BUCHANAN CROSSINGS

DEVELOPMENT ASSESSMENT REPORT

(Revised – incorporating 2nd- reviewers' comments)

OCTOBER 25 - 2023

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ACKNOWLEDGMENTS

This document was created by the timely assistance of Jordan Fohkens and Alex Jackman both of B.M. Ross.

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INTRODUCTION

This report has been prepared on behalf of SLD Group Limited in support of a proposed Draft Plan of Subdivision application in the Municipality of Strathroy-Caradoc to create a 359-lot residential subdivision with access from Albert Street and Saulsbury Street. (Figure 5)

This subdivision (Buchanan Crossings) is intended to be developed on the lands at Pt. Lot 19, Concession 4 SER, Geographic Township of Adelaide, Municipality of Strathroy – Caradoc) between Saulsbury St. and Albert St. in the south-west of the community of Strathroy. (Figure 1)

In accordance with the Middlesex County Official Plan (2007), development applications within 50 metres of floodplains and flood prone areas mapped by the Conservation Authority, shall require submission of a Development Assessment Report (DAR). The DAR shall describe the ecological processes creating and maintaining the affected elements of the Natural System and indicate the potential impacts of the proposed development upon those processes. Where the Development Assessment Report indicates that there will be a negative impact on the natural system or ecological process that cannot be adequately mitigated, the development applications shall not be approved. If local municipalities require a Development Assessment Report or equivalent impact assessment document or equivalent impact assessment document as part of their approval process, the County will waive its requirement, provided the impact assessment submitted to the local municipality meets the County's requirements as set out below

The Development Assessment Report shall be undertaken to a professional standard and approved by the County. The DAR shall address the following:

A) Description of the development;

B) Description of the natural features;

C) Identification of Potential Impacts; and

D) Identification and Recommendation of Mitigation Measures.

This report is the Development Assessment Report for the Buchanan Crossing project.

THE PROJECT

The proposed mixed housing subdivision will have an area of approximately 15.2 hectares (37.6 acres) and is proposed to have: 13 single detached dwellings, 102 semi-detached dwellings (link homes), 19 street multiple attached dwellings (freehold town houses) and 225 multiple attached dwellings (condominium town houses). (Figure 5)

The proposed development lands are currently under agriculture. Adjacent land uses are residential housing and institutional retirement and nursing homes. The natural areas on the subject lands are primarily along the corridor which contains the Ward and Cable Drains and also on immediately adjacent lands; all other lands are under agriculture. Access is from Saulsbury St. in the north east and Albert St. in the south.

The lands described above are described as 'Phase I' and are located east of the Cable Drain. Development is anticipated to begin in the next two years. The lands located west of 'Phase I' are also owned by the SLD Group. These lands are described as 'Phase 2' and are located north of the Seasons

Retirement Community, on the periphery of the Strathroy-Caradoc boundary. However, these lands are located outside of the Settlement Area and cannot be developed at this time. (Figure 5)

For this reason, this Development Assessment Report applies to Phase I only. At such time in future if Phase 2 is proposed for development a second DAR will be prepared for that Phase.

The proposed study area for the proposed development is shown in Figure 2 "Property Inquiry County Lands (Napperton Drive)".

NATURAL HAZARDS

As mentioned in the Property Inquiry letter from the St. Clair Region Conservation Authority (See Appendix), *"The subject property contains areas within the flooding and erosion hazard of the Cable Drain. The hazard is made up of the meander belt erosion hazard and associated allowance (30 metres on either side of the drain) and the estimated engineered floodplain as shown on the map included with this report. The limit of the floodplain is defined by the extent of flooding expected under the regulatory storm as established by the Authority. The regulatory storm for the Municipality is based upon the Hurricane Hazel storm centered event."* (Figure 3)

A portion of the hazard on the subject property is shown on Schedule 'K' of the Municipality of Strathroy-Caradoc's Official Plan and in the Zoning By-law through the 'Natural Environment Overlay'. The PPS and Official Plan generally prohibit buildings and structures within Hazard Land areas. The PPS may permit development where the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards and if the following can be demonstrated and achieved:

a) development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;

b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies;

c) new hazards are not created and existing hazards are not aggravated; and

d) no adverse environmental impacts will result.

Aligned with the PPS, Strathroy-Caradoc's Official Plan policy 6.1.1.3 requires that if development is proposed in 'Hazard Land' areas the proponent may be required to undertake, at his expense, studies to provide the technical information necessary to evaluate the proposal in accordance with the following:

a) the degree of existing or potential physical hazard;

b) the potential impact of these hazards on proposed buildings, structures or additions thereto;

c) the proposed methods by which these impacts may be overcome in a manner consistent with accepted resource management practices and engineering techniques;

d) minimum building setbacks in relation to the kind, extent, and severity of both the existing and potential hazard.

In addition to the Official Plan policies, the Zoning By-law further regulated development in Hazard Land areas by prohibiting buildings and structures on lands exhibiting hazardous characteristics and through the following setbacks from Municipal Drains:

c) Municipal Drain (greater than 7.5 m wide) – 30 m from top-of-bank.

The approval of the authority will be required and may only be given where the control of flooding, erosion, pollution or the conservation of land will not be affected by the development. The completion of the above technical studies does not guarantee that the development proposal will be supported by the authority. All design parameters for stormwater management are to be reviewed by SCRCA. Any outlet for the drainage works will require written approval from the authority. As per the PPS policy 3.1.5 institutional uses and essential emergency services will not be permitted within the hazard area.

As identified in correspondence from North-South Environmental Inc. through a peer review of a previous version of this report, there is a section of the property that runs west/east (See Figure 3), which is identified as part of the regulated area (O. Reg 171/06). The regional floodplain has been redefined through a more detailed 'Flood Hazard Assessment' that was completed by Greck and Associates Limited on July 29, 2021 and approved by the SCRCA on November 26, 2021. The revised floodplain does not include the west/east area that was previously identified as floodplain. The feature is used for farm machinery access and does not contain any natural features to be retained or mitigated.

NATURAL HERITAGE

As identified in the property inquiry letter from the SCRCA (See Appendix), *"The natural features along the drain on the property has been identified in the Middlesex Natural Heritage System Study (MNHSS) (2014). This feature is not identified in the current Official Plan or Zoning By-law. It is expected that the natural heritage features will be retained within the natural hazard setbacks. Should significant encroachment into the erosion hazard of the drain be proposed, additional review may be required through a scoped Development Assessment Report, to be reviewed by SCRCA*."

St. Clair Region Conservation Authority – Ontario Regulation 171/06

SCRCA staff have provided the following comments as part of SCRCA's Regulatory Authority under Ontario Regulation 171/06 "Development, Interference with Wetlands and Alterations to Shoreline and Watercourses" made under Section 28 of the Conservation Authorities Act.

"The subject property has been identified as being regulated under Ontario Regulation 171/06. The policies of the Authority regulated development including: construction/reconstruction of a structure; placement or removal of fill; regrading; altering a watercourse; altering/developing a shoreline; or interfering with the function of a wetland. Written approval from this Authority will be required in order to undertake any of these activities within the regulated area.

Based on SCRCA's best available mapping for the Regulated Area on the property includes the estimated floodplain and meander belt for the Cable Drain (approximately 30 metres on each side of the drain). If development is located outside of the regulated area as shown on the attached mapping, then further written permission from the Conservation Authority will not be required."

MIDDLESEX COUNTY OFFICIAL PLAN

The County of Middlesex Official Plan contains a policy framework that provides guidance to local municipalities, such as the Municipality of Strathroy-Caradoc, in the preparation of local Official Plans and Zoning By-laws.

The Middlesex County Official Plan Section 2.2.1.2 General Policies notes that: "The boundaries and extent of the specific elements of the natural system designated on Schedule 'A' as Natural Environment Areas, and shown on Schedule 'C' as natural Heritage Features are approximate. Refinements to boundaries may occur through environmental evaluations such as a Development Assessment Report (DAR) in consultation with the Ministry of Natural Resources, the Conservation Authority having jurisdiction and the County. Changes to the boundaries as a result of more detailed shall not require an amendment to the Plan.

Development applications within or adjacent to Natural Heritage Features shown on Schedule 'C' shall require submission of a Development Assessment Report (DAR). More specifically, subsection 2.3.10 of the OP requires a DAR for areas within 50 metres of a significant woodland, floodplains and flood prone areas mapped by the Conservation Authority. While the development is further than 50 metres from a significant woodland (as shown on Schedule 'C'), it contains a regional floodplain adjacent to the Cable Drain and for this reason, a DAR is required.

Subsection 2.2.1.2 of the OP states that "If local municipalities require a Development Assessment Report or equivalent impact assessment document as part of their approval process, the County will waive its requirement, provided the impact assessment submitted to the local municipality meets the County's requirements as set out below.

The Development Assessment Report shall be undertaken to a professional standard and approved by the County. The DAR shall address the following:

a) Description of the development

b) Description of Natural Hazards, Natural Heritage System features and their ecological functions

c) Identification of Potential Impacts

d) Identification and Recommendation of appropriate protection and mitigation measures."

Also noted in Section 3.4 "Natural Environment Areas" of the Middlesex County Official Plan is the provision that, "… For new development proposed within 50 metres of a flood regulated watercourse and within 120 m of wetland components of the Natural Environment Area boundary, the applicant may be required to submit a DAR in accordance with the policies of Section 2.2.1.2."

Further guidance on Development Assessment Reports is provided in Appendix 'C' of the OP.

MIDDLESEX COUNTY OFFICIAL PLAN – AMENDMENT NO. 3

In June 2022, the County launched an updated version of their Official Plan (Amendment No. 3). The plan was updated to ensure land use planning policies were current and reflected updated provincial

legislation and technical studies, and contains an updated vision on how the community will grow over the next 25 years.

The updated plan contains a revised Schedule C (Natural Heritage System) that included revised boundaries of natural heritage features based on the updated Natural Heritage Study (2014). The area along the Cable Drain is now recognized as 'Natural Heritage System' on Schedule 'C'. As mentioned, subsection 2.2.1.2 of the Plan requires a DAR for development applications adjacent to natural features, which shall address the same matters described above, including identification and recommendation of appropriates protection and mitigation measures.

STRATHROY-CARADOC OFFICIAL PLAN

The Municipality's OP contains more detailed policies than the County OP, but shall conform to the County policies mentioned earlier in this report. It is a goal of the Plan to protect and enhance significant natural Heritage features and to increase the amount of forest cover in the Municipality (subsection 1.3)

Section 3.3.7 "Natural Heritage" of the Strathroy-Caradoc Official Plan (April 2018) notes that:

"Natural heritage features in the Settlement Area of Strathroy are primarily associated with the Sydenham River and its tributaries. They include wetlands, woodlands and valleylands. Areas designated as "Wetlands" may also include adjacent lands that do not constitute wetlands as defined; yet are considered an integral part of the wetland complex. Natural heritage features warrant protection on account of their ecological and social value as well as their contribution to the natural landscape and the character of Strathroy. It is intended that such features shall be left in their natural or undisturbed state and that any adjacent land use or land use activity be controlled so as not to adversely impact on the natural and ecological integrity of the feature."

Wetlands

Section 3.3.7.2 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Areas designated as 'wetlands' on Schedule 'D' shall be maintained in their natural state and protected from development and site alteration that would threaten their ecological integrity. Within a wetland or wetland complex, development shall not be permitted. On adjacent lands (generally lands being within 120 metres of the wetland or wetland complex) development and site alteration shall not be permitted unless it can be demonstrated that there will be no negative impacts on the natural features or on the ecological functions. These areas are regulated by Conservation Authorities. Uses permitted shall be restricted to existing agricultural uses, conservation, outdoor education, and passive recreation uses. Buildings or structures shall not be permitted. Other activities permitted may include hunting, trapping and fishing." Schedule D of the OP shows the location of wetlands and natural watercourses. The subject lands are located further than 120 metres from these features.

Woodlands

Section 3.3.7.3 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Areas designated as 'Woodlands' on Schedule 'D' have been identified by the Middlesex Natural Heritage Study, 2003 as meeting one or more landscape criteria established by the study. They are generally four hectares or greater in size and are considered to be significant as a result of their contribution to the ecology, quality and natural diversity of the Municipality. It is intended that these

woodlands be protected and enhanced wherever possible. They shall be maintained in their natural state wherever possible and protected from incompatible development.

Development and Site Alteration Affecting Woodlands

Section 3.3.7.4 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

"Development and site alteration may be permitted within a 'woodland' designated on Schedule 'D' and on adjacent land (generally the lands being within 50 metres of the woodland) where it is demonstrated that there will be no negative impacts on the woodlands or the ecological functions for which it was identified." The subject lands are located further than 50 metres from a 'woodland' designated on Schedule 'D'.

Evaluation of Development Proposals

Section 3.3.7.5 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Where development is proposed on land lying adjacent to a 'Wetland' or lying within or adjacent to an area designated as a 'Woodland', the proponent shall submit a Development Assessment Report (or DAR) in accordance with Section 7.5.3.2 of this Plan.

Reports/Studies Relating to Environmental and Natural Matters

Section 7.5.3.2 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

The required reports/studies are to identify the environmental and natural features which may be affected by the proposed development and/or change in land use; identify the areas that are to be employed as a buffer between the environmental and/or natural features and the proposed development and/or change in land use; and identify any other mitigative measures to be undertaken to protect the environmental and natural features from any adverse impacts associated with the proposed development and/or change in land use. These studies may include, but not be limited to Development Assessment Reports as outlined in sections 3.4.7.5, 4.4.6.4 and 5.4.2.4 of the Official Plan. Study components may be determined in consultation with the applicable Conservation Authority or other agency.

STRATHROY-CARADOC OFFICIAL PLAN-AMENDMENT NO. 14

In November of 2022, the Municipality of Strathroy-Caradoc adopted Amendment No. 14 to the OP, which was a five-year review of the OP to ensure the policies reflect and implement, current Provincial and County legislation.

The subject lands form part of the 'Saulsbury Secondary Plan – Special Study Area'. Policies require development applications to provide appropriate stormwater management facilities and provide access to a storm drain (subsection 3.3.9.4). The site is adjacent to the Cable Drain, which will provide the outlet for the majority of stormwater from the proposed development.

The updated OP has separated the previous Schedule 'D' into two new schedules. Schedule D-1 shows the Natural Heritage System, whereas Schedule D-2 shows the Wetlands and Woodlands in the Municipality. The western section of the subject lands (adjacent to the Cable Drain) is recognized as a Natural Heritage System. The subject lands do not contain, and are not adjacent to, Wetlands or Woodlands shown on Schedule D-2.

Subsection 5.2.1 of the Plan provides policies on development and site alteration in, or adjacent to, natural heritage features. More specifically, subsection 5.2.1 (d) states that "Development and site alteration may be permitted on lands adjacent, within 120 metres to the Natural Heritage System shown on Schedule D-1 if it does not result in any of the following:

i) A loss of ecological function;

ii) Subsequent demand for future development which will negatively impact on existing ecological functions; or

iii) Negatively impact ecological linkage functions which exist within adjacent lands."

Subsection 5.2.6 of the Plan contains policies on evaluation of development proposals adjacent to lands of the Natural Heritage System on Schedule D-1. More specifically, the policies state that "Where development is proposed within the adjacent lands of the Natural Heritage System on Schedule D-1, the proponent shall submit a Development Assessment Report in accordance with Section 7.4.3.2 of this Plan. Further study and confirmation of the boundary of features prior to the approval of development applications and site alterations may be required, but does not prevent existing agriculture and farm uses from continuing. Mitigation recommendation of the DAR to demonstrate no negative impact may include designating areas found to be natural linkages and enhancement areas." Permitted uses within the Natural Heritage System include recreational trails and watercourse crossings (subsection 5.2.6b, c, and f).

Subsection 7.4.3.2 of the OP deals with reports and studies relating to environmental and natural matters. The policies state that a DAR may be required for development applications and that a term of reference should be discussed with the Municipality and Conservation Authority.

A GUIDELINE FOR DEVELOPMENT ASSESSMENT REPORTS

Appendix C of the Middlesex County Official Plan provides 'A Guideline for Development Assessment Reports' (August 2007).

This guideline is written for landowners and developers to assist in the review and approval of development applications and/or site alterations that may affect the Natural System shown or described in the County of Middlesex Official Plan.

The Ontario Provincial Policy Statement (2020) provides policy direction on matters of provincial interest related to land use planning and development including the Natural Environment. The Planning Act requires that municipal decisions affecting planning matters "shall be consistent with" policy statements issued under the Act. As a result, the County of Middlesex Official Plan sets out a policy framework that encourages the protection of the County's Natural System which comprises the following elements:

- Natural Hazards
    - Steep slope hazards
    - Unstable soils
    - Fill regulated areas
- Natural Environment Areas
    - Floodplains
    - Flood regulated watercourses

- Natural Heritage Features
    - Significant woodlands
    - Wildlife habitat
    - Habitat of endangered and threatened species
    - Aquatic ecosystems including fish habitat
    - River, stream, ravine and upland corridors
    - Significant valley lands
    - Aggregate Resource Areas
    - Petroleum Resource Pool Areas
    - Areas of natural and scientific interest (ANSIs)
- Ground water Features
    - Groundwater recharge areas
    - Groundwater discharge and headwater areas
    - Well head protection areas

Development shall not be permitted on lands designated as 'Natural Environment Areas' on Schedule "A" of the County Official Plan which are:

- Wetlands
- Flood regulated water courses and associated flood plain
- Thedford Marsh Floodplain
- Significant portions of the habitat of threatened and endangered species

PROCESS OF THE DEVELOPMENT ASSESSMENT REPORTS

Appendix 'C' notes that before starting a Development Assessment Report, a work plan will be prepared to the satisfaction of the County, in consultation with the relevant agencies. Depending on the extent of the proposed development and the potential for impact on natural features, the County may approve a work plan for a Development Assessment Report that is reduced in scope and content; referred to as a 'scoped' Development Assessment Report.

A Development Assessment Report shall be required to show that development will have no negative impact on the natural features or on their ecological functions. The public, particularly adjacent property owners, may be notified of the preparation of a Development Assessment Report and given the opportunity to comment.

Content of Development Assessment Report

The County requires the Development Assessment Report to be completed to a professional standard, in consultation with the relevant public agencies. The detailed content required for Development Assessment reports is as follows:

- Description of the Development
- Description of Natural Features
- Identification of Potential Impacts
- Identification and Recommendation of Mitigation Measures
- Demonstration of Consistency

ST. CLAIR REGION CONSERVATION AUTHORITY REQUIREMENTS

Correspondence from Sarah Hodgkiss of SCRCA (November 10, 2021) outlines the requirements of SCRCA in this instance.

"I had the opportunity to discuss the DAR requirements with Tim Williams yesterday. I am providing a high-level outline to you of what we would like to see covered in the DAR. Then we ask that you prepare a term of reference with the details of the study, proposed timing, etc. for review by me and Tim. The report will need to review the natural heritage policies of the County and Strathroy-Caradoc Official Plans, and the Middlesex Natural Heritage System Study."

The Natural Heritage System identified in the Middlesex Natural Heritage System Study for the property is made up of the watercourse, meadow along the watercourse, and the woodland. The report should outline the existing site conditions, significance and functional connections between these features, and to the greater natural heritage system.

Aquatic Habitat Assessment – The watercourse should be described, including permanency, amount of flow, type of substrate, description of vegetation, habitat, etc. If fish habitat is present, we may require additional details re: thermal regime, water quality, etc.

Woodland: The woodland should be assessed on site and mapped. Please provide a description of the tree species, age class and general health. There should be a description of understory/ground cover, etc.

Meadow: the vegetation along the riparian corridor (e.g., the non-agricultural areas) should be described.

The site should be reviewed for Significant Wildlife Habitat and Habitat for Species at Risk. MECP should be contacted regarding the SAR screening. I am attaching a list of potential SAR for Strathroy-Caradoc to assist you in scoping your review.

The Development Master Plan prepared by B. M. Ross can be used for discussion, but the actual development setbacks should be determined through the findings of the technical studies, including the DAR and the floodplain assessment."

FISHERIES ACT

Section 34 of the Fisheries Act notes that, "…" fish habitat" means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend on directly or indirectly in order to carry out their life processes …". *Due to physical barriers to fish migration and a sluggish low flowing eutrophic condition of the Cable Drain there is no significant fish habitat at this site.*

In accordance with the new Fisheries Act the barrier at the Cable Drain "weir" at the culvert under Albert St. should be removed. Buffering of the Cable Drain corridor with a 30-metre naturalized set back will greatly help with sediment encroachment from surrounding agriculture. The modern SWM facilities with extensive use of Stormceptors will assist water quality by preventing oil and grease from entering the SWM stream.

The new Fisheries Act improves the protection of our fisheries and their ecosystems. Lost protections are provided with comprehensive protection for all fish and fish habitat. The previous prohibition against the harmful alteration, disruption and destruction of fish habitat (HADD) has been restored. It

provides for strengthening the role of Indigenous peoples in project reviews, monitoring and policy development as part of early steps to advance reconciliation and recognizes that decisions can be guided by principles of sustainability, precaution and ecosystem management.

As well, the Fisheries Act promotes restoration of degraded habitat and rebuilding of depleted fish stocks and allows for the better management of large and small projects impacting fish and fish habitat through a new permitting framework and codes of practice. New fisheries management tools can be used to enhance the protection of fish and ecosystems in situations such as the Cable Drain and this project.

MIGRATORY BIRDS CONVENTION ACT

The purpose of the Migratory Birds Convention Act (MBCA) is to protect and conserve migratory bird populations and individuals. Legal protection extends to their nests, eggs, and any part of the bird.

The killing or harming of the birds or destruction or disturbance of nests and eggs is unlawful regardless of intent. Harm that results from human activities that are not directed at the birds or nests is called 'incidental take' because it occurs incidental to otherwise lawful activity. The law is clear; Incidental take of the MBCA is a contravention of the MBCA. With respect to birds nesting in forested habitats, activities that result in incidental take may include forest harvesting, stand thinning, brush removal, site clearing and road construction and maintenance if they are done during the nesting period.

Nearly all native birds in Canada are protected, even if they don't migrate. The only native species that are excluded are birds of prey (hawks, owls, eagles, falcons), kingfishers, ravens, crows, jays and three species in the blackbird family (rusty blackbirds, common grackles, and brown-headed cowbirds). The excluded species were viewed as detrimental to humans when the Act was originally adopted in.

SPECIES AT RISK ACT

The purposes of the Species at Risk Act are to prevent Canadian indigenous species, sub-species, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk.

ENDANGERED SPECIES ACT

More than 200 species of plants and animals are at risk of disappearing from Ontario. The Endangered Species Act provides science-based assessment of relevant species. Species are assessed by an independent body based on the best-available science and Aboriginal Traditional Knowledge.

PROPOSED METHODOLOGY FOR SAULSBURY SUBDIVISION DAR

Introduction:

As requested by the SCRCA a fairly comprehensive approach has been taken in developing the Terms of Reference for the Buchanan Crossings Phase I Subdivision DAR (See Appendix). A review of policy and planning documents and also technical information has ensured that an accurate and sensitive approach will provide the information required.

First and foremost, this approach is to consider a regional ecosystem perspective as informed by the MNHSS. It is most important to determine how the stream and stream corridor relate to the goals, objectives and criteria of the MNHSS and what is this level of significance with regard to natural heritage features, areas and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems.

The DAR was developed from an overall synthetic perspective based on the information gathered from background research and collected from field surveys based on scientific protocols and government agency and Ministry criteria.

BACKGROUND STUDIES

In order to fulfill the DRAFT TOR a records review was undertaken along with other background research.

The following information sources were reviewed:

- Provincial Policy Statement, 2020.
- Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (Second Edition), 2010.
- Middlesex County Official Plan (September 9, 1997; Amended July 11, 2006)
- Middlesex County Official Plan – Amendment No. 3 (June 17, 2022)
- Municipality of Strathroy-Caradoc Official Plan – Consolidated Version (February, 2023)
- Municipality of Strathroy-Caradoc Official Plan – Amendment No. 14 (July 2022)
- Municipality of Strathroy-Caradoc Comprehensive Zoning By-law, August 4, 2021.
- Ministry of Natural Resources and Forestry's Municipal Species at Risk Reference Guide for the Municipality of Strathroy-Caradoc, May 2018.
- Middlesex Natural Heritage Systems Study – 2014.
  Upper Thames River Conservation Authority.
- O. Reg. 171/06: St. Clair Region Conservation Authority: Regulation of Development, Interference with wetlands and alterations to shorelines and water courses.
- OMNRF. 2022. N.H.I.C. Make A Map.
- United States Department of Agriculture, Natural Resources Conservation Service, Plants Data Base. (plants.usda.gov/java/profile?symbol)

- The Physiography of Southern Ontario, 3 rd. Edition, L. J. Chapman and D. F. Putnam, Ministry of Natural Resources, 1984.
- VASCAN, Database of Vascular Plants of Canada. http://data.canadensys.net/vascan/
- Manual of Vascular Plants of Northeastern United States and Adjacent Canada, 2nd Edition. The New York Botanical Garden. H. A. Gleason and A. Cronquist, 1999.
- Illustrated Companion to Gleason and Cronquist's Manual, Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden. Noel H. Holmgren, 1998.
- Canadian Wildlife Species At Risk, October 2011. Committee on the Status of Endangered Wildlife in Canada.
- Atlas of the Breeding Birds of Ontario, 2001- 2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, Ontario nature. M. D. Cadman et al, 2007.
- Natural Heritage Resources of Ontario, Rare Vascular Plants, 3rd Edition. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Mike J. Oldham, 1999.
- Floristic Quality Assessment System for Southern Ontario. ONTDEX. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Mike J. Oldham et al, December 1995.
- Appendix 'C' - Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Mike J. Oldham et al, December 1995.
- Significant Wildlife Habitat Technical Guide. Ontario Ministry of Natural Resources, October 2000.
- DRAFT Significant Wildlife Habitat Ecoregion Criteria Schedule, SWH Ecoregion 6E Criterion Schedule, Identification of Significant Wildlife Habitat. Ontario Ministry of Natural Resources, February 2012.
- DRAFT Significant Wildlife Habitat Ecoregion Criteria Schedules, Addendum to Significant Wildlife Habitat Technical Guide. Ontario Ministry of Natural Resources, January 2009.
- Ecological Land Classification for Southern Ontario: First Approximation and Its Application. OMNR, South Central Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. North Bay, Ontario. Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998.
- Ontario, Endangered Species Act, 2007, S.O. 2007, Chapter 6. (Consolidation Period: June 30, 2008 to June 11, 2012). Ontario, 2007.
- Ontario Regulation 176/13 made under the Endangered Species Act, 2007. (Made: May 15, 2013, Filed: May 31, 2013, Published on e-Laws: May 31, 2013, Printed in The Ontario Gazette: June 15, 2013; Amending O. Reg. 242/08).
- Manual of the Grasses of the United States. Volume One. 2nd edition. Dover Publications Inc. New York, N.Y. Hitchcock, A.A. 1971.
- Manual of the Grasses of the United States. Volume two. 2nd edition. Dover Publications Inc. New York, N.Y. Hitchcock, A.A. 1971.

- Grasses of Ontario. Research Branch Agriculture Canada Monograph 26, 1980. Minister of Supply and Services Canada. Hull, Quebec. W. G. Dore and J. McNeill. 1980.
- Michigan Flora Part III, Dicots (Pyrolaceae-Compositae). Cranbrook Institute of Science Bulletin 61 and University of Michigan Herbarium. University of Michigan Press. Ann Arbor, Michigan. E.G. Voss, 1996.
- Michigan Flora Part II, Dicots (Saururaceae-Cornaceae). Cranbrook Institute of Science Bulletin 59 and University of Michigan Herbarium. University of Michigan Press. Ann Arbor, Michigan. E.G. Voss, 1985.
- Michigan Flora Part I, Gymnosperms and Monocots. Cranbrook Institute of Science and University of Michigan Herbarium. University of Michigan Press. Ann Arbor, Michigan. E.G. Voss, 1972.
- Goldenrods of Ontario (Solidago and Euthamia), University of Waterloo Biology Series, Number 36, Revised Edition. Semple, J. and Gordon Ringius, 1992.
- A Revision of Heterotheca sect. Phyllotheca (Nutt.) Harms (Compositae: Asteracea) The Prairie and Montane Goldenasters of North America. University of Waterloo Biology Series, Number 37. John Semple,1996.
- Cultivated and Native Asters of Ontario (Compositae: Asteraceae). University of Waterloo Biology Series, Number 41. Semple, J., Heard, S., and L. Brouillet. 2002.
- Grasses of Ontario. Research Branch Agriculture Canada Monograph 26, 1980. Minister of Supply and Services Canada. Hull, Quebec. W. G. Dore, and J. McNeill. 1980.
- Flora of North America, North of Mexico, Volumes 24 and 25, *Magnoliophyta Commelinidae: Poaceae*, Parts 1 & 2. Oxford University Press, 2007.
- Common Wetland Delineation Sedges of the Northeast. Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire. June 2005.
- Ecological Buffer Guideline Review. Beacon Environmental Limited (for Credit Valley Conservation). December 2012.
- SCRCA Section 28 Wetland Policy. SCRCA Policies ad Procedures of Administration of Section 28 Regulations, Wetland Policies. April 21, 2016.

Online Information Sources:

The following is a list of links to key online information sources:

- **Endangered Species Act, 2007**
  http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

- **Species at Risk in Ontario List** (Ontario Regulation 230/08)
  http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080230_e.htm

- **Local MNR office locations**
  http://www.mnr.gov.on.ca/en/ContactUs/2ColumnSubPage/STEL02_179002.html

- **Species specific habitat regulations under the ESA** Ontario Regulation 242/08) http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm
- **Natural Heritage Information Centre (NHIC)**
  http://nhic.mnr.gov.on.ca/

- **Rare Species Reporting Form - Natural Heritage Information Centre (NHIC)**
  http://nhic.mnr.gov.on.ca/species/species_report.cfm

- **Biodiversity Explorer**
  https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/mainSubmit.do

- **Department of Fisheries and Oceans Canada (DFO)**
  http://www.dfo-mpo.gc.ca/species-especes/index-eng.htm

- **Ontario Breeding Bird Atlas**
  http://www.birdsontario.org/atlas/index.jsp

  http://www.sararegistry.gc.ca/default_e.cfm

- **SAR Bulletin 4.2 "*Explanation of key terms relating to habitat identification, description and protection under the Endangered Species Act, 2007*"**
  http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/241604.html
- **SAR Policy 4.1 "*Habitat protection for endangered, threatened and extirpated species under the Endangered Species Act, 2007"***
  http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/241604.html
- **Committee on the Status of Species at Risk in Ontario (COSSARO) webpage**
  http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/244543.html

- **Species at Risk Website**
  http://www.mnr.gov.on.ca/en/Business/Species/index.html

Other than the planning and regulatory documents and online information sources as described above there was little applicable documentation to review.

