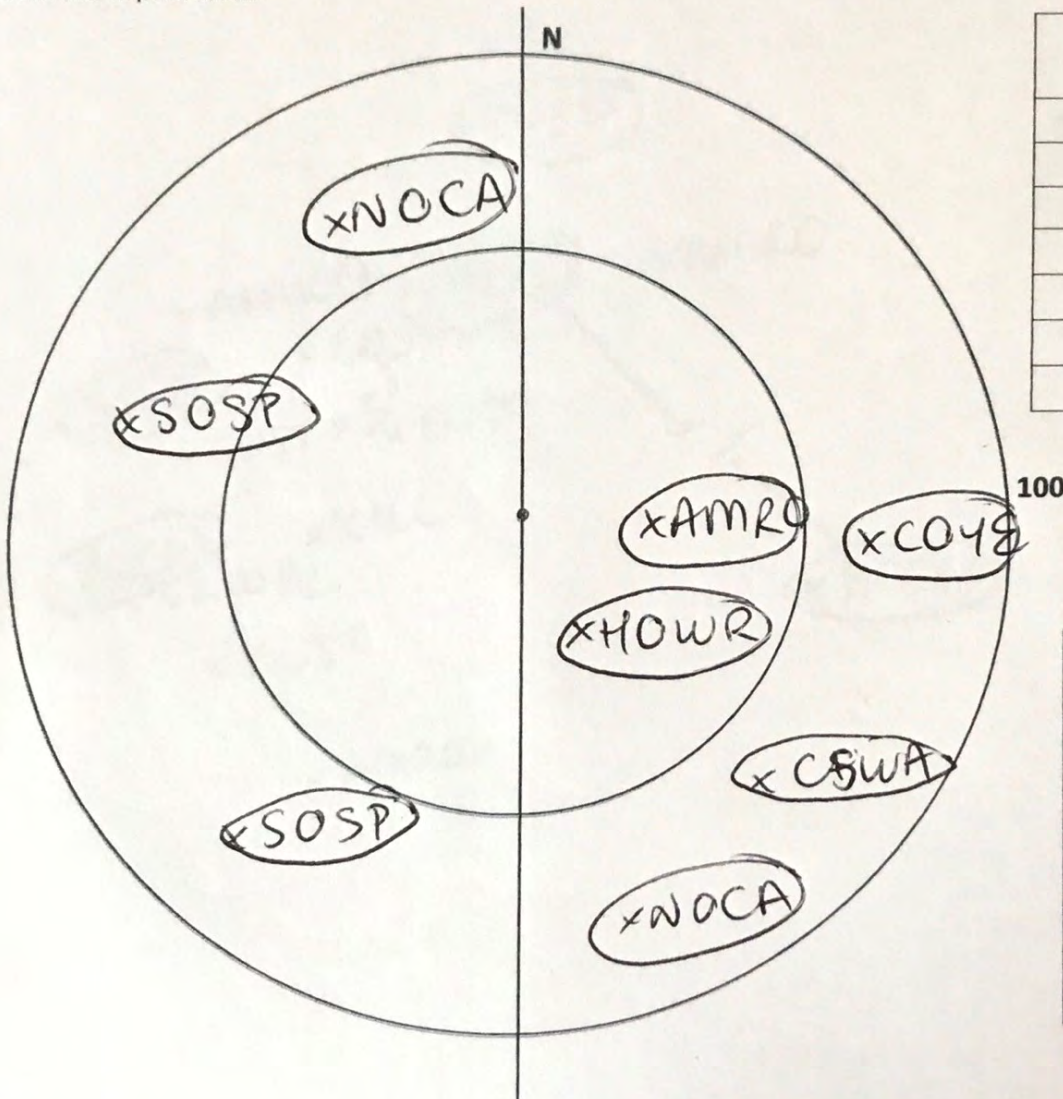
- Single bird, singing/calling
- Different bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 10 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 8:14 End Time: 8:19
 GPS file name: _____ UTM: E 43,041,701 N: -9,791,229,06
 Temperature: 21 Precip: 0 Wind speed: 9 km/h cloud cover: 59% Photo #: _____
 Description of Location: west side of road by guardrail
 Habitat Codes (%) Hab 1: FOD (100) Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#

LEGEND

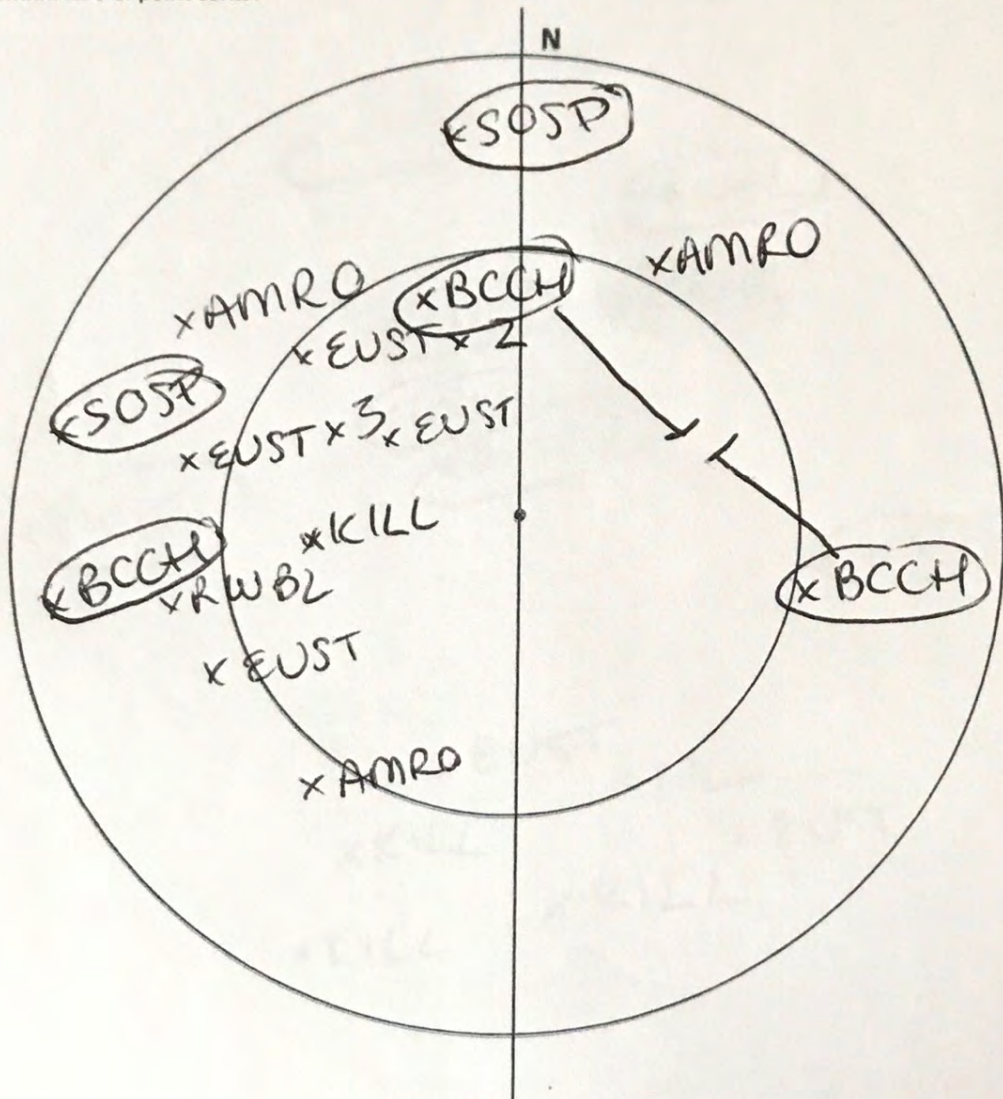
- Single bird, singing/calling
- Different bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 11 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 8:03 End Time: 8:08
 GPS file name: _____ UTM: E: 43,048808 N: -79.122823
 Temperature: 21 Precip: 0 Wind speed: 8 km/h Cloud cover: 59% Photo #: _____
 Description of Location: FOD & manicured lawn east of Montrose
 Habitat Codes (%) Hab 1: FOD 100 Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
RWBZ	1
EUST CF	1

LEGEND	
	Sings/calling
	Different bird of same species
	Pair together
	Family group
	Observation, but not calling/singing
	Known change in position

Incidental Observations / Notes:
moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 12 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 7:52 End Time: 7:57
 GPS file name: _____ UTM: E: 43.054061 N: -79.123289
 Temperature: 21 Precip: 0 Wind speed: 9kmh Cloud cover: 59% Photo #: _____
 Description of Location: West of Montrose @ Blackburn Pkwy
 Habitat Codes (%) Hab 1: CWT (85) Hab 2: OAO (5) Hab 3: CWT (10) Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
GBHE	1
EWST	111
DCCO	1



100

LEGEND

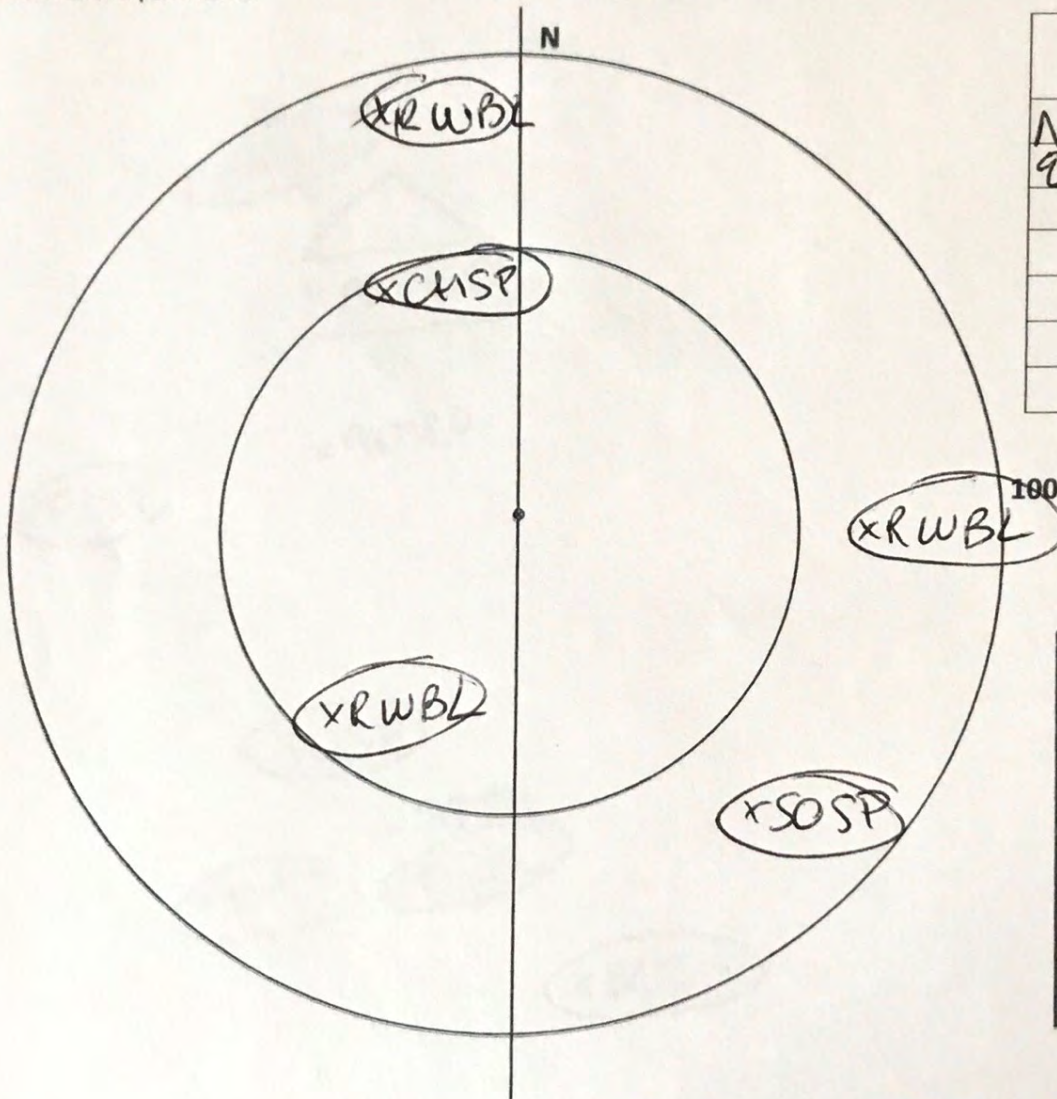
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 13 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 7:44 End Time: 7:49
 GPS file name: _____ UTM: E: 43.057707 N: -79.123189
 Temperature: 21 Precip: 0 Wind speed: 9 km/h Cloud cover: 5% Photo #: _____
 Description of Location: west side of Montrose near FOD
 Habitat Codes (%) Hab 1: FOD 90 Hab 2: CWH 10 Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
NOFL	1
RWST	2

LEGEND

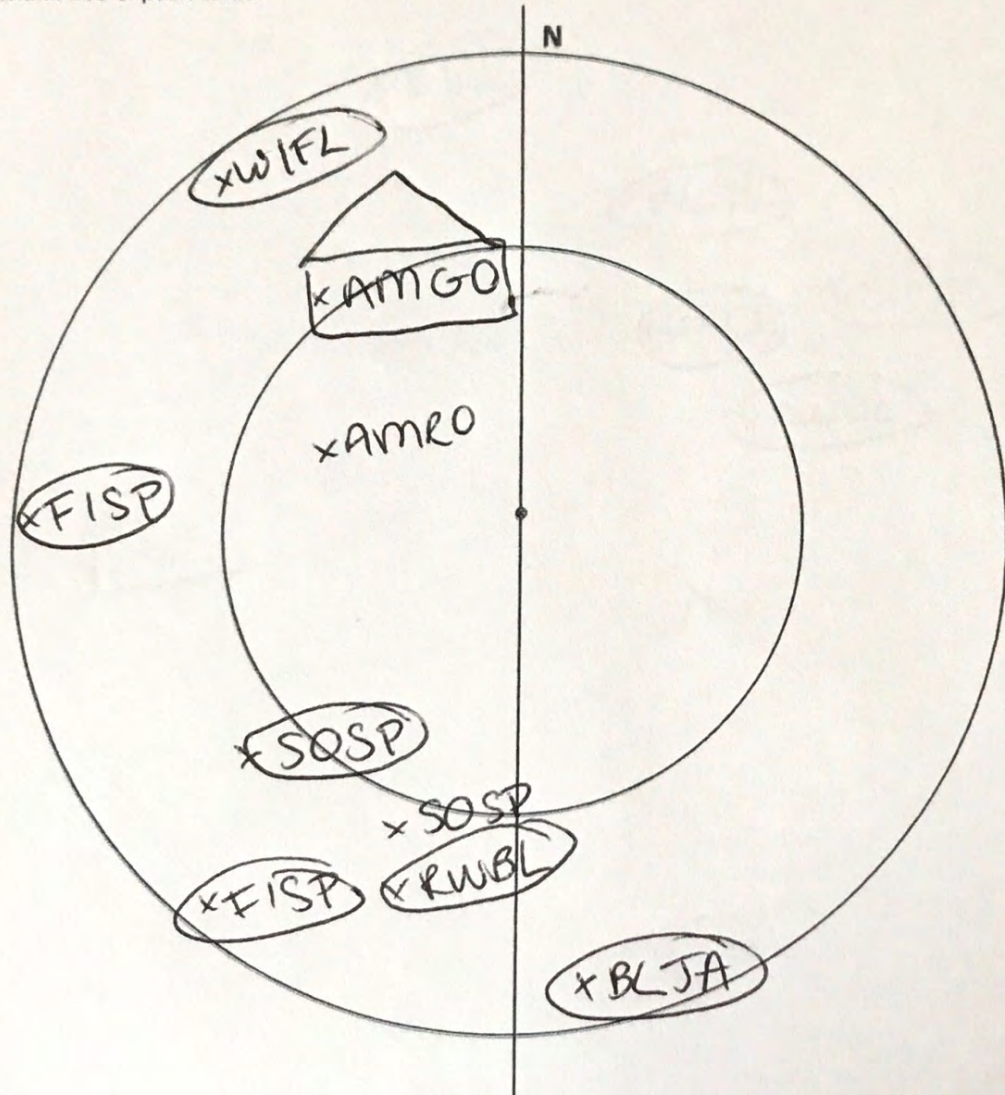
- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- known change in position

