

Appendix A1
Natural Environment Technical Report





**Addendum to Oshawa to
Bowmanville Rail Service
Extension
Environmental Project
Report: Natural
Environment Technical
Report**

Final

September 26, 2023

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Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Natural Environment Technical Report

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Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Natural Environment Technical Report

Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by Metrolinx, an agency of the Province of Ontario, to complete a Natural Environment Technical Report (NETR) for the Oshawa to Bowmanville Rail Service Extension Project (the Project) formerly referred to as the Oshawa to Bowmanville Rail Service Expansion Project in the 2011 Environmental Project Report (EPR). The Project is located in the City of Oshawa and Municipality of Clarington, within the Regional Municipality of Durham, Ontario.

The Project includes the proposed addition of new tracks, development of four GO stations, bridges, at-grade crossing widenings, and modifications to structures and utilities. This NETR evaluates lands within and adjacent to the Project. The main purpose of the NETR is to outline existing conditions with respect to the natural environment and evaluate potential impacts to natural heritage features and areas which may result from the construction and operational phases of the Project. The scope of field investigations and assessment methodology within the Project Footprint and Study Area differs according to anticipated Project impacts to natural heritage features and the complexity of the feature.

Previous studies and background information for the Study Area were reviewed as part of the preliminary assessment process and prior to completing field investigations to inform targeted field surveys. Natural features in the Study Area include 14 watercourses, fish habitat, headwater drainage features, valleylands, woodlands, wetlands and wildlife habitat. The field program was carried out in spring and summer of 2021, 2022, and 2023, and included surveys for vegetation, wildlife and wildlife habitat, fish and aquatic habitat. Specifically, these studies included Ecological Land Classification, botanical inventories, Butternut Health Assessments, breeding bird surveys, amphibian call surveys, bat acoustic surveys (treed habitat and building exit surveys), wildlife habitat assessments, wildlife movement review, headwater drainage feature assessment, fish community and fish habitat assessments. Following field surveys, additional assessments were completed as part of study, including the species at risk (SAR) and species of conservation concern habitat screening assessments, and significant wildlife habitat screening assessments, followed by the impact assessment.

The environmental components of the impact assessment are grouped into four primary categories: designated features and policy areas; vegetation communities; wildlife and wildlife habitat, and aquatic habitats. The environmental components occur across the Project Footprint (lands within the construction limits of the Project) and Study Area (Project Footprint plus Adjacent Lands) and are concentrated in the valleylands associated with the Oshawa Creek and Farewell Creek watersheds. Further, most of the natural features and designated areas (planning policy areas related to natural heritage) are concentrated around the watercourses and associated valleyland systems.



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For example, most woodland and wetland features are predominantly located adjacent to existing watercourse corridors associated with Harmony Creek, Robinson Creek, Tooley Creek, and Darlington Creek tributaries.

The Oshawa Creek, Harmony Creek, and Farewell Creek corridors are designated as Urban River Valleys under the Greenbelt Plan. Further, Greenlands System and Key Natural Heritage Features (KNHFs) and Key Hydrologic Features (KHF) have been identified in the Study Area (Regional Municipality of Durham). Lands surrounding various creek systems have been identified by the City of Oshawa as KNHFs and KHF, and by the Central Lake Ontario Conservation Authority (CLOCA) and the lower tier municipalities as Natural Heritage System (NHS). Additional lower tier natural heritage designations surrounding these features include Green Space and Environmental Protection Area (EPA). Lands surrounding the watercourses and wetlands within the Project Footprint and Adjacent Lands are also within CLOCA's regulated area. Potentially present and confirmed SAR have been identified in the Study Area.

There were no provincially significant vegetation communities identified in the Study Area. The Study Area is located partially within an urban environment comprised of residential, commercial and recreational properties in Oshawa and Bowmanville and partially within a rural environment comprised of agricultural fields, rural residences and light industry. Natural vegetation features throughout the Study Area show signs of disturbance with an abundance of invasive species including Common Reed and Dog-strangling Vine. Forest and swamp communities are concentrated along the 14 creeks and tributaries in the Study Area. Meadow, thicket and woodland cultural communities are abundant throughout the Study Area in both urban and rural environments.

The natural areas in the Study Area provide habitat for breeding bird species protected under the *Migratory Birds Convention Act* (MBCA). There is both confirmed, and candidate Significant Wildlife Habitat features within the Study Area. Butternut, Bobolink, Eastern Meadowlark and SAR Bats have been confirmed in the Study Area. Fish habitat was identified at 14 existing watercourse crossing locations in the Study Area. The watercourses at these crossings provided direct fish habitat (i.e., frequented by fish). Two unnamed tributaries provided indirect fish habitat. Coldwater thermal regime was documented at Oshawa Creek and Farewell Creek. Coolwater thermal regime was documented at Tooley Creek and a tributary of Tooley Creek. At the remaining crossings a warmwater thermal regime was identified. There are no records of provincially or federally protected aquatic SAR for the Study Area.