AGENCY CORRESPONDENCE

As part of the preparation of this document, the following agency correspondence took place:

1) St. Clair Region Conservation Authority (SCRCA) – Property Inquiry – County Lands in Strathroy
   - March 3, 2021, from Melissa Deisley (SCRCA) indicated that the feature along the drain on the property is identified in the Middlesex Natural Heritage Systems Study (2014) but is not identified in the Official Plan or Zoning By-law.
   - Indicated that it was expected that the natural heritage features would be retained within the natural hazard setbacks and that additional review may be required through a scoped Development Assessment Report, if there is proposed significant encroachment into the erosion hazard of the drain.
2) Pre-application Discussions with Middlesex County staff
   - October 6, 2021, meeting with Tim Williams (County of Middlesex) and Jennifer Huff (Municipality of Strathroy-Caradoc) on the proposed development. The meeting included information on the requirements for a complete application for the development proposal, which included a Development Assessment Report.
3) Terms of Reference
   - November 10, 2021, e-mail from Sarah Hodgkiss (SCRCA) included a high-level outline of DAR contents. Attached to the email was a map that showed the extent of the natural heritage features.
   - April 20, 2022, meeting with Sara Hodgkiss, which included a discussion on the requirements for a scoped Terms of Reference for the proposed development.
   - May 26, 2022, e-mail from Sara Hodgkiss, which indicated baseline information on existing conditions of the watercourse and screening for the agricultural lands. Also directed for field work to proceed in accordance with the draft terms of reference that was provided.
   - May 29, 2023, e-mail from Tim Williams to include additional information on relevant Official Plan policies, particularly those found in updated policy documents for the County and Municipality.
   - June 16, 2023, e-mail from Sarah Hodgkiss confirming that the terms of reference was sufficient, provided that SAR screening was completed for agricultural lands, baseline information provided for the watercourse, and recommendation on the appropriate level of water quality and quantity control is provided for the stormwater management facility.
4) MNRF Correspondence
   - Correspondence with Cheryl Dickson, MNRF, Senior Resources Planner (MNRF) seeking any information with regards to studies and surveys by MNRF especially with SAR and any Species of Conservation Concern
   - Correspondence with Darren Unger, MNRF, Wildlife Management Biologist (MNRF) with regards to studies and surveys of the Cable Drain with regards to SAR, fish and fish habitat, turtles, mussels and any Species of Conservation Concern.
   - Correspondence with Ron Gould (formerly of MNRF) now a Protected Areas specialist with Ontario Parks. Ron notes that the only SAR related info is that a report was made of a Snapping Turtle observed crossing the road in May 2018 where the drain (Cable Drain) intersects Napperton Drive. There would be a mix of suitable aquatic and terrestrial habitat for the species n the project area.

5) DFO Map Tool

- Mapped information on possible fish and mussel SAR records
- https://www.ddfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html
- * this map was reviewed and the Cable Drain in the area of the DAR was found to not show any SAR

6) MECP Correspondence

- Emails requesting information were sent twice to MECP in the autumn of 2022 and the spring of 2023 but no response was provided.
- Email to SAR Ontario (MECP) on October 5/2023 requesting information regarding site and need for SAR Permit.

7) SCRCA Correspondence

- Comments from SCRCA were solicited October 6, 2023
- Craig Paterson (Conservation Biologist) was contacted for information regarding SAR Mussels and fish within the Cable Drain above Napperton Drive.

8) Third Pary Review

- Comments from North-South Environmental Inc. were received on April 19, 2023.
- Meeting with Sarah Mainguy and Leanne Wallis took place on June 8, 2023, to discuss the comments on the Development Assessment Report that was submitted.
- Comments received from North-South have been reviewed and are addressed in this updated report.
- Comments from North South Environmental on September 20, 2023

FOCUSSED STUDIES

Middlesex Natural Heritage System Study

The Middlesex Natural Heritage System Study (2014) was reviewed to obtain a regional perspective and any information specific to the Cable Drain at the development site and downstream to the Sydenham River. This document provided information on how the development lands relate to the landscape of the Middlesex Natural Heritage System and any effects the proposed development might have at the site lands and downstream to the Sydenham River.

Wetland Boundary Delineation

There are no Provincially Significant Wetlands found within the subject lands or adjacent lands. However, from a preliminary site review there are floodplain areas that may be determined to be wetland features with further studies. If the landscape feature(s) is determined to be a wetland the boundary will be staked by Chris Hart who is a Certified Ontario Wetland Evaluator. Further to this staking the feature will be reviewed and confirmed by a wetland specialist/ecologist from the SCRCA. Boundaries will be determined using vegetation community borders and soil probes to a depth of up to 60 cm for water and hydric soil detection, as per the Ontario Wetland Evaluation system (OWES 2013). Wetland boundaries are established where vegetation is comprised of 50% wetland and 50% upland species and where soils display hydric conditions (e.g., presence of mottles and/or gleys), per the

Ontario Wetland Evaluation system (OWES 2013). Detailed dates and weather information will be provided.

Buffer Recommendation and Setbacks

- Recommended buffers and setbacks for wetland boundaries and other natural heritage features were determined through a variety of resources including the SCRCA wetland policies as below.
- SCRCA Section 28 Wetland Policy. SCRCA Policies ad Procedures of Administration of Section 28 Regulations, Wetland Policies. April 21, 2016.
- Ecological Buffer Guideline Review. Beacon Environmental Limited (for Credit Valley Conservation). December 2012.

An ecological buffer of 30 metres from the top of bank and the drip line of the Black Walnut grove is recommended based on the above references.

Ecological Land Classification and Vegetation Surveys

Ecological Land Classification (ELC) surveys were completed in mid-May, August, and late-September by Chris Hart who is a certified ELC examiner and ecologist. Vegetation communities within the study area were characterized and delineated following the ELC system for Southern Ontario 1st approximation; community codes usually follow the 2nd approximation (Lee, et al, 1998, 2008). Boundaries of ELC communities were mapped by using aerial images and field observations. As part of this mapping process, soils were characterized and the study area was systematically searched in order to provide an inventory of vascular plants to provide a three season Botanical Inventory of the Study Area. Detailed survey dates and weather information was noted.

Identified ELC communities were cross referenced with the NHIC Ontario Plant Community List (NHIC 2018) to determine the presence of rare plant communities (S1-Critically Imperiled, S2-Imperiled, or S3-Vulnerable). The Subnational or Provincial Ranks (S Rank) are assigned by the Ontario Ministry of Natural Resources and Forestry (NHIC) in order to help assign protection priorities. Detailed descriptions of each ELC community are provided in this report.

Identified vascular plant species were compared to Provincial and Federal SAR lists (COSARO, SARA), PROVINCIAL RANKS (NHIC 2018), global ranks and Distribution and Status of the Vascular Plants of Southwestern Ontario (Oldham 1993) in order to assess Federal, Provincial, regional and local conservation status of each species. Final definitive identification was provided by the "Field Manual of Michigan Flora" (Voss, E. G., and A. Reznicek, 2012). The taxonomic nomenclature of plant species were further defined by the Database of Vascular Plants of Canada (VASCAN 2016).

A list of all identified plant species has been provided in Appendix 'A'. The list provides botanical names, common names, provincial rarity rank (S-rank), global rarity rank (G-rank), provincial Species at Risk status (SARO), federal Species At Risk status (SARA), coefficient of conservatism (CC) and coefficient of wetness (CW).

Wildlife Habitat

A list of all identified wildlife is provided in Appendix 'B'.

Amphibians (Anurans)

Evening point count surveys to detect the breeding calls of anurans (frog and toad) were conducted by Chris Hart who is an experienced ecologist in accordance with the Marsh Monitoring Program Participants Handbook for Surveying Amphibians (Bird Studies Canada 2008). Three surveys were completed during the recommended windows for the spring and early summer, in order to maximize the chances of detecting all potential species. Surveys were conducted on April 20, May 29 and July 6. Surveys were intended to coincide with optimum weather conditions for anuran breeding activity and detection of calls, i.e., suitable temperature relative to each survey window, humid or damp but not raining, and low wind. Call level Codes were applied to each species detected. Suitable habitat and numbers of individuals were counted or estimated where applicable. The surveys took place in mid-April, mid to late-May and late June.

No species were detected calling in April or May. It was only on July 6 that Leopard Frogs (Rana pipiens) were detected on adjacent (residential) land at the west end and at the 1st survey point (Figure 2)

Breeding Birds

Breeding Bird Surveys were conducted by Chris Hart who is an experienced ecologist in order to determine if significant bird breeding habitat occurs within or adjacent to the study area. Two surveys were conducted and comprised of 10-minute point counts position at pre-determined locations approximately 150 m apart. Surveys were conducted on May 27 and July 7. Where appropriate (stream corridor) a wandering transect was used to capture nests and calling birds. Surveys followed the Ontario Breeding Bird Atlas: Guide for Participants (Federation of Ontario Naturalists, March 2001) and Ontario Breeding Bird Atlas, Instructions for Point Counts (Birds Canada, June 2021).

Surveys were undertaken during the peak breeding season for the bulk of species in southern Ontario (last week of May through early July) and were spaced at least 10 days apart in order to determine presumed permanent territories through territorial singing males. The two surveys were undertaken in the early morning between 30 minutes before dawn and 5 hours after dawn.

Incidental Wildlife Observations

Incidental observation of insects, mammals, birds and reptiles were recorded during all field visits.

Significant Wildlife Habitat

With the guidance of the Significant Wildlife Habitat Technical Guide (2000) and the SWH Ecoregion Schedule 7E (2015), the proposed development and adjacent lands (within 120 m) were considered for the presence of Significant Wildlife Habitat (e.g., specialized habitats for wildlife and habitat for species of conservation concern). It is noted that no significant wildlife habitat was identified within 120 m of the Cable Drain.

Species at Risk Habitat

The subject property and the study area were reviewed for the presence of habitat that may be suitable for Species at Risk. Guidance was provided by the MNRF-Aylmer District as to what SAR may have the potential to occur in or near to Strathroy-Caradoc. A review of the site along with habitat requirements for each species was be conducted. A variety of sources including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) documents was used to determine habitat suitability. The site

was then evaluated for potential habitat using Ecological Land Classification, guidance from MNRF documents and on-site knowledge acquired through field surveys. An assessment of the study area of candidate habitat for SAR is provided in the following report sections.

Other Project Details:

- Existing Site Conditions in general from a landscape perspective.
- Significance of features – common, rare or unusual on a regional or provincial basis.
- Potential Impacts (cumulative impacts) occurring in the surrounding area as a result of the proposed development.
- Potential impacts associated with changes related to drainage of the site, water quality and water quantity.
- Mitigative measures that may be undertaken as part of the design process (Low Impact Design) to prevent, minimize or offset anticipated negative impacts of the proposed land development.

DAR – TASK SCHEDULE

TASK	TIMING	REFERENCE
Background Review	March to April	NA
Organize equipment and supplies	March to May	NA
Amphibian Calling Surveys	20/04, 29/05, 06/07	Bird Studies Canada – Marsh Monitoring Program Participants handbook for Surveying Amphibians, Revised 2008
Incidental Wildlife Observations	April to October	Various field guides and monographs
ELC and Vegetation Surveys	27/05, 28/07, 15/09	Ecological Land Classification for Southern Ontario First Approximation and Its Application (Lee, H. et al 1998) Southern Ontario Ecological Land Classification Vegetation Type List (Lee, H. May 2008) Field Manual of Michigan Flora (Voss, E. G., A. Reznicek. 2012) Floristic Quality Assessment System for Southern Ontario (Oldham, M. J. and W. Bakowsky, December 1995)
Fish and Aquatic Habitat Surveys (as needed)	May to July	Ontario Stream Assessment Protocol - 2017
Species At Risk Habitat	May to September	MNRF NHIC - Make A Map 2008 MECP – information inquiry MNRF – information inquiry MNHSS - 2014
Breeding Bird Surveys	27/05, 11/07	Ontario Breeding Bird Atlas Guide for Participants, March 2001 Ontario Breeding Bird Atlas, Instructions for Point Counts, June 2021

TASK	TIMING	REFERENCE
Significant Wildlife Habitat	July	SWHTG – 2000 SWH – ECS 6E – 2015 MNRF NHIC Make A Map MNHSS - 2014
Buffer Recommendations and Setbacks	August to September	Natural Heritage Reference Manual, 2010
Draft Report	November - December	NA

NOTE: This information was collected in the field. Field data sheets are found in the appendices for Birds and Anurans.

MASTER ELC ANALYSIS – VEGETATION

This section provides a summary and analysis of Landscape Polygons within the study area for Phase I of Buchanan Crossings. (Figure 4) In most cases while there are distinct landscape polygons more than one ELC classification of vegetation can be found within a polygon. The result is that as many as 4 different ELC classifications for habitat have been used to describe the landscape feature.

This approach has been found to be more accurate in describing the landscape because gradation in plant communities can be understood by the use of ELC codes and where they occur.

The focus of this study has been the Cable Drain and lands adjacent to it from Albert Street to the property boundary to the north-west. ELC studies were undertaken in detail on May 27, July 28, and September 15.

POLYGON 1

This is the portion of the Cable Drain between the north property boundary and the Black Walnut grove along the drain. Consideration has been given to adjacent lands within 10 metres of the top of bank and plants in these areas have been included. We have considered those areas of the Cable Drain that has been colonized by trees, shrubs, vines, forbs and grasses. As well, the bottom of the drain with swampy conditions, where there are seeps, small floodplains and periodic inundation from snow melt and storm events surveyed. Upper elevations of ditch sides to adjacent cropland verges have shrub copses (dogwoods and willows).

Components of Polygon 1 include:

SWTM2 – Dogwood Mineral Deciduous Thicket Swamp Ecosite

- Mineral and peaty phase mineral (organic accumulations 20-40 cm) substrates
- Areas where flooding duration is short-substrate aerated by early to mid-summer

MEFM4 – Fresh-Moist Forb Meadow Ecosite (Open Graminoid Meadow Type)

- Upper ditch areas and adjacent lands transitional to cropland

THDM2- Dray-Fresh Deciduous Shrub Thicket Ecosite (Gray Dogwood Deciduous Shrub Thicket Type)

- Upper ditch areas and adjacent lands transitional to cropland

- May include Red Osier Dogwood and/or shrub willow

POLYGON 1 VEGETATION

TREES: Silver maple, Green Ash, Black Walnut

SHRUBS: Gray Dogwood, Red Osier Dogwood, Black Raspberry, Highbush Cranberry

VINES: River Bank Grape, Virginia Creeper

FORBS: Canada Goldenrod, Gray goldenrod, Yellow Avens, Little White Aster, Common Mustard, Garlic Mustard

GRASSES: Smooth Brome, Orchard Grass, Reed Canary Grass

POLYGON 2

This feature is a grove of Black Walnut trees in a widening of the drain bottom and side slopes including a localized floodplain at the north end of the study area. This appears to be a natural feature that may have started with a cultural planting that spread across the site. Trees appear to be actively regenerating with the oldest about 40 years and up to 30 cm dbh. There are about 60 trees of all ages. Other trees include White Pine, Manitoba Maple, Green Ash and Aspen Poplar.

Components of Polygon 2 include:

WODM-4 – Dry Fresh Black Walnut Deciduous Woodland Type

- Dominated by Black Walnut 35% < tree cover < 60%; semi-closed treed communities; natural areas have unique floras (e.g. tall grass woodland) areas with a cultural legacy typically dominated by more invasive herbaceous, shrub and tree species; tree cover more closed and shaded
- Mineral soil > 15cm deep; areas with intermediate levels of environmental limitations (e.g. fire, drought) intensity of cultural disturbances, or time since last disturbance)

SWTM2 – Dogwood Mineral Deciduous Thicket Swamp Ecosite

- Mineral and peaty phase mineral (organic accumulations 20-40 cm) substrates
- Areas where flooding duration is short-substrate aerated by early to mid-summer

This feature is considered dry-fresh because it is well-drained and soil cores revealed no gleiing.

FOD7-4 – Fresh- Moist Black Walnut Lowland Deciduous Type

- This habitat component is small (1-5%). It is an inclusion of minor significance.
- Typically associated with riparian zones and terraces, stream and river banks and floodplains.
- Areas of wet soils are rare and unusual at this site. There is no area which is continuous and demonstrates a clear connection between seeps and areas of FOD7-4 which is discontinuous. The sources of water along the wetted perimeter of the Cable Drain is a reflection of water elevation related to discharge fluctuation from baseflow above Polygon 2 and discharge related to storm events in the watershed above the site.

POLYGON 2 VEGETATION

TREES: Black Walnut, Aspen Poplar, White Pine, Green Ash, Manitoba Maple

SHRUBS: Black Raspberry, Highbush Cranberry, Gray Dogwood, Common Buckthorn

VINES: Virginia Creeper, Wild Cucumber, River Bank Grape

FORBS: Canada Goldenrod, Gray Goldenrod, Enchanters Nightshade, Sunflower, Yellow Avens, Garlic Mustard, Little White Aster, Narrow Leaved Goldenrod, Motherwort, Common Mustard, Jewelweed

GRASSES: Smooth Brome, Orchard Grass, Reed Canary Grass, Blue Grass

POLYGON 3

This feature is the vegetation community along the drain including adjacent lands to 10 metres from top of bank to either side. This includes the wet area in the bottom of the drain, side slopes and level areas beyond the top of bank and areas transitioning to croplands.

Upland areas have random trees, large shrubs, shrub copses and mixed areas of forbs and grasses. Much of this vegetative representation appears due to natural representation. NOTE: adjacent to the east of Polygon 3 is a natural area that is an extension of Polygon three; this is not a separate polygon and has the same characteristics of Polygon 3 but was considered part of agricultural lands.

The dominant canopy is formed of Gray Dogwood and Willow copses surrounded by individual shrubs.

SWTM2 – Dogwood Mineral Deciduous Thicket Swamp Ecosite

This is the area of lower side slopes of the drain and shallow floodplain areas.

Areas where flooding duration is short and the lower substrate is aerated early to mid-summer.

There is some flowing and standing water in the drain which promotes a lower emergent macrophyte component which is suppressed by intense shading of shrubs and collapsing graminoid and forb communities on the drain side slopes. This is less than 5% of community representation and biomass.

THMM 1-1 – Native Mixed Regeneration Thicket Type

This is the predominating side slope community of the drain along its length on the subject lands. Composed primarily of common local plants including shrubs, forbs and grasses.

Shrubs are primarily dogwoods and willows. Forbs are Goldenrods and Asters. Grasses are Reed Canary Grass and Tall Fescue grasses.

- This form of thicket has a shrub cover of >25%; tree cover <25%; shrub cover varies from scattered and patchy to continuous; natural areas typically have unique floras; areas with a cultural legacy typically dominated by more invasive shrub species.
- Mineral soil>30 cm deep; tree establishment inhibited by environment or have been removed by land use practices; areas subjected to natural disturbance (e.g. fire) or recovering from cultural disturbance (e.g. clearing pasture); drain maintenance; often found associated with the drier verges of wetlands.

THDM 2-4 – Dry-Fresh Deciduous Shrub Thicket Ecosite (Gray Dogwood Deciduous Shrub Thicket Type)

This is found on the upper drain side slopes and adjacent lands that are transitional to cropland. May include Red Osier Dogwood, Gray Dogwood and/or shrub willow copses and clusters.

- Upper side slopes and lands adjacent to the top of bank include meadow areas that are interspersed among shrub copses and trees clustered with larger shrubs.
- These meadow aera appeared to be derived from natural regenerative processes and include:
- MEFM 1-1 – Goldenrod Forb Meadow Type
- MEFM 1-2 – Aster forb Meadow Type

There may or may not be areas with special characteristics or higher species concentrations

POLYGON 3 - VEGETATION

TREES: Silver Maple, Eastern Red Cedar, Black Walnut, Green Ash, Manitoba Maple, White Pine, Bitternut Hickory, Basswood, feral Malus, Aspen Poplar

SHRUBS: Missouri Willow, Sandbar Willow, Shining Willow, Chokecherry, Gray Dogwood, Red Osier Dogwood, Downy Hawthorn, Red Osier Dogwood, Honey Suckle, Common Buckthorn

VINES: Wild Cucumber, Riverbank Grape, Virginia Creeper

FORBS: Common Milkweed, Sunflower, Brown Eyed Susan, Dame's Rocket, Jewelweed, Stinging Nettle, Phragmites, Evening Primrose, Motherwort, Canada Thistle, Common Burdock, Meadow Hawkweed, Stinging Nettle, Common Burdock, Herb Robert, Canada Goldenrod, Gray Goldenrod, Little White Aster, Azure Aster, Common Mustard, Daisy Fleabane, Alfalfa, Wild Basil, Bladder Campion, Wild Carrot, Comfrey, Field Horsetail, Jewelweed, Common Milkweed, Dandelion, New England Aster

GRASSES: Reed Canary Grass, Phragmites, Orchard Grass, Sheep Fescue

POLYGON 4

This feature is a transitional area between polygon 3 and 5. There is a strong influence of shrubby growth and larger trees set in a matrix similar to that of Polygon 3. The drain is still central with a larger component to the east on table lands.

Polygon 4 has many of the same characteristics of Polygon 3 but it has some larger and older trees and is not as disturbed as the drain; it is more natural. It is not a woodland but biologically part of forested residential lands to the south.

This area has most of the characteristics of the drain thicket vegetation communities upstream above it.

THMM 1-1 – Native Mixed Regeneration Thicket Type

As above it, this plant community is the predominant side slope vegetation. In this case the same vegetation is found beyond the top of bank and spreads into the level tableland where it shares habitat with a forb meadow (MEFM4).

MEFM4 – Fresh-Moist Forb Meadow Ecosite

This is an open meadow type with a high graminoid component. Found in the upper drain areas and adjacent lands transitional to groomed institutional lands and naturalistic areas of residential lands.

POLYGON 4 - VEGETATION

TREES: White Oak, Aspen Poplar, Black Walnut, Siberian Elm

SHRUBS: Bush Honey Suckle

VINES: River Bank Grape, Virginia Creeper

FORBS: Black Medick, Wild Carrot, Yellow Sweet Clover, Common Plantain, Goatsbeard, Russian Knapweed, Daisy Fleabane, Canada Goldenrod

GRASSES: Smooth Brome, Blue Grass, Rye Grass

POLYGON 5

Polygon 5 is an area that is predominantly meadow. This ELC feature has a tree and shrub cover of <25% open herbaceous communities; cover varies from scattered and patchy to continuous meadow; natural areas typically have unique floras (e.g. Tallgrass Prairie), areas with a cultural legacy, typically dominated by alien plant species.

These plant communities are based on mineral soil substrate .30cm deep; shrub and tree establishment inhibited by environment or have been removed by land use practices; areas subjected to natural disturbance (e.g. fire) or recovering from cultural disturbance (e.g. clearing, pasture)

Polygon 5 includes components of the following ELC communities:

MEFM4 – Fresh-Moist Forb Meadow Ecosite (Open Graminoid Meadow Type)

As in Polygon 4 this type of community was found in the upper elevation of the drain sides and in the adjacent table lands. It was included in a larger meadow area which transitioned at least 20 metres west to institutional lands which are groomed turf and also south to naturalistic lands (forested) of residential areas.

In this case there are trees with shrub copses (Silver maple, Black Walnut, Aspen Poplar) on large centers nearest to the drain. Other trees include Eastern White Cedar, Norway Spruce, Sycamore, and Sugar Maple.

Providing a solid forb complement to the graminoid meadow are ELC habitat areas dominated by:

MEFM 1-1 – Goldenrod Forb Meadow Type; and,

MEFM 1-2 – Aster Forb Meadow Type.

There may or may not be areas with special characteristics or higher species concentrations depending on overall site conditions.

POLYGON 5 - VEGETATION

TREES: Manitoba Maple, Black Walnut, American Elm, Eastern White Cedar

SHRUBS: -none-

VINES: River Bank Grape

FORBS: Russian Knapweed, Common Milkweed, Common Plantain, Mullein, Yarrow, Meadow Hawkweed

GRASSES: Smooth Brome, Little Bluestem, Switch Grass

POLYGON 6

This area is linear and runs adjacent to County Lane, which is entirely within the tableland area and does not include the drain.

This is a culturally affected area that includes streetside plantings and cropland.

This feature has Silver Maple street trees with other trees on adjacent lands including Eastern White Cedar, Black Walnut, White Elm and Blue Spruce.

Other components include ground covers such as turf grass and white clover and other adventitious alien species.

The predominant habitat components include:

MEFM 4 – Fresh-Moist Forb meadow Ecosite (open Graminoid Meadow Type)

MEFM 1-1 – Goldenrod Forb Meadow Type

MEFM 1-2 – Aster Forb Meadow Type

As found in Polygon 4 the ELC classifications of THMM 1-1 describes areas of this polygon at the northern end which are closest to naturalistic lands (forested) of residential areas to the west.

POLYGON 6 - VEGETATION

TREES: Manitoba Maple, Black Walnut, American Elm, Eastern White Cedar, Silver Maple

SHRUBS: -none-

VINES: River Bank Grape

FORBS: Russian Knapweed, Common Milkweed, Common Plantain, Mullein, Yarrow, White Pigweed, Jimson Weed, Meadow Hawkweed

GRASSES: Smooth Brome, Little Bluestem, Switch Grass

SIGNIFICANT WILDLIFE HABITAT

Significant Wildlife Habitat is considered within the Provincial Policy Statement (2020) section 2.1 as natural features, natural heritage systems, significant landscapes and significant landscape features.

Consideration of the meaning of “Significant” with regard to landscapes and landscape features and habitat is described in Section 6 “Definitions”. This section also notes that “Wildlife Habitat” means areas where plants, animals and other organisms live and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annular life cycle and also areas which are important to migratory or non-migratory species.

The PPS (2020) notes that:

Significant means

A) In regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources and forestry using evaluation procedures established by the Province, as amended from time to time;
B) In regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources and Forestry;
C) In regard to other features and areas in policy 2.1, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system;
D) In regard to mineral potential, an area identified as provincially significant through evaluation procedures developed by the Province, as amended from time to time, such as the Provincially Significant Mineral Potential Index.

Criteria for determining significance for the resources identified in section (D) are recommended by the Province, but municipal approaches that achieve or exceed the same objective may be also be used.

While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation

IDENTIFICATION OF SIGNIFICANT WILDLIFE HABITAT

A review of the Significant Wildlife Habitat Technical Guide (Ontario Ministry of Natural Resources, October 2000) lays the ground work for identifying habitat features.

Section 8, Evaluation of Significant Wildlife Habitat (SWH) describes the evaluation process and Evaluation Criteria and Guidelines. Although somewhat outmoded this information is still valuable today in a planning context for designing wildlife surveys and understanding wildlife landscapes.

Since the development of the Ecological Land Classification for Southern Ontario, First Approximation and its Application (Lee, H. et al., September 1998) there has been a more landscape-oriented approach to wildlife habitat. This has resulted in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E, January, 2015 (Ontario Ministry of Natural Resources and forestry).

The approach taken in this latter document has largely taken over from the Significant Wildlife Habitat Technical Guide. Within the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E, Schedule 6E: Identification of Significant Wildlife Habitat is designed to provide the recommended criteria for identifying Significant Wildlife Habitat within Ecoregion 7E. Tables 1.1 through 1.4 within the Schedules provide guidance for SWH designation for the four categories of SWH outlines in the Significant Wildlife Habitat Technical Guide and its Appendices. Table 1.5 contains and provides descriptions for exceptions criteria for ecoregional SWH which will be identified at an ecodistrict scale. Exceptions occur when criteria for a specific habitat are different within an ecodistrict compared to the remainder of an ecoregion or if a habitat only occurs within a restricted area of the ecoregion.

The schedules, including description of wildlife habitat, wildlife species, and the criteria provided for determining SWH, are based on science and expert knowledge. The ELC Ecosite codes are described using the Ecological Land Classification (ELC) for Southern Ontario (1998). The information within these schedules will require periodic updating to keep pace with changes to wildlife species status in the Species at Risk (SARO) list, or as new scientific information pertaining to wildlife habitats becomes available. Therefore, MNRF will occasionally need to review and update these schedules and provide addenda. A reference document for all SWH is found after the schedules and includes citations for all ecoregional schedules. Each citation used to assist with the criteria for SWH will be indicated by a roman numeric symbol. Where no reference exists, MNRF expert opinion was used for determination of criteria.

CRITERIA FOR SIGNIFICANT WILDLIFE HABITAT IN ECOREGION 7E

Criteria for the designation of SWH fall under 4 categories:

1.1 Seasonal Concentration Areas of Animals

1.2 Rare Vegetation Communities or Specialized Habitat for Wildlife
1.2.1 Rare Vegetation Communities
1.2.2 Specialized Habitat for Wildlife

1.3 Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

1.4 Animal Movement Corridors

1.5 Exceptions for Eco-Region 7E
(Exceptions are candidate wildlife habitats that will have different criteria than what is proposed in the above schedules for an area within the Eco-region. The exceptions will be based on Eco-Districts and municipalities can apply the exception for the eco-district within their planning area.

SIGNIFICANT WILDLIFE HABITAT REVIEW

A site review of landscape features and species of conservation concern has considered both the direction of the Significant Wildlife Habitat Technical Guide (Ontario Ministry of Natural Resources, October 2000) and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E, January, 2015 (Ontario Ministry of Natural Resources and forestry).

SIGNIFICANT WETLANDS

The background information review and site investigations conducted as part of the EIS review revealed that there are no significant wetlands within 120 metres of the proposed development lands. Smaller pocket wetlands occur within the bottom of the Cable Drain on site and on adjacent lands floodplains. These features will be protected with planned vegetated setbacks and habitat corridors that are enhanced with a re-naturalized buffer.

Development envelopes will avoid stream corridors and low-lying areas. As well, zoning setbacks and restrictive covenants could be drafted to ensure development does not impact these features. Renaturalization of stream corridors, that have been historically negatively affected by agriculture, as

well as vegetated buffers will be implemented to offset impacts. Potential ecological enhancement areas will be identified prior to detailed landscape design.

It is noted that the Sydenham River Wetland Complex occurs downstream of the subject lands on the south side of Albert Street; four kilometres to the west of the Cable Drain lie the Kerwood Woods and Kerwood Swamp. This wetland is primarily a marsh which is evaluated and has a Provincial status. It is noted that significance is limited to those areas south of Albert Street. While the section of the Cable Drain within the Subject lands is mapped as part of the MNHS this reach and adjacent lands have no special significance or designation.

SIGNIFICANT WOODLANDS

The woodlands along the Cable Drain are not large enough to be considered as significant primarily because of size and a lack of landscape contiguity.