Incidental Observations / Notes:

moderate to high background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 14 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 7:35 End Time: 7:40
 GPS file name: _____ UTM: E: 43.061231 N: -79.123309
 Temperature: 21 Precip: 0 Wind speed: 9 km/h Cloud cover: 5% Photo #: _____
 Description of Location: Cum west of Montrose Rd
 Habitat Codes (%) Hab 1: Cum 100 Hab 2: _____ () Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center



Aerial Forager/Fly Thru Species	#
KILL	2
EWST	

LEGEND

- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

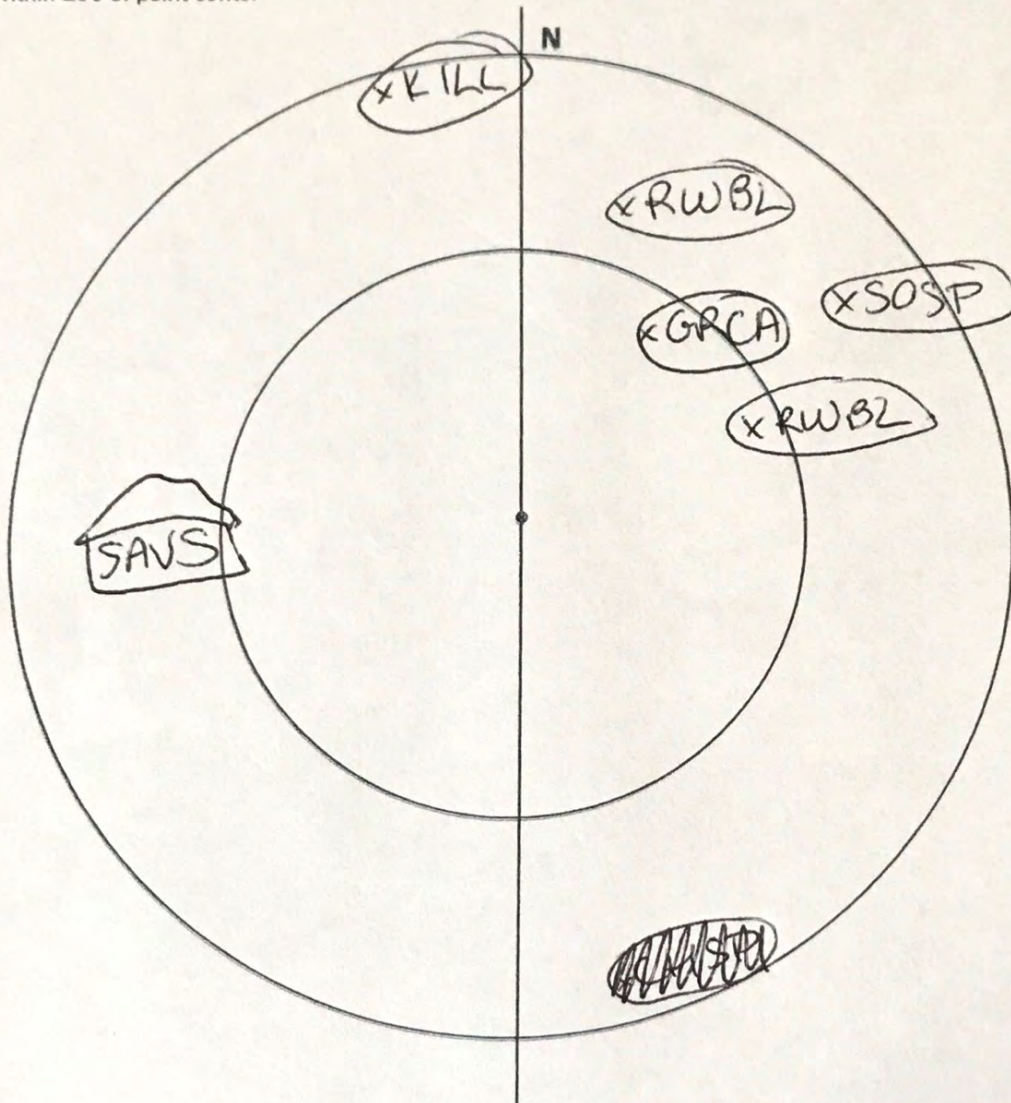
Incidental Observations / Notes:

moderate background traffic noise

BREEDING BIRD SURVEY POINT COUNT DATASHEET

Project Name: Montrose Road Project Number: _____
 Point #: 15 Observer(s): M. Olson Date (dd/mon/yy): 03/07/20 Start Time: 7:16 End Time: 7:21
 GPS file name: _____ UTM: E: 43.068894 N: -79.124696
 Temperature: 21 Precip: 0 Wind speed: 9 km/h Cloud cover: 5% Photo #: _____
 Description of Location: CVM surrounded by road & parking lot
 Habitat Codes (%) Hab 1: CVM10 Hab 2: CVH10 Hab 3: _____ () Hab 4: _____ ()
 Within 100 of point center

Aerial Forager/Fly Thru Species	#
MODO	3
RBGU	1
EUST	23



LEGEND

- Single Bird, singing/calling
- Different Bird of same species
- Pair together
- Family group
- Observation, but not calling/singing
- Known change in position

Incidental Observations / Notes:

low background noise due to construction activities

Bat Habitat Assessment

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees $\geq 10\text{cm}$ dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd.

Survey Date(s): 12/07/2020

Site Name:

Observer(s): A. Vaskoviciute, M. Olson

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
2	Pop tree	~10	2	<input type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? ⁴			Decay class 4
9	snag	10-15	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
10	snag	10	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
25	"	"	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
29	"	"	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
30	"	"	"	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
34 239	" oak?	30	3	<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3?			#34 exists, changed ID to 239
44	snag	25-30	4	<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
51	snag ULMADNER?	15-20	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			2 stems
52	"	"	"	<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			DC 4

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees $\geq 10\text{cm}$ dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
54	snag	25 30	4	<input type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? ⁴			DC 4
57	" oak?	"	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
59	snag ULMAMEL	17.5	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			" Dutch Elm Disease
60	" "	14	"	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
61	"	11	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
62	"	12	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
64	"	2	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			DC 4
66	"	17	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
67	"	12.5	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
68	"	25	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees ≥ 10 cm dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
71	Oak snag	10 50	3	<input type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? ⁴			Broken top
72	Oak snag	58. 5	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
88	Oak snag	45 5	1	<input checked="" type="checkbox"/> cavity <input type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
89	snag	40 25.5	4	<input checked="" type="checkbox"/> cavity <input type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3?			DC4
90	"	14	"	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
91	"	~ 15	"	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
94	"	15 20	"	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			2 stems broken top
100	snag US named	18	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			2 stems Dutch elm disease
103	Shagbark Hickory	15. 5	3	<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
104	Red Oak snag	21	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			Broken top

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees $\geq 10\text{cm}$ dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose rd

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
110	Red Oak snag	10.5	3	<input type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3 ⁴			
129	snag	15-20	3	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
130	"	~15	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
131	Red Oak	25	3	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			same tree as other select
137	snag	~20	3	<input checked="" type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
143	shagbark Hickory	35-40	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
148	"	"	"	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			"
150	snag	15-20	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			2 stems
153	"	15-30	"	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			3 stems
154	" uh mamek	20	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			Dutch elm disease

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

156 snag 25-30 2 loose bark
157 " 15-20 " "

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees ≥ 10 cm dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd.

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
169				<input checked="" type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? ⁴ <u>3</u>			see
171	hickory (shagbark?)	14.2	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1</u>			
172	"	17.6	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? <u>1</u>			
173	"	14	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1</u>			
174	"	14 18.7	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1</u>			
175	elm	19.3	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3/4</u>			-dutch elm disease
176	elm	25.5	4	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>5</u>			-dutch elm disease
178			4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>2-3</u>			
179	shagbark hickory	13	2-3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? <u>1</u>			-bark not yet kade
180	"	13	2-3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? <u>1</u>			

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees $\geq 10\text{cm}$ dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
182	elm	31.5	2-3	<input type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? ⁴ 3			
184	black gum	33.5	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 2			
185	shagbark hickory	27 26.6 27	1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 1			
186	elm	19.5 19.5	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 5-6			<3 m tall
189	elm	20.1	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 2			
191	elm	22	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 2			
192	elm	11.5	3-4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 3			
193	elm	22.2	3-4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 3-4			
195	elm	~40 -50	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 4-5			
198	elm?	~40	4	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3?			

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees ≥ 10 cm dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
200	beech	~25	1	<input type="checkbox"/> cavity ³ <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1</u>			> 2 knot holes
201	beech	~25	3	<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1-2</u>			
203	"	25 ~30	2-3	<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>2</u>			
209	hard oak		1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1</u>			
210	ash	~50	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3</u>			-ash borer -possible chimney cavity
211	ash	~13	1 2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3</u>			
212	"	~15	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3</u>			
213	elm	~15 -20	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3/4</u>			
214	elm	~20	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>4</u>			
215	elm	~20	1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3</u>			

² **Height Class:** 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ **Decay Class:** 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees $\geq 10\text{cm}$ dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
216	ash ash	~15 -20	1	<input type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? ⁴ 3			
217	ash ash	~15 -20	1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 3			
218	deciduous ash	~80	4	<input checked="" type="checkbox"/> cavity <input type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? 5/6			
219	ash sp. ash sp.	108	4	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? 5			- great - new shoots at trunk
220	maple	~30	3	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? 4			- cluster of snags
221	Ohio buckeye?	71.5	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input checked="" type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 2			- check bark photo
222	ash	~15 -20	1	<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 2			
223	"	~15 -20	1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 2			
224	"	~35	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? 3			
225	ash?	~20	4	<input checked="" type="checkbox"/> cavity <input type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? 6			< 3 m ~2m height

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees $\geq 10\text{cm}$ dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
226	osh sp.	~30	4	<input checked="" type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? ⁴ <u>6</u>			~3 m tall
227	osh	~30		<input checked="" type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? <u>4-5</u>			
228	dec	~50	1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1</u>			
229	coniferous	~20 24	2 -3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>4</u>			
230	elm	37.8	1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3</u>			
231	"	35	1	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>1</u>			
232	"	16.5	3	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3? <u>4</u>			
233	"	19.8	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3</u>			
234	"	18.7	2	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <u>3</u>			
235	"	24	✓	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Little Brown Myotis/Northern Myotis Datasheet

Include all live and dead standing trees $\geq 10\text{cm}$ dbh with loose or naturally exfoliating bark, cavities, hollows or cracks.

Project Name: *Montrose Rd*

Survey Date(s): *12/14/2020*

Site Name:

Observer(s): *ME AV*

ELC Ecosite:

Snag Density (snags/ha):

Tree #	Tree Species ID	dbh (cm)	Height Class ²	Snag attributes (check all that apply)	Easting	Northing	Notes
236	<i>ash</i>	<i>15.3</i>	<i>3</i>	<input type="checkbox"/> cavity ³ <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? ⁴ <i>3</i>			
237	<i>il</i>	<i>20</i>	<i>2-3</i>	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input checked="" type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <i>3</i>			
238	<i>cedarwood</i>	<i>80</i>	<i>1</i>	<input type="checkbox"/> cavity <input checked="" type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input checked="" type="checkbox"/> other snag within 10m? <input checked="" type="checkbox"/> Decay Class 1-3? <i>1</i>			<i>possible chimney</i>
				<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
				<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
				<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
				<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
				<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
				<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			
				<input type="checkbox"/> cavity <input type="checkbox"/> loose bark <input type="checkbox"/> crack <input type="checkbox"/> knot hole <input type="checkbox"/> other snag within 10m? <input type="checkbox"/> Decay Class 1-3?			

² Height Class: 1 = Dominant (above canopy); 2 = Co-dominant (canopy height); 3 = Intermediate (just below canopy); 4 = suppressed (well below canopy)

³ The approx. height of the cavity should be noted. Note that cavities with an entrance near the ground may also be used by bats if they are "chimney-like".

⁴ Decay Class: 1 = Healthy, live tree; 2 = Declining live tree, part of canopy lost; 3 = Very recently dead, bark intact, branches intact

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name: Par

Observer(s): M. Olson, A. Vaskeviciute

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
1	Pin Oak	L	30	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			Location estimated due to lack of PTE
3	"	"	15-20	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			3 stems
4	Red Maple?	"	~15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			2 stems
5	Oak spp. Pin Oak?	"	25	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
6	Red Oak	"	20-25	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			2 stems
7	Pin Oak	"	15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
8	Red Maple	"	15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			

* clusters assumed as surveys conducted in leaf-off conditions

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose

Survey Date(s): 12/04/2020

Site Name:

Observer(s): AV MO

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
11	Unknown oak	L	30	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
12	Oak spp.	"	15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
13	Pin oak	"	20-25	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
14	Red oak	"	"	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
15	Pin oak	"	20	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
16	Oak spp. Red?	"	"	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
17	"	"	"	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			

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Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
18	Oak spp. (Redb.)	L	15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
19	Pin Oak	"	20-25	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			Bird nest
20	"	"	15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
21	"	"	15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
22	"	"	10-15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
23	"	"	10	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
24	"	"	~15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
26	Pin oak	L	15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
27	"	"	15 20	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
28	Oak spp.	"	15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
31	Red Oak?	"	20- 25	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
32	Pin Oak	"	15 18	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			2 stems
33	Red Oak	"	17	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
34 ^a	Red Oak	"	25	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			different from 34b (Snzg)

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
35	Red oak	L	12-15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
36	"	L	35-40	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			Broken top
37	"	"	15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
38	"	"	20	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
39	"	"	35-40	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
40	"	"	50-60	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
41	"	"	~60	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
42	<u>Pinoak</u>	<u>L</u>	<u>70-80</u>	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
43	<u>Red oak</u>	<u>"</u>	<u>30-40</u>	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
45	<u>"</u>	<u>"</u>	<u>15-5</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
46	<u>Red maple</u>	<u>"</u>	<u>10-20</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			<u>5 stems 12.5, 11.5 rest under 10</u>
47	<u>Red oak</u>	<u>"</u>	<u>25-30</u>	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
48	<u>Red Maple</u>	<u>"</u>	<u>15-15</u>	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			<u>2 stems</u>
49	<u>"</u>	<u>"</u>	<u>10-15</u>	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			<u>10 stems</u>

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
50	Red Maple	L	14.5	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			100% stems
53	"	"	10-20	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			16 stems
55	"	"	15.5	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
56	Red Oak	"	50-60	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			leaf
58	Pin Oak	"	20	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
63	"	"	23	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			100% stems
65	"	L	50-60	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			leaf IT

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
69	Oak	L	27	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
70	Red Oak	"	12-15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
73	Red Oak	"	35	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
74	Red Oak	"	40	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
75	White Oak	"	49	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
76	Red white Oak	"	69	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
77	Red Oak	"	50-60	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
78	Red Oak	L	51	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
79	White Oak?	"	50	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
80	Red oak	L	14.5 14.5	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			2 stems
81	"	L	24.5	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			76 SP
82	"	"	14.5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			" CP
83	"	L	15-20	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			" 20
84	Oak?	"	26.5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			140 19

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
85	Red Oak	L	22.5	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
86	"	"	25-30	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			2 stems
87	"	"	35-40	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
92	"	"	14	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			2 stems
93	"	"	11	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			58
95	"	"	12	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			88
96	Red Oak	"	35 16	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			3 stems

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd.