Polygon 2 at the upper end on the subject lands contains Black Walnut, Aspen Poplar, White Pine, Green Ash and Manitoba Maple. The dripline of Polygon 2 was digitized on a Geographic Information System by using South Western Ontario Orthophotography Project (SWOOP) images. These images were then confirmed through field survey work which provided actual digital surveys of the woodland dripline.

As mentioned in the Ministry's Natural Heritage Reference Manual, there are four criteria for evaluating if a woodland is significant. This includes size, ecological functions, uncommon characteristics, and economic and social values. These criteria are discussed below:

Size – The woodland on Polygon 2 is less than 4ha in size and does meet the minimum size requirement for significant woodland according to the Middlesex Natural Heritage Systems Study (2014)

Ecological Function – The woodland does not contain woodland interior and is not in close proximity to other woodlands, however it does contain woodland diversity. It is noted that this feature could provide wildlife shelter from agricultural activities.

Uncommon Characteristics – there are uncommon characteristics for this polygon. This refers to FOD7-4 – Fresh- Moist Black Walnut Lowland Deciduous Type that are found as inclusions

- This habitat component is small (1-5%). It is an inclusion of minor significance.
- Typically associated with riparian zones and terraces, stream and river banks and floodplains.
- Areas of wet soils are rare and unusual at this site. There is no area which is continuous and demonstrates a clear connection between seeps and areas of FOD7-4 which is discontinuous. The sources of water along the wetted perimeter of the Cable
- Drain is a reflection of water elevation related to discharge fluctuation from baseflow above Polygon 2 and discharge related to storm events in the watershed above the site.

Economic and Social Values - There are no commercial values to the Black Walnut grove or shrubby areas of the Cable Drain since this area does not contain valuable trees that could be manufactured into lumber. Socially, the forested characteristics have a potential value for recreation for bird watchers. However it is noted that there are no pedestrian trails along the Cable Drain corridor and no pedestrians have been seen walking along the drain at the retirement home or in cropland.

The woodland will not be negatively affected by the proposed development because of setbacks, planned vegetative buffers which will use native species that are bioregionally appropriate and grown from native stock, and other mitigative measures proposed in this report.

SIGNIFICANT VALLEYLANDS

According to the Natural Heritage Reference Manual 2010 (NHRM), section 8.1, "Valleylands means a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year." In accordance with Section 8.3 of the NHRM there are no significant Valleylands on or within 120 m of the proposed development lands.

The development intent is to optimize recharge potential and have the predevelopment hydrograph mirrored in the post-development condition.

AREAS OF NATURAL AND SCIENTIFIC INTEREST

A review of current background information sources searched as part of this DAR did not identify any candidate or designated Areas of Natural and Scientific Interest (ANSI) on or within 120 metres of the proposed development site.

NATURAL HERITAGE SYSTEM

The MNHS includes the Cable Drain and provides a link to the Sydenham River corridor. This primary corridor contains the Sydenham River Wetland Complex. The Kerwood Woods and Kerwood Swamp are 4 km distant to the SW.

SIGNIFICANT WILDLIFE HABITAT / SPECIES AT RISK

A review of historical data from the St. Clair Region Conservation Authority and the MNRF was used along with site investigations at the study area to determine if significant wildlife habitat exists within or adjacent to the proposed development lands. Wildlife habitat was investigated in the study area to identify candidate Significant Wildlife Habitat (SWH).

Municipal Species at Risk Reference Guide for the Municipality of Strathroy-Caradoc

The ELC community mapping completed for this DAR was used as the basis for determining the presence (or absence) of candidate SWH that are found in the Municipality of Strathroy-Caradoc: Municipal Species at Risk Reference Guide. These include: Acadian Flycatcher, Bank Swallow, Barn Owl, Barn Swallow, Bobolink, Cerulean Warbler, Chimney Swift, Eastern Meadowlark, King Rail, Least Bittern, Louisiana Waterthrush, Prothonotary Warbler, Yellow-breasted Chat, Fish and Mussel SAR, American Ginseng, Drooping Trillium, False Hop Sedge, Goldenseal, Willowleaf Aster, American Badger, Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-colored Bat, Spoon-leaved Moss, Eastern Hog-nosed Snake, American Chesnut, Blue Ash, Butternut, Eastern Flowering Dogwood, Blanding's Turtle, Spiny Softshell Turtle, Spotted Turtle.

**None of these species was found in field studies. **

Natural Heritage Information Centre

Other potential species of fauna on the subject lands were determined through a search of Natural Heritage Information Centre data. A 1 km square (17MH4756) contains all of the subject lands and the

following species were listed as having the potential to exist in this general geographic area: Midland Painted Turtle, Least Bittern, Eastern Meadowlark, Snapping Turtle, American Burying Beetle, Tawny Emperor.

Potential Species of Conservation Concern out of those listed include: Acadian Flycatcher, Barn Swallow, Bobolink, Eastern Meadowlark, Least Bittern, Little Brown Myotis, Eastern Hog-nosed Snake, Butternut, Eastern Flowering Dogwood, Blanding's Turtle, Spotted Turtle, Midland Turtle, Least Bittern, Eastern Meadowlark, Snapping Turtle and Tawny Emperor.

None of these species was found in field studies.

OMNR Significant Wildlife Habitat Technical Guide (OMNR, 2000) and Significant Wildlife Ecoregion Criteria Schedules (OMNR, January, 2015)

The OMNR Significant Wildlife Habitat Technical Guide (OMNR, 2000) and Significant Wildlife Ecoregion Criteria Schedules (OMNR, January, 2015) were the primary documents used to identify and evaluate wildlife habitat. The Significant Wildlife Habitat Technical Guide describes five broad categories of wildlife habitat which includes: (1) seasonal concentration areas; (2) rare vegetation communities; (3) specialized habitat for wildlife; (4) habitat for species of conservation concern; and (5) animal movement corridors.

A review of these documents as well as technical monographs for individual species were used to determine if there is potential habitat for species of conservation concern.

Field Studies

Field studies using the protocols provided by OMNRF were undertaken during every site visit (See Appendix). The actual stream channel of the Cable Drain was walked with a collecting net to search for flora and fauna, especially SAR. In breeding bird studies and also observations for incidental bird sightings special attention was paid to species of conservation concern.

CONCLUSIONS:

No SAR or species of conservation concern were present during the field season of 2022.

SEASONAL CONCENTRATION OF ANIMALS

The Significant Wildlife Habitat Technical Guide (OMNR) 2000 has identified 14 potential types of seasonal concentration areas:

WINTER DEER YARDS

- The OMNRF has undertaken mapping for "Areas of Wintering Deer Yard Habitat". While there are deer game trails in the woodlands along the north and west edges of the proposed development lands there is no habitat within these lands which are under intensive agricultural usage.

MOOSE LATE WINTER HABITAT

- Not applicable in Middlesex County

COLONIAL BIRD NESTING SITES

- No observations of colonial nesting birds were made during the site field visits. Landscape use, terrain characteristics and habitat types are not conducive to colonial bird nesting within the study area.

WATERFOWL STOPOVER AND STAGING AREAS

- The Aylmer District of OMNRF, Canadian Wildlife Service and Ducks Unlimited Canada have jointly undertaken historical land reviews for potential significant waterfowl stopover and staging areas in Middlesex County. The subject lands have not been identified nor do they have suitable habitat to support this ecological function within the proposed licensed boundary or adjacent lands.

WATERFOWL NESTING HABITAT

- Waterfowl nesting habitat does not occur within the subject lands or the adjacent lands for Canada Geese.

SHOREBIRD MIGRATORY STOPOVER SITES

- No lands for shorebird migratory stop over occurs at the site lands.

LAND BIRD MIGRATORY STOP OVER AREAS

- There are no habitat opportunities within the agricultural lands which make up over 90% of the subject lands.
- Woodland and wetland areas provide opportunities for seasonal migrants and these areas will remain as they are and will not be impacted by the proposed development.

RAPTOR WINTERING AREAS

- There is potential for hawks such as Red-tailed hawk, Coopers Hawk and American Kestrel to find habitat at this site. All birds favor a landscape habitat mix of open fields, scrub land and woodlands. In this case with land use dominated by agriculture opportunities are limited and will be about the same in a developed state. It is noted that Red-tailed Hawks were seen flying over the site on a number of occasions in 2022. Since the surrounding regional landscape is largely rural and natural it is expected that raptors are commonly sighted.

WILD TURKEY WINTERING AREAS

- There is little to no potential for Wild Turkey at the subject lands.

TURKEY VULTURE SUMMER ROOSTING AREAS

- No suitable habitat or surrounding habitat features to support this ecological function were found within the subject lands or adjacent lands.

REPTILE HIBERNACULA

- No suitable habitat or surrounding habitat features to support this ecological function were found within the subject lands or adjacent lands.

BAT HIBERNACULA

- No suitable habitat or surrounding habitat features to support this ecological function were found within the subject lands or adjacent lands.

BULLFROG CONCENTRATION AREAS

- At the time of the spring field survey (May 23, 2021) no bull frogs were seen or heard calling. It is noted that habitat conditions were not suitable for any sizeable amphibian concentrations and there is no open water within the subject lands.

MIGRATORY BUTTERFLY STOPOVER AREAS

- The subject lands are under intensive agriculture with little old field character. Therefore, there is no suitable habitat or surrounding habitat features to support this ecological function within the proposed development lands or on adjacent lands.

WILDLIFE MOVEMENT CORRIDORS

No provincially or regionally significant corridors are designated for this area of Ontario. There are game trails within the woodlands and along the edges of farm fields but these are small and incidental. Field investigations confirmed that no significant wildlife corridor functions occur within the subject lands or adjacent lands. It is noted that there are game trails at the woodland edges that lead into the adjacent woodlands and disperse thereafter.

RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT

- RARE VEGETATION COMMUNITIES
    - No rare or unusual vegetation communities are found within the proposed development lands. Most of the land use is for agricultural purposes and the vegetation and ELC units within the subject lands and adjacent lands have been described as not significant in the foregoing.
- SPECIALIZED HABITAT FOR WILDLIFE
    - The Significant Wildlife Habitat Technical Guide (OMNR, 2000) identifies 12 categories for the evaluation of specialized habitat for wildlife:
    - Sites supporting area sensitive species:
        - No suitable habitat or surrounding habitat features were observed to support this ecological function within the subject lands or the adjacent lands. The majority of current land use within the subject lands is predominantly agricultural.
    - Forest stands providing a diversity of habitat:
        - The results of field studies indicate that the only forest stands of significance are in ELC polygons 7, 8, 9, and 10 and also on adjacent lands. The subject lands have only a very small fringe of woodland to the north and west.
    - Old Growth or mature forest stands:
        - There are no old growth characteristics, as defined by the Province for Old Growth Forests at the subject lands.
    - Seeps and Springs:
        - There are no seeps or clear springs on the subject lands.

        - There is no potential for over-wintering habitat for Wild Turkeys.
    - Woodlands Supporting Amphibian Breeding Ponds:
        - As noted earlier no open water was found at the subject lands or on adjacent lands. Amphibian breeding habitat was not identified in the spring field season.
    - Special Woodland Feeding Habitat:
        - There is no special woodland feeding habitat found in the subject lands or adjacent lands. No mast trees were found here.
        - It is not expected that development of the subject lands would negatively affect wildlife.
    - Osprey and specialized raptor nesting habitat:
        - No suitable habitat was found within the subject lands
    - Turtle Nesting Habitat:
        - Habitat suitable for Snapping Turtles was found along the Cable Drain but evidence of turtle nesting was not found within the subject lands or adjacent lands.
    - Special Moose Habitats:
        - Not applicable in Middlesex County.
    - Mink and Otter Feeding/Denning Sites; Marten and Fisher Denning Sites:
        - No suitable habitat for Otter was found at the subject lands or adjacent lands.
        - Mink feeding and denning habitat was not found at the subject lands or adjacent lands due to low quality of eutrophic waters.
    - Areas of High Diversity:
        - There are no areas of high diversity and specialized microhabitat on the subject lands.
    - Cliffs and Caves:
        - No geological features of this nature were identified within the subject lands or the adjacent lands.

HABITAT OF SPECIES OF CONSERVATION CONCERN

FLORA

Field investigations of the subject lands and adjacent lands included plant surveys which were used to complete Ecological Land Classification inventories and habitat descriptions. Plants are described in Appendix "A" – Plant Species List. *It is noted that no plant species of Conservation Concern at any level of classification was found.*

FAUNA

The results of the background information review, ELC mapping and field surveys showed that the subject lands do not contain significant wildlife habitat features. Wildlife is described in Appendix 'B', Wildlife Species List

Scattered Monarch Butterflies were found associated with the same areas where Milkweed was flowering along the edges of cropland.

AQUATIC HABITAT ASSESSMENT

The Cable Drain is located west of the proposed development and as mentioned in the Functional Servicing Report (FSR) was completed by B.M. Ross and Associates Limited (BMROSS) in December 2022, it is proposed to have a stormwater management facility that outlets into the drain. For this reason, the SCRCA requested an aquatic habitat assessment be completed.

The Cable Drain contains a 2.5-metre bottom width and 3:1 side slopes, including bank seeding and protection with erosion control blanket. The drain collects stormwater runoff from agricultural lands (on the subject lands and lands north-west of the site) and outlets to the Sydenham River approximately 2km south of the site.

At the bottom end of the study area the Cable Drain is impounded by an informal wooden barrier that blocks a GSW culvert under Napperton Drive. This creates a head of approximately 1.0 metre upstream from the culvert when there is sufficient flow. In the months of July and August the water level draws down and the impounded water is sluggish and green, appearing to have filamentous algae and to be eutrophic.

Contact was made with Cheryll Dickson who is a regional manager of OMNRF. She provided a referral me to Darren Ungar who is a wildlife specialist with MNRF and has access to historical records. Following a formal request Mr. Ungar took several weeks to check records and a more recent database for fish in the Cable Drain. No information was found by Mr. Ungar and he provided the opinion that in a situation like this the stream in question was not considered to have fisheries potential and was not surveyed by MNRF.

The Cable Drain was initially reviewed by walking the length of the study area in an unleafed condition (November 2021) and periodically walking down side slopes to assess depth and substrate conditions. Water temperatures were noted and a D-net was used to scoop up and examine bottom sediments at regular intervals. The drain itself was walked along a center line with a D-net in an attempt to find turtles and fish. No fish were noted in the drain and mussels were not found either. Over the course of all surveys, signs of turtles such as excavations at the top of banks or egg remnants or basking logs were searched for. No turtles were found in the drain or in the immediate vicinity of farmland.

Aquatic habitat was surveyed by walking the length of the drain with a D-net. The general appearance of the water and temperature at various times of the spring and summer as well as the presence/absence of aquatic plants and algae were noted. Signs of amphibians and reptiles were searched for. The presence/absence of fish and mussels were searched for with a D-net. It is noted that from at least the area of Polygon 2 the character of the Cable Drain was one of a eutrophic system with low biodiversity. The stream substrate was fine sediment as would be expected from agricultural lands and erosion on a clay plain.

Section 34 of the Fisheries Act notes that, "…" fish habitat" means spawning grounds and nursery, rearing, food supply and migration areas on which fish depend on directly or indirectly in order to carry out their life processes …". *Due to physical barriers to fish migration and a sluggish low flowing eutrophic condition of the Cable Drain there is no significant fish habitat at this site.*

In accordance with the new Fisheries Act the barrier at the Cable Drain "weir" at the culvert under Albert St. should be removed. Buffering of the Cable Drain corridor with a 30-metre naturalized set back

will greatly help with sediment encroachment from surrounding agricultural activities. The modern SWM facilities with extensive use of Stormceptors will assist water quality by preventing oil and grease from entering the SWM stream.

The new Fisheries Act improves the protection of our fisheries and their ecosystems. Lost protections are provided with comprehensive protection for all fish and fish habitat. The previous prohibition against the harmful alteration, disruption and destruction of fish habitat (HADD) has been restored. It provides for strengthening the role of Indigenous peoples in project reviews, monitoring and policy development as part of early steps to advance reconciliation and recognizes that decisions can be guided by principles of sustainability, precaution and ecosystem management.

As well, the Fisheries Act promotes restoration of degraded habitat and rebuilding of depleted fish stocks and allows for the better management of large and small projects impacting fish and fish habitat through a new permitting framework and codes of practice. New fisheries management tools can be used to enhance the protection of fish and ecosystems in situations such as the Cable Drain and this project.

AGRICULTURAL LAND / HEDGEROW ASSESSMENT

The subject lands are currently farmed and contain hedgerows along County Lane to the west, Dominion Street to the east, and adjacent to Napperton Drive to the south. The trees adjacent to Dominion Street and County Lane are not proposed to be disturbed. Some trees adjacent to Napperton Drive / Albert Street are proposed to be removed to provide access to the proposed development.

The study area is situated within a clay plain. Site soils and those of the surrounding agricultural lands are poorly drained partly due to a low general slope and also poor internal drainage. Due to many decades of agricultural activities the farm lands have become compacted and have also shed fine soil particles and these are found as a fine mucky substrate within the drain bottom.

Recent cropping has been continuous corn from one year to another. Field investigations from November 2021 to September 2023 found only corn. There was no evidence of other crops at field verges or very small areas of fallow lands at polygon perimeters. There was no evidence of fallowing or hay crops that would be significant for grassland birds.

The agricultural fields to the east of the Cable Drain have been used for agriculture for many years. The entire area is a clay plain with poor internal drainage. Over time these fields have been compacted and there is no vestige of the original habitat cover due to continuous tillage and the use of agricultural chemicals such as atrazine and Roundup. Between crops the fields are often left with no trash and are subject to erosion. The only plants left are aggressive and opportunistic non-natives (SNA). These fields were searched for grassland bird species as far as 120 metres from the Cable Drain and occasionally binoculars for species flying overhead. NO SAR species were observed at any time during the field season between April and October.

There was a concern as well that trees along Napperton Drive would be cut or disturbed by limbing and that potential habitat for SAR would be lost of disturbed. This was not the case as

no SAR habitat was found and no SAR bird species were observed in this area. It is also noted that tree species such as Silver Maple or Shagbark Hickory which are favored by bats were not found here.

NATURAL HERITAGE INFORMATION CENTRE

A search of the 1 km square information in the "Make A Map" function of the NHIC website revealed 6 species of conservation concern within the 1 km square which contains the subject lands. These species have the potential of being at the subject lands if adequate habitat is available.

- Midland Painted Turtle – SC - Special Concern: The midland painted turtle is currently listed as Special Concern under the federal Species at Risk Act (2018) and has yet to be assessed by the Committee on the Status of Species at Risk in Ontario. The species has been designated as a Specially Protected Reptile under the Ontario Fish and Wildlife Conservation Act which offers protection to individuals but not their habitat. This species was searched for along with other potential turtles and was not found. It is expected that the natural habitat at the subject lands is too degraded to meet their needs.
- Least Bittern – THR - Threatened: The Least Bittern is currently listed as Threatened under both the federal Species at Risk Act and the provincial Endangered Species Act. "Threatened" means the species lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it. In Ontario the Least Bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels.
  Small numbers of this bird breed in southern Ontario but this species has disappeared from much of its former range, especially in southwestern Ontario, where wetland loss has been most severe. This is the situation at the subject lands where habitat is very limited and the aquatic habitat is degraded and eutrophic. This species was searched for during field studies over the course of the summer and was not found.
- Eastern Meadowlark – THR - Threatened: There is potential habitat along the length of the subject lands but no birds were detected at any time in field surveys. Though still common and wide spread, the Eastern Meadowlark was recently designated as a threatened species in Ontario, primarily as a result of strong population declines that have been occurring in Ontario and across most of their breeding ranges. This species was searched for during field studies over the course of the summer and was not found. It is suspected that this absence is due to habitat disturbance and that the crop rotations on agricultural lands surrounding the study area do not include hay or pasture.
- Snapping Turtle – SC – Special Concern: habitat with the potential for life cycle and overwintering is found in the main lower creek and associated floodplain. Despite extensive searches for this species and other turtles none were found in 2022. The SC designation means that the species lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.
- American Burying Beetle – EXP – Extirpated: This species is believed to be extirpated in this area of Ontario and has not been seen since 1972. Its preferred habitat is in a woodland setting which is limited at the subject lands.

- Tawny Emperor – G5 – apparently Secure: This species of butterfly does not have a ranking under SARO or CSEWIC. It was not detected over the course of field studies.

NOTE: Any areas of potential habitat will not be disturbed by this project. The proposed 30 metre buffer from top of bank and the dripline of the Black Walnut grove will provide sufficient mitigation to protect and promote the foregoing wildlife species.

SIGNIFICANT WILDLIFE HABITAT CRITERIA SCHEDULES

A review of the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (January, 2015) indicates that the following significant wildlife habitat and related species may be found at this site.

Identification of Significant Wildlife Habitat

Raptor Wintering Area

There is potential for Red-tailed Hawk to over winter at the site lands.

The habitat association is with deciduous woodlands and open lands where prey such as meadow voles or rabbits may be found.

The overall habitat provides a combination of fields and woodlands that provides roosting, foraging and resting habitats for wintering raptors. It is noted that Red-tailed hawks have been observed in incidental sightings overhead at the subject lands from March to September.

Turtle Wintering Areas

There may be over wintering sites for Snapping Turtles in swamps with both standing and flowing water.

For most turtles wintering areas are in the same general areas as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates.

Over-wintering sites are permanent water bodies, large wetlands and bogs or fens with adequate dissolved oxygen.

The mapped ELC ecosite area with potential for over wintering turtles is associated with polygon 4 and adjacent sections of the Cable Drain and adjacent lands downstream.

It is noted that ditches and lower wetland areas on the main stream in the south end of the site were searched and no turtles were found.

Reptile Hibernaculum

Despite a concerted effort from March to September no snakes were found at the site. This is likely due to a lack of habitat in the agricultural fields.

Deer Yarding Areas

Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of snow and cold.

Despite a limited amount of potential SWH and deer (signs in the agricultural fields at the site there is no mapped habitat for the subject lands.

Deer Winter Congregation Areas

As above for Deer Yarding Areas.

Woodlots are below a typical threshold (4 Hectares) of recognized habitat.

Rare Vegetation Communities or Specialized Habitat for Wildlife

Seeps and Springs are typical of headwater areas and are often at the source of cold-water streams.

This would have been true at one time before headwater drainage was put in the existing tile drains and the Ward and Cable Drains were created. However the general habitat has been degraded and water quality has been generally degraded and now appears eutrophic with a characteristic green caste and filamentous algae (Cladophora or Lyngbaea) floating in the central channel and accumulating where the channel widens and above the makeshift weir at the culvert on the bottom end of the study area.

Seeps and springs that are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species but this is not found at the subject lands.

Amphibian Breeding Habitat (Woodland)

This type of habitat does not occur at the subject lands.

These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.

Wildlife associated with this habitat include: Eastern newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog.

A combination of observational study and call count surveys could detect very few frog calls and only those of *pickerel frogs from the vicinity of polygon 4 on July 11;* there were very few calls. This situation was probably due to low water quality.

HABITAT FOR SPECIES OF CONSERVATION CONCERN (NOT INCLUDING ENDANGERED OR THREATENED SPECIES)

OPEN COUNTRY BIRD BREEDING HABITAT

This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly over the past 40 years based on CWS (2004) trend records.

The site species for this category includes Savannah Sparrow which is apparently secure.

Habitat Criteria and Information Sources

Grasslands 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 grassland areas than the common grassland species.

Defining Criteria

A field with 1 or more breeding Short-eared Owls is considered SWH.

The area of SWH is the contiguous ELC ecosite field areas.

Conduct field investigation 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.

SHRUB/EARLY SUCCESSIONAL BIRD BREEDING HABITAT

This wildlife habitat is declining throughout Ontario and North America.

The site species for this category includes Field Sparrow.

Habitat Criteria and Information Sources

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. not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years).

Shrub thickets 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, with abandoned fields or pasturelands.

Defining Criteria

Field Studies confirm:

Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.

A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat.

The area of the SWH is the contiguous ELC ecosite field/thicket area.

Conduct field investigation 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”.

OTHER POTENTIAL SWH CHARACTERISTICS AND FEATURES.

Other potential SWH characteristics and features as described in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (January, 2015) are not included here due to a lack of necessary and defining criteria such as wildlife species or habitat characteristics.

NOTE: Any areas of potential habitat will not be disturbed by this project. The proposed 30 metre buffer from top of bank and the dripline of the Black Walnut grove will provide sufficient mitigation to protect and promote the foregoing wildlife species.

ENGINEERING CONSIDERATIONS

HYDROLOGY / HYDROGEOLOGY / SITE SERVICING

Surface Water

As mentioned in the Flood Hazard Assessment, completed by Greck and Associates Limited on July 29, 2021, there is a municipal drain (Cable Drain) that intersects the proponents land holdings. As mentioned in the assessment, *"the drain conveys runoff from primarily agricultural lands in a southerly direction towards a watercourse crossing at Napperton Drive. Beyond Napperton Drive, the Cable Drain continues to drain in the southwest direction until its ultimate outlet location into Sydenham River".*

Groundwater

Geotechnical investigations reports were completed by EXP Services Inc. on April 7, 2021 and April 6, 2023. The 2021 report identified that groundwater was measured near depths of 2.1m to 4.4m in 11 test pits. Most of these test pits are located outside the lands proposed for development. Four of these are located on the lands proposed to be developed and are located in the centre of the development and one in the north-east corner of the development. The remaining 22 test pits were dry.

A Functional Servicing Report (FSR) was completed by B.M. Ross and Associates Limited (BMROSS) in December 2022. The report includes information on the servicing and stormwater management for the proposed residential management. The report includes the following information on the road, water, sanitary and storm networks.

STORM DRAINAGE

Existing Drainage Outlets

As mentioned in the FSR, "the existing Cable Municipal Drain runs south from Pike Road and Saulsbury Street towards Napperton Drive, and is currently the legal outlet for all the development lands. The predevelopment conditions are overland flow through most of the development areas. However, some of the flow is tributary into existing storm sewers along the north edge of Napperton Drive and conveyed to the Cable Drain at the Napperton Drive culvert crossing."

As mentioned in the FSR, due to a redistribution of floodwater to achieve a balanced flood volume, an area will be cut from the southern most section of Block 137, (approximately 700 cubic metres).

Storm Sewers

As mentioned in the FSR, "… storm drainage within the proposed development will be by conventional gravity sewers, discharging to the existing Cable Municipal Drain.

The storm sewers will be designed using a 5-year design storm for the minor system each and each residential lot will have a 150mm PVC storm service connection and a rear yard catch basin connected to the storm service."

Stormwater Management

AS mentioned in the FSR, "… the proposed SWMFs will be designed to provide storage for surplus runoff from a 100-yr storm event for the entirety of the proposed Plan of Subdivision. The SWMF located in

Block 137 will be an extended detention wet pond with a sediment forebay and permanent pool sized for Enhanced 80% long-term TSS removal under 60% imperviousness. The SWMF will consist of a control structure with a reverse slope pipe and orifice plates to restrict flow to predevelopment rates and achieve a 24hr draw-down time for the treatment events. The SWMF basin will utilize stepped side slopes of 3:1 and 7:1 for safety as per MECP guidelines."

The FSR also provides the following information on the proposed infiltration basin:

The infiltration basin located in Block 136 will have 4:1 side-slopes, an inlet headwall with energy dissipation features, and rip rap protection over the basin bottom to reduce erosion potential and protect the soils from compaction during rainfall events. The outlet from the SWM basin will consist of a grated outlet structure with an outlet pipe with an orifice sized as a flow restrictor to control discharge to the downstream system to pre-development levels. The minor storm events will be infiltrated through the bottom of the pond with major events using the orifice to control flows to within predevelopment rates.

The hydrograph of the two (2) SWMFs will be used to determine that the cumulative flows are restricted to the predevelopment flow rates."

To address stormwater quality, The FSR mentioned that, "… it is proposed to implement a combination of lot level and end-of-pipe quality control measures in the development. Roof drainage shall be discharged to the ground surface and directed to flow overland through landscaped areas towards rear yard catch basins and the road to promote filtration and absorption of runoff. The catch basins on the proposed road shall be provided with appropriate sumps per Strathroy-Caradoc Standards. The gravity collection sewers tributary to SWMF in Block 136 shall flow through an oil-grit-separator (OGS) to collect suspended sediments, oils, and floatable debris and reduce the potential for the conveyance of contaminants to the downstream receiver. The proposed OGS unit will be a Stormceptor® EF-8 unit or approved equivalent sized to provide an 80% TSS removal rate meeting the Enhanced level of treatment.

In order to ensure the stormwater quality control features, continue to function properly the catch basins, manholes, and Stormceptor® devices shall be inspected annually to monitor the amount of oil and sediment collected. The catch basin and OGS sumps will be pumped out and accumulated deleterious materials disposed of as required. The inlet and outlet devices in the OGS unit shall also be checked for any trapped debris or blockages and be cleaned as required."

POTENTIAL PROJECT IMPACTS

NATURAL HERITAGE

VEGETATION

Field studies have determined that there are no species of conservation concern within the designated study area. Bitternut Hickory (Carya cordiformis) (S3) and Black Walnut (Juglans nigra) (S4) are the only other species of interest. These are apparently secure and within the study area. These species would only be impacted if natural areas were disturbed which is unlikely since the stream corridor will be buffered by a 30 metre naturalized and reforested setback from the top of bank and the dripline of the Black Walnut grove.

The additional homes proposed in the area could negatively impact vegetation communities with landscaping elements that could include invasive garden plants. Construction of roads, servicing, and homes could also impact mature trees located along the rear lots of Dominion Street and County Lane. Measures shall be put in place to mitigate any impact of invasive plants on the natural feature and any impacts construction activities may have on root zones of any mature trees. Trees should also be replaced at a minimum ratio of 2 trees for every tree removed, in order to restore the urban canopy in the area. These trees should be in addition to street trees, and may be provided in the proposed parkland in the subdivision and/or in the buffer area.

WILDLIFE

Species of Conservation Concern were determined to be Carolina Wren (Thyrothorus ludovicianus) (S4), Field Sparrow (Spizella pusilla) (S4B), and Kildeer (Charadrius vociferus) (S4), and Monarch Butterfly (S4B). These species are apparently secure and habitat is found within the study area. Field studies did not find appropriate habitat for these species within adjacent lands. If the study area is disturbed then species will be disturbed.

The proposed development includes the removal of several deciduous trees along Albert Street, at the south side of the development. As these trees may be capable of containing SWH for SAR bats and/or birds, provisions shall be put in place to ensure that any tree removals avoid both active bat season and nesting activities of birds.

The additional homes proposed in the area could include domestic pets, which could encroach onto the natural feature and disturb wildlife. Measures shall be put in place to mitigate any impact domesticated animals may have on wildlife.

Middlesex Natural Heritage System (MNHS)

The corridor of the Cable Drain is within the MNHS. No special status is given to this reach of the corridor. A disturbance of the corridor could negatively impact on habitat through fragmentation and a direct loss of wildlife habitat which is on-site and downstream beyond the study area. The intent of this project is to enhance the corridor with a substantial buffer of 30 metres from the top of bank and the dripline of the Blac Walnut grove. The buffer will be re-naturalized with native trees, shrubs, grasses and forbs that are intended to provide cover, nesting habitat and food. As well additional wildlife habitat features such as brush piles, water collecting swales, bat boxes and houses and blue bird houses will be part of this approach.

ENGINEERING CONSIDERATIONS

The disturbance of development lands during installation of services and infrastructure during various construction phases could cause problems with erosion and sediment runoff over land and into storm sewers.

STORM WATER MANAGEMENT

Storm water management for both quality and quantity needs to be considered. This is especially true to protect the stream corridor and stream itself. There is always the potential for SWMF to be overwhelmed by 100 year and larger storm events which could be damaging to property and wildlife habitat.

It is also important to maintain the pre-development stormflow characteristics to protect aquatic and terrestrial habitat; this is especially important within the context of the MNHSS.

QUALITY CONTROL

It is especially important to maintain quality control of SW where the discharge will go directly into a water course and a sensitive natural heritage corridor. This is important for maintaining integrity in the long term and the habitat of extant species which inhabit the corridor. Both sediment load and chemicals such as grease and oil need to be mitigated.

PROPOSED MITIGATION

The greatest mitigation from potential impacts is maintaining a 30-metre offset from the Cable Drain top of bank as required by the municipality. These buffers shall be naturalized with plants that are bioregionally appropriate and will help to create a habitat that is suitable for the wildlife that was found in the site surveys and grassland bird species. The recommended setback would provide sufficient space for tree-fall and for protection of root zones of trees located in Polygon 2. It would also reduce impacts of light and noise on the feature and provide additional separation to mitigate impacts from domestic pets. While the proposed setback with a naturalized buffer would be the most efficient form of mitigation, the following mitigative measures are also recommended, in order to provide additional protection to the natural features:

- Provide an Erosion and Sediment Control (ESC) Plan prior to construction, which may include:
    - Silt fencing along the limits of construction and be inspected regularly
    - Topsoil piles that are required to be located away from natural features and silt fencing to be provided around the piles and
    - Requirement that no site alteration, including grading, shall occur in the naturalized buffer area.
- In the property covenant for each lot in this subdivision the use of road salt will not be allowed and streets and sidewalk maintenance shall use sand and stone dust only.

The ESC plan would mitigate construction impacts on the natural feature, through the implementation of standard mandated approaches. Standard methods will be implemented and maintained through all phases of development.

SAR BATS AND TREE NESTING BIRDS

While there would be no vegetation removed from the natural features adjacent to the Cable Drain, there would be tree removal required along Albert Street, in order for a road and Municipal services to service the development. Tree removal may also be required adjacent to the proposed stormwater management facility at the south side of the development. To mitigate any impact to SAR bats and birds that may use these trees, it is recommended that the following be incorporated into a future development agreement with the Municipality:

- No vegetation clearing between April 1 and August 31 shall occur, in order to limit disturbances to nesting activities of birds and
- No vegetation clearing between April 1 to September 30 shall occur, in order for tree removal to occur outside the bat maternity window.

If SAR are found or are occasionally encountered during construction activities an ecologist will be brought to the site to review the situation with staff from the SCRCA. A plan to remedy the situation such as ceasing activities temporarily or shifting these to a more appropriate time will be put in place in order to protect SAR activities and habitat. As well, fencing or hoarding may be put in place to direct SAR and to keep construction activities away from SAR corridors and habitat.

VEGETATION

As construction of the new services and homes in the subdivision has potential negative impacts to mature hedgerows on adjacent lands, it is recommended that the following be required to mitigate any potential impacts:

- Construction limit fencing should be established along the edge of the hedgerow and be installed a minimum of 1m from the dripline (where possible) and
- Tree protection fencing should be installed prior to any construction activities or site alteration.
- All removed trees shall be replaced with new trees at a 2:1 ratio, with new trees of an indigenous species.

STORM DRAINAGE

Pre-existing Storm Flow will be re-routed through new facilities with sufficient capacity prior to development. Larger capacity storm sewers will replace older storm sewers on Napperton Drive from County Lane to the Cable Drain crossing. As a section of Block 136 is within the regional floodplain, the flood volume filled was calculated with a cut-fill analysis. The volume filled has been replaced with a cut volume greater than the required fill volume. The location of the cut area has been determined in coordination with SCRCA to restore this area to a more natural condition.

STORM WATER MANAGEMENT

QUANTITY

The existing lands or the proposed Plan of Subdivision and the adjacent properties have been analyzed to determine the proper catchment areas and pre-development flow rates that are tributary to the Cable Drain. The proposed SWMFs will be designed to provide storage for surplus runoff from a 250-yr storm event for the entirety of the proposed Plan of Subdivision.

The control structures for each SWM basin will consist of orifice plates and weirs used to control the outlet of each SWM basin so that the sum of each hydrograph is restricted to the total pre-development rates for the 25mm, 5yr, 10yr, 25yr, 50yr, 100yr and 250yr storm events.

QUALITY

Quality control will be carried out through a combination of an extended detention SWM wet pond complete with a forebay and a dry pond with OGS, both designed to enhanced protection level with 80% TSS removal.

As mentioned in the FSR stormwater quality will be addressed through a combination of lot level and end-of-pipe quality control measures in the development …", as previously described. The use of perforated rear-yard catch basins will allow for more groundwater exfiltration of smaller events, better

representing the existing hydrological cycle within the area. A piped connection to the storm sewer will allow the conveyance of stormwater that cannot be exfiltrated to the end-of-pipe controls.

As mentioned in the FSR, "…the multi-component SWM approach will be designed to meet MECP guidelines for quantity and quality control for the proposed residential development. The storm sewer infrastructure will be designed to capture and convey runoff for the minor system. Major storm runoff in excess of what can be accommodated by the minor collection system will flow overland along the road allowances to the SWMF."

As mentioned in the FSR, "... in order to endure the stormwater quality control features continue to function properly, there should be annual inspection and maintenance of all stormwater infrastructure.

RECOMMENDATIONS	
	NATURAL HERITAGE
	VEGETATION
	Trees replaced at a minimum ration of 2 trees for every tree removed. These trees should be in addition to street trees and may be provided in the proposed parkland in the subdivision or in the buffer area.
	Measures shall be put in place to mitigate any impact of invasive plants on the natural features and any impacts construction activities may have on root zones of any mature trees.
	WILDLIFE
	There is a concern regarding bats in the vicinity of Albert Street. Bat habitat will be protected and bat habitat will be replaced/augmented with bat houses.
	No vegetation clearing between April 1 and August 31 shall occur in order to limit disturbances to nesting activities of birds
	No vegetation clearing between April 1 to September 30 shall occur, in order for tree removal to occur outside the bat maternity window.
	No grading of current agricultural lands during periods of nesting. Construction limit fencing should be established along the edge of the hedgerow and be installed a minimum of 1 metre from the dripine; Tree protection fencing should be installed prior to any construction activities or site alteration; All removed trees shall be replaced with new trees at a 2:1 ratio with new trees being bioregionally appropriate native trees.

	MIDDLESEX NATURAL HERITAGE SYSTEM
	The immediate corridor of the Cable Drain is within the MNHS.
	The intent of this project is to enhance the corridor with a substantial buffer of 30 metres from the top of bank. The buffer will be re-naturalized with native trees, shrubs, grasses and forbs that are intended to provide cover, nesting habitat and food. As well, additional wildlife features such as brush piles, water collecting swales, bat houses and blue bird house will part of this approach.

ENGINEERING CONSIDERATIONS	
	Maintaining a 30 metre off set from the Cable Drain top of bank.
	Provide an Erosion and Sediment Control (ESC) Plan that includes: Silt fencing along the limits of construction; Topsoil piles located away from natural features and bounded by silt fencing; no site alteration, including grading, shall occur in the naturalized buffer area.
	In the property covenant for each lot in this subdivision the use of road salt will not be allowed and streets and sidewalk maintenance shall use sand and stone dust only.
	The proposed SWMFs will be designed to provide storage for surplus runoff from a 250 year storm event for the entirety of the proposed Plan of Subdivision.
	Quality control will be carried out through a combination of an extended detention SWM wet pond complete with a forebay and a dry pond with OGS, both designed to enhanced protection level with %80 TSS removal.

CONCLUSIONS

In accordance with the Middlesex County Official Plan (2007), development applications within or adjacent to Natural Heritage Features shown on Schedule 'C' shall require submission of a Development Assessment Report (DAR). The DAR shall describe the ecological processes creating and maintaining the affected elements of the Natural System and indicate the potential impacts of the proposed development upon those processes. Where the Development Assessment Report indicates that there will be a negative impact on the natural system or ecological process that cannot be adequately mitigated, the development applications shall not be approved. If local municipalities require a Development Assessment Report or equivalent impact assessment document or equivalent impact assessment document as part of their approval process, the County will waive its requirement, provided the impact assessment submitted to the local municipality meets the County's requirements as set out below

The Development Assessment Report shall be undertaken to a professional standard and approved by the County. The DAR shall address the following:

A) Description of the development;

B) Description of the natural features;

C) Identification of Potential Impacts;

D) Identification and Recommendation of Mitigation Measures.

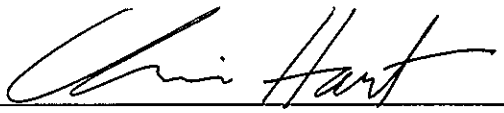
This report is the Development Assessment Report for the Buchanan Crossings project.

The above approach has been undertaken in accordance with Provincial and Municipal requirements.

It is the opinion of the author that the proposed development can be undertaken with minimal impact on the Cable Drain and the MNHS. It is anticipated that there will be no negative impact on the natural

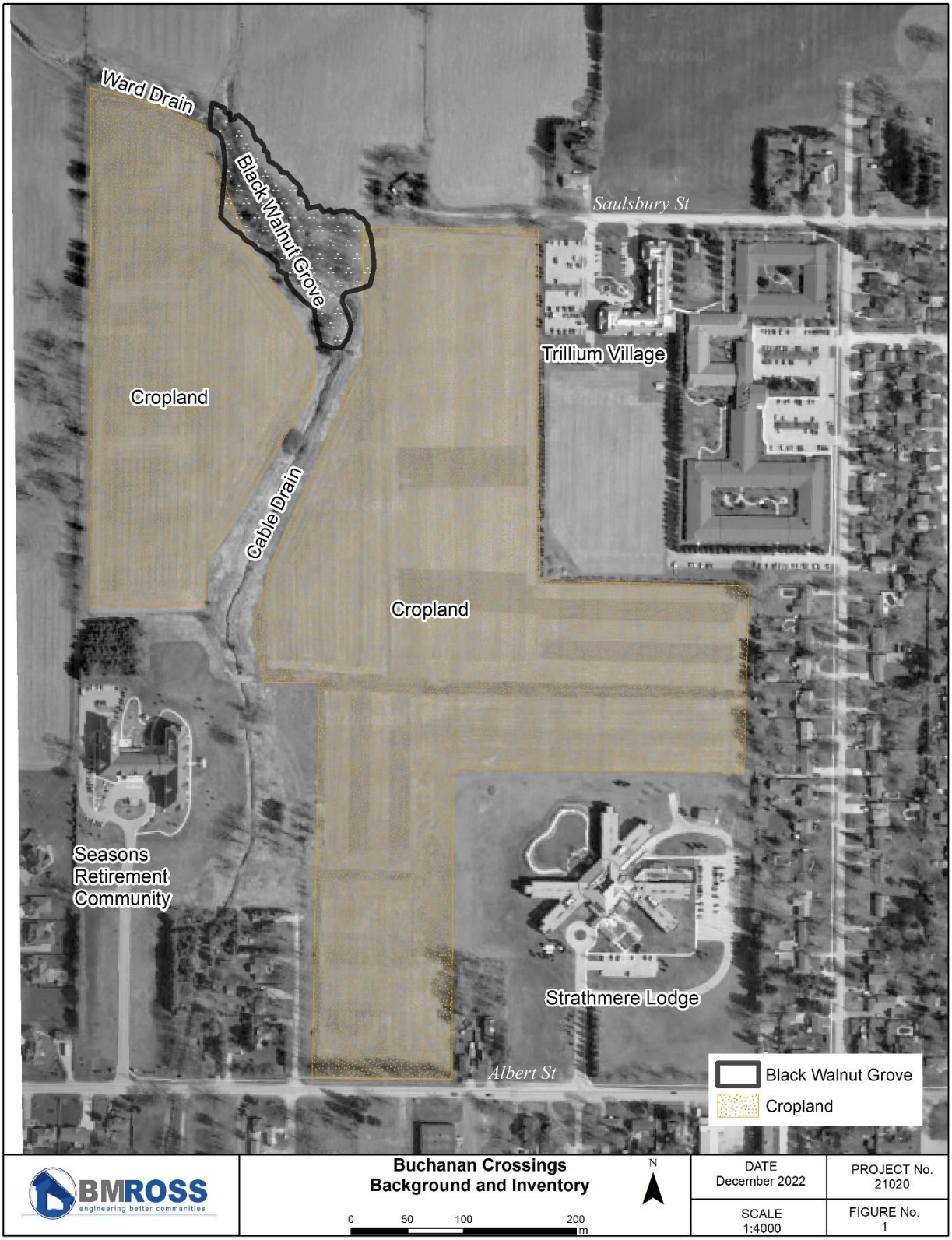
system or ecological processes that cannot be adequately mitigated. For these reasons, it is the opinion of the author that the development proposal is consistent with Section 2.1 of the PPS.

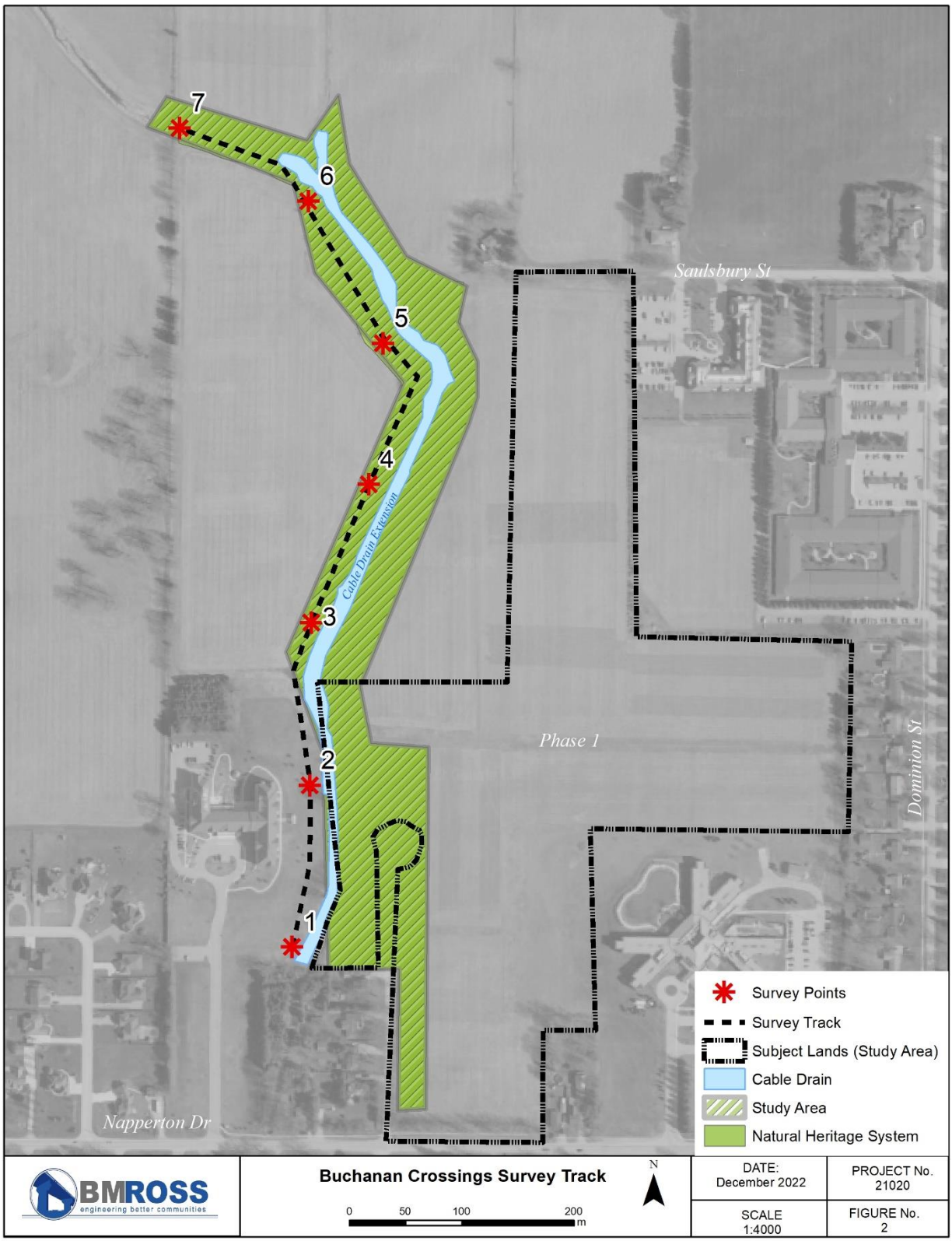
Respectfully submitted (October, 2023).



Christopher Jay Hart, M.Sc., M.L.A., OALA, CSLA - Ecologist / Landscape Architect

FIGURES


Ward Drain
Black Walnut Grove
Saulsbury St
Trillium Village
Cropland
Cable Drain
Cropland
Seasons
Retirement
Community
Strathmere Lodge
Albert St
Black Walnut Grove
Cropland
BMROSS
engineering better communities
Buchanan Crossings
Background and Inventory
N
0 50 100 200 m
DATE
December 2022
PROJECT No.
21020
SCALE
1:4000
FIGURE No.
1


7
6
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4
3
2
1
Saulsbury St
Cable Drain Extension
Phase 1
Dominion St
Napperton Dr
Survey Points
Survey Track
Subject Lands (Study Area)
Cable Drain
Study Area
Natural Heritage System
BMROSS
engineering better communities
Buchanan Crossings Survey Track
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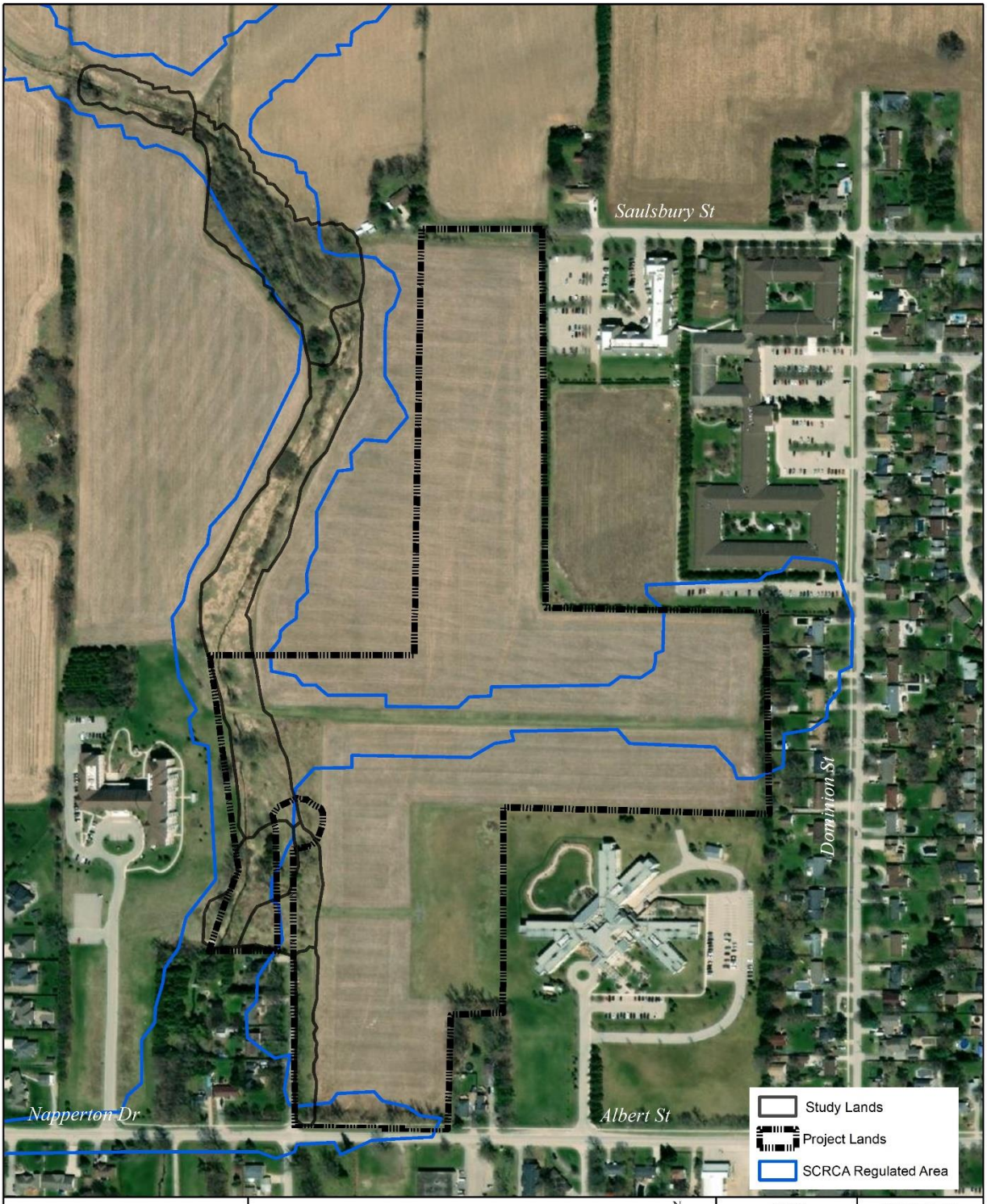
50
100
200
m
DATE:
December 2022
PROJECT No.
21020
SCALE
1:4000
FIGURE No.
2



BMROSS engineering better communities

Buchanan Crossings
SCRCA Regulated Area

0 50 100 200 m

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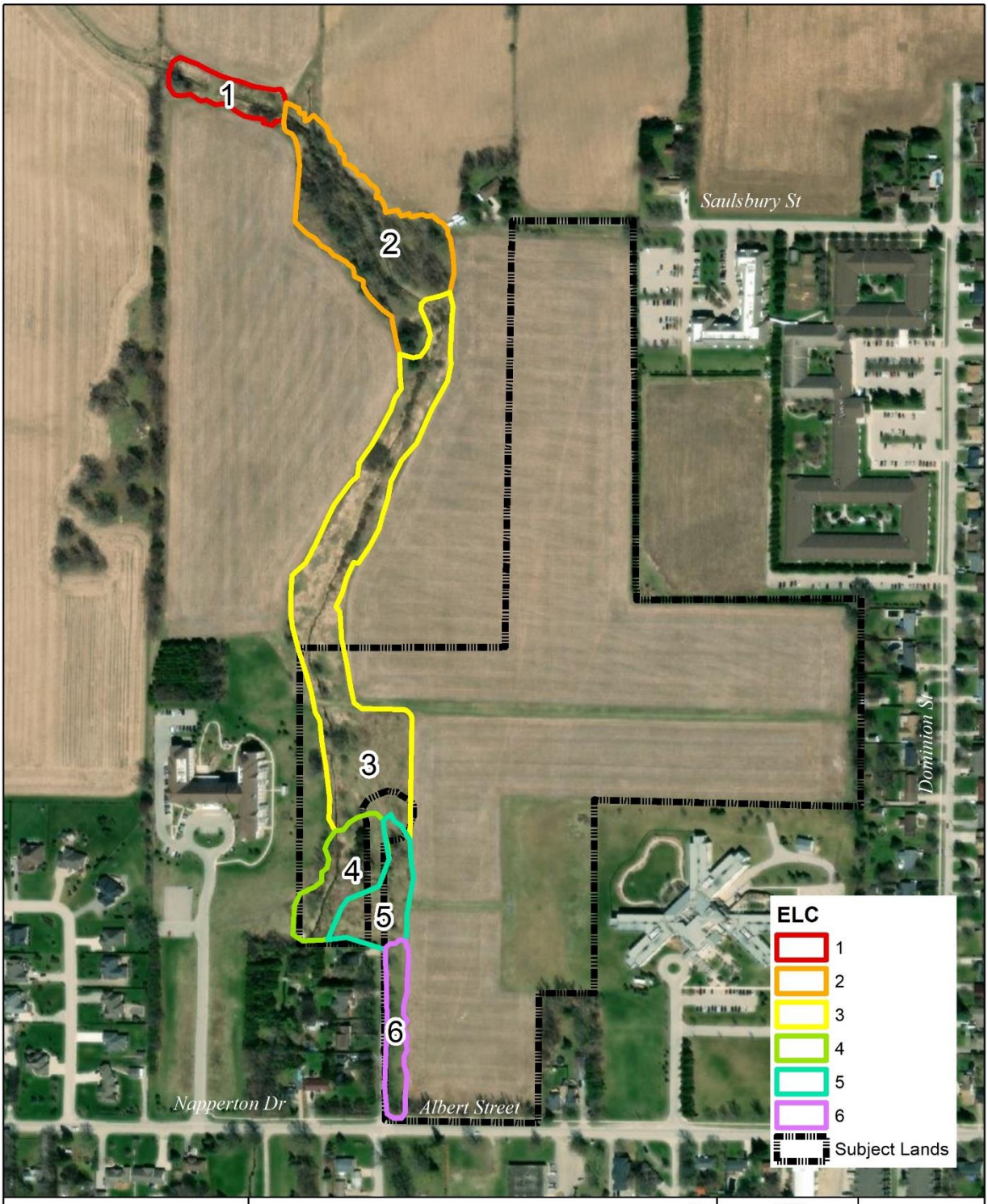
DATE	PROJECT No.
December 2022	21020
SCALE	FIGURE No.
1:4000	3


1
2
3
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6
Saulsbury St
Dominion St
Napperton Dr
Albert Street
ELC
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Subject Lands
BMROSS
engineering better communities
Buchanan Crossings
Ecological Land Classification
0 50 100 200 m
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DATE
October 2023
PROJECT No.
21020
SCALE
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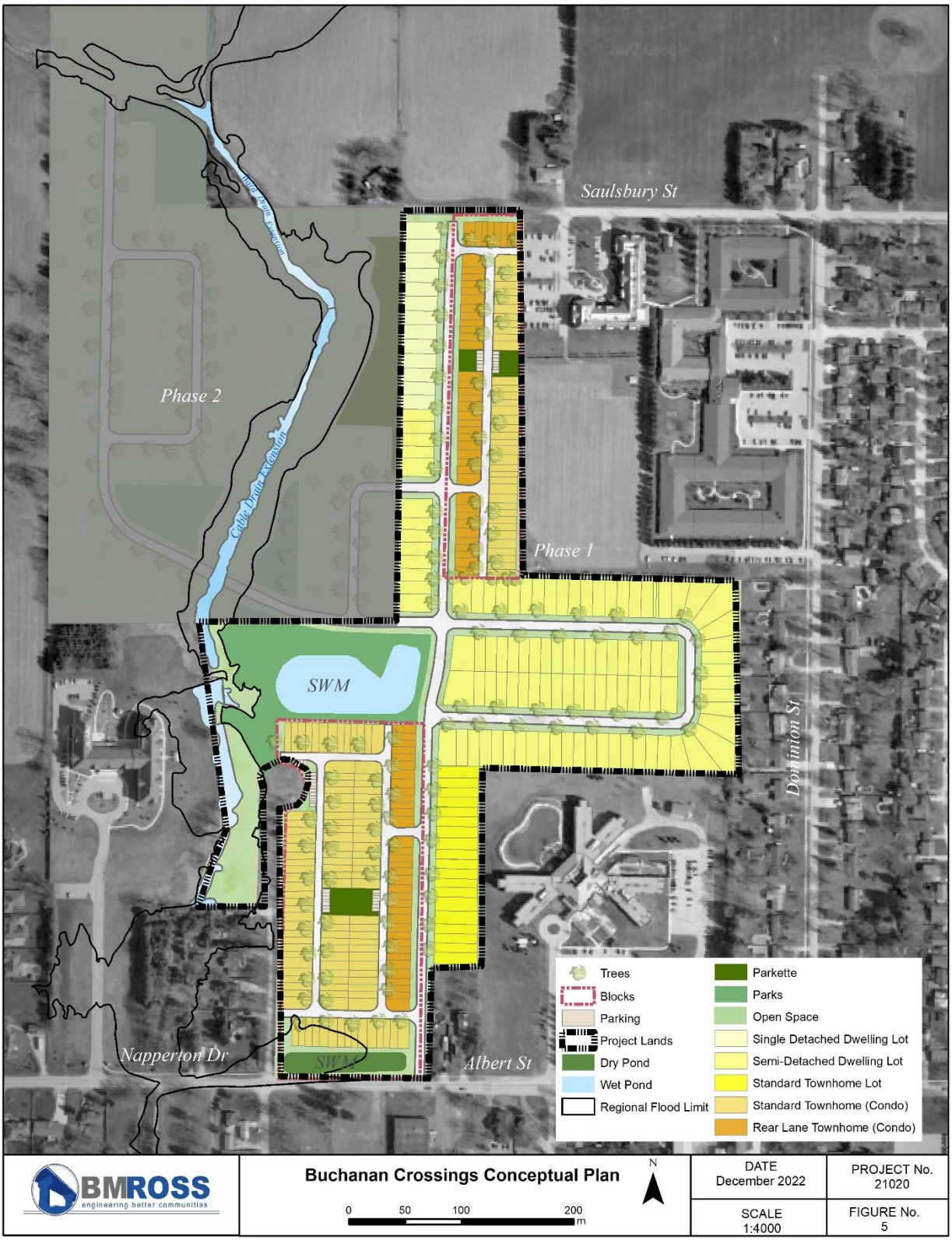
FIGURE No.
4