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
97	red oak	L	30	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			4 stems
98	"	L	15.5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
99	Oak spp.	L	28	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
100	red oak	"	22	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
102	"	"	21	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			2 stems
105	"	"	25	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
106	"	"	21	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
107	White Oak	L	17, 11, 9	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input checked="" type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			3 stems
108	Pin Oak	"	~15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input checked="" type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
109	"	"	11	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input checked="" type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
111	"	"	25, 5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input checked="" type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
112	Red Pin Oak	"	11	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
113	Red Oak	"	11	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
114	"	"	13, 5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

 Project Name: Montrose Rd.

 Survey Date(s): 12/04/2020

Site Name:

 Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
215	Red Maple	L	15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
216	Oak spp.	L	15	<input type="checkbox"/> dead/dying leaf cluster <input checked="" type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
217	Red Maple	"	12	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
218	Oak spp.	"	10-15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
219	"	"	10-15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
220	"	"	10-15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
221	"	"	10-15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
122	<u>Oak spp.</u>	<u>L</u>	<u>10-15</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
123	<u>Bur Oak?</u>	<u>"</u>	<u>15.5</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
124	<u>"</u>	<u>"</u>	<u>18</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			<u>Loose bark</u>
125	<u>Oak spp.</u>	<u>"</u>	<u>29.5</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
126	<u>"</u>	<u>"</u>	<u>~15</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
127	<u>Bur Oak</u>	<u>"</u>	<u>15-20</u>	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			<u>2 stems</u>
128	<u>Red maple</u>	<u>"</u>	<u>19</u>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/04/2020

Site Name:

Observer(s): MO AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
131	Red Oak	Both	25-30	<input type="checkbox"/> dead/dying leaf cluster <input checked="" type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			2 stems - one dead, one live (see other sheet)
132	Bur Oak	L	25-30	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
133	"	L	20-25	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
135	"	L	"	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
136	"	L	30-35	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
137	"	L	25-30	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
138	Pin Oak	L	100	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/04/2020; 12/14/2020

Site Name:

Observer(s): (MO AV) (ME AV)

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
147	Pin Oak	L	30-35	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
148	Red Oak	"	10-15	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
151	"	"	20-25	<input checked="" type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
152	Red Pin Oak	"	"	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
155	Bur Oak	"	13-5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
158	Pin Oak	L	26.5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
159	"	"	28	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name: Montrose Rd

Observer(s): ME AV

ELC Ecosite: Montrose Rd

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
160	oak pin?	L	19.6	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
161	oak bur	L	46.3	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
162	oak bur	L	42.8	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
163	oak bur	L	43.4	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
164	oak bur	D	32	<input type="checkbox"/> dead/dying leaf cluster <input checked="" type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			-loose bark
165	oak bur	L	51.6	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
166	Pin oak	L	40	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
167	bur oak	L	44.2	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
168	bur oak	D	22.8	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			- loose bark - cavities
169	bur oak	L	29.8	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
170	? oak	L	21	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			- check photo
177	bur oak	L	31.9	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			3 Stems 5
178	bur oak	L	16 <small>(2 stems)</small>	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			- 1 stem is using ag - loose bark - cracks
181	red oak	L	26.4	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
183	red oak	L	13.5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
187	oak sp.	L	13	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			-cracks to base b/c of base
188	red oak	L	19.4	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			-dead branch at base
190	red oak	L	45.8	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
194	pin oak	L	31.7	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
196	pin oak	L	43.0	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
197	red oak	L	25.5	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
199	red oak	L	~15	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
202	"	L	3 stems ~30	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
204	"	L	~60 70	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
205	maple red	L	~35	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
206	"	L	~50	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
207	red oak	L	~40 50	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			
208	maple (red)	L	~30	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input checked="" type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			

Suitable Maternity Roost Trees for Tri-colored Bat Datasheet

Include all oak trees >10cm dbh (if present). If oaks are absent, include maples >10cm dbh IF dead/dying leaf clusters are present; and maples >25cm dbh if no dead/dying leaf clusters are present.

Project Name: Montrose Rd

Survey Date(s): 12/14/2020

Site Name:

Observer(s): ME AV

ELC Ecosite:

Tree#	Tree Species ID	Tree Status (live/dead)	Dbh (cm)	Tree Structural & Locational Attributes (check all that apply)	Easting	Northing	Notes
209	bur oak	L	~70	<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input checked="" type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input checked="" type="checkbox"/> preferred tree species within 10m?			end of hedge row - loose bark
				<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
				<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
				<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
				<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
				<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			
				<input type="checkbox"/> dead/dying leaf cluster <input type="checkbox"/> cavity <input type="checkbox"/> open area/forest gap <input type="checkbox"/> forest edge <input type="checkbox"/> interior <input type="checkbox"/> preferred tree species within 10m?			

Fisheries Field Notes

GENERAL INFORMATION											
PROJECT #:	477511		PROJECT DESCRIPTION:	Montrose Rd. EA		DAY:	12	MONTH:	08	YEAR:	2020
Is STREAM REALIGNMENT required for this section:											
<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown											
COLLECTORS:	B. MacEachron & Welsh		WEATHER CONDITIONS:	Sunny / hazy		TIME STARTED:	9:30		TIME FINISHED:		10:00
AIR TEMP:	22		WATER TEMP:	—		CONDUCTIVITY (µS/cm):					—
PHOTO NUMBERS AND DESCRIPTIONS:											
LOCATION											
NAME OF WATERBODY:	unimproved tributary to Niagara Creek		DRAINAGE SYSTEM:	Welland River		CROSSING #:	1		STATION #:		WC-01
LOCATION OF CROSSING:											
Montrose Rd crossing ~ 805m north of Chippewa Creek Rd											
GPS COORDINATES:	177 652845 4768979		MTO CHAINAGE:								—
TOWNSHIP:	Niagara Falls		MNR DISTRICT:								Geolph
LAND USE AND POLLUTION											
SURROUNDING LAND USE:					SOURCES OF POLLUTION:						
Natural area, Municipal Road, etc					Highway (over)						
EXISTING STRUCTURE TYPE											
Bridge <input type="radio"/>		Box Culvert <input checked="" type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>			
Other <input type="radio"/> Describe:						Size (w x h) m ²					
SECTION TYPE AND MORPHOLOGY											
SECTION IDENTIFIER:			SECTION LOCATION:								
4/3			(include on habitat map)								
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:					
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	No					
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):						
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other					
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dry					
Percentage of area						100					
Mean depth wetted (m)						—					
Mean width wetted (m)						—					
Mean bankfull width (m)						—					
Mean bankfull depth (m)						—					
Substrate						Mn, S.					
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D			

BANK STABILITY								
	Stable	Slightly Unstable	Moderately Unstable	Unstable				
Left Upstream Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Right Upstream Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris		Organic debris	Vascular Macrophytes	None
	/	/	/	Instream /	Overhanging /	/	Instream 80	Overhanging 20
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None	
Predominant Species	/		/		100 Grasses, cattails		/	
MIGRATORY OBSTRUCTIONS:	None /		Seasonal Low water /		Permanent /			
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning /		Evidence of Groundwater /		Other /			
POTENTIAL ENHANCEMENT OPPORTUNITIES:								
NONE								
COMMENTS:								
-> channel dry during survey -> dense instream grasses -> channel flows through narrow grassy meadow within natural forest area; natural meander pattern -> some ponded water within culvert -> riparian zone grasses/forbs along channel edge and deciduous forest -> wet meadow @ culvert inlet, head/dry streambed up to inlet								
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes number of pages _____								

SECTION IDENTIFIER: 43	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
		PROJECT #: 477511	
		MAPPER: C. M. O'G...	
		NAME OF WATERBODY: Unnamed Tributary of Wolfen Creek	
		CROSSING #: 1	
		STATION #: W.C-01	
		DATE: DD-MMM-YY 12-08-2010	
		LEGEND	
		10d depth (cm) 6w width → Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOoO Cobble / Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining // // // // Eroded Bank xxx Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ® Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert	
PROFILE:	Horz. Scale	Vert. Scale	

GENERAL INFORMATION											
PROJECT #:	477511		PROJECT DESCRIPTION:	Mortrose Rd EA		DAY:	12	MONTH:	08	YEAR:	2020
Is STREAM REALIGNMENT required for this section:											
<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown											
COLLECTORS:			WEATHER CONDITIONS:			TIME STARTED:		TIME FINISHED:			
B. McOrgh, N. Welch						9:30		10:00			
AIR TEMP:				WATER TEMP:				CONDUCTIVITY (µS/cm):			
22°C				_____				_____			
PHOTO NUMBERS AND DESCRIPTIONS:											
LOCATION											
NAME OF WATERBODY:			DRAINAGE SYSTEM:			CROSSING #:		STATION #:			
Unnamed tributary of Wolfer Creek			Wolfer River			1		WC-01			
LOCATION OF CROSSING:											
Mortrose Rd Crossing, ~ 805m North of Chippewa Creek Rd											
GPS COORDINATES:						MTO CHAINAGE:					
12T 652845 4768979						_____					
TOWNSHIP:						MNR DISTRICT:					
Niagara Falls						Geolph					
LAND USE AND POLLUTION											
SURROUNDING LAND USE:						SOURCES OF POLLUTION:					
Roadside ditches, QEW, Municipal Rd						Roadside drainage					
EXISTING STRUCTURE TYPE											
Bridge <input type="radio"/>		Box Culvert <input checked="" type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>			
Other <input type="radio"/> Describe:								Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY											
SECTION IDENTIFIER:				SECTION LOCATION:							
d/s				(include on habitat map)							
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:					
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	No					
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):						
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other					
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	DRY					
Percentage of area						100					
Mean depth wetted (m)											
Mean width wetted (m)											
Mean bankfull width (m)											
Mean bankfull depth (m)											
Substrate						Si, Muck					
Bedrock	Boulder	Cobble	Gravel	Sand	Silt	Clay	Muck	Detritus			
Br	Bo	Co	Gr	Sa	(Si)	Cl	(Mu)	D			

BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Right Upstream Bank	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	/	Instream — Overhanging —	/	Instream 100 Overhanging —	/
SHORE COVER (% stream shaded):	100 – 90 % <input type="radio"/>	90 – 60% <input type="radio"/>	60- 30% <input type="radio"/>	30 – 1% <input type="radio"/>	None <input checked="" type="radio"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species	/		/		Phragmites, grasses 100		/
MIGRATORY OBSTRUCTIONS:	None /		Seasonal Low water		Permanent /		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning /		Evidence of Groundwater /		Other /		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
→ Phragmites Removal							
COMMENTS:							
→ short section (m) on of channel to culvert under QEW → partly d/s in channel @ dense phragmites patch immediately d/s of outlet → wet muck @ outlet had/dry streambed d/s → drainage ditches enter from north + south → riparian zone is disturbed roadside meadow w forbs + small woody shrubs							
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes number of pages _____							

SECTION IDENTIFIER: <i>ds</i>		SECTION LOCATION:		SECTION LENGTH (m): <i>10</i>		SCALE (cm / m): _____	
						PROJECT #: <i>477511</i>	
						MAPPER: <i>B. M. O'Leigh</i>	
						NAME OF WATERBODY: <i>f</i> <i>unnamed tributary</i> <i>Wallen Creek</i>	
						CROSSING #: <i>1</i>	
						STATION #: <i>WC-01</i>	
DATE: DD-MMM-YY <i>12-08-2020</i>						LEGEND 10d depth (cm) 6w width → Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar [stippled] Fine Substrate [###] Gravel Substrate oOoO Cobble / Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining [] Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ⊗ Riparian Tree ▶ Seep/Spring - - - Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line [] Culvert	
PROFILE:		Horz. Scale		Vert. Scale			



GENERAL INFORMATION									
PROJECT #:		PROJECT DESCRIPTION:			DAY:	MONTH:	YEAR:		
		Montrose Rd EA			12	08	2020		
Is STREAM REALIGNMENT required for this section:									
<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown									
COLLECTORS:			WEATHER CONDITIONS:		TIME STARTED:		TIME FINISHED:		
B. McEwen, N. Welch			Sunny / Warm		10:05		11:20		
AIR TEMP:			WATER TEMP:			CONDUCTIVITY (µS/cm):			
			18.2			667			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY:			DRAINAGE SYSTEM:		CROSSING #:		STATION #:		
Walter Creek			Walter River		2		WC-02		
LOCATION OF CROSSING:									
Montrose Rd Crossing, ~ 390m North of Chippewa Creek Rd									
GPS COORDINATES:					MTO CHAINAGE:				
177 652862 4768567									
TOWNSHIP:					MNR DISTRICT:				
Niagara Falls					Geoph				
LAND USE AND POLLUTION									
SURROUNDING LAND USE:					SOURCES OF POLLUTION:				
Municipal Rd, Open agricultural field					Roadside runoff, agricultural runoff				
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>		Box Culvert <input checked="" type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe:						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER:				SECTION LOCATION:					
4/5				(include on habitat map)					
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:			
	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	No			
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):				
SUB-SECTION(S)	Run	Pool	Rifle	Flats	Inside culvert	Other			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	/			
Percentage of area				100					
Mean depth wetted (m)				0.43					
Mean width wetted (m)				2.5					
Mean bankfull width (m)				3.8					
Mean bankfull depth (m)				0.58					
Substrate				Silt, Cl, Mu					
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

BANK STABILITY								
		Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank		●	○	○	○			
Right Upstream Bank		●	○	○	○			
HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None	
	10	/	/	Instream 10 Overhanging 15	10	Instream 25 Overhanging 30	/	
SHORE COVER (% stream shaded):	100 - 90 %		90 - 60%		60 - 30%		30 - 1%	None
	○		○		○		●	○
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None	
	20		/		80		/	
Predominant Species	Milkfoil		/		Sedges, grasses Cattails		/	
MIGRATORY OBSTRUCTIONS:	None		Seasonal			Permanent		
	/		Low water			/		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater			Other		
	Medminnow, Sunfish		/			/		
POTENTIAL ENHANCEMENT OPPORTUNITIES:								
->								
COMMENTS:								
-> channelized watercourse flowing along Montrose Rd. -> function as roadside ditch -> soft substrate 20cm deep (silt/mud overlying bed) -> standing water w/ very little flow for ~ 30m up of culvert then trickle flow for remainder of section -> dense submergent veg @ culvert, mainly emergent further up -> riparian zone disturbed roadside meadow w/ grasses/forbs + small trees/shrubs								
Additional Notes Appended? ● No ○ Yes number of pages _____								

SECTION IDENTIFIER: <i>4/5</i>		SECTION LOCATION: —		SECTION LENGTH (m): —	SCALE (cm / m): —
					PROJECT #: <i>477 511</i>
					MAPPER: <i>Bill O'Leary</i>
					NAME OF WATERBODY: <i>Wallen Creek</i>
					CROSSING #: <i>2</i>
					STATION #: <i>WC-02</i>
DATE: DD-MMM-YY <i>12-08-2020</i>					
LEGEND					
10d depth (cm) 6w width → Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOooO Cobble / Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining // // // Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ⊗ Riparian Tree ▶ Seep/Spring - - - Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert					
PROFILE:	Horz. Scale	Vert. Scale			