Saulsbury St
Phase 2
Phase 1
SWM
SWM
Dominion St
Napperton Dr
Albert St
Trees
Blocks
Parking
Project Lands
Dry Pond
Wet Pond
Regional Flood Limit
Parkette
Parks
Open Space
Single Detached Dwelling Lot
Semi-Detached Dwelling Lot
Standard Townhome Lot
Standard Townhome (Condo)
Rear Lane Townhome (Condo)
BMROSS
engineering better communities
Buchanan Crossings Conceptual Plan
N
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DATE
December 2022
PROJECT No.
21020
SCALE
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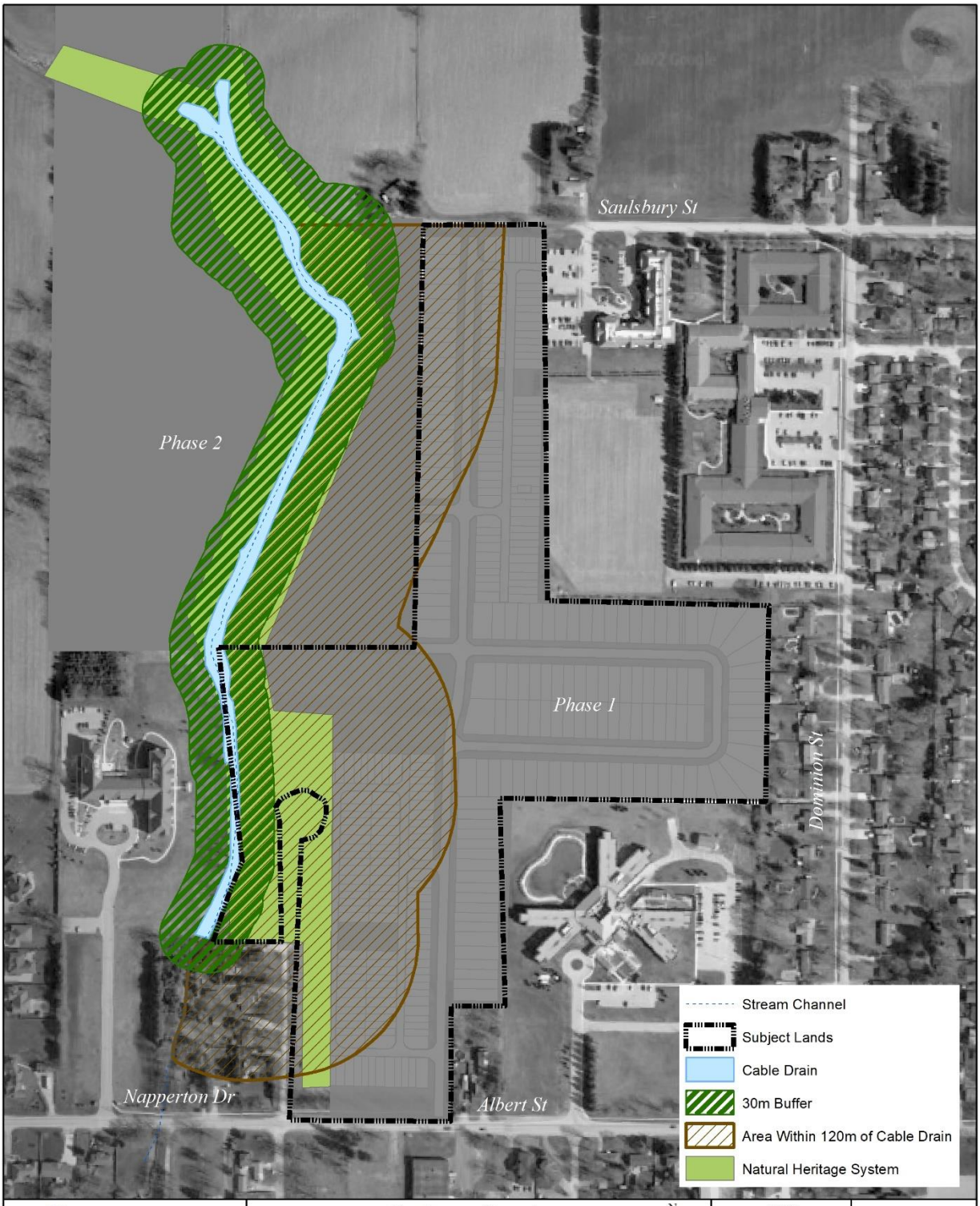
FIGURE No.
5



BMROSS engineering better communities

Buchanan Crossings
Mitigation Measures

0 50 100 200 m

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DATE	PROJECT No.
December 2022	21020
SCALE	FIGURE No.
1:4000	6

APPENDICES

- **A - PLANT LIST**
- **B - WILDLIFE SPECIES LIST**
    - **Breeding Bird Forms**
    - **Anuran calling Forms**
- **C - TOWNSHIP OF STRATHROY-CARADOC: MUNICIPAL SPECIES at RISK REFERENCE GUIDE**
- **D - DAR – TERMS OF REFERENCE**
- **E – QUALIFICATIONS OF AUTHOR**
- **F – AGENCY CORRESPONDENCE**

APPENDIX A

PLANT LIST

BUCHANAN CROSSINGS - PLANT LIST		ELC POLYGON						CONSERVATION		WET-	SENSI-	WEED-
Oct-23		1	2	3	4	5	6	Global	Provincial			
Scientific Name	*Common Name*							GRANK	SRANK	NESS	TIVITY	INESS
Acer negundo	Manitoba Maple		X	X		X	X	G5	S5	-1	5	
Acer saccharinum	Silver Maple	X		X		X		G5T5	S5	-3	5	
Acer saccharum ssp. saccharum	Sugar Maple						X	G5T5	S5	3	4	
Achillea millefolium	Yarrow					X	X	GNR	SNA	5	0	3
Alliaria petiolata	Garlic Mustard	X	X					GNR	SNA	0	0	-3
Arctium minus ssp. minus	Common Burdock			X				GNRTNR	SNA	0/5?	5/8?	-2
Asclepias syriaca	Common Milkweed					X	X	G5	S5	5	0	
Aster azureus	Azure Aster			X				G5	S5	3		
Brassica rapa	Field Mustard	X	X	X				GNR	SNA	0/5?	0	-1
Bromus inermis ssp. inermis	Smooth Brome	X	X		X	X	X	GNR	SNA	5	0	-3
Carya cordiformis	Bitternut Hickory			X				G5	S5	0	6	
Chenopodium album	White Pigweed						X	GNR	SNA	3		
Circacea canadensis	Enchanter's Nightshade		X					GNR	SNA	5		
Cirsium arvense	Canada Thistle					X		GNR	SNA	3	0	-1
Clinopodium vulgare	Wild Basil			X				G5	S5	5	4	
Cornus racemosa	Gray Dogwood	X	X	X				G5	S5	3		
Cornus stolonifera	Red Osier Dogwood	X		X				G5	S5	-3	2	
Crataegus mollis	Downy Hawthorn			X				G5	S5	-2	4	0
Dactylis glomerata	Orchard Grass	X		X				GNR	SNA	3	0	0
Datura stramonium	Jimsonweed						X	GN3	SE5	3		
Daucus carota	Wild Carrot			X	X			GNR	SNA	5	0	-2
Dactylis glomerata	Orchard Grass		X					GNR	SNA	3		
Diervilla lonicera	Bush Honeysuckle		X		X			G5	S5	5	5	
Echinocystis lobata	Wild Cucumber		X	X				G5	S5	-2		
Equisetum arvense	Field Horsetail			X				G5	S5	0	0	
Erigeron annuus	Daisy Fleabane			X	X			G5	S5	1	0	
Euthamia graminifolia	Narrow Leaved Goldenrod		X					G5	S5	-2	2	
Fraxinus pennsylvanica	Green Ash	X	X	X				G5	S5	-3	3	
Festuca ovina	Sheep Fescue			X				GNR	SE4	5		
Geranium robertianum	Herb Robert			X				G5	S5	3		
Geum aleppicum	Yellow Avens	X	X					G5	S5	-1		
Helianthus annuus	Common Sunflower		X	X				G5	S5	3		
Hesperis matronalis	Dames Rocket			X				G4C5	Exotic	5		-3

	POLYGON	1	2	3	4	5	6					
Impatiens capensis	Jewelweed		X	X				G5	S5	-3	4	
Juglans nigra	Black Walnut	X	X	X	X	X	X	G5	S4	3	5	
Juniperus virginiana	Eastern Red Cedar			X				N5	S5	3		
Leonurus cardiaca	Motherwort		X					GNR	SE5	3		
Lolium perenne	Ryegrass				X			GNR	SNA	1		
Malus sp.	Feral Apple			X				NA	NA	0	5	
Medicago lupulina	Black Medick				X			GNR	SNA	1	0	-1
Medicago sativa ssp. sativa	Alfalfa			X				GNRTNR	SNA	5	0	-1
Melilotus officinalis	Sweet Yellow Clover				X			GNR	SNA	3		
Oenothera biennis	Evening Primrose			X				G5	S5	3	0	
Panicum virgatum	Panic Switch Grass					X	X	G5	S4	-1	6	
Parthenocissus quinquefolia	Virginia Creeper	X	X	X	X			G5	S5	1	6	
Phalaris arundinacea	Reed Canary Grass	X	X					G5	S5	-4	0	
Phragmites communis	Phragmites			X				GNR	N5	3		
Picea abies	Norway Spruce					X		GNR	Exotic	3	0	-1
Pilosella caespitosa	Meadow Hawkweed					X	X	GNR	SNA	5	0	
Pinus strobus	Eastern White Pine		X	X				G5	S5	3	4	
Plantago major	Common Plantain				X	X	X	G5	S5	-1	0	-1
Poa compressa	Canada Bluegrass		X					GNR	SNA	3		
Populus tremuloides	Aspen Poplar		X	X	X			G5	S5	0	2	
Prunus virginiana ssp. virginiana	Choke Cherry			X				G5	S5	1	2	
Quercus alba	White Oak				X			G5	S5	3		
Rhamnus cathartica	Common Buckthorn		X	X				GNR	SNA	3	0	
Rhaponticum repens	Russian Knapweed				X	X	X	GNR	SNA	3		
Rubus idaeus ssp. Idaeus	Wild Red Raspberry		X					G5T5	SE5	-2	0	
Rubus occidentalis	Black Raspberry	X	X					GNR	SNA	5	2	
Rudbeckia triloba	Brown-eyed Susan			X				G5	S5	3	0	
Salix eriocephala	Missouri Willow			X				G5	S5	-3	4	
Salix exigua	Sandbar Willow			X				G5	S5	-3	4	
Salix lucida	Shining Willow			X				G5	S5	-4	5	
Schizachyrium scoparium	Little Bluestem					X	X	G5	S5	3		
Solanum nigrum	Black Nightshade					X		GNR	SNA	0	0	-1

	POLYGON	***1***	***2***	***3***	***4***	***5***	***6***					
Solidago canadensis	Canada Goldenrod	X	X	X	X			G5	S5	3	1	
Solidago nemoralis ssp. nemoralis	Gray Goldenrod	X	X	X				G5T5	S5	5	2	
Symphyotrichum lanceolatum	Little White aster	X	X	X	X			G5T5	S5	-2	3	
Symphyotrichum novae-angliae	New England Aster			X				G5	S5	-3	2	
Symphytum officinale	Common Comfrey			X				GNR	SNA	3		
Taraxacum officinale	Common Dandelion				X	X	X	G5	SNA	3	0	-2
Thuja occidentalis	Easterm White Cedar					X	X	G5	S5	-3	4	
Tilia americana	Basswood			X				G5	S5	3	4	
Tragopogon dubius	Goat'sbeard				X			GNR	SNA	5	0	
Ulmus americana	American Elm					X	X	G5	S5	-2	3	
Ulmus pumilla	Siberian Elm				X			GNR	SNA	3		
Urtica dioica	Stinging Nettle			X				GNR	SNA	3		
Verbascum thapsus	Common Mullein					X	X	GNA	Exotic	5		-2
Viburnum trilobum	Highbush Cranberry	X	X					G5T5	S5	-3	5	
Vitis riparia	Riverbank Grape	X	X	X	X	X	X	G5	S5	3	3	

APPENDIX B

WILDLIFE LIST

BUCHANAN CROSSINGS					ELC POLYGON						Comments
WILDLIFE SPECIES LIST - OCTOBER 2023		Conservation			1	2	3	4	5	6	
Common Name	*Scientific Name*	*G-RANK*	S-RANK	COSEWIC							
MAMMALS											
Cottontail Rabbit	Sylvilagus floridanus	G5	S5					X			sight
Coyote	Canis latrans	*G5*	S5		X	X	X				sign
Eastern Grey Squirrel	Sciurus carolinensis	*G5*	S5			X	X	X	X	X	sight
Raccoon	Procyon lotor	*G5*	S5			X	X				sign
White-tailed Deer	Odocoileus virginianus	*G5*	S5		X	X	X				sign
BIRDS											
American Crow	Corvus brachyrhnchos	G5	S5B,SZN						X	X	sight-song
American Goldfinch	Spinus tristis	G5	S5B,SZN				X	X	X		sight-song
American Robin	Turdus migratorius	G5	S5B			X		X	X	X	sight-song
Black-capped Chickadee	Poecile atricapillus	G5	S5			X	X	X	X		sight-song
Canada Goose	Branta canadensis	G5	S5B			X					sight-song
Cardinal	Cardinalis cardinalis	G5	S5				X	X	X		sight-song
Carolina Wren	Thyrothorus ludovicianus	G5	S4						X	X	sight-song
European Starling	Sturnus vulgaris	G5	SE			X	X	X	X		sight-song
Field Sparrow	Spizella pusilla	G5	S4B, SZN	NAR			X	X	X		sight-song
Great Horned Owl	Bubo virginianus	G5	S5			X	X				sight-song
Kildeer	Charadrius vociferus	G5	S4B	SC				X	X		sight-song
Mallard Duck	Anas platyrhynchos	G5	S5					X			sight-song
Mourning Dove	Zenaida macroura	G5	S5			X	X	X	X		sight-song
Red-winged Blackbird	Agelaius phoeniceus	G5	S5B, SZN			X	X	X	X		sight-song
Spotted Sand Piper	Aetitus macularis	G5	S5B	SC		X	X	X			sight-song
Savannah Sparrow	Passerculus sandwichensis	G5	S5B, SZN	SC				X		X	sight-song
Song Sparrow	Melospiza melodia	G5	S5B, SZN			X	X	X	X		sight-song
European Starling	Sturnus vulgaris	G5	SB						X	X	sight-song
AMPHIBIANS											
Northern Leopard Frog	Rana pipiens	*G5*	S5	NAR					X	X	song
BUTTERFLIES											
Monarch	Danaus plexippus	*G5*	S5	SC					X	X	sight

BREEDING BIRD FORMS

Species	Count	B.E.

Species	Count	B.E.

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§ **Species of Interest:** extra documentation required for **CONFIRMED** breeding records only

BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing/calling/drumming** associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** Pair observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
- **D** **Display** involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
- **V** **Visiting** a probable nest site in suitable habitat
- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
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- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 1

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
27	05	2022	07:00	07:10	10

Procedure
- [x] Single location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
- [x] Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove		
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin	2	M
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch		
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	3	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE TRAIN - 2

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
27	05	2022	07:15	07:20	005

Procedure
- [x] Single location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
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Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove		
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
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Blue-headed Vireo ‡		
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American Crow		
Common Raven ‡		
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Tufted Titmouse ‡		
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Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 3

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
27	05	2022	07:20	07:25	005

Procedure
- ☑ Single location
- ☑ Travelling count
- ☐ Area search
- ☐ Entire square

Incidental observations
- ☐ Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
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Atlas point counts
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Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove		
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
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Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren	1	M
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin	2	M
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch		
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	3	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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‡ **Regionally Rare:** extra documentation required for **ALL** breeding records
§ **Species of Interest:** extra documentation required for **CONFIRMED** breeding records only

BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
- **D** **Display** involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
- **V** **Visiting** a probable nest site in suitable habitat
- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 4

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
27	05	2022	0715	0735	110

Procedure
- ☑ Single location
- ☑ Travelling count
- ☐ Area search
- ☐ Entire square

Incidental observations
- ☐ Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- ☐ No ☑ Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- ☐ No ☑ Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove		
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling	R	M
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin		
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	1	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow	1	M
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	4	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
- **D** **Display** involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
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- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

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- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
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- **FY** Recently **fledged** or downy **young** incapable of sustained flight
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- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 5

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
17	05	2022	0745	0750	05

Procedure
- [x] Single location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
- [x] Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	2	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin		
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	R	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	R	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
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PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
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- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 6

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
27	05	2022	0760	0810	05

Procedure
- ☑ ~~Single location~~
- ☑ ~~Travelling count~~
- ☐ Area search
- ☐ Entire square

Incidental observations
- ☐ Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- ☐ No ☑ ~~Yes~~

Atlas point counts
Did you complete Atlas point counts during this session?
- ☐ No ☑ ~~Yes~~

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	2	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin		
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	2	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow	1	M
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	2	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak	2	M
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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BREEDING EVIDENCE (B.E) CODES

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- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
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- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
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- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 7

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
27	05	2022	0820	0825	05

Procedure
- [x] ~~Single location~~
- [x] ~~Travelling count~~
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] ~~Yes~~

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
- [x] ~~Yes~~

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	1	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin		
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	1	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	1	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal	2	M
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

† **Provincially Rare:** extra documentation required for **ALL** breeding records
‡ **Regionally Rare:** extra documentation required for **ALL** breeding records
§ **Species of Interest:** extra documentation required for **CONFIRMED** breeding records only

BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
- **D** **Display** involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
- **V** **Visiting** a probable nest site in suitable habitat
- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 1

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
11	07	2012	0630	0640	010

Procedure
- [x] ~~Single~~ location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] ~~No~~ Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
- [x] ~~No~~ Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	2	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow	2	M
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin		
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	1	M
Grasshopper Sparrow §		
Chipping Sparrow	2	M
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	5	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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§ **Species of Interest:** extra documentation required for **CONFIRMED** breeding records only

BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
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- **V** **Visiting** a probable nest site in suitable habitat
- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 2

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
11	07	2012	0645	0655	10

Procedure
- [x] ~~Single location~~
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
- [x] Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	2	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin	1	M
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	2	M
Grasshopper Sparrow §		
Chipping Sparrow	2	M
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	4	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
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CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE TRAIL - 3

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
11	07	2022	0700	0710	010

Procedure
- [x] Single location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
- [x] Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	2	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow	1	M
Common Raven ‡		
Black-capped Chickadee	3	M
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin	2	M
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	1	M
Grasshopper Sparrow §		
Chipping Sparrow	2	M
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	4	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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‡ **Regionally Rare:** extra documentation required for **ALL** breeding records
§ **Species of Interest:** extra documentation required for **CONFIRMED** breeding records only

BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
- **D** **Display** involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
- **V** **Visiting** a probable nest site in suitable habitat
- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 4

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
11	07	2022	0715	0725	10

Procedure
- [x] Single location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
- [x] Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove		
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee	2	M
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin	1	M
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	1	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	3	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal	2	M
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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§ **Species of Interest:** extra documentation required for **CONFIRMED** breeding records only

BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** **Singing**/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult **bird**, at the same place, on ≥2 visits, one week or more apart
- **D** **Display** involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
- **V** **Visiting** a probable nest site in suitable habitat
- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or downy **young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE DRAIN - 5

Atlas square: 17TMH45

Day: 11 | Month: 07 | Year: 2022

Start time (24h): 07:35 | End time (24h): 07:45 | Duration (min): 10

Procedure
- [x] Single location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No [x] Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove		
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee	2	M
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin	1	M
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	2	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird		
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal	2	M
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

Species	Count	B.E.

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BREEDING EVIDENCE (B.E) CODES

OBSERVED
- **X** Observed but not in suitable nesting habitat

POSSIBLE BREEDING
- **H** In suitable nesting **habitat** in breeding season
- **S** Singing/calling/drumming associated with breeding in nesting habitat in breeding season

PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
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- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
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- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLE TRAIL-6

Atlas square: 17TMH45

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
11	07	20RR	0750	0800	015

Procedure
- [x] Single location
- [x] Travelling count
- [ ] Area search
- [ ] Entire square

Incidental observations
- [ ] Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- [ ] No
- [x] Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- [ ] No
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Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	2	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee	3	M
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin		
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	2	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	1	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal	2	M
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

Species	Count	B.E.

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PROBABLE BREEDING
- **M** **Multiple** (≥7) individuals singing/calling/drumming heard on the same date and in the same square
- **P** **Pair** observed together in suitable nesting habitat
- **T** Presumed **territory** = presence of an adult bird, at the same place, on ≥2 visits, one week or more apart
- **D** **Display** involving male & female (display, courtship feeding, copulation) or antagonistic behaviour between ≥2 individuals (territorial disputes or chases)
- **V** **Visiting** a probable nest site in suitable habitat
- **A** **Agitated** behaviour or alarm call of an adult
- **B** **Brood patch** or cloacal protuberance on an adult
- **N** **Nest-building** by wrens or woodpeckers

CONFIRMED BREEDING
- **NB** **Nest building**, including carrying nesting material (except wrens and woodpeckers)
- **DD** **Distraction display**, attempt to draw attention away from nest/young by feigning injury or other distraction
- **NU** Empty **nest used** during atlas survey period, or identifiable egg shells
- **FY** Recently **fledged** or **downy young** incapable of sustained flight
- **AE** **Adult** occupying, leaving or **entering** a probable nest site or behaviour suggesting an occupied nest
- **FS** Adult carrying a **fecal sac**
- **CF** Adult **carrying food** for young
- **NE** **Nest** containing one or more **eggs**
- **NY** **Nest** with one or more **young** (seen or heard)

Atlas Checklist - Region 4

Atlasser's name: CHRIS HART

Location: CABLETRAIN - 7

Atlas square: 17TMH445

Day	Month	Year	Start time (24h)	End time (24h)	Duration (min)
11	07	2022	0810	0820	10

Procedure
- ☐ Single location
- ☑ Travelling count
- ☐ Area search
- ☐ Entire square

Incidental observations
- ☐ Check if start time or duration are unknown.

Complete checklist
Are you reporting all of the birds you were able to identify? Check no to submit casual observations.
- ☐ No ☑ Yes

Atlas point counts
Did you complete Atlas point counts during this session?
- ☐ No ☑ Yes

Instructions: Complete one Atlas Checklist per active birdwatching session. Do not record time spent on other activities. If you are recording migrants do not assign them a breeding evidence code, simply leave the space blank (i.e. do not use X for migrants). B.E. = Breeding Evidence.

Species	Count	B.E.
Canada Goose		
Mute Swan ‡		
Trumpeter Swan ‡		
Wood Duck		
Blue-winged Teal ‡		
Northern Shoveler ‡		
Gadwall ‡		
American Wigeon ‡		
Mallard		
American Black Duck ‡		
Northern Pintail ‡		
Green-winged Teal ‡		
Redhead †		
Hooded Merganser ‡		
Ruddy Duck ‡		
Northern Bobwhite †		
Ring-necked Pheasant ‡		
Ruffed Grouse ‡		
Wild Turkey		
Pied-billed Grebe ‡		

Species	Count	B.E.
Rock Pigeon (Feral Pigeon)		
Mourning Dove	1	M
Yellow-billed Cuckoo		
Black-billed Cuckoo		
Common Nighthawk ‡		
Eastern Whip-poor-will ‡		
Chimney Swift §		
Ruby-throated Hummingbird		
King Rail †		
Virginia Rail		
Sora		
Common Gallinule ‡		
American Coot ‡		
Sandhill Crane ‡		
Killdeer §		
Upland Sandpiper †		
American Woodcock		
Wilson's Snipe ‡		
Spotted Sandpiper		
Ring-billed Gull ‡		

Species	Count	B.E.
Herring Gull ‡		
Black Tern †		
Double-crested Cormorant ‡		
American Bittern ‡		
Least Bittern †		
Great Blue Heron §		
Green Heron §		
Turkey Vulture		
Osprey		
Northern Harrier ‡		
Sharp-shinned Hawk ‡		
Cooper's Hawk		
Northern Goshawk ‡		
Bald Eagle ‡		
Red-shouldered Hawk ‡		
Broad-winged Hawk ‡		
Red-tailed Hawk		
Barn Owl †		
Eastern Screech-Owl		
Great Horned Owl		
Barred Owl ‡		
Long-eared Owl ‡		
Northern Saw-whet Owl ‡		
Belted Kingfisher		
Yellow-bellied Sapsucker ‡		
Red-headed Woodpecker †		
Red-bellied Woodpecker		
Downy Woodpecker		
Hairy Woodpecker		
Pileated Woodpecker		
Northern Flicker		
American Kestrel ‡		
Merlin		

Species	Count	B.E.
Peregrine Falcon ‡		
Eastern Wood-Pewee §		
Acadian Flycatcher †		
Alder Flycatcher		
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe		
Great Crested Flycatcher		
Eastern Kingbird		
White-eyed Vireo †		
Yellow-throated Vireo		
Blue-headed Vireo ‡		
Warbling Vireo		
Red-eyed Vireo		
Blue Jay		
American Crow		
Common Raven ‡		
Black-capped Chickadee		
Tufted Titmouse ‡		
Horned Lark §		
Northern Rough-winged Swallow		
Purple Martin §		
Tree Swallow		
Bank Swallow §		
Barn Swallow §		
Cliff Swallow §		
Golden-crowned Kinglet ‡		
Red-breasted Nuthatch		
White-breasted Nuthatch		
Brown Creeper		
Blue-gray Gnatcatcher		
House Wren		
Winter Wren ‡		

Species	Count	B.E.
Sedge Wren ‡		
Marsh Wren		
Carolina Wren		
European Starling		
Gray Catbird		
Brown Thrasher		
Northern Mockingbird ‡		
Eastern Bluebird		
Veery		
Hermit Thrush ‡		
Wood Thrush §		
American Robin		
Cedar Waxwing		
House Sparrow		
House Finch		
Purple Finch ‡		
Pine Siskin ‡		
American Goldfinch	1	M
Grasshopper Sparrow §		
Chipping Sparrow		
Clay-colored Sparrow ‡		
Field Sparrow §		
White-throated Sparrow ‡		
Vesper Sparrow		
Savannah Sparrow		
Song Sparrow		
Swamp Sparrow		
Eastern Towhee §		
Yellow-breasted Chat †		
Bobolink §		
Eastern Meadowlark §		
Orchard Oriole		
Baltimore Oriole		

Species	Count	B.E.
Red-winged Blackbird	1	M
Brown-headed Cowbird		
Common Grackle		
Ovenbird		
Louisiana Waterthrush †		
Northern Waterthrush		
Golden-winged Warbler †		
Blue-winged Warbler		
Black-and-white Warbler		
Prothonotary Warbler †		
Nashville Warbler ‡		
Mourning Warbler		
Common Yellowthroat		
Hooded Warbler		
American Redstart		
Cerulean Warbler †		
Magnolia Warbler ‡		
Blackburnian Warbler ‡		
Yellow Warbler		
Chestnut-sided Warbler		
Black-throated Blue Warbler ‡		
Pine Warbler		
Yellow-rumped Warbler ‡		
Yellow-throated Warbler †		
Black-throated Green Warbler ‡		
Canada Warbler ‡		
Scarlet Tanager		
Northern Cardinal		
Rose-breasted Grosbeak		
Indigo Bunting		
Dickcissel †		

ANURAN CALLING FORMS

Marsh Monitoring Program - Amphibian Data Form

Return by 31 July

Please write legibly (in pen).

MARSH MONITORING PROGRAM

VISIT INFORMATION

Route #: 1 Route Name: CABLE DRAIN

Observer #: _____ Observer Name: CHRIS HART

Visit #: 3 Day: 14 Month: JULY Year: 2022

Cloud Cover (10th): 10% Temperature (°C or °F): 78F Beaufort Wind Scale (0-6): 1

Precipitation (check one): (X) None/Dry ( ) Damp/Haze/Fog ( ) Drizzle ( ) Rain

CALL LEVEL CODES

Code 1: Calls not simultaneous, number of individuals can be accurately counted

Code 2: Some calls simultaneous, number of individuals can be reliably estimated

Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated

Amphibian2008.xls, rev 03/2008

Species	In*	Out**
AMTO		
BAFR		
BCFR		
BULL		
CHFR		
COTR		
FOTO		
GRTR		
GWFR		
MFR		
NLFR	✓	
PIFR		
SPPE		
WOFR		

* Check if species is calling from inside 100-metre station area.
** Check if species is calling from outside 100-metre station area.

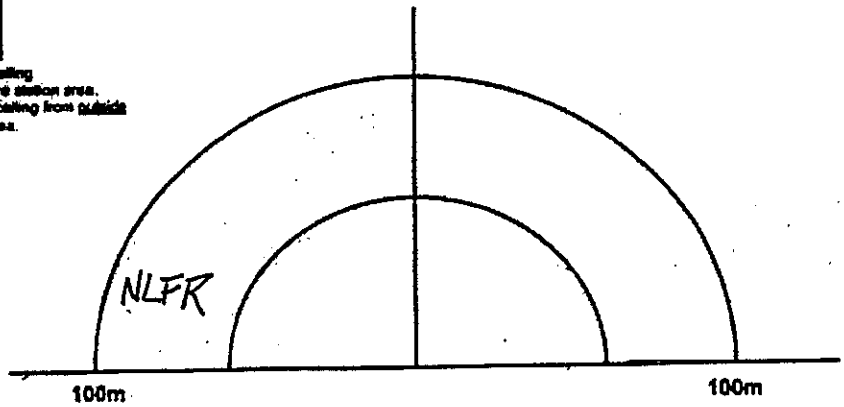
Station Start Time (24 hr): 19:30

Background Noise Code (1-4): 1

Station A

NNE

180°



* CODE 1 - Calls faint

APPENDIX C

TOWNSHIP OF STRATHROY-CARADOC: MUNICIPAL SPECIES at RISK REFERENCE GUIDE

Township of Strathroy-Caradoc

Municipal Species at Risk Reference Guide

Birds

Acadian Flycatcher — **Endangered** — Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information
Occupies a broad spectrum of deciduous and mixed woodlands of variable size across its breeding range. Refer to the Provincial Recovery Strategy (2016).
https://www.ontario.ca/page/acadian-flycatcher

Timing Windows
Migratory bird that may be present in Ontario from April through September.

Survey Protocol
Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.
http://www.ec.gc.ca/reom-mbs/default.asp?

Bank Swallow — **Threatened** — Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information
Bank swallows nest in burrows in natural and human-made settings where there are exposed and inclined areas of erodable substrate like silt or sand, such as banks of rivers and lakes, roadsides, aggregate pits, and stock-piled materials. Refer to the Provincial Recovery Strategy (2016) and contact ESA.Aylmer@Ontario.ca for the General Habitat Description (not yet available online).
https://www.ontario.ca/page/bank-swallow

Timing Windows
Migratory bird most commonly seen in Ontario from April through September.

Survey Protocol
Survey for burrows in potential habitat features and identify habitat according to the species general habitat description. Follow Breeding Bird Survey Protocol to assess habitat occupancy, conducting three rounds of surveys during the breeding window.
http://www.ec.gc.ca/reom-mbs/default.asp?

Barn Owl — **Endangered** — Species Protection ☑ Regulated Habitat Protection ☑ General Habitat Protection ☐

Habitat Information
Barn Owls are known to nest in both natural structures (e.g. hollows in trees or banks) and human-made structures (e.g. nest boxes, barns and other shelters with access). Refer to the Provincial Recovery Strategy (2010) and Ontario Regulation 242/08.
https://www.ontario.ca/page/barn-owl

Timing Windows
May be present year-round. Egg dates recorded in Ontario have occurred from March through October.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Barn Swallow — **Threatened** — Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information
Barn Swallow nests in Ontario are commonly situated inside or outside of buildings and other man-made shelters, under bridges and piers and in road culverts. Refer to the Provincial Recovery Strategy (2014) and the General Habitat Description.
https://www.ontario.ca/page/barn-swallow

Timing Windows
Migratory bird most commonly seen in Ontario from April through September.

Survey Protocol
Survey structures for the presence of nest cups. Identify habitat according to the species general habitat description.
http://www.ec.gc.ca/reom-mbs/default.asp?

Bobolink	**Threatened**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information

Nests in grassland-like habitats typically greater than 2 hectares, such as hayfield, pasture, alfalfa, winter wheat, old/overgrown fields, prairie, savannah, and meadow or meadow marsh. Refer to the Provincial Recovery Strategy (for Bobolink and Eastern Meadowlark; 2013).

https://www.ontario.ca/page/bobolink

Timing Windows

Migratory bird most commonly seen in Ontario from May to September.

Survey Protocol

Contact ESA.Aylmer@ontario.ca to obtain a copy of the MNRF draft Bobolink breeding survey protocol (2011).

Cerulean Warbler	**Threatened**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information

Typically occur in mature deciduous woodlands. Has been found breeding in tracts as small as 10 hectares in Ontario. Refer to COSEWIC Assessment and Status Report (2010).

https://www.ontario.ca/page/cerulean-warbler

Timing Windows

Migratory bird most commonly seen in Ontario from May to August.

Survey Protocol

Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.

http://www.ec.gc.ca/reom-mbs/default.asp?

Chimney Swift	**Threatened**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information

They typically nest and roost in chimneys and other man-made structures. Can also nest in hollow trees or tree cavities. Refer to COSEWIC Assessment and Status Report (2007) and the General Habitat Description.

https://www.ontario.ca/page/chimney-swift

Timing Windows

Migratory bird most commonly seen in Ontario from mid-April to mid-October.

Survey Protocol

Follow the Ontario Swift Watch Protocol by Bird Studies Canada (2015). Identify habitat according to the general habitat description.

http://www.bsc-eoc.org/volunteer/ai/resour

Eastern Meadowlark	**Threatened**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information

Breed primarily in grassland-like habitats, such as pastures and hayfields (including alfalfa), meadow and meadow marsh, old/overgrown fields, prairie, savannah, weedy borders of croplands, roadsides, orchards, gold courses, and other open areas, typically greater than 3 hectares. Refer to the Provincial Recovery Strategy (for Bobolink and Eastern Meadowlark; 2013).

https://www.ontario.ca/page/eastern-meadowlark

Timing Windows

Migratory bird most commonly seen in Ontario from March through October.

Survey Protocol

Contact ESA.Aylmer@ontario.ca to obtain a copy of the MNRF draft Eastern Meadowlark breeding survey protocol (2013) .

King Rail	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information

Found in marshes, often where vegetation cover is interspersed with areas of open water. They can be found in smaller isolated marshes though most known occurrences are in larger wetlands. Habitat use may differ year to year based on water levels. Refer to the Provincial Recovery Strategy (2016).

https://www.ontario.ca/page/king-rail

Timing Windows

Migratory bird most commonly seen in Ontario from April through September.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request advice on conducting adequate surveys for your project.

Least Bittern **Threatened** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Found in marshes, often where vegetation cover is interspersed with areas of open water. They can be found in smaller isolated marshes though most known occurrences are in larger wetlands. Refer to the Provincial Recovery Strategy (2016).

https://www.ontario.ca/page/least-bittern

Timing Windows

Migratory bird most commonly seen in Ontario from May through September.

Survey Protocol

Follow the National Least Bittern Survey Protocol, CWS Technical Report Series no. 519 (2011). Contact ESA.Aylmer@ontario.ca for more information if needed.

Lousiana Waterthrush **Threatened** Species Protection ☐ Regulated Habitat Protection ☐ General Habitat Protection ☐

Habitat Information

Generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps. Spends much of it's time in shallow water and on the banks.

https://www.ontario.ca/page/louisiana-waterthrush

Timing Windows

Clutch hatches June - July. Migrate south for winter.

Survey Protocol

Follow Breeding Bird Survey Protocol.

http://www.ec.gc.ca/reom-mbs/default.asp?

Prothonotary Warbler **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Key features are presence of water near wooded area with suitable cavity nest sites or nest boxes. Nests usually occur near large bodies of standing or slow-moving water, such as seasonally flooded forest, swamps, rivers, streams, ponds, or lakes. Refer to the Provincial Recovery Strategy (2012).

https://www.ontario.ca/page/prothonotary-warbler

Timing Windows

Migratory bird most commonly seen in Ontario from May through August.

Survey Protocol

Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.

http://www.ec.gc.ca/reom-mbs/default.asp?

Yellow-breasted Chat **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
A wide variety of early-successional habitats are used (i.e., dense, low deciduous or coniferous vegetation), including early shrubby regrowth on abandoned agricultural fields, power-line corridors, clear-cuts, fencerows, forest edges and openings, and areas near streams, ponds and swamps. Refer to the COSEWIC Assessment and Status report (virens subspecies; 2012).	Migratory bird most commonly seen in Ontario from May through August.	Follow Breeding Bird Survey Protocol as applicable, conducting three rounds of surveys during the breeding window.

https://www.ontario.ca/page/yellow-breasted-chat

http://www.ec.gc.ca/reom-mbs/default.asp?

Fish and Mussel SAR

Fish and Mussel SAR	**Threatened and Endangered**	Species Protection ☑	Regulated Habitat Protection ☑	General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
Consult DFO mapping (http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm) to determine if species at risk and/or their habitat may be in or near the proposed project area, and contact ESA.Aylmer@ontario.ca (and/or DFO) for site-specific information or advice as applicable.		

https://www.ontario.ca/environment-and-energy/species-risk-ontario-list

http://www.dfo-mpo.gc.ca/species-especes

Herbaceous

American Ginseng	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information	Timing Windows	Survey Protocol
American Ginseng typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple, White Ash and American Basswood. It usually grows in deep, nutrient rich soil over limestone or marble bedrock. Refer to the general habitat description (2013) and the federal recovery strategy (2015).	American Ginseng plants are typically found from May to late September. Refer to protocol for details.	Draft Site Occupancy Survey Protocol for American Ginseng in Ontario (2013) - contact MNRF Aylmer District for more information.

https://www.ontario.ca/page/american-ginseng

Drooping Trillium	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information

Generally grows in dry, sandy loam, non-acidic soils of mature, deciduous woodlands that are usually associated with watercourses. It is found in Carolinian forests with Maple, White Ash, Basswood, Hackberry, White Elm, and Blue Ash trees. It shares the forest floor with other native plants including Ostrich Fern, Wild Ginger and Jack-in-the-pulpit. Refer to the provincial recovery strategy (2012).

https://www.ontario.ca/page/drooping-trillium

Timing Windows

Flowering occurs from mid-May to early June.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

False Hop Sedge **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Found in riverine swamps and marshes, and around temporary forest ponds. It prefers open areas and areas under forest canopy openings or forest edges, with lots of sunlight. Refer to the federal recovery strategy (2014).

https://www.ontario.ca/page/false-hop-sedge

Timing Windows

Flowers from June to October. Fruit appears July to September.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Goldenseal **Threatened** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Grows in rich, moist semi-open to closed areas of deciduous forests. Found at periodically flooded upland sites and in moist lowlands near floodplains. Associated with Red Oak, Sugar Maple, Hawthorns, Shagbark Hickory, Ironwood and Basswood. Typically grows in disturbed areas where trees have fallen, or next to recreational paths or woodland edges. Prefers sandy loam, loam soils or clay soils depending on whether it is growing in an upland or lowland area. Refer to the provincial recovery strategy (2016).

https://www.ontario.ca/page/goldenseal

Timing Windows

Flowers April - May; fruit ripens July-August.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Willowleaf Aster **Threatened** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Found in openings of oak savannahs. Also been found along railways, roadsides and in abandoned farm fields. Refer to the provincial recovery strategy (2013).

https://www.ontario.ca/page/willowleaf-aster

Timing Windows

Flowers from late September through October, and sometimes into November.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Mammals

American Badger (Southwestern Ontario population)	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☑	General Habitat Protection ☐

Habitat Information
Badgers are found in a variety of habitats, such as tall grass prairie, sand barrens, meadows, grasslands, ravines, hedgerows, forest edges, and farmland. Refer to the provincial recovery strategy (2010) and Ontario Regulation 242/08.

https://www.ontario.ca/page/american-badger

Timing Windows
Present all year-round, semi-dormant over winter.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Eastern Small-footed Myotis	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information
Will roost in a variety of habitats changing day to day, including in trees or under tree bark, under rocks or in rock outcrops, in buildings, under bridges, etc. Over-winter in caves and abandoned mines.

https://www.ontario.ca/page/eastern-small-footed-bat

Timing Windows
Typically over-winter from about October to April.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Little Brown Myotis (formerly little brown bat)	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information
Roost habitat may include human structures such as houses, bridges, and barns, or natural features such as rock crevices and forests. May over-winter in buildings, caves, or mines. Refer to the draft federal recovery strategy (2015).

https://www.ontario.ca/page/little-brown-bat

Timing Windows
They feed at night and are most active in the two or three hours after sunset. Typically over-winter from about October to April.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Northern Myotis (formerly Northern Long-eared Bat)	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information
Roosts in tree cavities, under tree bark, in natural and artificial crevices such as rock outcrops and roof shingles. Over-winters in caves and mines. Refer to the draft federal recovery strategy (2015).

https://www.ontario.ca/page/northern-long-eared-bat

Timing Windows
Typically over-winter from about October to April.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Tri-colored Bat	**Endangered**	Species Protection ☑	Regulated Habitat Protection ☐	General Habitat Protection ☑

Habitat Information
Roosts in forests, and maternity colonies may be located in anthropogenic features such as barns and houses. Over-winters in caves and mines. Refer to the draft federal recovery strategy (2015).

https://www.ontario.ca/page/tri-colored-bat

Timing Windows
Typically over-winter from about October to April.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Mosses

Spoon-leaved Moss **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information
in Southern Ontario Spoon-leaved Moss grow in soil that is in or near flat, low-lying, seasonally wet areas. In the past in Ontario, it has been found in other locations including cedar swamps, deciduous forests, pine plantations.

https://www.ontario.ca/page/spoon-leaved-moss

Timing Windows
Reproduces during rain or flood water where there is available water for sperm cells from the male plants to swim a maximum distance of 10 cm to eggs borne by the female plants.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Snakes

Eastern Hog-nosed Snake **Threatened** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information
Generally use sandy beaches and dunes, wetlands, forests, forest edges, and meadows. Refer to the provincial recovery strategy (2011).

https://www.ontario.ca/page/eastern-hog-nosed-snake

Timing Windows
Emergence in April. Mating occurs in spring and late summer. Eggs are laid in June and July. Hatching occurs between late August and mid September.

Survey Protocol
Survey Protocol for Ontario's Species at Risk Snakes (December 2016) - contact ESA.Aylmer@Ontario.ca for more information

Trees

American Chestnut **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information
In Ontario, it is only found in the Carolinian Zone between Lake Erie and Lake Huron. American Chestnut grows alongside Red Oak, Black Cherry, Sugar Maple, American Beech and other deciduous tree species. Refer to the provincial recovery strategy (2012).

https://www.ontario.ca/page/american-chestnut-species-risk

Timing Windows
Trees typically flower in late May to early July. Nuts mature by mid-October.

Survey Protocol
No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Blue Ash **Threatened** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Blue Ash grows in floodplains, river valleys, alvar and limestone, and beaches. Refer to the draft federal management plan (2016).

https://www.ontario.ca/page/blue-ash-species-risk

Timing Windows

Flowering occurs in April and May, prior to leaf-out. Seed crops are produced every 3-4 years in late fall.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Butternut **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Butternut usually grows alone or in small groups in forests and woodlands. It prefers moist, well-drained soil and is also found on well-drained gravel sites. This species does not do well in the shade, and often grows in sunny openings and near forest edges. Refer to the provincial recovery strategy (2013).

https://www.ontario.ca/page/butternut-species-risk

Timing Windows

Flowers from April to June. Fruits reach maturity during the month of September or October in the year of pollination and usually remain on the tree until after leaf fall.

Survey Protocol

A certified butternut health assessor must assess Butternut trees. Contact ESA.Aylmer@Ontario.ca for more information.

Eastern Flowering Dogwood **Endangered** Species Protection ☑ Regulated Habitat Protection ☑ General Habitat Protection ☐

Habitat Information

Grows in deciduous or mixed forests, open woodlands, forest edges, floodplains, slopes, bluffs, ravines, roadsides, hedgerows, and along drains. Refer to the provincial recovery strategy (2010) and Ontario Regulation 242/08.

https://www.ontario.ca/page/eastern-flowering-dogwood

Timing Windows

Flowering occurs from mid-May to early June, as the leaves begin to develop. The fruits mature in August and September.

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Turtles

Blanding's Turtle **Threatened** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Blanding's Turtle lives in shallow water, usually in large wetlands and shallow lakes with lots of water plants. May travel long distances from nearest waterbody, usually while searching for mates or traveling to nesting or overwintering sites. Hibernate in the mud at the bottom of permanent water bodies from late October until the end of April. Refer to the general habitat description (2013) and the draft federal recovery strategy (2016).

https://www.ontario.ca/page/blandings-turtle

Timing Windows

Mating prior to and right after overwintering, typically in April to early May, and from the end of August to end of October. Eggs are laid in from late May to early July, with hatchlings emerging in throughout September and October. Overwinter from October to April.

Survey Protocol

Survey Protocol for Blanding's Turtle (Emydoidea blandingii) in Ontario (August 2015) - contact MNRF Aylmer District for more information.

Spiny Softshell **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Found in large lakes, rivers, creeks, drainage ditches, ponds, but can also occur in marshes, ponds, oxbows as well as wetlands and ponds next to large bodies of water. Overwinter in aquatic habitat in underwater hibernacula, often in the stream or lake they spend the majority of time during active season. Nest in areas of sand/gravel substrate with low vegetation density and slope. Refer to the draft federal recovery strategy (2016).

https://www.ontario.ca/page/spiny-softshell

Timing Windows

Active from late March/early April to October. Mate in spring (late April or May) after emergence. Nests from early June to mid-July. Hatchlings emerge in late summer. Overwintering starts in mid-October (females) and end of November (males).

Survey Protocol

No standardized species protocol available; contact ESA.Aylmer@Ontario.ca to request specific advice on conducting adequate surveys for your project.

Spotted Turtle **Endangered** Species Protection ☑ Regulated Habitat Protection ☐ General Habitat Protection ☑

Habitat Information

Semi-aquatic preferring ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and abundant supply of aquatic vegetation. Other aquatic habitat can include vernal pools, seeps, sloughs, creeks, stormwater ponds, sheltered edges of bays, channels and drainage ditches. Strong preference for marsh meadows as well. Nests will be found in well-drained, sunny locations that are bare or have sparse vegetation. Hibernates in wetlands or seasonally wet areas associated with structures including overhanging banks, hummocks, tree roots, or aquatic animal burrows. Refer to the draft federal recovery strategy (2016) for more information.

https://www.ontario.ca/page/spotted-turtle

Timing Windows

Overwinters in underwater hibernacula for 7 to 8 months of the year, from mid-September/October to mid-late April. Basks in April. Mates begins in early spring as soon as ice/snow melt and can occur from late May through to early July.

Survey Protocol

Survey Protocol for Spotted Turtle (Clemmys guttata) in Ontario (August 2015) - contact MNRF Aylmer District for more information.

ONTARIO MINISTRY of NATURAL RESOURCES and FORESTRY | AYLMER DISTRICT OFFICE
615 John Street N. Aylmer ON, N5H 2S8 esa.aylmer@ontario.ca

This report was produced May, 2018

Please refer to the associated Municipal Species at Risk Reference Material Memo for instructions on how to use this guide.

The Committee on the Status of Species at Risk in Ontario (COSSARO) meets regularly to evaluate new species for listing and/or re-evaluate species already on the SARO List. As a result, species designations may change, which could in turn change the protection they receive under the ESA and whether proposed projects may have adverse effects on SAR. Habitat protection provisions for a species may also change if a species-specific habitat regulation comes into effect, or as new general habitat guidance is developed based on the best available information. Additionally, the province has not been comprehensively surveyed and MNRF data relies on observers to report sightings. As such, the absence of an occurrence does not indicate the absence of SAR species or habitat, and new occurrence information may affect whether a proposed project may contravene the ESA.

APPENDIX D

DAR - TERMS OF REFERENCE

TERMS OF REFERENCE FOR DAR – BUCHANAN CROSSINGS

Municipality of Strathroy-Caradoc

Buchanan Crossings – Pt. Lot 19, Concession 4 SER, Geographic Township of Adelaide, Municipality of Strathroy – Caradoc

Date: May 3, 2022

Author: Christopher Hart

INTRODUCTION

The Corporation of SLD Group Inc. has intent to construct a subdivision between Saulsbury St. and Albert St. in the south-west of the Town of Strathroy. The proposed mixed housing subdivision will have an area of approximately 15.2 hectares (37.6 acres) and is proposed to have: 12 single detached dwellings, 105 semi-detached dwellings (link homes), 19 street multiple attached dwellings (freehold town houses) and 230 multiple attached dwellings (condominium town houses).

The proposed development lands are currently under agriculture. Adjacent land uses are residential housing and institutional retirement and nursing homes. There are no natural areas on the subject lands but there are on adjacent lands. Access is from Saulsbury St. in the north east and Albert St. in the south.

The lands described above are described as 'Phase I' and are located east of the Cable Drain. Development is anticipated to begin in the next two years. The lands located west of 'Phase I' are also owned by the SLD Group. These lands are described as 'Phase 2' and are located north of Seasons Retirement Community, on the periphery of the Strathroy-Caradoc boundary. However, these lands are located outside of the Settlement Area and cannot be developed at this time.

For this reason, the Development Assessment Report Terms of Reference contained in this document applies to Phase I only. At such time in future if Phase 2 is proposed for development a second DAR will be prepared for this Phase.

The proposed study areas for the two proposed development Phases are shown on the attached figure "Property Inquiry County Lands (Napperton Drive)".

NATURAL HAZARDS

Correspondence from the St. Clair Conservation Authority notes that, "The subject property contains areas within the flooding and erosion hazard of the Cable Drain. The hazard is made up of the meander belt erosion hazard and associated allowance (30 metres on either side of the drain) and the estimated engineered floodplain as shown on the map included with this report. The limit of the floodplain is defined by the extent of flooding expected under the regulatory storm as established by the Authority. The regulatory storm for the Municipality is based upon the Hurricane Hazel storm centered event.

A portion of the hazard on the subject property is shown on Schedule 'K' of the Municipality of Strathroy-Caradoc's Official Plan and in the Zoning By-law through the 'Natural Environment Overlay'. The PPS and Official Plan generally prohibit buildings and structures within Hazard Land areas. The PPS may permit development where the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards and if the following can be demonstrated and achieved:

a) development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;

b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies;

c) new hazards are not created and existing hazards are not aggravated; and

d) no adverse environmental impacts will result.

Aligned with the PPS, Strathroy-Caradoc's Official Plan policy 6.1.1.3 requires that if development is proposed in 'Hazard Land' areas the proponent may be required to undertake, at his expense, expense, studies to provide the technical information necessary to evaluate the proposal in accordance with the following:

a) the degree of existing or potential physical hazard;

b) the potential impact of these hazards on proposed buildings, structures or additions thereto;

c) the proposed methods by which these impacts may be overcome in a manner consistent with accepted resource management practices and engineering techniques;

d) minimum building setbacks in relation to the kind, extent, and severity of both the existing and potential hazard.

In additions to the Official Plan policies, the Zoning By-law further regulated development in Hazard Land areas by prohibiting buildings and structures on lands exhibiting hazardous characteristics and through the following setbacks from Municipal Drains:

c) Municipal Drain (greater than 7.5 m wide) – 30 m from top-of-bank.

The approval of the authority will be required and may only be given where the control of flooding, erosion, pollution or the conservation of land will not be affected by the development. The completion of the above technical studies does not guarantee that the development proposal will be supported by the authority. All design parameters for stormwater management are to be reviewed by SCRCA. Any outlet for the drainage works will require written approval from the authority. As per the PPS policy 3.1.5 institutional uses and essential emergency services will not be permitted within the hazard area.

Natural Heritage

The feature along the drain on the property has been identified in the Middlesex Natural Heritage System Study (MNHSS) (2014). The wooded feature is not identified in the Official Plan or the Zoning By-law. It is expected that the natural heritage features will be retained within the natural hazard setbacks. Should significant encroachment in to the erosion hazard of the drain be proposed, additional review may be required through a scoped Development Assessment Report, to be reviewed by SCRCA.

St. Clair Region Conservation Authority – Ontario Regulation 171/06

SCRCA staff provide the following comments as part of SCRCA's Regulatory Authority under Ontario Regulation 171/06 "Development, Interference with Wetlands and Alterations to Shoreline and Watercourses" made under Section 28 of the Conservation Authorities Act.

The subject property has been identified as being regulated under Ontario Regulation 171/06. The policies of the Authority regulated development including: construction/reconstruction of a structure; placement or removal of fill; regrading; altering a watercourse; altering/developing a shoreline; or interfering with the function of a wetland. Written approval from this Authority will be required in order to undertake any of these activities within the regulate area.

Based on SCRCA's best available mapping for the Regulate Area on the property includes the estimated floodplain and meander belt for the Cable Drain (approximately 30 metres on each side of the drain). If development is located outside of the regulated area as shown on the attached mapping, then further written permission from the Conservation Authority will not be required."

REQUIREMENTS FOR A DEVELOPMENT ASSESSMENT REPORT (DAR)

Middlesex County

The Middlesex County Official Plan section 2.2.1.2 General Policies notes that: "The boundaries and extent of the specific elements of the natural system designated on Schedule A as Natural Environment Areas, and shown on Schedule C as natural Heritage Features are approximate. Refinements to boundaries may occur through environmental evaluations such as a Development Assessment Report (DAR) in consultation with the Ministry of Natural Resources, the Conservation Authority having jurisdiction and the County. Changes to the boundaries as a result of more detailed shall not require an amendment to the Plan.

Development applications within or adjacent to Natural Heritage Features shown on Schedule C shall require submission of a Development Assessment Report (DAR).

The DAR shall describe the ecological processes creating and maintaining the affected elements of the Natural System and indicate the potential impacts of the proposed development upon those processes.

Where the Development Assessment Report indicates that there will be a negative impact on the natural system or ecological process that cannot be adequately mitigated, the development application shall not be approved.

If local municipalities require a Development Assessment Report or equivalent impact assessment document as part of their approval process, the County will waive its requirement, provided the impact assessment submitted to the local municipality meets the County's requirements as set out below.

The Development Assessment Report shall be undertaken to a professional standard and approved by the County. The DAR shall address the following:

a) Description of the development

b) Description of Natural Features

c) Identification of Potential Impacts

d) Identification and Recommendation of Mitigation measures.

Also noted in Section 3.4 "Natural Environment Areas" of the Middlesex County Official Plan is the provision that, …" For new development proposed within 50 metres of a flood regulated watercourse

and within 120 m of wetland components of the Natural Environment Area boundary, the applicant may be required to submit a DAR in accordance with the policies of Section 2.2.1.2."

Strathroy-Caradoc

Section 3.3.7 "Natural Heritage" of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Natural heritage features in the Settlement Area of Strathroy are primarily associated with the Sydenham River and its tributaries. They include wetlands, woodlands and Valleylands. Areas designated as "Wetlands" may also include adjacent lands that do not constitute wetlands as defined; yet are considered an integral part of the wetland complex. Natural heritage features warrant protection on account of their ecological and social value as well as their contribution to the natural landscape and the character of Strathroy. It is intended that such features shall be left in their natural or undisturbed state and that any adjacent land use or land use activity be controlled so as not to adversely impact on the natural and ecological integrity of the feature.

Wetlands

Section 3.3.7.2 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Areas designated as 'wetlands' on Schedule 'D' shall be maintained in their natural state and protected from development and site alteration that would threaten their ecological integrity. Within a wetland or wetland complex, development shall not be permitted. On adjacent lands (generally lands being within 120 metres of the wetland or wetland complex) development and site alteration shall not be permitted unless it can be demonstrated that there will be no negative impacts on the natural features or on the ecological functions. These areas are regulated by Conservation Authorities. Uses permitted shall be restricted to existing agricultural uses, conservation, outdoor education, and passive recreation uses. Buildings or structures shall not be permitted. Other activities permitted may include hunting, trapping and fishing.

Woodlands

Section 3.3.7.3 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Areas designated as 'Woodlands' on Schedule 'D' have been identified by the Middlesex Natural Heritage Study, 2003 as meeting one or more landscape criteria established by the study. They are generally four hectares or greater in size and are considered to be significant as a result of their contribution to the ecology, quality and natural diversity of the Municipality. It is intended that these woodlands be protected and enhanced wherever possible. They shall be maintained in their natural state wherever possible and protected from incompatible development.

Development and Site Alteration Affecting Woodlands

Section 3.3.7.4 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Development and site alteration may be permitted within a 'woodland' designated on Schedule 'D' and on adjacent land (generally the lands being within 50 metres of the woodland) where it is demonstrated that there will be no negative impacts on the woodlands or the ecological functions for which it was identified.

Evaluation of Development Proposals

Section 3.3.7.5 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

Where development is proposed on land lying adjacent to a 'Wetland' or lying within or adjacent to an area designated as a 'Woodland', the proponent shall submit a Development Assessment Report (or DAR) in accordance with Section 7.5.3.2 of this Plan.

Reports/Studies Relating to Environmental and Natural Matters

Section 7.5.3.2 of the Strathroy-Caradoc Official Plan (April 2018) notes that:

The required reports/studies are to identify the environmental and natural features which may be affected by the proposed development and/or change in land use; identify the areas that are to be employed as a buffer between the environmental and/or natural features and the proposed development and/or change in land use; and identify any other mitigative measures to be undertaken to protect the environmental and natural features from any adverse impacts associated with the proposed development and/or change in land use. These studies may include, but not be limited to Development Assessment Reports as outlined in sections 3.4.7.5, 4.4.6.4 and 5.4.2.4 of the Official Plan. Study components may be determined in consultation with the applicable Conservation Authority or other agency.

A GUIDELINE FOR DEVELOPMENT ASSESSMENT REPORTS

Appendix C of the Middlesex County Official Plan provides 'A Guideline for Development Assessment Reports' (August 2007).

This guideline is written for landowners and developers to assist in the review and approval of development applications and/or site alterations that may affect the Natural System shown or described in the County of Middlesex Official Plan.

The Ontario Provincial Policy Statement (2020) provides policy direction on matters of provincial interest related to land use planning and development including the Natural Environment. The Planning Act requires that municipal decisions affecting planning matters "shall be consistent with" policy statements issued under the Act. As a result, the County of Middlesex Official Plan sets out a policy framework that encourages the protection of the County's Natural System which comprises the following elements:

- Natural Hazards
    - Steep slope hazards
    - Unstable soils
    - Fill regulated areas
- Natural Environment Areas
    - Floodplains
    - Flood regulated watercourses
- Natural Heritage Features
    - Significant woodlands
    - Wildlife habitat
    - Habitat of endangered and threatened species
    - Aquatic ecosystems including fish habitat

    - River, stream, ravine and upland corridors
    - Significant valley lands
    - Aggregate Resource Areas
    - Petroleum Resource Pool Areas
    - Areas of natural and scientific interest (ANSIs)

- Ground water Features
    - Groundwater recharge areas
    - Groundwater discharge and headwater areas
    - Well head protection areas

Development shall not be permitted on lands designated as 'Natural Environment Areas' on Schedule "A" of the County Official Plan which are:

- Wetlands
- Flood regulated water courses and associated flood plain
- Thedford Marsh Floodplain
- Significant portions of the habitat of threatened and endangered species

PROCESS OF THE DEVELOPMENT ASSESSMENT REPORTS

Appendix 'C' notes that before starting a Development Assessment Report, a work plan will be prepared to the satisfaction of the County, in consultation with the relevant agencies. Depending on the extent of the proposed development and the potential for impact on natural features, the County may approve a work plan for a Development Assessment Report that is reduced in scope and content; referred to as a 'scoped' Development Assessment Report.

A Development Assessment Report shall be required to show that development will have no negative impact on the natural features or on their ecological functions. The public, particularly adjacent property owners, may be notified of the preparation of a Development Assessment Report and given the opportunity to comment.

Content of Development Assessment Report

The County requires the Development Assessment Report to be completed to a professional standard, in consultation with the relevant public agencies. The detailed content required for Development Assessment reports is as follows:

- Description of the Development
- Description of Natural Features
- Identification of Potential Impacts
- Identification and Recommendation of Mitigation Measures
- Demonstration of Consistency

ST. CLAIR REGION CONSERVATION AUTHORITY REQUIREMENTS

Correspondence from Sarah Hodgkiss of SCRCA (November 10, 2021) outlines the requirements of SCRCA in this instance.

“I had the opportunity to discuss the DAR requirements with Tim Williams yesterday. I am providing a high-level outline to you of what we would like to see covered in the DAR. Then we ask that you prepare a term of reference with the details of the study, proposed timing, etc. for review by me and Tim. The report will need to review the natural heritage policies of the County and Strathroy-Caradoc Official Plans, and the Middlesex Natural Heritage System Study.

The Natural Heritage System identified in the Middlesex Natural Heritage System Study for the property is made up of the watercourse, meadow along the watercourse, and the woodland. The report should outline the existing site conditions, significance and functional connections between these features, and to the greater natural heritage system.

Aquatic Habitat Assessment – The watercourse should be described, including permanency, amount of flow, type of substrate, description of vegetation, habitat, etc. If fish habitat is present, we may require additional details re: thermal regime, water quality, etc.

Woodland: The woodland should be assessed on site and mapped. Please provide a description of the tree species, age class and general health. There should be a description of understory/ground cover, etc.

Meadow: the vegetation along the riparian corridor (e.g., the non-agricultural areas) should be described.