GENERAL INFORMATION									
PROJECT #: 477511		PROJECT DESCRIPTION: Montrose Rd EA			DAY: 12	MONTH: 08	YEAR: 2020		
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown									
COLLECTORS: B. MacLaughlin, N. Welch			WEATHER CONDITIONS: Sunny, Hot		TIME STARTED: 10:05		TIME FINISHED: 11:20		
AIR TEMP: 24°C			WATER TEMP: 18.2			CONDUCTIVITY (µS/cm): 661			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY: Walter Creek			DRAINAGE SYSTEM: Welland River		CROSSING #: 2	STATION #: WC-02			
LOCATION OF CROSSING: Montrose Rd Crossing, ~ 390 m north of Chippawa Creek Rd									
GPS COORDINATES: 17T 652862 4768567					MTO CHAINAGE: —				
TOWNSHIP: Niagara Falls					MNR DISTRICT: GUELPH				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: OLGW, municipal Rd					SOURCES OF POLLUTION: roadside inst				
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe:						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: d13			SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input type="radio"/>	Channelized <input checked="" type="radio"/>	Permanent <input type="radio"/>	Intermittent <input checked="" type="radio"/>	Ephemeral <input type="radio"/>	ASSOCIATED WETLAND: No			
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):				
SUB-SECTION(S)	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Inside culvert <input type="radio"/>	Other			
Percentage of area						Dry 100%			
Mean depth wetted (m)									
Mean width wetted (m)									
Mean bankfull width (m)									
Mean bankfull depth (m)									
Substrate						Co/Bo			
Bedrock Br	Boulder Bo <input checked="" type="radio"/>	Cobble Co <input checked="" type="radio"/>	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

BANK STABILITY							
		Stable	Slightly Unstable	Moderately Unstable	Unstable		
Left Upstream Bank		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Right Upstream Bank		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
		50%				50%	
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60 - 30%	30 - 1%	None		
	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species					CT, Mint		
MIGRATORY OBSTRUCTIONS:	None			Seasonal Cobble/Boulders	Permanent		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning			Evidence of Groundwater	Other		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
-D remove invasive plants (ie purple loosestrife & phragm) buckthorn -D remove old silt fence							
COMMENTS:							
-D purple loosestrife, mint, CT, phrag, grasses, buckthorn, ^{Quercus} _{lake} -D channel dry b/w culverts, but water is present within the culverts LD Cobble / Boulders separate the two culverts & function as barrier							
Additional Notes Appended? <input type="radio"/> No <input type="radio"/> Yes number of pages _____							

SECTION IDENTIFIER: DIS		SECTION LOCATION: —		SECTION LENGTH (m): —		SCALE (cm / m): —	
						PROJECT #: 477511	
						MAPPER: N.W	
						NAME OF WATERBODY:	
						CROSSING #: 2	
						STATION #: WC-02	
DATE: DD-MMM-YY 12-Aug-20						LEGEND	
						10d depth (cm) 6w width → Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOooO Cobble / Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg V vegetation EV Emergent Vegetation W Watercress Fe Iron Staining // // // Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ⊗ Riparian Tree ▶ Seep/Spring - - - Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert	
PROFILE:		Horz. Scale		Vert. Scale			

GENERAL INFORMATION									
PROJECT #:	477511	PROJECT DESCRIPTION:	Montrose Rd E.A	DAY:	12	MONTH:	08	YEAR:	2020
COLLECTORS:	B. McVeigh N. Welch			TIME STARTED:	10:05		TIME FINISHED:	11:20	
WEATHER CONDITIONS:	Sunny / hr 10% cloud cover			SURFACE CONDITIONS (if applicable):					
	Calm	Rippled	Wavy	Rough					
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
GENERAL LOCATION									
NAME OF WATERBODY:	Warren Creek			LOCATION OF STATION:	~ 390m North of Chipewagan Creek Rd				
TOWNSHIP:	Nisquon Falls			MNR DISTRICT:	Geolph				
SAMPLING LOCATIONS AND WATER CHEMISTRY									
LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)			
Upstream									
Downstream									
Culvert / Hwy ROW		24	8.30	4.1	18.2	661			
WATER COLOUR:	Colourless <input type="radio"/>	Yellow/brown <input type="radio"/>	Blue/green <input type="radio"/>	Turbid <input checked="" type="radio"/>	Other <input type="radio"/>				
GEAR									
ELECTROFISHER:	<input checked="" type="radio"/> LR-24								
Length (m):	35	Settings:	80 Hz, 60V, 0.6A		Seconds:	235			
NETS and TRAPS:									
MINNOW TRAP: <input type="radio"/> #	DIP NET <input checked="" type="radio"/>			TRAP NET <input type="radio"/>					
SEINE: <input type="radio"/>	GILL <input type="radio"/>			OTHER <input type="radio"/> specify					
HAULS (#):	Period Of Time (24 hour clock):								
	Set Time				Clear time				
LENGTH (m):	MESH SIZE:				DEPTH OF CAPTURE:				
	Smallest (cm):				Minimum (m):				
	Largest (cm):				Maximum (m):				
SAMPLE COLLECTION									
FISH KEPT?	# OF BAGS	PRESERVATIVE:							
<input type="radio"/> Yes <input checked="" type="radio"/> No	—	Formalin <input type="radio"/>	Frozen <input type="radio"/>	Alcohol <input type="radio"/>	Other <input type="radio"/>				
COMMENTS:									
Fished upstream only									
Additional Notes Appended? <input type="radio"/> No <input type="radio"/> Yes number of pages _____									

CAPTURE INFORMATION					
PROJECT NO.: 477511			STATION NO.: WC-02		
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F = total fork or L = total length	AGE CLASS YOY / Adult
5	Greensun fish	—	—	—	Adult
23	Central mudminnow	—	—	—	Adult
4	Greensun fish	—	—	—	YOY
4	Jimmy Dorer	—	—	—	Adult
1	Large mouth Bass	—	—	—	YOY
1	Yellow Perch	—	—	—	Adult

Circle number if a sample was kept

GENERAL INFORMATION									
PROJECT #:		PROJECT DESCRIPTION:			DAY:	MONTH:	YEAR:		
477511		Montrose Rd E.A			12	08	2020		
Is STREAM REALIGNMENT required for this section:									
<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown									
COLLECTORS:		WEATHER CONDITIONS:			TIME STARTED:		TIME FINISHED:		
B. MacVeigh, N. Ludde		Sunny / Hot			14:45		15:30		
AIR TEMP:			WATER TEMP:			CONDUCTIVITY (µS/cm):			
27°C			27°C			332			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY:		DRAINAGE SYSTEM:			CROSSING #:	STATION #:			
Welland River		Welland River			3	WR-01			
LOCATION OF CROSSING:									
Welland River Bridge crossing on Montrose Rd									
GPS COORDINATES:					MTO CHAINAGE:				
17T 652878 4767659					—				
TOWNSHIP:					MNR DISTRICT:				
Niagara Falls					GUELPH				
LAND USE AND POLLUTION									
SURROUNDING LAND USE:					SOURCES OF POLLUTION:				
Construction, manicured lawn municipal Road					road runoff, construction site				
EXISTING STRUCTURE TYPE									
Bridge <input checked="" type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe:							Size (w x h) m ²		
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER:				SECTION LOCATION:					
4/5				(include on habitat map)					
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:			
	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	No			
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):				
49									
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other			
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	/			
Percentage of area	100								
Mean depth wetted (m)	>1.5								
Mean width wetted (m)									
Mean bankfull width (m)									
Mean bankfull depth (m)	>1.5								
Substrate	Si, Cl, Mu								
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	
					<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	

BANK STABILITY							
		Stable	Slightly Unstable	Moderately Unstable	Unstable		
Left Upstream Bank		●	○	○	○		
Right Upstream Bank		●	○	○	○		
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	/	Instream 10 Overhanging 20	/	Instream 50 Overhanging 20	/
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60-30%	30 - 1%	None		
	○	○	○	●	○		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
	35		30		15		
Predominant Species	Canada Waterweed, Coontail, Wild Celery, Natter, Arrowweed, pondweed		Frogbit, white water lily, algae		Cattails, grasses		
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent		
	X		—		—		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater		Other		
			—		—		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
-> Replace bridge w clear span							
COMMENTS:							
-> wide, slow moving river -> flooded cattail marsh along north bank ~ 30m ups of bridge -> dense submergent + floating vegetation for ~ 5-8m on either side of channel in shallow areas; open water channel ~ 25m wide in middle -> substrates soft ~ 15-30 cm deep; assumed to be clay in mid-channel -> overhanging shrubs covered in wild grape vine along south bank -> stand of emergent vegetation along north bank @ bridge -> angular cobble/gravel lines shallow area near bridge -> old duck pier extends from north bank near bridge							
Additional Notes Appended?		● No ○ Yes		number of pages _____			

SECTION IDENTIFIER: u/s	SECTION LOCATION: —	SECTION LENGTH (m): —	SCALE (cm / m): —
		PROJECT #: 477511	
		MAPPER: B. M. Wright	
		NAME OF WATERBODY: Welland River	
		CROSSING #: 3	
		STATION #: WR-01	
		DATE: DD-MMM-YY 12 08 - 2020	
LEGEND			
10d depth (cm) 6w width			
→ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar			
• Fine Substrate ### Gravel Substrate oOooO Cobble /Boulder *** Debris			
CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress			
Fe Iron Staining ///// Eroded Bank XXX Riprap / Other Stabilization			
○ Instream Log/Tree ▲▲▲ Dam/Weir/Obstruction Ⓡ Riparian Tree			
▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line ┌└ Culvert			
PROFILE:	Horz. Scale	Vert. Scale	

GENERAL INFORMATION										
PROJECT #:	477511	PROJECT DESCRIPTION:	Montrose Rd EA	DAY:	12	MONTH:	08	YEAR:	2020	
Is STREAM REALIGNMENT required for this section:										
<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown										
COLLECTORS:	B. MacVaugh, N. Wald		WEATHER CONDITIONS:	Sunny / Hot		TIME STARTED:	14:45		TIME FINISHED:	15:30
AIR TEMP:	27°C		WATER TEMP:	27°C		CONDUCTIVITY (µS/cm):				332
PHOTO NUMBERS AND DESCRIPTIONS:										
LOCATION										
NAME OF WATERBODY:	Welland River		DRAINAGE SYSTEM:	Welland River		CROSSING #:	3		STATION #:	WR-01
LOCATION OF CROSSING:										
Welland River Bridge crossing on Montrose Rd										
GPS COORDINATES:	177 652878 4767659		MTO CHAINAGE:							
TOWNSHIP:	Nagara Falls		MNR DISTRICT:							Geolph
LAND USE AND POLLUTION										
SURROUNDING LAND USE:					SOURCES OF POLLUTION:					
Road, Welland, commercial					Road runoff, construction d/s, Boat traffic					
EXISTING STRUCTURE TYPE										
Bridge	<input checked="" type="radio"/>	Box Culvert	<input type="radio"/>	Open Foot Culvert	<input type="radio"/>	CSP	<input type="radio"/>	N/A	<input type="radio"/>	
Other <input type="radio"/> Describe:								Size (w x h) m ²		
SECTION TYPE AND MORPHOLOGY										
SECTION IDENTIFIER:			SECTION LOCATION:							
DS			(include on habitat map)							
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:				
	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	No				
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):					
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other				
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	/				
Percentage of area	100%									
Mean depth wetted (m)	>1.5m									
Mean width wetted (m)										
Mean bankfull width (m)										
Mean bankfull depth (m)	>1.5m									
Substrate	Co, Gr, BO									
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D		
	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>							

BANK STABILITY								
	Stable	Slightly Unstable	Moderately Unstable	Unstable				
Left Upstream Bank	<input checked="" type="radio"/>	0	0	0				
Right Upstream Bank	<input checked="" type="radio"/>	0	0	0				
HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris		Organic debris	Vascular Macrophytes	None
				Instream	Overhanging		Instream	
		35%	35%	5%			10%	10%
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60 - 30%	30 - 1%		None		
	0	0	0	<input checked="" type="radio"/>		0		
VEGETATION TYPE (%):	Submergent <i>Coontail, Wild Celery, Fanwort, Nettle, -lensel pondweed</i>		Floating <i>Water lily, algae</i>		Emergent <i>Cattails, sedges</i>		None	
Predominant Species	50%		25%		25%			
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent			
	none							
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater		Other			
					Flow changes direction			
POTENTIAL ENHANCEMENT OPPORTUNITIES:								
COMMENTS:								
<ul style="list-style-type: none"> -D Large channel, Flow will change directions depending on if OPG is drawing water -D Active construction sixth downstream on the QEW Bridge -D Navigable channel, boat traffic -D Algae covering rocks -D Zebra mussels are present -D Shore cover limited due to channel width -D EV + FV Observed close to shore only 								
Additional Notes Appended? <input type="radio"/> No <input type="radio"/> Yes number of pages _____								

along shoreline

along shore

direction from time to time

-D large rocky shelf on the North bank & some old bridge piers

N bank D Flooded CT Marsh along North bank margin
S bank D Aspen sp. (large tooth?) Staghorn sumac, Dogwood

SECTION IDENTIFIER: d/s	SECTION LOCATION: —	SECTION LENGTH (m): —	SCALE (cm / m): —
<p style="text-align: center; font-size: 2em; font-weight: bold;">QEW Bridge</p> <p style="font-size: 1.5em;">Marsh</p> <p style="font-size: 1.5em;">Flow (sometimes it flips)</p> <p style="font-size: 1.5em;">Bridge</p> <p style="font-size: 1.5em;">Food Bridge Reefs</p> <p style="font-size: 1.5em;">Silt fence</p> <p style="font-size: 1.5em;">Silt fence</p>			PROJECT #: 477511
			MAPPER: N. Welch
			NAME OF WATERBODY: Welland River
			CROSSING #: 3
			STATION #: WR-01
			DATE: DD-MMM-YY 12-08-2020
LEGEND			
<p>10d depth (cm) Overhanging branches</p> <p>6w width</p> <p>→ Riffle</p> <p>⇨ Run/Glide</p> <p>○ Pool</p> <p>■ Island/Bar</p> <p>▨ Fine Substrate</p> <p>### Gravel Substrate</p> <p>oOooO Cobble / Boulder</p> <p>*** Debris</p> <p>CT Cattail</p> <p>SV/FV Submerg/Float Veg</p> <p>EV Emergent Vegetation</p> <p>W Watercress</p> <p>Fe Iron Staining</p> <p>///// Eroded Bank</p> <p>XXX Riprap / Other Stabilization</p> <p>○ Instream Log/Tree</p> <p>^^^ Dam/Weir/Obstruction</p> <p>⊗ Riparian Tree</p> <p>└▶ Seep/Spring</p> <p>----- Undercut Bank</p> <p>— Barrier to Fish Movement</p> <p>-S- Seasonal Barrier</p> <p>-x-x- Fence line</p> <p>┌└ Culvert</p>			
PROFILE:	Horz. Scale	Vert. Scale	
<p style="font-size: 1.5em;">□ Bridge piers</p>			