The site should be reviewed for Significant Wildlife Habitat and Habitat for Species at Risk. MECP should be contacted regarding the SAR screening. I am attaching a list of potential SAR for Strathroy-Caradoc to assist you in scoping your review.

The Development Master Plan prepared by B. M. Ross can be used for discussion purposed, but the actual development setbacks should be determined through the findings of the technical studies, including the DAR and the floodplain assessment.

PROPOSED METHODOLOGY FOR SAULSBURY SUBDIVISION DAR

Introduction

As requested by the SCRCA a fairly comprehensive approach has been taken in developing the Terms of Reference for the Buchanan Crossings Phase I Subdivision DAR. A review of policy and planning documents and also technical information has ensured that an accurate and sensitive approach will provide the information required.

First and foremost, in this approach is to consider a regional ecosystem perspective as informed by the MNHSS. It is most important to determine how the stream and stream corridor relate to the goals, objectives and criteria of the MNHSS and what is this level of significance with regard to natural heritage features, areas and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems.

Developed from an overall synthetic perspective based on the information gathered from background research and collected from field surveys based on scientific protocols and government agency and Ministry criteria.

Background Review

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

- Atlas of the Breeding Birds of Ontario, 2001-2005
- County of Middlesex, Official Plan, Appendix C, A Guideline for Development Assessment Reports, August 2007
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2018 a)
- Ontario Reptile and Amphibian Atlas Interactive Map (Ontario Nature, 2018 b)
- Ontario Mammal Atlas (1994)
- Ontario Ministry of Natural Resources and Forestry, Aylmer District (information search)
- Natural Heritage Information Centre database
- Natural Heritage Information Centre Make A Map (sensitive heritage species and features)
- Municipality of Strathroy-Caradoc Comprehensive Zoning By-law, August 4, 2021
- Municipality of Strathroy Caradoc Municipal Species At Risk Reference Guide, may 2018
- County of Middlesex Official Plan, August 2006
- Township of Strathroy-Caradoc Official Plan – April 2018
- SCRCA Species At Risk List
- Middlesex Natural Heritage System Study (2014)
- St. Clair Region Conservation Authority – Ontario Regulation 171/06

Regional Context and Natural Heritage System

The Middlesex Natural Heritage System Study (2014) was reviewed to obtain a regional perspective. This document provided information on how the development lands relate to the landscape of the Middlesex Natural System.

Wetland Boundary Delineation

There are no Provincially Significant Wetlands found within the subject lands or adjacent lands. However, from a preliminary site review there are floodplain areas that may be determined to be wetland features with further studies. If the landscape feature(s) is determined to be a wetland the boundary will be staked by Chris Hart who is a Certified Ontario Wetland Evaluator. Further to this staking the feature will be reviewed and confirmed by a wetland specialist/ecologist from the SCRCA. Boundaries will be determined using vegetation community borders and soil probes to a depth off up to 60 cm for water and hydric soil detection, as per the Ontario Wetland Evaluation system (OWES 2013). Wetland boundaries are established where vegetation is comprised of 50% wetland and 50% upland species and where soils display hydric conditions (e.g., presence of mottles and/or gleys), per the Ontario Wetland Evaluation system (OWES 2013). Detailed dates and weather information will be provided.

At the time of the boundary delineation, it will be determined if the wetland(s) are recognized by the Province.

Buffer Recommendation and Setbacks

Recommended buffers and setbacks for wetland boundaries and other natural heritage features will be determined through a variety of resources including the SCRCA wetland policies.

Ecological Land Classification and Vegetation Surveys

Ecological Land Classification (ELC) surveys will be completed in mid-May and again in August 2022. by Chris Hart who is a certified ELC examiner and ecologist. Vegetation communities within the study area will be characterized and delineated following the ELC system for Southern Ontario 1st approximation; community codes usually follow the 2nd approximation (Lee, et al, 1998, 2008). Boundaries of ELC communities will be mapped by using aerial images and field observations. As part of this mapping process, soils will be characterized and the study area will be systematically searched in order to provide an inventory of vascular plants to provide a two season Botanical Inventory of the Study Area. Detailed survey dates and weather information will be provided.

Identified ELC communities will be cross referenced with the NHIC Ontario Plant Community List (NHIC 2018) to determine the presence of rare plant communities (S1-Critically Imperiled, S2-Imperiled, or S3-Vulnerable). The Subnational or Provincial Ranks (S Rank) are assigned by the Ontario Ministry of Natural Resources and Forestry (NHIC) in order to help assign protection priorities. Detailed descriptions of each ELC community will be provided in an Appendix.

Identified vascular plant species will be compared to Provincial and Federal SAR lists (COSARO, SARA), PROVINCIAL RANKKS (NHIC 2018), global ranks and Distribution and Status of the Vascular Plants of Southwestern Ontario (Oldham 1993) in order to assess Federal, Provincial, regional and local conservation status of each species. Final definitive identification will be provided by the "Field Manual of Michigan Flora" (Voss, E. G., and A. Reznicek, 2012). The taxonomic nomenclature of plant species will be further defined by the Database of Vascular Plants of Canada (VASCAN 2016).

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

A list of all identified plant species will be provided in an Appendix. The list provides botanical names, common names, provincial rarity rant (S-rank), global rarity rank (G-rank), provincial Species at Risk status (SARO), federal Species At Risk status (SARA), coefficient of conservatism (CC) and coefficient of wetness (CW). Plant species that can only be identified to genus will not be assigned the above information.

Wildlife Habitat

Amphibians (Anurans)

Evening point count surveys to detect the breeding calls of anurans (frog and toad) will be conducted by an experienced ecologist in accordance with the Marsh Monitoring Program Participants Handbook for Surveying Amphibians (Bird Studies Canada 2008). Three surveys will be completed during the

recommended windows for the spring and early summer, in order to maximize the chances of detecting all potential species. Surveys are intended to coincide with optimum weather conditions for anuran breeding activity and detection of calls, i.e., suitable temperature relative to each survey window, humid or damp but not raining, and low wind. Call level Codes will be applied to each species detected per area of suitable habitat and numbers of individuals will be counted or estimated where applicable. The surveys will take place in mid-April, mid to late-May and late June. Point count locations will be shown on a figure and detailed survey dates and weather information will be provided in an Appendix.

Breeding Birds

Breeding Bird Surveys will be conducted by an experienced ecologist in order to determine if significant bird breeding habitat occurs within or adjacent to the study area. Two surveys will be conducted comprised of 10-minute point counts position at pre-determined locations approximately 175 m apart. Where appropriate (stream corridor) a wandering transect may be used to capture nests and calling birds. Surveys will follow the Ontario Breeding Bird Atlas: Guide for Participants (Federation of Ontario Naturalists, March 2001) and Ontario Breeding Bird Atlas, Instructions for Point Counts (Birds Canada, June 2021). The highest observed level of breeding evidence will be used to assign breeding status (i.e., confirmed, possible, probable or observed) to each species.

Surveys will be undertaken during the peak breeding season for the bulk of species in southern Ontario (last week of May through early July) and will be spaced at least 10 days apart in order to determine presumed permanent territories through territorial singing males. The two surveys will be undertaken in the early morning between 30 minutes before dawn and 5 hours after dawn. The point count locations will be shown on a figure; detailed survey dates and weather information will be provided in an appendix.

Incidental Wildlife Observations

Incidental observation of insects, mammals, birds and reptiles will be recorded during all field visits.

Significant Wildlife Habitat

With the guidance of the Significant Wildlife Habitat Technical Guide (2000) and the SWH Ecoregion Schedule 6E (2015), the proposed development and immediately adjacent lands (within 120 m) will be considered for the presence of Significant Wildlife Habitat (e.g., specialized habitats for wildlife and habitat for species of conservation concern). An assessment of the study area for all SWH will be provided in an Appendix.

Species at Risk Habitat

The subject property and the study area will be reviewed for the presence of habitat that may be suitable for Species at Risk. Guidance will be provided by the MNRF-Aylmer District as to what SAR may have the potential to occur in or near to Strathroy-Caradoc. A review of the site along with habitat requirements for each species will be conducted. A variety of sources including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) documents will be used to determine habitat suitability. The site will then be evaluated for potential habitat using Ecological Land Classification, guidance from MNRF documents and on-site knowledge acquired through field surveys. An assessment of the study area of candidate habitat for SAR will be provided in an Appendix.

The Ministry of Environment Conservation and Parks will be consulted to determine detailed species information for the site and immediately surrounding lands. The NHIC Make A Map function will be used to determine SAR within 1 k of the site. The SCRCA list of Strathroy-Caradoc SAR will be consulted to assist in determining what SAR may be at the site.

Other Project Details:

- Existing Site Conditions in general from a landscape perspective.
- Significance of features – common, rare or unusual on a regional or provincial basis.
- Potential Impacts (cumulative impacts) occurring in the surrounding area as a result of the proposed development.
- Potential impacts associated with changes related to drainage of the site, water quality and water quantity.
- Mitigative measures that may be undertaken as part of the design process (Low Impact Design) to prevent, minimize or offset anticipated negative impacts of the proposed land development.

APPENDIX E -

AGENCY CORRESPONDENCE

St. Clair Region Conservation Authority
205 Mill Pond Cres., Strathroy, ON, N7G 3P9
(519) 245-3710 (519) 245-3348 FAX
E-Mail: stclair@scrca.on.ca
Website: www.scrca.on.ca

No: R#2020-0846

March 3, 2021

Klaud Czeslawski
16 Sunray Ave
London, Ontario N6P 1B6

Dear Mr Czeslawski:

Re: Property Inquiry – County Lands in Strathroy
Pt. Lot 19, Concession 4 SER, Geographic Township of Adelaide, Municipality of Strathroy-Caradoc

St. Clair Region Conservation Authority (SCRCA) staff reviewed the above noted property inquiry. It is our understanding that you are a potential purchaser of the property and that you have contacted the Authority to inquire about any restrictions, requirements or regulations of the Authority that would impact development on the property. You are inquiring about developing the land for single detached homes and townhouses.

St. Clair Region Conservation Authority - Review under the *Planning Act*
It is our understanding that you will require Planning Act applications (i.e. Plan of Subdivision, Zoning By-Law Amendment, Official Plan Amendment) for the subject property in order to construct new townhouses and/or single detached dwellings. SCRCA provides comments regarding Natural Hazards and Natural Heritage policies from the *Provincial Policy Statement* (PPS) (2020) to the Municipality for applications made under the *Planning Act.*

Natural Hazards
The subject property contains areas within the flooding and erosion hazard of the Cable Drain. The hazard is made up of the meander belt erosion hazard and associated allowance (30 metres on either side of the drain) and the estimated engineered floodplain as shown on the map included with this report. The limit of the floodplain is defined by the extent of flooding expected under the regulatory storm as established by the Authority. The regulatory storm for the Municipality is based upon the Hurricane Hazel storm centred event.

A portion of the hazard on the subject property is shown as 'Hazard Land' on Schedule 'K' of the Municipality of Strathroy-Caradoc's Official Plan and in the Zoning By-law through the 'Natural Environment Overlay'. The PPS and Official Plan generally prohibit buildings and structures within Hazard Land areas. The PPS may permit development where the effects and risk to public safety are minor, could be mitigated in accordance with provincial standards and if the following can be demonstrated and achieved:

a) *development and site alteration is carried out in accordance with floodproofing standards, protection works standards, and access standards;*
b) *vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies;*
c) *new hazards are not created and existing hazards are not aggravated; and*
d) *no adverse environmental impacts will result.*

Aligned with the PPS, Strathroy-Caradoc's Official Plan policy 6.1.1.3 requires that if development is proposed in 'Hazard Land' areas, the proponent may be required to undertake, at his expense, studies to provide the technical information necessary to evaluate the proposal in accordance with the following:

a) *the degree of existing or potential physical hazard;*
b) *the potential impact of these hazards on proposed buildings, structures or additions thereto;*

St. Clair Region Conservation Authority
205 Mill Pond Cres., Strathroy, ON, N7G 3P9
(519) 245-3710 (519) 245-3348 FAX
E-Mail: stclair@scrca.on.ca
Website: www.scrca.on.ca

c) *the proposed methods by which these impacts may be overcome in a manner consistent with accepted resource management practices and engineering techniques;*
d) *minimum building setbacks in relation to the kind, extent, and severity of both the existing and potential hazard.*

In addition to the Official Plan policies, the Zoning By-law further regulates development in Hazard Land areas by prohibiting buildings and structures on lands exhibiting hazardous characteristics and through the following setbacks from Municipal Drains:

c) Municipal Drain (greater than 7.5 m wide) - 30 m from top-of-bank

The approval of the Authority will be required and may only be given where the control of flooding, erosion, pollution or the conservation of land will not be affected by the development. The completion of the above technical studies does not guarantee that the development proposal will be supported by the Authority. All design parameters for stormwater management are to be reviewed by SCRCA. Any outlet for the drainage works will require written approval from the Authority.
As per the PPS policy 3.1.5. institutional uses and essential emergency services will not be permitted within the hazard area.

Natural Heritage
The feature along the drain on the property has been identified in the *Middlesex Natural Heritage System Study* (MNHSS) (2014). The wooded feature is not identified in the Official Plan or the Zoning By-law. It is expected that the natural heritage features will be retained within the natural hazard setbacks. Should significant encroachment into the erosion hazard of the drain be proposed, additional review may be required through a scoped Development Assessment Report, to be reviewed by SCRCA.

St. Clair Region Conservation Authority - Ontario Regulation 171/06
SCRCA staff provide the following comments as part of SCRCA's Regulatory Authority under Ontario Regulation 171/06 "*Development, Interference with Wetlands and Alterations to Shoreline and Watercourses"* made under Section 28 of the *Conservation Authorities Act.*

The subject property has been identified as being regulated under Ontario Regulation 171/06. The policies of the Authority regulate development including: construction/reconstruction of a structure; placement or removal of fill; regrading; altering a watercourse; altering/developing a shoreline; or interfering with the function of a wetland. Written approval from this Authority will be required in order to undertake any of these activities within the regulated area.

Based on SCRCA's best available mapping the Regulated Area on the property includes the estimated floodplain and meander belt for the Cable Drain (approximately 30 metres on each side of the drain). If development is located outside the regulated area as shown on the attached mapping, then further written permission from the Conservation Authority will not be required.

Please be aware that the extent of the Regulation Limit as shown on the attached map is an approximation based on the available information. Please refer to Ontario Regulation 171/06 for a full description of the Regulation Limit.

St. Clair Region Conservation Authority
205 Mill Pond Cres., Strathroy, ON, N7G 3P9
(519) 245-3710 (519) 245-3348 FAX
E-Mail: stclair@scrca.on.ca
Website: www.scrca.on.ca

SCRCA recommends that you:

- Contact the Municipality to inquire about their requirements for development in this area
- Set up a pre-consultation meeting with the Municipality to review the Municipality's requirements in conjunction with the Conservation Authority.

Fees will apply for the review of Planning Act applications, technical studies and SCRCA permits. SCRCA's fee schedule is available on our website at: https://www.scrca.on.ca/planning-and-regulations/planning-and-regulations-fee-schedule/ and is updated annually.

If you have further questions, please do not hesitate to contact the undersigned.

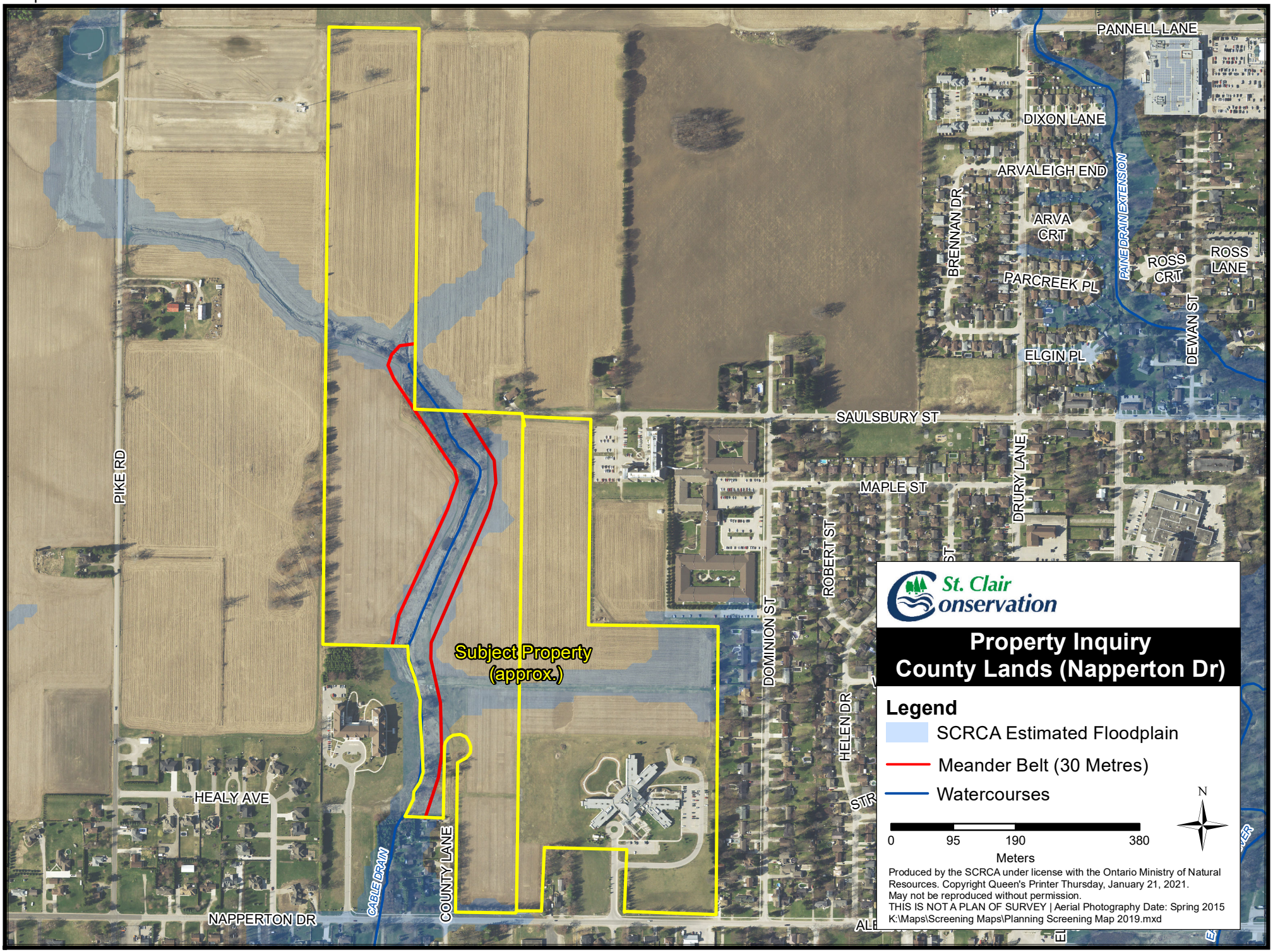
Sincerely,

Melissa Deisley
Regulations Coordinator

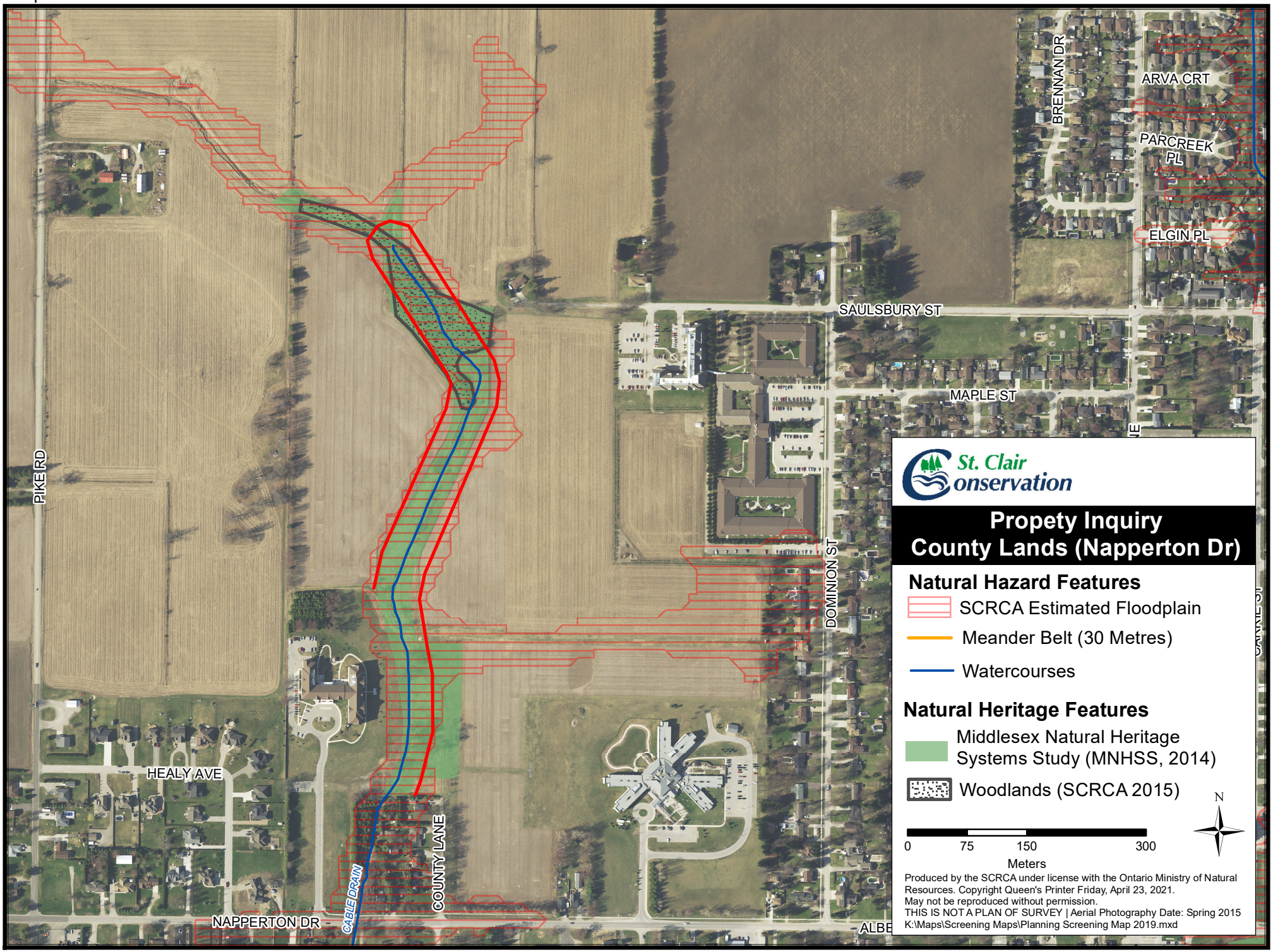
Laura Biancolin
Planner

Encl. Map

Map R#2020-0846



Map R#2020-0846



Jordan Fohkens

From: Sarah Hodgkiss <shodgkiss@scrca.on.ca>
Sent: May 26, 2022 10:56 AM
To: Chris Hart; Jordan Fohkens
Cc: Tim Williams; Jennifer Huff
Subject: RE: Buchanan Crossing ...

PL#2021-0054

Hi Chris,

Thanks for including the map with the updated terms of reference.

As discussed, we still recommend the SAR screening for the agricultural lands, specifically re: grassland birds if suitable habitat is present. I know in the text of the TOR you reference the study area and subject property re: SAR screening, I just wanted to reiterate that since it isn't captured on the map.

As we discussed on our call, since the stormwater management facility will be outletting into the watercourse, we are looking for you to provide the baseline information about the exiting conditions of the watercourse from an ecological perspective to provide recommendations about the appropriate level of water quality and quantity control from the SWMF.

Please continue with the field work as planned in the terms of reference, and keep us appraised if any of your plans change as new information is available as your proceed through the surveys.

As I mentioned in a previous emails, it is not a submission requirement, but you may find it useful to organize and submit your data using the Southern Ontario Floral Inventory Analysis spreadsheet, developed by the Essex Region Conservation Authority, and available on their website: https://link.edgepilot.com/s/0f1d6cd3/-7f79XSSDEWrDkHB1_1gXQ?u=https://essexregionconservation.ca/resources/reports/environmental-impact-assessment-guidelines/. Some of the consultants in our watershed have been using this system as it automates some of the summaries for the process. If you have any questions about it, there is a primer available on the website, or you can follow up with me.

Thank you,

Sarah

From: Chris Hart <hart.c3j@gmail.com>
Sent: May 24, 2022 10:38 AM
To: Sarah Hodgkiss <shodgkiss@scrca.on.ca>; Jordan Fohkens <jfohkens@bmross.net>
Subject: Buchanan Crossing ...

Hi Sarah:

It's timely for me to contact you since I am continuing to undertake field work along the primary stream corridor at the Buchanan Crossing site.

Please advise me if you require further information to supplement the DRAFT DAR TOR that I have submitted.

I would be glad to discuss this at any time.

sincerely,

Jordan Fohkens

From: Tim Williams <twilliams@middlesex.ca>
Sent: May 29, 2023 11:26 AM
To: Chris Hart; lwallis@nsenvironmental.com; smainguy@nsenvironmental.com; Jennifer Huff; Curt Bladon; Jordan Fohkens
Subject: RE: DAR For Buchanan Crossings ...
Attachments: BUCHANAN CROSSINGS_FINAL REVISED_TERMS OF REFERENCE FOR DAR_04_03_2022 with Comments.docx

Chris,

There were comments from the Municipality that don't seem to the included in the version of the DAR that you have provided. I have attached the comments that we provided in Nov 2022.

Regards,
Tim

From: Chris Hart <hart.c3j@gmail.com>
Sent: Sunday, May 28, 2023 10:21 AM
To: lwallis@nsenvironmental.com; smainguy@nsenvironmental.com; Tim Williams <twilliams@middlesex.ca>; Jennifer Huff <jhuff@strathroy-caradoc.ca>; Curt Bladon <cbladon@bmross.net>; Jordan Fohkens <jfohkens@bmross.net>
Subject: DAR For Buchanan Crossings ...

May 28, 2023

Attached please find the DAR as provided to SCRCA and Middlesex County.

Chris Hart

Jordan Fohkens

From: Sarah Hodgkiss <hodgkisss@thamesriver.on.ca>
Sent: June 16, 2023 11:33 AM
To: Jordan Fohkens
Cc: twilliams@middlesex.ca; Melissa Deisley
Subject: RE: TOR for Buchanan Crossing DAR (Strathroy-Caradoc)

Hi Jordan,

You found me! I hope you are doing well.

I obviously don't have all of my file history information available, but thanks for sending the email and document as a reminder. We typically expect an updated terms of reference document that incorporates our feedback to have as part of the complete record for the file, and that is generally included as an appendix of the final EIS report so that the peer-reviewer can easily confirm that all of the items have been addressed. I don't recall if I received an email back from Chris after this with him acknowledging the changes. Nevertheless, at this stage in the process, provided that those points were incorporated in the workplan and were completed as part of the field studies, I would consider that acceptable, but my email below should also be included in the appendix of the report under agency correspondence for the complete record.

I am copying Melissa and Tim for their information, and if they have any additional questions or recommendations.

Sarah

>>> Jordan Fohkens <jfohkens@bmross.net> 2023-06-13 3:15 PM >>>
Hi Sarah,

Hope all is well at the UTRCA.

My apologies for bringing up this old SCRCA file, but would you be able to confirm that you were satisfied with the TOR for the Buchanan Crossings, subject to the following additional information?

- SAR screening for agricultural lands
- Baseline information on the existing conditions of the watercourse from an ecological perspective and
- Recommendation on the appropriate level of water quality and quantity control from the SWMF.

Attached was the TOR reference. The Municipality had North-South Environmental complete a peer review of the DAR and one of their comments was that there was not an approved TOR for the DAR.

Thanks again and please let me know if you would like me to contact Melissa instead.

Regards,

Jordan

From: Sarah Hodgkiss <shodgkiss@scrca.on.ca>
Sent: Thursday, May 26, 2022 10:56 AM
To: Chris Hart <hart.c3j@gmail.com>; Jordan Fohkens <jfohkens@bmross.net>
Cc: Tim Williams <twilliams@middlesex.ca>; Jennifer Huff <jhuff@strathroy-caradoc.ca>
Subject: RE: Buchanan Crossing ...

PL#2021-0054

Hi Chris,

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Thank you,

Sarah

From: Chris Hart <hart.c3j@gmail.com>
Sent: May 24, 2022 10:38 AM
To: Sarah Hodgkiss <shodgkiss@scrca.on.ca>; Jordan Fohkens <jfohkens@bmross.net>
Subject: Buchanan Crossing ...

Hi Sarah:

It's timely for me to contact you since I am continuing to undertake field work along the primary stream corridor at the Buchanan Crossing site.

Please advise me if you require further information to supplement the DRAFT DAR TOR that I have submitted.

I would be glad to discuss this at any time.

sincerely,

Chris Hart
Tel: 519-574-5357

Jordan Fohkens

From: Gould, Ron (MECP) <ron.gould@ontario.ca>
Sent: October 5, 2023 8:24 AM
To: Chris Hart; Jordan Fohkens
Subject: RE: SAR in the Cable Drain ... Strathroy-Caradoc

Hi Chris,

I moved from the SAR program over to Ontario Parks many years ago so would recommend contacting SAROntario@ontario.ca to consult one of their biologists and complete your data screening.

The only record in the immediate vicinity I found our data is a Snapping Turtle observed crossing the road in May 2018 where the drain intersects Napperton Dr. There would be a mix of suitable aquatic and terrestrial habitat for the species in the project area. For information on possible fish and mussel SAR records I would suggest consulting the DFO map tool here https://link.edgepilot.com/s/1e2f8520/jRg5DCed0kGgN2tCt0Fr6g?u=https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Good luck with your project,

Ron Gould | Protected Areas Specialist – Southwest Zone
Ontario Parks
659 Exeter Rd W, London, Ontario, N6E 1L3
P: 226-559-0897 **W:** OntarioParks.com

Please Note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

From: Chris Hart <hart.c3j@gmail.com>
Sent: October-04-23 10:42 AM
To: Gould, Ron (MECP) <ron.gould@ontario.ca>; Jordan Fohkens <jfohkens@bmross.net>
Subject: SAR in the Cable Drain ... Strathroy-Caradoc

Dear Ron:

I am writing to request advice regarding the Cable Drain headwaters north of Napperton Drive on the west Boundary of Strathroy.

The Cable Drain is shown on the attached figure.

I am completing an EIS (DAR) for properties to the east and looking for any information regarding *SAR in the Cable Drain* and adjacent lands.

Does the MECP have any records for the Cable Drain in this area.