GENERAL INFORMATION									
PROJECT #:	472511	PROJECT DESCRIPTION:	Montrose Rd EA	DAY:	12	MONTH:	08	YEAR:	2020
COLLECTORS:	B MacQuigh, N. Welch			TIME STARTED:	14:45		TIME FINISHED:	15:30	
WEATHER CONDITIONS:	Sunny / worn			SURFACE CONDITIONS (if applicable):					
	Calm	Rippled	Wavy	Rough					
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
GENERAL LOCATION									
NAME OF WATERBODY:	Welland River			LOCATION OF STATION:	Montrose Rd Crossing				
TOWNSHIP:	Niagara Falls			MNR DISTRICT:	Genesee				
SAMPLING LOCATIONS AND WATER CHEMISTRY									
LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)			
Upstream									
Downstream									
Culvert / Hwy ROW			8.27	8.80	27	331.7			
WATER COLOUR:	Colourless <input type="radio"/>	Yellow/brown <input type="radio"/>	Blue/green <input checked="" type="radio"/>	Turbid <input type="radio"/>	Other <input type="radio"/>				
GEAR									
ELECTROFISHER:	<input type="radio"/>								
Length (m):	Settings:		Seconds:						
NETS and TRAPS:									
MINNOW TRAP:	<input type="radio"/>	#	DIP NET	<input checked="" type="radio"/>		TRAP NET	<input type="radio"/>		
SEINE:	<input type="radio"/>		GILL	<input type="radio"/>		OTHER	<input type="radio"/> specify		
HAULS (#):	Period Of Time (24 hour clock):								
	Set Time			Clear time					
LENGTH (m):	MESH SIZE:			DEPTH OF CAPTURE:					
	Smallest (cm):			Minimum (m):					
	Largest (cm):			Maximum (m):					
SAMPLE COLLECTION									
FISH KEPT?	# OF BAGS		PRESERVATIVE:						
<input type="radio"/> Yes <input type="radio"/> No			Formalin	Frozen	Alcohol	Other			
COMMENTS:									
• Dip net small area under bridge • Substantial fish community info already available for Welland River • In report use Parsons fish salvage data for Qew Salvages from 2019 + 2020									
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes number of pages _____									

GENERAL INFORMATION									
PROJECT #: 477511		PROJECT DESCRIPTION: Montrose Rd CA			DAY: 12	MONTH: 08	YEAR: 2020		
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown									
COLLECTORS: B. MacLaughlin		WEATHER CONDITIONS: Sunny/Hot			TIME STARTED: 12:45		TIME FINISHED: 14:15		
AIR TEMP: 27°C			WATER TEMP: 22.6°C			CONDUCTIVITY (µS/cm): 941			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY: Grassy Brook Creek			DRAINAGE SYSTEM: Wetland Runoff		CROSSING #: 4	STATION #: GBC-01			
LOCATION OF CROSSING: Montrose Rd Crossing, ~110m South of Grassy Brook Rd									
GPS COORDINATES: 177 652896 4767121					MTO CHAINAGE:				
TOWNSHIP: Niagara Falls					MNR DISTRICT: Geolph				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Forest, municipal Road					SOURCES OF POLLUTION: Food runoff				
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>		Box Culvert <input checked="" type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe: dual box						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: 4/3				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream/river <input checked="" type="radio"/>	Channelized <input type="radio"/>	Permanent <input checked="" type="radio"/>	Intermittent <input type="radio"/>	Ephemeral <input type="radio"/>	ASSOCIATED WETLAND: No			
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):				
SUB-SECTION(S)	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input checked="" type="radio"/>	Inside culvert <input type="radio"/>	Other			
Percentage of area				100					
Mean depth wetted (m)				0.53					
Mean width wetted (m)				4.1					
Mean bankfull width (m)				5.1					
Mean bankfull depth (m)				1.05					
Substrate				Si, cc Co, Gr					
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

BANK STABILITY								
		Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank		○	●	○	○			
Right Upstream Bank		●	○	○	○			
HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris		Organic debris	Vascular Macrophytes	None
	5	/	/	Instream 25	Overhanging 15	/	Instream 25 Overhanging 30	/
SHORE COVER (% stream shaded):		100 - 90 % ○	90 - 60 % ●	60 - 30 % ○		30 - 1 % ○	None ○	
VEGETATION TYPE (%):		Submergent 75		Floating /		Emergent 25		None /
Predominant Species		Milfoil		/		Grasses, Awt-Fruited Sedge Soft-stemmed Bulrush		/
MIGRATORY OBSTRUCTIONS:		None X		Seasonal —		Permanent —		
POTENTIAL CRITICAL HABITAT LIMITING:		Spawning Sunfish		Evidence of Groundwater —		Other —		
POTENTIAL ENHANCEMENT OPPORTUNITIES:								
<p>→ Replace culvert to open bottom and include substrates + low flow channel</p>								
COMMENTS:								
<p>→ deep, flat area → channel meanders through natural forest area → cobbles/gravel substrates concentrated @ culvert inlet, silt overlying clay throughout → overhanging shrubs along south bank, dense submergent vegetation ~ 15 m ups of inlet → riparian zone deciduous forest w/ grasses/forbs for ground cover deciduous shrubs w/ understory + large willows/manitoba maples for overhead cover/shade</p>								
Additional Notes Appended?		● No ○ Yes		number of pages _____				

SECTION IDENTIFIER: 415		SECTION LOCATION:		SECTION LENGTH (m):		SCALE (cm / m):	
						PROJECT #: 477511	
						MAPPER: B McLaughlin	
						NAME OF WATERBODY: Grassy Brook Creek	
						CROSSING #: 4	
						STATION #: GBC-01	
DATE: DD-MMM-YY 12-08-2000						LEGEND 10d depth (cm) 6w width ➔ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ■ Fine Substrate ### Gravel Substrate oOooO Cobble /Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining ///// Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ® Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert	
PROFILE:		Horz. Scale		Vert. Scale			

GENERAL INFORMATION									
PROJECT #: 477511		PROJECT DESCRIPTION: Montrose Rd EA			DAY: 12	MONTH: 08	YEAR: 2020		
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown									
COLLECTORS: B.M. Vaughn, N. Welch			WEATHER CONDITIONS: Sunny / Wind		TIME STARTED: 12:45		TIME FINISHED: 14:15		
AIR TEMP: 27°C			WATER TEMP: 22.6°C			CONDUCTIVITY (µS/cm): 941			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY: Grassy Brook Creek			DRAINAGE SYSTEM: Welland Rivr		CROSSING #: H	STATION #: GBC-01			
LOCATION OF CROSSING: Montrose Rd crossing, ~110m South of Grassy Brook Rd									
GPS COORDINATES: 17T 652896 4767121					MTO CHAINAGE: _____				
TOWNSHIP: Niagara Falls					MNR DISTRICT: Guelph				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: woodlot & road					SOURCES OF POLLUTION: road runoff				
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>		Box Culvert <input checked="" type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe: 2 box culverts attached						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: D/S				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input checked="" type="radio"/>	Intermittent <input type="radio"/>	Ephemeral <input type="radio"/>	ASSOCIATED WETLAND: N/A			
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):				
SUB-SECTION(S)	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input checked="" type="radio"/>	Inside culvert <input type="radio"/>	Other			
Percentage of area				100%		/			
Mean depth wetted (m)				0.6m					
Mean width wetted (m)				4.5m					
Mean bankfull width (m)				5.5m					
Mean bankfull depth (m)				0.9m					
Substrate				cl, Co/Bo Si					
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

BANK STABILITY							
		Stable	Slightly Unstable	Moderately Unstable	Unstable		
Left Upstream Bank		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Right Upstream Bank		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	25%	Instream 5% Overhanging —	/	Instream 55% Overhanging 5%	10%
SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None		
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species	50%		/		25%		25%
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent		
	none		/		/		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater		Other		
	/		/		/		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<p>-D Remove invasive plant sp.</p>							
COMMENTS:							
<p>-D Algae present -D slow flow -D SV Arrowweed, grasses, purple loosestrife, grape vine Goldenrod, Manitoba maple, Milkweed -D some slumping along banks, minor -D Channel by culvert -D shallower, si over day which then transitions to cobble -D more EV present</p>							
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes number of pages _____							

-D Channel further down stream -D channel deepens, substrate dominated by clay, more SV, less EV present.

SECTION IDENTIFIER: D/S		SECTION LOCATION:		SECTION LENGTH (m):		SCALE (cm / m):							
				PROJECT #: 477511		MAPPER: N.W							
				NAME OF WATERBODY: Grassy Brook Creek		CROSSING #: 4		STATION #: GBC-01					
				DATE: DD-MMM-YY 12-Aug-20		<p>LEGEND</p> <p>10d depth (cm) 6w width</p> <p>➔ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOooO Cobble / Boulder *** Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining ///// Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree AAA Dam/Weir/Obstruction ® Riparian Tree ▸ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert</p>							
				PROFILE:						Horz. Scale		Vert. Scale	
										v vegetation			

GENERAL INFORMATION										
PROJECT #:	477511	PROJECT DESCRIPTION:	Montrose Rd EA	DAY:	12	MONTH:	08	YEAR:	2020	
COLLECTORS:				TIME STARTED:	TIME FINISHED:					
WEATHER CONDITIONS:				SURFACE CONDITIONS (if applicable):						
Sunny/Hot, 10% cloud				Calm	Rippled	Wavy	Rough			
				0	0	0	0			
GENERAL LOCATION										
NAME OF WATERBODY:				LOCATION OF STATION:						
Grassy Brook Creek				Milton South of Grassy Brook Rd						
TOWNSHIP:				MNR DISTRICT:						
Napanee Falls				Guelph						
SAMPLING LOCATIONS AND WATER CHEMISTRY										
LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)				
Upstream	---	---	---	---	---	---				
Downstream	---	27	7.97	5.2	22.6	941				
Culvert / Hwy ROW	---	---	---	---	---	---				
WATER COLOUR:	Colourless 0	Yellow/brown 0	Blue/green 0	Turbid 0	Other 0					
GEAR										
ELECTROFISHER: <input checked="" type="radio"/> LR-24										
Length (m):		Settings: 80 Hz, 60v, 0.7A			Seconds: 1022					
NETS and TRAPS:										
MINNOW TRAP: <input type="radio"/> #		DIP NET <input checked="" type="radio"/>			TRAP NET <input type="radio"/>					
SEINE: <input type="radio"/>		GILL <input type="radio"/>			OTHER <input type="radio"/> specify					
HAULS (#):		Period Of Time (24 hour clock):								
		Set Time			Clear time					
LENGTH (m):		MESH SIZE:			DEPTH OF CAPTURE:					
		Smallest (cm):			Minimum (m):					
		Largest (cm):			Maximum (m):					
SAMPLE COLLECTION										
FISH KEPT?		# OF BAGS		PRESERVATIVE:						
<input type="radio"/> Yes <input checked="" type="radio"/> No		---		Formalin <input type="radio"/>		Frozen <input type="radio"/>		Alcohol <input type="radio"/>		Other <input type="radio"/>
COMMENTS:										
fished long reach d/s + short reach ups										
Additional Notes Appended? <input type="radio"/> No <input type="radio"/> Yes number of pages _____										

CAPTURE INFORMATION					
PROJECT NO.: 477511			STATION NO.: GBC-01		
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F = total fork or L = total length	AGE CLASS YOY / Adult
d/s	1	Central Mudminnow			
:	6	Green Sunfish			
:	2	Pumpkinseed			
:	1	Brown Bullhead			
<hr/>					
U/S	2	Central Mudminnow			
:	1	Bowfin			
:	4	Green Sunfish			
:	1	Bluegill			

Circle number if a sample was kept

PAGE 1 of 1 Number all pages

GENERAL INFORMATION									
PROJECT #: 477511		PROJECT DESCRIPTION: Montrose R/E			DAY: 12	MONTH: 08	YEAR: 2020		
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown									
COLLECTORS: B. McLaughlin, N. Welch		WEATHER CONDITIONS: Sunny / Hot			TIME STARTED: 11:33		TIME FINISHED: 12:15		
AIR TEMP: 25°C			WATER TEMP: _____			CONDUCTIVITY (µS/cm): _____			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY: unnamed tributary of Lyons Creek			DRAINAGE SYSTEM: Welland River		CROSSING #: 5	STATION #: LC-01			
LOCATION OF CROSSING: Montrose Rd Crossing, ~ 630 m North of Biggar Rd / Lyons Creek Rd									
GPS COORDINATES: 177 652906 4766681					MTO CHAINAGE: _____				
TOWNSHIP: Niagara Falls					MNR DISTRICT: Guelph				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: meadow, municipal Rd					SOURCES OF POLLUTION: roadside runoff				
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>		Box Culvert <input checked="" type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe: _____						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: 4/5				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input checked="" type="radio"/>	Channelized <input type="radio"/>	Permanent <input type="radio"/>	Intermittent <input type="radio"/>	Ephemeral <input checked="" type="radio"/>	ASSOCIATED WETLAND: No			
TOTAL SECTION LENGTH (m): 50				CURRENT VELOCITY (m/s): _____					
SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dry			
Percentage of area						100			
Mean depth wetted (m)						_____			
Mean width wetted (m)						_____			
Mean bankfull width (m)						_____			
Mean bankfull depth (m)						_____			
Substrate						Si, Mu, Co			
Bedrock Br	Boulder Bo	Cobble Co <input checked="" type="radio"/>	Gravel Gr	Sand Sa	Silt Si <input checked="" type="radio"/>	Clay Cl	Muck Mu <input checked="" type="radio"/>	Detritus D	

BANK STABILITY								
		Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank		●	○	○	○			
Right Upstream Bank		●	○	○	○			
HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris		Organic debris	Vascular Macrophytes	None
	/	/	10	Instream —	Overhanging 10		Instream	/
SHORE COVER (% stream shaded):		100 – 90 %	90 – 60%	60- 30%	30 – 1%	None		
		○	○	○	●	○		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None	
	/		/		100		/	
Predominant Species					grasses sedges cattails		/	
MIGRATORY OBSTRUCTIONS:	None —		Seasonal Low Water		Permanent —			
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning —		Evidence of Groundwater —		Other —			
POTENTIAL ENHANCEMENT OPPORTUNITIES:								
None								
COMMENTS:								
→ channel dry, has been for awhile → channel meanders through grassy meadows & some foils (goldenrod, Kettle small grove of dead ash in new bottom growth along north bank etc.) → Cobble from embankment/calvert stabilization in channel & calvert inlet → mainly grasses in channel & some sedges + cattails ~ 40m up → some ponded water in calvert cobble barriers @ either end								
Additional Notes Appended?		● No ○ Yes		number of pages _____				

SECTION IDENTIFIER: <i>4/5</i>	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
			PROJECT #: <i>477511</i>
			MAPPER: <i>B. McLaughlin</i>
			NAME OF WATERBODY: <i>unnamed tributary of Lyons Creek</i>
			CROSSING #: <i>5</i>
			STATION #: <i>LC-01</i>
			DATE: DD-MMM-YY <i>12-08-2020</i>
LEGEND			
<p>10d depth (cm) 6w width</p> <p>➔ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOooO Cobble /Boulder * * * Debris CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining // // // Eroded Bank XXX Riprap / Other Stabilization ○ Instream Log/Tree ^^^ Dam/Weir/Obstruction ® Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert</p>			
PROFILE:	Horz. Scale	Vert. Scale	

GENERAL INFORMATION									
PROJECT #: 477511		PROJECT DESCRIPTION: Montrose Rd EA			DAY: 12	MONTH: 08	YEAR: 2020		
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown									
COLLECTORS: B MacUagh, N. Welch		WEATHER CONDITIONS: Sunny, Hot			TIME STARTED: 11:33		TIME FINISHED: 12:15		
AIR TEMP: 25°C			WATER TEMP: _____			CONDUCTIVITY (µS/cm): _____			
PHOTO NUMBERS AND DESCRIPTIONS:									
LOCATION									
NAME OF WATERBODY: Unnamed tributary of Lyons Creek		DRAINAGE SYSTEM: Welland River			CROSSING #: 5	STATION #: LC-01			
LOCATION OF CROSSING: Montrose Rd Crossing, ~ 630m North of Biggar Rd/Lyons Creek Rd									
GPS COORDINATES: 17T 652906 4766681					MTO CHAINAGE: _____				
TOWNSHIP: Niagara Falls					MNR DISTRICT: Guelpk				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Farm land, road					SOURCES OF POLLUTION: Road runoff, runoff from farm land				
EXISTING STRUCTURE TYPE									
Bridge <input type="radio"/>		Box Culvert <input checked="" type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe:						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: d/s				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input type="radio"/>	Intermittent <input checked="" type="radio"/>	Ephemeral <input type="radio"/>	ASSOCIATED WETLAND: No			
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s):				
SUB-SECTION(S)	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Inside culvert <input type="radio"/>	Other Dry 100%			
Percentage of area							100%		
Mean depth wetted (m)									
Mean width wetted (m)									
Mean bankfull width (m)									
Mean bankfull depth (m)									
Substrate							Si		
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si <input checked="" type="radio"/>	Clay Cl	Muck Mu	Detritus D	

BANK STABILITY							
		Stable	Slightly Unstable	Moderately Unstable	Unstable		
Left Upstream Bank		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Right Upstream Bank		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
			10%	Instream Overhanging		Instream 90% Overhanging	
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None		
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species					Phrag, CT		
MIGRATORY OBSTRUCTIONS:	None			Seasonal Low Flow / cobble/boulders		Permanent	
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning			Evidence of Groundwater		Other	
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<p>→ Remove invasive phrag</p>							
COMMENTS:							
<p>→ phrag, CT, Goldenrod, grapevine (growing on trees), Queen Anne's Lace</p> <p>→ channel is rocky, cobble/boulders begin in channel and cent' with flow by transitioning to phrag ↳ water in culvert</p> <p>→ does the channel likely flows through 3 corrugated plastic pipes under local road</p>							
Additional Notes Appended? <input type="radio"/> No <input type="radio"/> Yes number of pages _____							

Crossing

SECTION IDENTIFIER: DS	SECTION LOCATION: ✓	SECTION LENGTH (m): —	SCALE (cm / m): —
			PROJECT #: 477511
			MAPPER: N.W
			NAME OF WATERBODY: Unnamed tributary of Lynn's Creek
			CROSSING #: LC-01
			STATION #: —
			DATE: DD-MMM-YY 12-Aug-20
LEGEND			
<p>10d depth (cm) 6w width</p> <p>➔ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar</p> <p>••• Fine Substrate ### Gravel Substrate</p> <p>oOoO Cobble / Boulder *** Debris</p> <p>CT Cattail SV/FV Submerg/Float Veg</p> <p>EV Emergent Vegetation W Watercress</p> <p>Fe Iron Staining // // // Eroded Bank</p> <p>XXX Riprap / Other Stabilization</p> <p>○ Instream Log/Tree ^^^ Dam/Weir/Obstruction</p> <p>⊗ Riparian Tree</p> <p>└▶ Seep/Spring - - - Undercut Bank</p> <p>— Barrier to Fish Movement -S- Seasonal Barrier</p> <p>-x-x- Fence line ┌ └ Culvert</p>			
PROFILE:	Horz. Scale	Vert. Scale	

Appendix F

Significant Wildlife Habitat Screening

Appendix F – Significant Wildlife Habitat Assessment

Definitions

Ecosite – Vegetation community type determined using the Ecological Land Classification (ELC) System for Southern Ontario (Lee et al., 1998)

SWH – Significant Wildlife Habitat

Candidate SWH – Criteria which an area must satisfy in order to potentially qualify as SWH. For areas identified as potential SWH, further studies should be conducted to confirm whether it is SWH

Presence of SWH in the Project – Evaluation of whether the SWH type is present within the study area. ‘Absent’ indicates that no part of the study area satisfies the criteria for that SWH; ‘Candidate’ indicates that a portion of the study area satisfies the criteria for Candidate SWH; ‘Confirmed’ indicates that a portion of the study area satisfies the criteria for that SWH type.

Table 1 – Significant Wildlife Habitat Assessment

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
Seasonal Concentration Areas of Animals				
Waterfowl Stopover and Staging Areas (Terrestrial)	American Black Duck, Northern Pintail, Gadwall, Blue-winged Teal, Green-winged Teal, American Wigeon, Northern Shoveler, Tundra Swan	<u>Cultural Meadow</u> – CUM1 <u>Cultural Thicket</u> – CUT1 or THD Plus, evidence of annual spring flooding from meltwater or run-off within these Ecosites.	Candidate SWH Criteria <ul style="list-style-type: none"> Fields with sheet water during Spring (mid-March to May). Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have Spring sheet water. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. Any mixed species aggregations of 100 or more individuals required. The area of the flooded field ecosite habitat plus a 100-300 m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat. Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). 	ABSENT – Suitable habit is not considered present in the study area.
Waterfowl Stopover and Staging Areas (Aquatic)	Canada Goose, Cackling Goose, Snow Goose, American Black Duck, Northern Pintail, Northern Shoveler, American Wigeon, Gadwall, Green-winged Teal, Blue-winged Teal, Hooded Merganser, Common Merganser, Lesser Scaup Greater Scaup, Long-tailed Duck, Surf Scoter, White-winged Scoter, Black Scoter, Ring-necked Duck, Common Goldeneye, Bufflehead, Redhead Ruddy Duck, Red-breasted Merganser, Brant, Canvasback, Ruddy Duck	<u>Shallow Marsh</u> – MAS1, MAS2, MAS3 <u>Shallow Water</u> – SAS1, SAM1, SAF1 <u>Swamp</u> – SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7	Candidate SWH Criteria <ul style="list-style-type: none"> Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Aggregations of 100 or more individuals of listed species for 7 days, results in >700 waterfowl use days. Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. The combined area of the ELC ecosites and a 100-m radius area is the SWH. Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). 	CANDIDATE – The Welland River has the potential to function as a waterfowl stopover and staging area for aquatic habitat. Waterfowl staging areas were noted in the wetland evaluation report for the Welland River East PSW.
Shorebird Migratory Stopover Area	Greater Yellowlegs, Lesser Yellowlegs, Marbled Godwit, Hudsonian Godwit, Black-bellied Plover, American Golden- Plover, Semipalmated Plover, Solitary Sandpiper, Spotted Sandpiper, Pectoral Sandpiper, White-rumped Sandpiper, Baird’s Sandpiper, Least Sandpiper, Purple Sandpiper, Stilt Sandpiper, Short-billed Dowitcher, Red-necked Phalarope, Whimbrel, Ruddy, Turnstone, Sanderling, Dunlin	<u>Beach/Bar</u> – BB01, BB02, BBS1, BBS2, BBT1, BBT2 <u>Sand Dune</u> – SD01, SDS2, SDT1 <u>Meadow Marsh</u> – MAM1, MAM2, MAM3, MAM4, MAM5	Candidate SWH Criteria <ul style="list-style-type: none"> Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Stormwater retention ponds and sewage lagoons are not considered SWH. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of 3 or more of listed species and >1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). Whimbrel stop briefly (<24 hrs.) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. The area of significant shorebird habitat includes the mapped ELC ecosites plus a 100-m radius area. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	CANDIDATE – The Welland River has the potential to support this habitat type, although there is likely limited opportunities within the portion that extends within the study area.
Raptor Wintering Area	Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, Snowy Owl <u>Special Concern:</u> Short-eared Owl, Bald Eagle	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; <u>Forest</u> – FOD, FOM, FOC <u>Upland (Cultural)</u> – CUM, CUT, THD, CUS, CUW. <u>Bald Eagle:</u> Forest/Swamp series on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area). <u>Forest</u> – FOD, FOM, FOC <u>Swamp</u> – SWD, SWM or SWC	Candidate SWH Criteria <ul style="list-style-type: none"> The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be >20 ha with a combination of forest and upland Least disturbed sites, idle/fallow or lightly grazed field/meadow with adjacent woodlands. Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle Sites have open water and large trees and snags available for roosting. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> One or more Short-eared Owls; One or more Bald Eagles or; at least 10 individuals and two spp. of the listed hawk/owl spp. To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. The habitat for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	ABSENT – The combination of vegetation communities within the study area do not meet the size criteria for hawks or owls. The Welland River may support Bald Eagle habitat, although this would be present outside of the study area.

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
Bat Hibernacula	Big Brown Bat, Tri-coloured Bat	<p><u>Crevice and Cave</u> – CCR1, CCR2, CCA1, CCA2</p> <p><u>Note:</u> buildings are not considered to be SWH.</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> Hibernacula may be found in abandoned caves, horizontal mine shafts (adits), abandoned underground foundations and areas of limestone bedrock with solution channels known as Karsts. Active mine sites should not be considered as SWH. The locations and site characteristics of bat hibernacula are relatively poorly known. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> All sites with confirmed hibernating bats are SWH. The area includes 200-m radius around the entrance of the hibernaculum for most developments and 1000-m for wind farms. Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats”. 	<p>ABSENT – No caves, mine shafts, underground foundations, or other suitable structures were observed in the study area.</p>
Bat Maternity Colonies	Big Brown Bat, Silver-haired Bat	<p>Maternity colonies considered SWH are found in forested Ecosites.</p> <p>All ELC ecosites in ELC community Series: <u>Forest</u> – FOD, FOM <u>Swamp</u> – SWD, SWM</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario. Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25 cm dbh) wildlife trees. Female Bats prefer wildlife trees (snags) in early stages of decay class 1 -3 or classes 1 or 2. Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees. Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> Maternity colonies with confirmed use by: <ul style="list-style-type: none"> >10 Big Brown Bats >5 Adult female Silver-haired Bats The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies. Evaluation methods for maternity colonies should be conducted following methods outlined in the “Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats”. 	<p>CANDIDATE – The woodland and swamp communities in the study area have the potential to support this habitat type. A snag tree survey was completed within the ROW from Grassy Brook Road and along Biggar Road / Lyons Creek Road which identified several potential roosting trees. Incidental recordings of bats were detected in the study area in June 2020 using a handheld Echo Meter 2 Pro for iOS. Eastern Red Bat and Silver-haired Bat were recorded in the woodland east of the CPR. Hoary Bat, Big Brown Bat and Eastern Red Bat were recorded in the Lyons Creek North PSW and Lyons Creek PSW. Silver-haired Bat was also recorded in the Lyons Creek PSW. Several snag trees were also recorded in these woodlands and wetlands.</p>
Turtle Wintering Areas	<p>Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle</p>	<p>Snapping and Midland Painted Turtles <u>Swamp</u> – SW <u>Marsh</u> – MA <u>Open Water</u> – OA <u>Shallow Water</u> – SA <u>Open Fen</u> – FEO <u>Open Bog</u> – BOO Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. Over-wintering sites are permanent waterbodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. Man made storage ponds such as sewage lagoons or storm water ponds should not be considered SWH. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> Presence of 5 or more over-wintering Midland Painted Turtles is significant. One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sep. – Oct) or spring (Mar. - April). Congregation of turtles is more common where wintering areas are limited and therefore significant. 	<p>CANDIDATE – The Welland River has the potential to support overwintering habitat for turtles.</p>

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
Reptile Hibernaculum	Eastern Gartersnake, Northern Watersnake, Northern Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, Northern Ring-necked Snake <u>Special Concern:</u> Milksnake, Eastern Ribbonsnake	Habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.	Candidate SWH Criteria <ul style="list-style-type: none"> For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Confirmed SWH Criteria (Field Studies confirm): Studies confirming: <ul style="list-style-type: none"> Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. Congregations of a minimum of five individuals of a snake sp. or; individuals of two or more snake spp. near potential hibernacula (e.g. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). Note: If there are Special Concern species present then the site is SWH. Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. As such, the feature in which the hibernacula is located plus a 30-m radius buffer is the SWH. Presence of any active hibernaculum for skink is significant. The ELC Ecosite polygon containing the skink hibernacula is the SWH. 	CANDIDATE – Overwintering habitat for snakes may be present in all vegetation communities throughout the study area. This habitat type is difficult to confirm, even with targeted surveys and will therefore be assumed present with mitigation measures provided should hibernaculum be discovered during construction.
Colonially – Nesting Bird Breeding Habitat (Bank and Cliff)	Cliff Swallow, Northern Rough – winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies).	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: <u>Cultural Meadow</u> – CUM1 <u>Cultural Thicket</u> – CUT1, THD <u>Cultural Savannah</u> – CUS1 <u>Bluff</u> – BLO1, BLS1, BLT1 <u>Cliff</u> – CLO1, CLS1, CLT1	Candidate SWH Criteria <ul style="list-style-type: none"> Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, and soil or aggregate stockpiles. Does not include a licensed/permitted Mineral Aggregate Operation. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of 1 or more nesting sites with 8 or more cliff swallow pairs or 50 bank swallow pairs and rough-winged swallow pairs during the breeding season. A colony identified as SWH will include a 50m radius habitat area from the peripheral nests. Field surveys to observe and count swallow nests are to be completed during the breeding season (May-July). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	ABSENT – Suitable habitat for colonially nesting species was not observed during the field studies.
Colonially – Nesting Bird Breeding Habitat (Trees/Shrubs)	Great Blue Heron, Black-crowned Night-Heron, Great Egret, Green Heron	<u>Swamp</u> – SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7 <u>Fen</u> – FET1	Candidate SWH Criteria <ul style="list-style-type: none"> Nests in live or dead standing trees in wetlands, lakes, islands and peninsulas. Shrubs and occasionally emergent vegetation may also be used. Most nests in trees are 11 to 15 m from ground, near the top of the tree. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of 5 or more active nests of Great Blue Heron. The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH. Confirmation of active heronries must be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. 	ABSENT – No heronries were observed in the study area during field investigations. A Great Egret was observed foraging along the Welland River, although nesting habitat was not identified.
Colonially – Nesting Bird Breeding Habitat (Ground)	Herring Gull, Great Black-backed Gull, Little Gull, Ring-billed Gull, Common Tern, Caspian Tern, Brewer’s Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river. Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer’s Blackbird). <u>Meadow Marsh</u> – MAM1-6 <u>Shallow Marsh</u> – MAS1-3 <u>Cultural Meadow</u> – CUM <u>Cultural Thicket</u> – CUT, THD <u>Cultural Savannah</u> – CUS	Candidate SWH Criteria <ul style="list-style-type: none"> Nesting colonies of gulls and terns are on islands or peninsulas (natural or artificial) associated with open water or in marshy areas, lakes or large rivers (two-lined on a 1: 50,000 NTS map). Brewers Blackbird colonies are found loosely on the ground or in low bushes in close proximity to streams and irrigation ditches within farmlands. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. Presence of 5 or more pairs for Brewer’s Blackbird. Any active nesting colony of one or more Little Gull and Great Black-backed Gull is significant. The edge of the colony and a minimum 150 m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0 ha with a colony is the SWH. Studies would be done during May/June when actively nesting. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	ABSENT – Suitable habitat for colonially nesting ground species was not identified in the study area.