Sincerely,

Chris Hart
Tel: 519-574-5357

Jordan Fohkens

From: Species at Risk (MECP) <SAROntario@ontario.ca>
Sent: October 5, 2023 11:46 AM
To: Chris Hart; Jordan Fohkens
Subject: RE: Cable Drain species in Strathroy Caradoc ...
Attachments: Client Guide to Preliminary Screening-May 2019.pdf

Hello Chris,

Thank you for your submission to the Ministry of the Environment, Conservation and Parks (MECP) about species at risk (SAR).

MECP is responsible for the administration of the *Endangered Species Act, 2007* (ESA) (Endangered Species Act, 2007, S.O. 2007, c. 6 (ontario.ca)). The ESA provides for the protection and recovery of species on the Species at Risk in Ontario (SARO) List (O. Reg. 230/08: SPECIES AT RISK IN ONTARIO LIST). The ESA includes prohibitions against killing, harming, harassing, capturing or taking a living member of a species listed as extirpated, endangered, or threatened on the SARO List (section 9) and against damaging or destroying the habitat of a species listed as endangered or threatened on the SARO List (section 10), without an exemption or authorization.

Seeking an ESA authorization or exemption is a proponent-led process. **This means that the person carrying out an activity is responsible for determining whether SAR and their habitat are present on or around the site of the activity, and ultimately ensuring their actions do not contravene the ESA**.

For information about assessing which SAR may be present on or in the area of your site, please refer to the MECP's draft "Client's Guide to Screening for Species at Risk" (attached).

You may proceed with the screening on your own or you may wish to consider hiring a qualified professional to perform a screening on your behalf. MECP recommends that the services of a professional environmental consultant be retained to assist in the completion of a screening, field assessments and surveys. An environmental consultant will be able to provide advice and direction on the type of surveys that should be performed and will be able to interpret the results of any surveys carried out.

If after carrying out a thorough SAR screening, including any field assessments and surveys that might be necessary, there is **no evidence of SAR or SAR habitat located on or adjacent to the site of your activity** and your activity will therefore not cause any prohibited impacts, an exemption or authorization under the ESA would not be necessary to proceed. The ministry strongly recommends that you document your SAR screening and assessment and rationale for avoiding prohibited impacts for future reference if needed. Proponents are responsible for ensuring their actions do not contravene the ESA.

If there IS evidence of species a risk and/or habitat on or around the location of your activity, the ministry recommends that you carry out the work necessary to prepare an Information Gathering Form (IGF). This includes consideration of all the elements in your SAR screening data collection and further levels of assessment of impacts and potential to minimize adverse effects.

After considering all the data and information in the IGF, if you have determined that the activity can be carried out in such a way that you WILL NOT have adverse impacts prohibited by sections

9 and/or 10 of the ESA, an exemption or authorization under the ESA would not be necessary to proceed if the activity is carried out in that way. Again, proponents are responsible for ensuring their actions do not contravene the ESA.

If after considering all the data and information in the IGF you have determined that the proposed activities COULD POTENTIALLY have adverse impacts prohibited by sections 9 and/or 10 of the ESA, an exemption or authorization may likely be required before you proceed. If there is no applicable exemption in regulations under the ESA, submit the IGF to the ministry at SAROntario@ontario.ca to seek a permit or agreement. Please visit How to get an Endangered Species Act permit or authorization | ontario.ca to obtain information on how to get an ESA permit or authorization.

Please consider in your project planning that it takes an average of 12-15 months from the submission of a complete IGF to a decision about a permit, if one is needed. This considers the time required to conduct the technical review of the application as well as to carry out public and Indigenous consultation, along with factors such as project complexity, seasonal nature of field survey and data collection required, volume of applications and quality of submissions. It is recommended that proponents submit a complete IGF well in advance of the activity's proposed start date. Failure to submit a complete and accurate IGF with supporting rationale and not allowing adequate time for review and the issuance of any required authorizations could result in delays to the activity's anticipated start date.

Thank you,

Species at Risk Branch

From: Chris Hart <hart.c3j@gmail.com>
Sent: October 5, 2023 9:41 AM
To: Species at Risk (MECP) <SAROntario@ontario.ca>; Jordan Fohkens <jfohkens@bmross.net>
Subject: Cable Drain species in Strathroy Caradoc ...

Dear Sir/Madam:

I am writing to request advice regarding the Cable Drain headwaters north of Napperton Drive on the west Boundary of Strathroy.

The Cable Drain is shown on the attached figure.

I am completing an EIS (DAR) for properties to the east and looking for any information regarding *SAR in the Cable Drain* and adjacent lands.

Does SAR Ontario have any records for the Cable Drain in this area.

Sincerely,

Chris Hart
Ecologist/Landscape Architect
Tel: 519-574-5357

Client's Guide to Preliminary Screening for Species at Risk

Ministry of the Environment, Conservation and Parks

Species at Risk Branch, Permissions and Compliance

DRAFT - May 2019

Table of Contents

1.0 Purpose, Scope, Background and Context

1.1 Purpose of this Guide

This guide has been created to:

- help clients better understand their obligation to gather information and complete a preliminary screening for species at risk before contacting the ministry,
- outline guidance and advice clients can expect to receive from the ministry at the preliminary screening stage,
- help clients understand how they can gather information about species at risk by accessing publicly available information housed by the Government of Ontario, and
- provide a list of other potential sources of species at risk information that exist outside the Government of Ontario.

It remains the client's responsibility to:

- carry out a preliminary screening for their projects,
- obtain best available information from all applicable information sources,
- conduct any necessary field studies or inventories to identify and confirm the presence or absence of species at risk or their habitat,
- consider any potential impacts to species at risk that a proposed activity might cause, and
- comply with the *Endangered Species Act* (ESA).

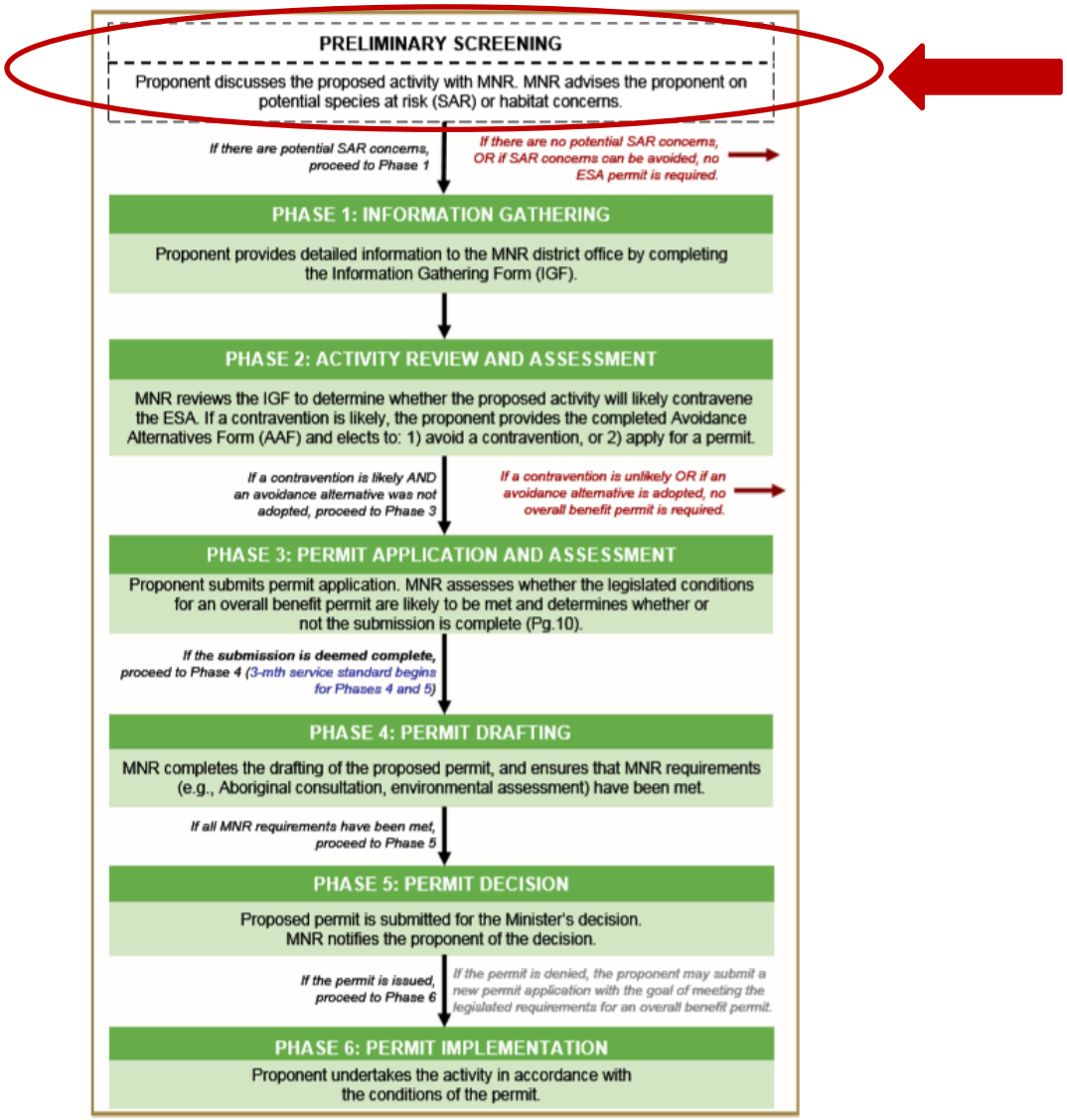
To provide the most efficient service, clients should initiate species at risk screenings and seek information from all applicable information sources identified in this guide, at a minimum, prior to contacting Government of Ontario ministry offices for further information or advice.

1.2 Scope

This guide is a resource for clients seeking to understand if their activity is likely to impact species at risk or if they are likely to trigger the need for an authorization under the ESA. It is not intended to circumvent any detailed site surveys that may be necessary to document species at risk or their habitat nor to circumvent the need to assess the impacts of a proposed activity on species at risk or their habitat. This guide is not an exhaustive list of available information sources for any given area as the availability of information on species at risk and their habitat varies across the province. This guide is intended to support projects and activities carried out on Crown and private land, by private landowners, businesses, other provincial ministries and agencies, or municipal government.

1.3 Background and Context

To receive advice on their proposed activity, clients must first determine whether any species at risk or their habitat exist or are likely to exist at or near their proposed activity, and whether their proposed activity is likely to contravene the ESA. Once this step is complete, clients may contact the ministry at SAROntario@ontario.ca to discuss the main purpose, general methods, timing and location of their proposed activity as well as information obtained about species at risk and their habitat at, or near, the site. At this stage, the ministry can provide advice and guidance to the client about potential species at risk or habitat concerns, measures that the client is considering to avoid adverse effects on species at risk or their habitat and whether additional field surveys are advisable. This is referred to as the "Preliminary Screening" stage. For more information on additional phases in the diagram below, please refer to the *Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits* policy available online at https://www.ontario.ca/page/species-risk-overall-benefit-permits. Please note: any reference to MNR in the diagram is replaced by MECP.



2.0 Roles and Responsibilities

To provide the most efficient service, clients should initiate species at risk screenings and seek information from all applicable information sources identified in this guide prior to contacting Government of Ontario ministry offices for further information or advice.

Step 1: Client seeks information regarding species at risk or their habitat that exist, or are likely to exist, at or near their proposed activity by referring to all applicable information sources identified in this guide.

Step 2: Client reviews and consider guidance on whether their proposed activity is likely to contravene the ESA (see section 3.4 of this guide for guidance on what to consider).

Step 3: Client gathers information identified in the checklist in section 4 of this guide.

Step 4: Client contacts the ministry at SAROntario@ontario.ca to discuss their preliminary screening. Ministry staff will ask the client questions about the main purpose, general methods, timing and location of their proposed activity as well as information obtained about species at risk and their habitat at, or near, the site. Ministry staff will also ask the client for their interpretation of the impacts of their activity on species at risk or their habitat as well as measures the client has considered to avoid any adverse impacts.

Step 5: Ministry staff will provide advice on next steps.

Option A: Ministry staff may advise the client they can proceed with their activity without an authorization under the ESA where the ministry is confident that:

- no protected species at risk or habitats are likely to be present at or near the proposed location of the activity; or
- protected species at risk or habitats are known to be present but the activity is not likely to contravene the ESA; or
- through the adoption of avoidance measures, the modified activity is not likely to contravene the ESA.

Option B: Ministry staff may advise the client to proceed to Phase 1 of the overall benefit permitting process (i.e. Information Gathering in the previous diagram), where:

- there is uncertainty as to whether any protected species at risk or habitats are present at or near the proposed location of the activity; or
- the potential impacts of the proposed activity are uncertain; or
- ministry staff anticipate the proposed activity is likely to contravene the ESA.

3.0 Information Sources

Land Information Ontario (LIO) and the Natural Heritage Information Centre (NHIC) maintain and provide information about species at risk, as well as related information about fisheries, wildlife, crown lands, protected lands and more. This information is made available to organizations, private individuals, consultants, and developers through online sources and is often considered under various pieces of legislation or as part of regulatory approvals and planning processes.

The information available from LIO or NHIC and the sources listed in this guide should not be considered as a substitute for site visits and appropriate field surveys. Generally, this information can be regarded as a starting point from which to conduct further field surveys, if needed. While this data represents best available current information, it is important to note that a lack of information for a site does not mean that species at risk or their habitat are not present. There are many areas where the Government of Ontario does not currently have information, especially in more remote parts of the province. The absence of species at risk location data at or near your site does not necessarily mean no species at risk are present at that location. On-site assessments can better verify site conditions, identify and confirm presence of species at risk and/or their habitats.

Information on the location (i.e. observations and occurrences) of species at risk is considered sensitive and therefore publicly available only on a 1km square grid as opposed to as a detailed point on a map. This generalized information can help you understand which species at risk are in the general vicinity of your proposed activity and can help inform field level studies you may want to undertake to confirm the presence, or absence of species at risk at or near your site.

Should you require specific and detailed information pertaining to species at risk observations and occurrences at or near your site on a finer geographic scale; you will be required to demonstrate your need to access this information, to complete data sensitivity training and to obtain a Sensitive Data Use License from the NHIC. Information on how to obtain a license can be found online at https://www.ontario.ca/page/get-natural-heritage-information.

Many organizations (e.g. other Ontario ministries, municipalities, conservation authorities) have ongoing licensing to access this data so be sure to check if your organization has this access and consult this data as part of your preliminary screening if your organization already has a license.

3.1 Make a Map: Natural Heritage Areas

The Make a Natural Heritage Area Map (available online at https://www.ontario.ca/page/make-natural-heritage-area-map provides public access to natural heritage information, including species at risk, without the user needing to have Geographic Information System (GIS) capability. It allows users to view and identify generalized species at risk information, mark areas of interest, and create and print a custom map directly from the web application. The tool also shows topographic information such as roads, rivers, contours and municipal boundaries.

Users are advised that sensitive information has been removed from the natural areas dataset and the occurrences of species at risk has been generalized to a 1-kilometre grid to mitigate the risks to the species (e.g. illegal harvest, habitat disturbance, poaching).

The web-based mapping tool displays natural heritage data, including:

- Generalized Species at risk occurrence data (based on a 1-km square grid),
- Natural Heritage Information Centre data.

Data cannot be downloaded directly from this web map; however, information included in this application is available digitally through Land Information Ontario (LIO) at https://www.ontario.ca/page/land-information-ontario.

3.2 Land Information Ontario (LIO)

Most natural heritage data is publicly available. This data is managed in a large provincial corporate database called the LIO Warehouse and can be accessed online through the LIO Metadata Management Tool at https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home. This tool provides descriptive information about the characteristics, quality and context of the data. Publicly available geospatial data can be downloaded directly from this site.

While most data are publicly available, some data may be considered highly sensitive (i.e. nursery areas for fish, species at risk observations) and as such, access to some data maybe restricted.

3.3 Additional Species at Risk Information Sources

- The Breeding Bird Atlas can be accessed online at http://www.birdsontario.org/atlas/index.jsp?lang=en
- eBird can be accessed online at https://ebird.org/home
- iNaturalist can be accessed online at https://www.inaturalist.org/
- The Ontario Reptile and Amphibian Atlas can be accessed online at https://ontarionature.org/programs/citizen-science/reptile-amphibian-atlas
- Your local Conservation Authority. Information to help you find your local Conservation Authority can be accessed online at https://conservationontario.ca/conservation-authorities/find-a-conservation-authority/

  Local naturalist groups or other similar community-based organizations
- Local Indigenous communities
- Local land trusts or other similar Environmental Non-Government Organizations
- Field level studies to identify if species at risk, or their habitat, are likely present or absent at or near the site.
- When an activity is proposed within one of the continuous caribou ranges, please be sure to consider the caribou Range Management Policy. This policy includes figures and maps of the continuous caribou range, can be found online at https://www.ontario.ca/page/range-management-policy-support-woodland-caribou-conservation-and-recovery

3.4 Information Sources to Support Impact Assessments

- Guidance to help you understand if your activity is likely to adversely impact species at risk or their habitat can be found online at https://www.ontario.ca/page/policy-guidance-harm-and-harass-under-endangered-species-act and https://www.ontario.ca/page/categorizing-and-protecting-habitat-under-endangered-species-act
- A list of species at risk in Ontario is available online at https://www.ontario.ca/page/species-risk-ontario. On this webpage, you can find out more about each species, including where is lives, what threatens it and any specific habitat protections that apply to it by clicking on the photo of the species.

4.0 Check-List

Please feel free to use the check list below to help you confirm you have explored all applicable information sources and to support your discussion with Ministry staff at the preliminary screening stage.

- ✓ Land Information Ontario (LIO)
- ✓ Natural Heritage Information Centre (NHIC)
- ✓ The Breeding Bird Atlas
- ✓ eBird
- ✓ iNaturalist
- ✓ Ontario Reptile and Amphibian Atlas
- ✓ List Conservation Authorities you contacted:_____

  _____
- ✓ List local naturalist groups you contacted:_____

  _____
- ✓ List local Indigenous communities you contacted:_____

  _____
- ✓ List any other local land trusts or Environmental Non-Government Organizations you contacted:_____

  _____
- ✓ List and field studies that were conducted to identify species at risk, or their habitat, likely to be present or absent at or near the site: _____

  _____
- ✓ List what you think the likely impacts of your activity are on species at risk and their habitat (e.g. damage or destruction of habitat, killing, harming or harassing species at risk):_____

  _____

APPENDIX F

QUALIFICATIONS OF AUTHOR

CHRISTOPHER J. HART, M.Sc., M.L.A., OALA, CSLA

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Kitchener, Ontario N2H 5L5

Tel: 519-574-5357

Email: hart.c3j@gmail.com

BIOGRAPHICAL INFORMATION: ECOLOGIST/LANDSCAPE ARCHITECT

Chris Hart is an Ecologist/Landscape Architect and an experienced project manager who has worked with Conservation Authorities, Ministry of Natural Resources & Forestry and Environmental Consultants for over 20 years. Chris has experience with both qualitative and quantitative botanical field studies for scientific research (phytogeography and species typing) and habitat characterization for environmental planning projects and restoration projects. Chris is a specialist in the use of native plants and the management of natural areas for environmental restoration and habitat mitigation for a wide range of habitat types; he has specialized in wetland habitat.

Through a progressive range of regional projects Chris has been able to develop a truly regional perspective that lends itself to watershed and ecosystem restoration. Chris has 26 years of experience with the Public Interest Advisory Committee of the Niagara Escarpment Commission and understands the unique planning issues of the Niagara Escarpment Plan Area and the Ontario Greenbelt. Chris has experience with land development planning and design and N.E.C. Plan Amendment Applications as well as development peer reviews for conservation authorities and municipalities.

Chris has worked with E.A., E.I.S. and N.E.T.R. projects as a proponent and reviewer for 15 years. He has undertaken many field studies of both aquatic and terrestrial environments using recognized scientific protocols and those of the MNRF for S.A.R. He is primarily a botanist but can undertake wildlife studies for Breeding Birds, small mammals, bats and amphibians and reptiles for the provision of full E.I.S. reports. He has experience with radio-telemetry tracking of S.A.R. turtles, use of PIT Tags and data loggers. While not certified as an arborist Chris undertakes tree inventories and writes tree management plans.

Chris has a keen interest in natural heritage systems and natural areas management. He has experience with Environmental Restoration, Hydrology, Conservation Biology, Landscape Ecology, Ecological Land Classification (E.L.C.), Wetland Delineation (O.W.E.S.) and GIS analysis (ArcGIS). Chris is recognized for his writing ability, for every level of comprehension from the lay public to government scientists and managers. He is an able presenter and is comfortable meeting the public as well as providing presentations at conferences and large public open houses.

WORK EXPERIENCE:

Present) **<u>Dillon Consulting</u>**

(12_2015 Chris provides consulting services for natural heritage assessment, management and environmental planning projects. He undertakes ELC Studies, Wetland Delineation, Woodland Delineation, Breeding Birds, Wetland Birds, Amphibian call monitoring & Botanical inventories. He provides management review for natural science and land development projects. He also provides design services for environmental restoration, habitat mitigation and enhancement.

03_2023) **<u>Chris Hart & Associates</u>**

(12_2015 Chris provides consulting services for natural heritage assessment, management and environmental planning projects. He undertakes ELC Studies, Wetland Delineation, Woodland Delineation, Breeding Birds, Wetland Birds, Amphibian call monitoring & Botanical inventories. He works as a sub-consultant on consulting teams to provide technical support as an ecologist and environmental planner. He provides design services for environmental restoration, habitat mitigation and enhancement.

01_2022) Lincoln Environmental Consulting – Ecologist

(12_2020 Chris provided management support to the Environmental Science and Planning group at LEC. This group provides consulting services for natural heritage assessment / management and environmental planning. Chris undertook landscape analysis, natural habitat assessment and planning policy analysis. Chris also worked on consulting teams to provide technical support as an ecologist and environmental planner for EA. EIS and NETR (aggregate license) projects. He contributed design services for environmental restoration, habitat mitigation and enhancement.

12_2022) Independent Environmental Consultant

(12_2015 Chris provided consulting services for natural heritage assessment, management and environmental planning projects. He undertook ELC Studies, Wetland Delineation, Woodland Delineation, Breeding Birds, Wetland Birds, Amphibian call monitoring, Botanical inventories. He worked as a sub-consultant on consulting teams to provide technical support as an ecologist and environmental planner. He provided design services for environmental restoration, habitat mitigation and enhancement.

2017 Professor at Fanshawe College, London - 2017)

Chris was a part-time Professor in the School of Design at Fanshawe College. He taught courses in Professional Practice and Presentation Skills.

12_2015) Senior Ecologist/Project Manager - Manager of Natural Science Services (AET Group Inc.)

(03_2011- Provided consulting services for natural heritage assessment and management, recreational systems, parkland development, cultural heritage resources, sustainable communities and social marketing practices. Chris worked with green infrastructure projects that provided recreation opportunities through trail access and linear corridors that linked SWM facilities with ESAs, parkland and other public lands. Chris was involved in all phases of project management and contract administration. Other project work included renewable Energy, ARA License Natural Environment Studies, Land Development EIS and monitoring of environmental effects. Other responsibilities included report writing, junior staff supervision and business development. (*Position was terminated when Environmental Group was closed by AET Group Inc*. in 2016)

10_2010) Planning Ecologist – Project Coordinator (Greenlands Centre Wellington – Contract)

(08_2008- Development of a Landscape Analysis for the Township of Centre Wellington incorporating Urban green infrastructure, cultural heritage features, trails and recreational greenways. This Project involved the sourcing and analysis of all relevant policy with respect to municipal and Environmental planning at local, watershed and provincial levels. This project included a study of all urban and near-urban natural heritage features in detail with recommendations for planting and other habitat enhancement including management of invasive species, retirement of cultural landscapes, enhancement and restoration of stream corridors and strategic reforestation. Also produced was a set of "Development Guidelines for Sustainable Rural Communities".

06_2008) Area Biologist (Ontario Ministry of Natural Resources & Forestry- Contract)

(04_2007- Management and participation in a wide range of conservation programs involving fish and wildlife, species at risk, and land stewardship for rural lands. Coordinated the Canada Ontario Agreement program funding for environmental enhancement projects oriented to Great Lakes water quality enhancement. Undertook environmental restoration projects in rural and urban environments with private landowners and volunteers for municipal lands. Supervised and trained seasonal staff in field and administrative procedures. Represented MNR on technical and management committees involving regional municipalities and local conservation authorities. Field work included botanical studies, mapping and assessment of SAR habitat, radio-telemetry tracking of SAR turtles and creation, maintenance and monitoring. of turtle nesting habitat. Design projects included gravel pit restoration with S.A.R. turtle nesting habitat, pilot wetland creation and enhancement and stream corridor erosion control and reforestation.

03_2007) <u>Ecologist/Project Manager (Maitland Valley Conservation Authority - Contract)</u>

(12_2006- Developed and delivered a program for the promotion and implementation of environmental conservation projects for rural municipalities involving parks natural areas and water courses. Encouraged the protection, conservation, enhancement and restoration of these features. Also provided a new focus to promote energy efficient and sustainable landscapes with private rural landowners. Sourced funding and managed a wide variety of community environmental enhancement / restoration projects.

09_2006) <u>Ecologist/Project Manager (Grand River Conservation Authority - Contract)</u>

(01_2006- Coordinated a project involving the development of Grand River watershed regional trail systems. Responsibilities included renewing the administrative structure of the Grand Valley Trail Association, developing a feasible 5-year strategic plan, promoting new trails and trail linkages within the Grand Valley and to other external regional trail systems. Maintained liaison with planners and recreational specialists in all municipalities involved including Ministry of Health Promotion and Trail Groups.

01_2006) <u>Sustainable Landscape Specialist (Maitland Valley Conservation Authority - Contract)</u>

(02_2005- Developed and delivered educational materials and program workshops to teach the principles of environmental stewardship of natural areas and wildlife habitat enhancement on rural lands. Conducted farm tours and created environmental farm plans based on current best management practices and the principles of conservation biology and restoration ecology.

02_2005) <u>Ecologist/Project Manager (Ecoplans Ltd. - Contract)</u>

(02_2004 As a Biologist and Environmental Planner provided project management on development related projects by providing landscape analysis, field studies and planning solutions.

- Project management, Environmental Assessment and Environmental Impact Studies
- Biological field studies (ELC, G.I.S.), sub-watershed analysis, wetland delineation
- Design for environmental restoration and mitigation of development impacts

01_2004) <u>Ecologist/Project Manager (Conestoga-Rovers & Associates - Full Time)</u>

(12_1999 Provided design and management solutions on a project basis for the environmental cleanup of contaminated sites, design of mitigation and treatment wetlands at landfill sites and for agricultural runoff, stream channel bioengineering and erosion control.

- Project management, natural science field studies (ELC, G.I.S.), monitoring studies for Conformance reports, Environmental Assessment, Environmental Impact Studies

12_1999) <u>Independent Ecologist/Project Manager and Contractor</u>

(06_1996- Independent consulting Ecologist and specialty landscape contractor for environmental restoration, site reclamation, stream geomorphic analysis for fisheries habitat and bioengineering design, stream channel and ravine stabilization with bioengineering design, and conservation lands master planning. Continued many ongoing projects for Cumming Cockburn Ltd.

06-1996) Senior Environmental Scientist Architect (Cumming Cockburn Ltd. - Full Time)

(11_1995- Project management for a wide variety of projects involving new residential development throughout Ontario, urban infrastructure, storm water management and erosion control.
- Project management, Environmental Assessment, Environmental Impact Studies
- Bioengineering designs, urban storm water naturalization design, tree saving plans
- Water quality monitoring net design, data analysis, report writing, public information centers
- Sub-watershed planning

11_1995) Ecologist (Maitland Valley Conservation Authority - Full Time)

(05_1991- Ecologist with a focus on landscape restoration and rural community development for the creation of public greenways, naturalized parks, wetland/wildlife pilot projects in Huron and Perth Counties (swamp restoration, agricultural drain habitat enhancement, millpond habitat enhancement); sourced grant funding and managed community projects

- Coordinated public planting programs for parks, greenway reforestation and renaturalization
- Secured grant funding, scheduled projects, sourced and requisitioned plants and supplies
- Conservation lands master planning including design for reforestation and renaturalization
- Large river channel manipulation for construction of fisheries habitat and stone placement

EDUCATION

M.L.A. University of Guelph, S.E.D.R.D., (Landscape Architecture/Planning), 1991

M.Sc. University of Waterloo, Ecology (Botany/Limnology), 1983

B.E.S. University of Waterloo, Joint Honours Geography/Biology, 1979

Courses: Low Impact Development - design course by Credit Valley Conservation, 2015

O.B.B.N. – Benthic Invertebrate Identification, 2014

O.M.N.R. - Aboriginal Relations Management Consultation, 2008

St. John's Ambulance - CPR/First Aid Level II, 2013, (Certificate)

O.M.N.R. - Ecological Land Classification System for Ontario, 2002, (Certificate)

O.M.N.R. - Ontario Wetland Evaluation System Training, 2001, (Certificate)

Wilfrid Laurier School of Business & Economics – Small Business Management, 1999

MEMBERSHIPS

- Ontario Association of Landscape Architects, Full Member (1992-current), Councillor (2013-2017); Secretary (2015-16); Treasurer (2016-17)
- Ontario Nature
- Field Botanists of Ontario
- Society of Canadian Ornithologists

PRESENTATIONS

- **“Green Infrastructure and Active Lifestyles in Rural Ontario”**

  Presented at the Grey to Green Conference

  Toronto, August 2014

- **“Planning for Green Infrastructure in Rural Communities”**

  A tour presented for the Ontario Association of Landscape Architects in Elora and Fergus, ON

  August 2014

- **“A Landscape Analysis of the Township of Centre Wellington”**

  Presented to Heritage Elora,

  November 2009

- **“Sustainable Landscape Management”**

  A workshop prepared and presented under contract to the Ecological

  Farmers Association of Ontario, Winter 2006

- **“The Milton Mill Pond – Historic Mill Pond Restoration”**

  Presented at the 14th Annual Conference of the Society for Ecological Restoration

  October, 2002, Niagara Falls, Canada.

- **“Completing Ontario’s Greenways”**

  +Presented jointly with Bryan Howard, Ontario Ministry of Natural Resources, at the Ontario Parks Heritage Symposium, Heritage Resources Center

  March, 1994, University of Waterloo, Canada.

- **“Wooded Swampland Restoration with Hydroperiod Control”**

  Presented jointly with Jane Bowles, Ph.D., University of Western Ontario, at the 54th Midwest Fish and Wildlife Conference -“In Pursuit of Ecosystem Integrity”

  December, 1992, Toronto, Canada

- **“Wooded Swampland Restoration”**

  Presented at the 4th Annual Conference of the Society for Ecological Restoration

  August, 1992, University of Waterloo, Canada