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
Migratory Butterfly Stopover Areas	Painted Lady, Red Admiral <u>Special Concern:</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: Field and Forest <u>Cultural Meadow</u> – CUM <u>Cultural Thicket</u> – CUT, THD <u>Cultural Savannah</u> – CUS Forest: FOC, FOD, FOM <u>Cultural Plantation</u> – CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	Candidate SWH Criteria <ul style="list-style-type: none"> A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario. The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south. The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. MUD of >5000 or >3000 with the presence of Painted Ladies or White Admiral's is to be considered significant. 	ABSENT – The study area is not located within 5 km of Lake Erie and is therefore this habitat type is not present.
Landbird Migratory Stopover Areas	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors).	All Ecosites associated with these ELC Community Series; Forest – FOC, FOM, FOD Swamp – SWC, SWM, SWD	Candidate SWH Criteria <ul style="list-style-type: none"> Woodlots need to be >5 ha in size and within 5 km of Lake Erie and Lake Ontario. If woodlands are rare in an area of shoreline, woodland fragments 2-5 ha can be considered for this habitat. If multiple are located along the shoreline those woodlands <2km from Lake Ontario are more significant. Sites have a variety of habitats; forest, grassland and wetland complexes. The largest sites are more significant. Woodlots and forest fragments are important habitats to migrating birds, these features located along the bank and located within 5km of Lake Erie and Ontario are Candidate SWH. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects. 	ABSENT – The study area is not located within 5 km of Lake Erie and is therefore this habitat type is not present.
Deer Winter Congregation Areas	White-tailed Deer	All Forested Ecosites with these ELC Community Series; Forest – FOC, FOM, FOD Swamp – SWC, SWM, SWD Conifer plantations much smaller than 50 ha may also be used.	Candidate SWH Criteria <ul style="list-style-type: none"> Woodlots need to be >100 ha in size. Or if woodlots are rare in a planning area woodlots > 50 ha. Deer movement during winter in the southern areas of Eco-region 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. Large woodlots >100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha Woodlots with high densities of deer due to artificial feeding are not significant. Confirmed SWH Criteria <ul style="list-style-type: none"> Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. Studies should be completed during winter (Jan/Feb) when >20 cm of snow is on the ground using aerial survey techniques, ground or road surveys or a pellet count deer density survey. 	CONFIRMED – The NDMNRF identified deer wintering areas (stratum 2) within the Warren Creek PSW, Welland River East PSW, Lyons Creek North PSW and Lyons Creek PSW. The Project limits only extend within this habitat type in the Lyons Creek North and Lyons Creek PSWs, along Biggar Road and Lyons Creek Road, respectively.
Rare Vegetation Communities				
Cliffs and Talus Slopes	N/A	Any ELC Ecosite within Community Series: Talus – TAO, TAS, TAT Cliff – CLO, CLS, CLT	Candidate SWH Criteria <ul style="list-style-type: none"> A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. <ul style="list-style-type: none"> Most cliff and talus slopes occur along the Niagara Escarpment. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Confirm any ELC Vegetation Type for Cliffs or Talus Slopes. 	ABSENT – None of the listed ecosites are present in the study area.
Sand Barren	N/A	<u>Sand Barren</u> – SB01, SBS1, SBT1	Candidate SWH Criteria <ul style="list-style-type: none"> Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%. Confirmed SWH Criteria (Field Studies confirm):	ABSENT – None of the listed ecosites are present in the study area.

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
			<ul style="list-style-type: none"> • A sand barren area greater than > 0.5 ha in size. • Sand Barrens containing any characteristic plant species should be considered significant. • ELC Ecosite Area for the sand barren is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). 	
Alvar	<ul style="list-style-type: none"> • <i>Carex crawei</i> • <i>Panicum philadelphicum</i> • <i>Eleocharis compressa</i> • <i>Scutellaria parvula</i> • <i>Trichostema brachiatum</i> 	<p><u>Alvar</u> – ALO1, ALS1, ALT1 <u>Coniferous Forest</u> – FOC1, FOC2 <u>Cultural Meadow</u> – CUM2 <u>Cultural Savannah</u> – CUS2 <u>Cultural Thicket</u> – CUT2-1 <u>Cultural Woodland</u> – CUW2</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> • An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars may be complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> • An Alvar site > 0.5 ha in size. • Field studies identify one or more of the 6E Plant Indicator species • Site must not be dominated by exotic or introduced species (<50%). The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses. 	ABSENT – None of the listed ecosites are present in the study area.
Old Growth Forest	N/A	<p><u>Forest</u> – FOD, FOC, FOM <u>Swamp</u> – SWD, SWC, SWM</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> • Old Growth forests are characterized by exhibiting the greatest number of old-growth characteristics, such as mature forest with large trees that has been undisturbed. Heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> • Stands 30 ha or greater in size or with at least 10 ha interior habitat assuming 100-m buffer at edge of forest. • Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat. • The stand will have experienced no recognizable forestry activities. • The area of Forest Ecosites combined to make up the stand is the SWH. 	ABSENT – Trees older than 140 years were not identified in the study area.
Savannah	N/A	<p><u>Tallgrass Savannah</u> – TPS1, TPS2 <u>Tallgrass Woodland</u> – TPW1, TPW2 <u>Cultural Savannah</u> – CUS2</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> • A Savannah is related to tallgrass prairie, but includes trees, which vary from 25 – 60% canopy cover. The open areas between the trees are dominated by prairie species, while forest species are found beneath the tree canopy. • In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> • No minimum size to site though remnant sites such as railway right of ways are not considered to be SWH. • Site must be restored or a natural site. • Field studies confirm one or more of the Savannah indicator species listed in SWHTG Appendix N should be present. • Note: Savannah plant spp. list from Ecoregion 7E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species. 	ABSENT – None of the listed ecosites are present in the study area.
Tallgrass Prairie	N/A	<p><u>Open Tallgrass Prairie</u> – TPO1, TPO2</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> • Tallgrass Prairie is an open vegetation with less than <25% tree cover, and dominated by prairie species, including grasses. • In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> • No minimum size to site. • Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. • Field studies confirm one or more of the Tallgrass Prairie Indicator Species listed (used Eco-Region 7E in Appendix N) is a SWH. • Area of the ELC Ecosite is the SWH. • Site must not be dominated (e.g. <50%) by exotic or introduced species. 	ABSENT – None of the listed ecosites are present in the study area.

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
Other Rare Vegetation Communities	N/A	<p>S1 – Extremely rare – usually 5 or fewer occurrences in the province, or very few remaining hectares.</p> <p>S2 – Very rare – usually between 5 and 20 occurrences in the province, or few remaining hectares.</p> <p>S3 – Rare to uncommon – usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining.</p>	<ul style="list-style-type: none"> • ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M. • The OMNRF/NHIC will have up to date listing for rare vegetation communities. • Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of the SWHTG. • Area of the ELC vegetation type polygon is the SWH. 	<p>CONFIRMED – The Pin Oak Mineral Deciduous Swamp Type (SWD1-3) is considered provincially rare (S2S3) and globally rare (G2). This community type is associated with the Lyons Creek North PSW along Biggar Road.</p>
Specialized Habitat for Wildlife				
Waterfowl Nesting Area	American Black Duck, Northern Pintail Northern Shoveler Gadwall, Blue-winged Teal, Green-winged Teal Wood Duck, Hooded Merganser, Mallard	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH.</p> <p>Shallow Marsh – MAS1, MAS2, MAS3</p> <p>Shallow Water – SAS1, SAM1, SAF1</p> <p>Meadow Marsh – MAM1, MAM2, MAM3, MAM4, MAM5, MAM6</p> <p>Swamp – SWT1, SWT2, SWD1, SWD2, SWD3, SWD4</p> <p>Note: includes adjacency to Provincially Significant Wetlands.</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> • A waterfowl nesting area extends 120 m from a wetland (>0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks, and Hooded Mergansers utilize large diameter trees (>40 cm) in woodlands for cavity nest sites. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. 	<p>CANDIDATE – All wetland communities >0.5 ha within the study area have the potential to support waterfowl nesting.</p>
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Osprey <u>Special Concern Species</u> Bald Eagle	<p>Forest – FOD, FOM, FOC</p> <p>Swamp – SWD, SWM, SWC (directly adjacent to riparian areas – rivers, lakes, ponds and wetlands).</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> • Nests are associated with lakes, ponds, rivers or wetlands along treed shorelines, islands, or on structures over water. • Osprey nests are usually at the top of a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. • Nests located on man-made objects such as telephone or hydro poles will not normally be considered as SWH, however the MNR District retains discretion regarding significance of constructed nesting platforms. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> • One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300-m radius around the nest or the contiguous woodland stand is the SWH, maintaining large undisturbed shorelines with large trees within this area is important. • For Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat 400-800 m is dependant on the site lines from the nest to the development and inclusion of perching and foraging habitat. • To be significant the site must be used annually. When found inactive the site must be known to be inactive for >= 3 years or suspected of not being used for > 5 years before being considered not significant. • Observational studies to determine nest site use. Perching sites and foraging areas need to be done from early March to mid August. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines or Wind Power Projects”. 	<p>ABSENT – There were no Osprey or Bald Eagle nests observed within the study.</p>
Woodland Raptor Nesting Habitat	Northern Goshawk Cooper’s Hawk Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl, Broad-winged Hawk	<p>May be found in all forested ELC Ecosites. May also be found in:</p> <p>Swamp – SWD, SWC (directly adjacent to riparian areas – rivers, lakes, ponds and wetlands) SWM</p> <p>Coniferous Plantations – CUP3</p>	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> • All natural or conifer plantation woodland/forest stands >30 ha with 4 ha of interior habitat. • Stick nests found in a variety of intermediate-aged to mature. conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers Hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest may be in close proximity to old nest. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> • Presence of 1 or more occupied nests from species list is considered significant. • Red-shouldered Hawk and Northern Goshawk – A 400-m radius around the nest or 28 ha of suitable habitat is the SWH. • Barred Owl – A 200-m radius around the nest is the SWH. 	<p>ABSENT – The woodland and wetland communities in the study area do not meet the size criteria for this habitat type to be considered. There were no nests observed during the field investigations, although it is likely that these species will forage in the area.</p>

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
			<ul style="list-style-type: none"> Broad-winged Hawk, Coopers Hawk, Great Horned Owl, Red-tailed Hawk – A 100-m radius around the nest is the SWH. Sharp-Shinned Hawk – A 50-m radius around the nest is the SWH. Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/ nesting) raptors and facilitate the discovery of nests by narrowing down the search area. 	
Turtle Nesting Areas	Midland Painted Turtle <u>Special Concern Species:</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ecosites: <u>Shallow Marsh</u> – MAS1, MAS2, MAS3 <u>Shallow Water</u> – SAS1, SAM1, SAF1 <u>Open Bog</u> – B001 <u>Open Fen</u> – FE01	Candidate SWH Criteria <ul style="list-style-type: none"> Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of 5 or more nesting Midland Painted Turtles is a SWH. The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH. Travel routes from wetland to nesting area are to be considered within the SWH. As part of the 30-100 m habitat. One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is the recommended method. 	CANDIDATE – Turtle nesting habitat has the potential to occur along the Welland River, Warren Creek, Grassy Brook Creek, and Lyons Creek where sand or gravel substrates are present. There were no turtle nests observed during the field investigations, although targeted surveys were not completed.
Seeps and Springs	Wild Turkey, Ruffed Grouse, Spruce Grouse, White-tailed Deer, Salamander spp.	Seeps/Springs are areas where groundwater comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Candidate SWH Criteria <ul style="list-style-type: none"> Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of a site with 2 or more seeps/springs should be considered SWH. The area of ELC forest ecosite containing the seeps/springs is the SWH. The protection of the function of the feature considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. 	ABSENT – There were no seeps or springs observed during the field investigations. There are no headwater streams or rivers within the study.
Amphibian Breeding Habitat (Woodland)	Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog	<u>Forest</u> – FOC, FOM FOD <u>Swamp</u> – SWC SWM SWD Breeding pools within the woodland or the shortest distance from the forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	Candidate SWH Criteria <ul style="list-style-type: none"> Presence of a wetland, lake or pond of area >500 m2 (about 25-m diameter) within or adjacent (within 120 m) to a woodland (no minimum size). The wetland, lake or pond and surrounding forest, would be the Candidate SWH. Some small wetlands may not be mapped and may be important breeding pools for amphibians. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of breeding population of 1 or more of the listed newt/salamander or 2 or more with listed frog species with at least 20 individuals (adults, juveniles, eggs/larval masses) or 2 or more of the listed frog species with call codes of 3. A combination of observational study and call count surveys will be required during the Spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetland. The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. 	CONFIRMED – Amphibian call surveys were completed within the study area and identified SWH in the woodland associated with the Baden-Powel Grassy Brook Park located south of the CPR, north side of Montrose Road (survey station A-7). CANDIDATE – Other notable woodland and swamp communities with at least two species documented (unless a station was only surveyed once) but that didn't meet the criteria for significance (e.g., two species with at least 20 individuals or at call codes of 3) included survey stations A-1, A-9, A-10, and A-13 to A-17 (only one survey at these stations). These areas are considered in terms of generalized wildlife habitat.
Amphibian Breeding Habitat (Wetlands)	Eastern Newt, American Toad Spotted, Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog	Typically, these wetland ecosites will be isolated (>120 m) from woodland ecosites, however, larger wetlands containing predominantly aquatic species (e.g., Bull Frog) may be adjacent to woodlands. <u>Swamp</u> – SW <u>Marsh</u> – MA <u>Fen</u> – FE <u>Bog</u> – BO <u>Open Water</u> – OA	Candidate SWH Criteria <ul style="list-style-type: none"> Wetlands > 500 m2 (about 25-m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of breeding population of 1 or more of the listed salamander species or 3 or more of the listed frog or toad species with at least 20 breeding individuals (adults, juveniles, eggs/larval masses) or Wetland with confirmed breeding Bullfrogs is significant. The ELC ecosite area and the shoreline are the SWH. A combination of observational study and call count surveys will be required during the Spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. 	ABSENT – Amphibian call surveys were completed and none of the wetlands met the criteria for SWH.

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
		<u>Shallow Water</u> – SA	<ul style="list-style-type: none"> If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Amphibian Movement Corridors are to be considered (see Table 3.10, Animal Movement Corridors). 	
Woodland Area- Sensitive Bird Breeding Habitat	Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler	All Ecosites associated with these ELC Community Series: <u>Forest</u> – FOC, FOM FOD <u>Swamp</u> – SWC SWM SWD	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs. old) forest stands or woodlots >30 ha. Interior forest habitat is at least 100 m from forest edge habitat. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	ABSENT – The woodland and wetland communities in the study area do not meet the size criteria for interior habitat to be present.
Habitat for Species of Conservation Concern (SoCC)				
Marsh Bird Breeding Habitat	American Bittern, Virginia Rail Sora, Common Moorhen, American Coot Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Green Heron, Trumpeter Swan <u>Special Concern:</u> Black Tern Yellow Rail	<u>Marsh</u> – MAM1-6 <u>Shallow Water</u> – SAS1, SAM1, SAF1 <u>Fen</u> – FEO1 <u>Bog</u> – BOO1 For Green Heron: All SW, MA and CUM1 sites.	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> Nesting occurs in wetlands. All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species. Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns, Green Heron or Yellow Rail is SWH. Area of the ELC ecosite is the SWH. Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	CANDIDATE – The meadow marsh communities within the study area have the potential to support marsh bird nesting habitat. NDMNRF noted Green Heron in the Welland River East PSW and Lyons Creek North PSW.
Open Country Bird Breeding Habitat	Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, Savannah Sparrow <u>Special Concern:</u> Short-eared Owl	<u>Cultural Meadow</u> – CUM1, CUM2	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> Large grasslands areas (includes natural and cultural fields and meadows) >30 ha. Field/meadow not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The indicator bird species are area sensitive requiring larger field/meadow areas than the common Field/meadow species. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> Presence of nesting or breeding of 2 or more of the listed species. A field with 1 or more breeding Short-eared Owls is to be considered SWH. The area of SWH is the contiguous ELC ecosite field areas. Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	ABSENT – None of the meadow communities in the study area meet the size criteria for this habitat type to be considered.
Shrub/Early Successional Bird Breeding Habitat	Indicator Spp: Brown Thrasher, Clay-coloured Sparrow, Common Spp. Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher <u>Special Concern:</u> Yellow-breasted Chat Golden-winged Warbler	<u>Cultural Thicket</u> – CUT1, CUT2, THD <u>Cultural Savannah</u> – CUS1, CUS2 <u>Cultural Woodland</u> – CUW1, CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	<p>Candidate SWH Criteria</p> <ul style="list-style-type: none"> Large field areas succeeding to shrub and thicket habitats >10 ha in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years). Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <p>Confirmed SWH Criteria (Field Studies confirm):</p> <ul style="list-style-type: none"> Presence of nesting or breeding of 1 indicator species and at least 2 of the common species. A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as SWH. The area of the SWH is the contiguous ELC ecosite area. Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. 	ABSENT – None of the woodland or thicket communities in the study area meet the size criteria for this habitat type to be considered.

HABITAT TYPE	INDICATOR SPECIES	ELC ECOSITE CODES	HABITAT CRITERIA	ASSESSMENT DETAILS
Terrestrial Crayfish	Chimney or Digger Crayfish; (<i>Fallicambarus fodiens</i>) Devil Crayfish or Meadow Crayfish; (<i>Cambarus diogenes</i>)	<u>Meadow Marsh</u> – MAM1-6 <u>Shallow Marsh</u> – MAS1-3 <u>Swamp</u> – SWD, SWT, SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish.	Candidate SWH Criteria <ul style="list-style-type: none"> Wet Meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. Constructs burrows in marsh, mudflats, meadow, the ground can't be too moist. Can often be found far from water. Both species are semi-terrestrial burrower, which spends most of its life within burrows consisting of a network of burrows, usually the soil is not too moist so the tunnel is well formed. Confirmed SWH Criteria (Field Studies confirm): <ul style="list-style-type: none"> Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites. The area of the ELC polygon is the SWH. Surveys should be done in adult breeding season (April to late June) and in late summer-early August in nearby temporary or permanent water for juveniles. 	CANDIDATE – The marsh and swamp communities in the study area have the potential to provide habitat for terrestrial crayfish. One terrestrial crayfish burrow of an unknown species was incidentally observed along Warren Creek. To be considered SWH, only one individual or burrow of a listed species is required.
Special Concern and Rare Wildlife Species All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	All Special Concern and Provincially Rare (S1, S2, S3, SH) plant and animal species. Lists of these species are tracked by the NHIC	All plant and animal element occurrences (EOs) within a 1 km or 10 km grid. Older EOs were recorded prior to GPS being available, therefore location information may lack accuracy.	CRITERIA <ul style="list-style-type: none"> When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites 	CONFIRMED - SoCC were documented during the field investigations, none of which are provincially or locally rare except for Monarch (provincially rare). There are two globally rare bat species and all birds are conservation priority species which are recognized as declining in the Bird Conservation Strategy for Bird Conservation Region (BCR) 13 in Ontario Region: Lower Great Lakes/St. Lawrence Plain (Environment Canada 2014). Only edge habitat would be impacted by the Project, although several potential roost trees for bats may be removed which are assessed under bat maternity colonies. <ul style="list-style-type: none"> Bats (Eastern Red Bat and Hoary Bat; assessed under bat maternity colonies) Monarch (observed throughout the study area) Birds (American Woodcock, Eastern Kingbird, Field Sparrow, Killdeer, Northern Flicker, Savannah Sparrow, Spotted Sandpiper, and Vesper Sparrow).
Animal Movement Corridors				
Amphibian Movement Corridors	Eastern Newt, American Toad, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Candidate SWH Criteria <ul style="list-style-type: none"> Movement corridors between breeding habitat and summer habitat. Movement corridors must be determined when Amphibian Breeding Habitat (Wetland) is confirmed as SWH. Confirmed SWH Criteria <ul style="list-style-type: none"> Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. Corridors should consist of native vegetation, roadless area, no gaps such as fields, waterways or bodies, and undeveloped areas are most significant. Corridors should be at least 200 m wide with gaps <20 m and if following riparian area with at least 15 m of vegetation on both sides of waterway. Shorter corridors are more significant than longer corridors; however, amphibians must be able to get to and from their summer and breeding habitat. Corridors should have several layers of vegetation and should be unbroken by roads, waterways or bodies and undeveloped areas are most significant. 	CANDIDATE – The natural areas and watercourses surrounding areas identified as amphibian breeding habitat (woodland) are considered as amphibian movement corridors.

Appendix G

Species at Risk Screening

Species		SAR Status		Source	Habitat	Habitat Assessment	Impact Potential
Common Name	Scientific Name	National (SARA)	Provincial (ESA, 2007)				
AMPHIBIANS							
Allegheny Mountain Dusky Salamander	<i>Desmognathus ochrophaeus</i>	END, Schedule 1	END	ORAA	Inhabit in or near small streams, springs, or seeps in forested areas. Nest in underground cavities close to seeps or in shallow depressions in moist soil beneath leaf litter, stumps, logs, stones or moss. Overwinter underground or in streams.	Unlikely - ORAA has recent records of this species from 2018 within the 10km ² map square (17PH57) that overlaps the northern limits of the study area. This species is found along the Niagara Gorge which outside of the study area.	None
Northern Dusky Salamander	<i>Desmognathus fuscus</i>	END, Schedule 1	END	ORAA	Inhabit underneath rocks, logs, leaf litter on land, within or near water close to small groundwater fed streams, seeps and springs. Overwinter underground or in streams.	Unlikely - ORAA has recent records of this species from 2018 within the 10km ² map square (17PH57) that overlaps the northern limits of the study area. This species is found along the Niagara Gorge which outside of the study area.	None
REPTILES							
Blanding's Turtle	<i>Emydoidea blandingii</i>	THR, Schedule 1	THR	ORAA	Inhabit a variety of wetlands, including marshes, swamps, ponds, bogs, slow-flowing streams, shallow bays of lakes or rivers, graminoid shallow marsh and slough forests adjacent to larger wetland complexes. Overwintering habitat includes permanent bogs, fens, marshes, ponds and other open water habitats that don't freeze over in the winter.	Unlikely - ORAA has recent records of this species from 2011 within the 10km ² map square (17PH56) that overlap the study area. Potential habitat for this species may be present in the areas surrounding Welland River as well as in marsh and open aquatic wetland communities associated with the Welland River East, Warren Creek, Lower Grassy Brook and Lyons Creek North Wetland Complexes.	Unlikely
Timber Rattlesnake	<i>Crotalus horridus</i>	EXP, Schedule 1	EXP	NHIC	Inhabit upland forested habitat with rocky areas. Hibernates communally in south facing rock slides, ledges and outcrops.	Unlikely - NHIC has historical records of this species from 1941 within the 1km ² map squares (17PH5266, 5267, 5268, 5269, 5270, 5365, 5366, 5367, 5466). Habitat for this species is limited to forested areas with rocky outcrops. This species is considered extirpated from Ontario.	Unlikely
MAMMALS							
Eastern Small-footed Myotis	<i>Myotis leibii</i>		END	AMO	Roosts in caves, mine shafts, crevices or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests (MNR, 2000)	Potential - All woodlands within the study area have the potential to provide habitat for bats. Direct impacts to potential SAR habitat is expected. Consultation with MECP was initiated and an Information Gathering Form (IGF) submitted will be submitted to determine permitting and compensation requirements. Acoustic surveys to confirm SAR potential is not currently anticipated based on initial consultation. Implementing timing restrictions to avoid tree removal during the active period (April 1 to September 30) is recommended, along with the installation of bat boxes to mitigate impacts due to construction.	High
Little Brown Myotis	<i>Myotis lucifugus</i>	END, Schedule 1	END	AMO	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges (MNR, 2000). Roosts in crevices and cavities in dead or dying trees, or sometimes beneath naturally loose bark on species like Shagbark Hickory (MNR, 2017).		
Northern Myotis	<i>Myotis septentrionalis</i>	END, Schedule 1	END	AMO	Hibernates during winter in mines or caves; during summer males roost alone and females form maternity colonies of up to 60 adults; roosts in houses, manmade structures but prefers hollow trees or under loose bark; hunts within forests, below canopy (MNR, 2000)		
Tricolored Bat	<i>Perimyotis subflavus</i>	END, Schedule 1	END	AMO	Open woods near water; roosts in trees, cliff crevices, buildings or caves; hibernates in damp, draft-free, warm caves, mines, or rock crevices (MNR, 2000). Prefers roosts in foliage within or below the canopy, mostly in oak species but also sometimes in maples. Clusters of dead or dying leaves on live branches are preferred (MNR, 2017).		
BIRDS							
Acadian Flycatcher	<i>Empidonax virens</i>	END, Schedule 1	END	OBBA	Inhabits mature forests and maple-beech dominated swamps.	Unlikely - Suitable habitat for this species is not present in the study area. This species was not observed during the 2020 breeding bird surveys.	Unlikely
Bank Swallow	<i>Riparia riparia</i>	THR, Schedule 1	THR	OBBA	Nest in natural and human-made setting where there are vertical faces in silt and sand deposits, often on banks of rivers or lakes.	Unlikely - Habitat does not appear present in the study area and this species was not observed during the 2020 breeding bird surveys.	Unlikely
Barn Swallow	<i>Hirundo rustica</i>	THR, Schedule 1	THR	E-bird; OBBA; Colville; Parsons 2020	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. They prefer unpainted, rough-cut wood as mud does not adhere as well to smooth surfaces.	Potential - The structural culverts and Welland River bridge have the potential to provide habitat for Barn Swallows. This species was observed foraging in the fields and along the Welland River during the 2020 breeding bird surveys, although no nests were observed. Registration under O. Reg. 242/08 of the ESA is not currently anticipated. However, it is recommended that a survey for Barn Swallows is completed prior to construction. As habitat potential exists, for works occurring during the breeding window (i.e., April 1 to August 31) at structural culverts and the Welland River bridge, it is also recommended that exclusionary measures be installed by April 1 to prevent nesting	Moderate
Bobolink	<i>Dolichonyx oryzivorus</i>	THR, Schedule 1	THR	OBBA; Parsons 2020	Tall grasslands, such as pastures and hayfields or shrubby overgrown fields or other open areas.	Potential - This species was documented by Parsons during breeding bird surveys on June 17, 2020 at BB-2 along Biggar Road near the western limits. This species was not recorded during the July 3, 2020 survey. It is possible this species is nesting in the agricultural field, although not confirmed. The proposed design would encroach edge habitat only. It is not expected that a permit will be required. This species will be included in the IGF (along with bats) and submitted to MECP for review.	Unlikely
Chimney Swift	<i>Chaetura pelagica</i>	THR, Schedule 1	THR	OBBA	Urban settlements in chimneys or other manmade structures.	Unlikely - Habitat potential may exist under the Welland River bridge; however, there this species was not observed during 2020 breeding bird surveys.	Unlikely
Common Nighthawk	<i>Chordeiles minor</i>	THR, Schedule 1	SC	OBBA	Preferred nesting habitats include bare ground in open areas in association with clearings such as fields, clear cuts, ponds and wetlands that are used for aerial foraging.	Unlikely - Habitat is present in the study area within limited habitat in the Project limits. There are no recent records of this species from the background review.	Unlikely

Species		SAR Status		Source	Habitat	Habitat Assessment	Impact Potential
Common Name	Scientific Name	National (SARA)	Provincial (ESA, 2007)				
Eastern Meadowlark	<i>Sturnella magna</i>	THR, Schedule 1	THR	OBBA	Tall grasslands, such as pastures and hayfields or shrubby overgrown fields or other open areas.	Unlikely - The agricultural pasture and grassland habitat within the study area is suitable for this species. However, there are no recent records of this species in the background review and none were observed during 2020 field investigations.	Unlikely
Northern Bobwhite	<i>Colinus virginianus</i>	END, Schedule 1	END	NHIC	Savannahs, grasslands, around abandoned farm fields, along brush fencerows and other similar sites.	Unlikely - NHIC has historical records of this species from 1900 within the 1km ² map squares (17PH5265, 5266, 5267, 5268, 5269, 5270, 5365, 5366, 5367, 5466). Suitable habitat for this species is not present and there have been no recent records of this species in over 100 years.	Unlikely
Wood Thrush	<i>Hylocichla mustelina</i>	THR, Schedule 1	SC	E-bird; OBBA	Prefers moist deciduous or mixed second-growth forests with dense undergrowth and tall trees for perching (COSEWIC, 2012).	Unlikely - There are recent records from e-bird of this species within the southern portion of the study area (2020). The woodlands within the study area may provide suitable habitat; however no Wood Thrush were recorded during breeding bird surveys conducted by Parsons in 2020.	Unlikely
PLANTS							
American Water-willow	<i>Justicia americana</i>	THR, Schedule 1	THR	NHIC; NPCA	Occur along the shores and in the water of streams, rivers, lakes, ditches and occasionally wetlands. Grows in wet soil and in up to 1.2 metres of water.	Unlikely - There are recent records (2010) from NHIC of this species within the within the 1km ² map squares (17PH5365, 5366, 5466). MECP noted that that there are records of this species along Lyons Creek but outside of the study area. The Project is not expected to directly impact Lyons Creek.	Unlikely
Deerberry	<i>Vaccinium stamineum</i>	THR, Schedule 1	THR	NHIC; iNaturalist	Found in habitats with climates moderated by large bodies of water. In Ontario, predominately found in dry open woods on sandy and well-drained soils and usually growing under oaks, Pitch Pine or White Pine.	There are records of Deerberry in the City of Niagara Falls. There are no records within the study area, however, suitable habitat may be present in the oak woodlands. In the Niagara Region, this species is found in open oak woodlands dominated by Red Oak, White Oak, Sugar Maple, Ash species, Ironwood, Sassafras, Witch-hazel and Gray Dogwood (National Deerberry Recovery Team, 2010) . If direct impacts to open oak wooded areas is required, a targeted survey for this species is recommended.	Low
Round-leaved Greenbrier	<i>Smilax rotundifolia</i>	THR, Schedule 1	THR	NHIC	A woody vine that is found mainly in the warmer climate of the Carolinian Forest. Prefers open moist to wet woodland and is often found growing on sandy soil.	There are records of this species in the City of Niagara Falls in Lyons Creek North. This species is found in open wet to moist woodlands, typically red maple and oak communities. The woodlands along Biggar Road / Lyons Creek Road in particular may provide suitable habitat. A targeted survey for this species is recommended where direct impacts to these communities are expected.	Low

Definitions, Acronyms and Symbols

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

ESA: Endangered Species Act

SARA: Species at Risk Act

SARO: Species at Risk in Ontario

SARA or ESA designation

EXP - Extirpated

END - Endangered

THR - Threatened

SC - Special Concern

Sources

1. NHIC - Natural Heritage Information Centre (NHIC) Make-a-map Tool (Ministry of Natural Resources and Forestry, 2020)
2. ORAA - Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019)
3. OBBA - Ontario Breeding Bird Atlas (Bird Studies Canada, 2005)
4. e-Bird website available online at <https://ebird.org/map/>
5. AMO - Atlas of the Mammals of Ontario (Dobbyn, J.S. 1994)
6. iNaturalist website available online at <https://www.inaturalist.org/>
7. Colville - Natural Heritage Assessment South Niagara Hospital Project (Colville Consulting Inc. 2019)

Impact Potential

None	Habitat is not present
Unlikely	No impacts anticipated
Low	May be encountered, although unlikely.
Moderate	Potential to be encountered incidentally
High	High likelihood to be encountered or habitat impacted