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Potential impacts to existing natural heritage were assessed for both the construction and operational phases of the Project. The potential impacts have been determined based on an understanding of the Project Footprint and Study Area and anticipated interactions with the existing natural environment during each Project phase. Where potential adverse impacts have been identified, environmental protection, mitigation and/or ecological restoration and subsequent monitoring activities are recommended to reduce these impacts. Mitigation and monitoring recommendations related to vegetation are based on Metrolinx's Vegetation Guideline (Metrolinx 2022). Further field studies to comply with policies and permitting may be required, including conducting nest searches for migratory birds during the breeding bird window to avoid contravention of the MBCA. Confirmed SAR or SAR habitat requires consultation with the MECP to determine any specific mitigation, compensation and/or permit requirements under the *Endangered Species Act* (ESA). Project review by Fisheries and Oceans Canada (DFO Request for Review) is recommended for activities that occur at or below the high-water level of waterbodies that are considered fish habitat. Fish habitat includes all waterbodies that contain fish at any time of the year or that contribute to waterbodies that contain fish.

With the implementation of the mitigation measures, monitoring activities, follow-up surveys (i.e., fish spawning, wildlife crossing/trail camera) and approvals outlined in this report, impacts to the natural environment can be managed to comply with regulatory and policy requirements.



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Appendix I Fish Community Sampling Results



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Abbreviations

ac	Acres
AMP	Amphibian Monitoring Station
ANSI	Area of Natural and Scientific Interest
BBS	Breeding Bird Station
BHA	Butternut Health Assessment
BMS	Bat Monitoring Station
CAA	Conservation Authorities Act
CP	Canadian Pacific
CLOCA	Central Lake Ontario Conservation Authority
CSP	Corrugated Steel Pipe
CVC	Credit Valley Conservation
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Study
ELC	Ecological Land Classification
EPA	Environmental Protection Area
EPR	Environmental Project Report
ESA	<i>Endangered Species Act</i>
FWCA	<i>Fish and Wildlife Conservation Act</i>
Growth Plan	A Place to Grow: Growth Plan for the Greater Golden Horseshoe
GTHA	Greater Toronto and Hamilton Area



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ha	Hectares
HDF	Headwater Drainage Feature
IVM	Integrated Vegetation Management
KHF	Key Hydrologic Feature
KNHF	Key Natural Heritage Feature
LIO	<i>Land Information Ontario</i>
m	metre
MBCA	<i>Migratory Birds Convention Act</i>
MECP	Ministry of the Environment, Conservation and Parks
MMAH	Ministry of Municipal Affairs and Housing
MNR	Ministry of Natural Resources (currently MNRF)
MNRF	Ministry of Natural Resources and Forestry
NETR	Natural Environment Technical Report
NHIC	Natural Heritage Information Centre
NHRM	Natural Heritage Reference Manual
NHS	Natural Heritage System
OP	Official Plan
ORM	Oak Ridges Moraine
ORMCP	Oak Ridges Moraine Conservation Plan
O. Reg.	Ontario Regulation
PPS	Provincial Policy Statement
PSW	Provincially Significant Wetland
RfR	Request for Review
SAR	Species at Risk



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SARA	<i>Species at Risk Act</i>
SNA	No Provincial Conservation Status
SOCC	Species of Conservation Concern
SWH	Significant Wildlife Habitat
SWM	Stormwater Management
TOC	Transit Oriented Community
TPAP	Transit Project Assessment Process
TPZ	Tree Protection Zone
TRCA	Toronto Region Conservation Authority
VPZ	Vegetation Protection Zone
WC	Watercourse Crossing Location



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Introduction
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1.0 Introduction

1.1 Project Context

Stantec Consulting Ltd. (Stantec) was retained by Metrolinx, an agency of the Province of Ontario, to complete a Natural Environment Technical Report (NETR) for the Oshawa to Bowmanville Rail Service Extension Project (the Project) formerly referred to as the Oshawa to Bowmanville Rail Service Expansion Project in the 2011 Environmental Project Report (EPR). The Project is located in the City of Oshawa and Municipality of Clarington, within the Regional Municipality of Durham, Ontario.

All-day rail service currently operates on the Lakeshore East Rail Corridor between Union Station in downtown Toronto and the Durham College Oshawa GO (DC Oshawa GO) Station¹. The Lakeshore East Rail Corridor extension from Oshawa to Bowmanville was originally identified as one of 52 rapid transit improvements and expansion projects in the MoveOntario 2020 plan, Ontario's multi-year \$17.5 billion rapid transit action plan for the Greater Toronto and Hamilton Area (GTHA). More recently, the expansion initiative was supported through the Initial Business Case Update (Metrolinx 2022) and a preferred alignment option was selected.

The Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility Environmental Project Report (EPR) was completed in 2011, in accordance with the Transit Project Assessment Process (TPAP) outlined in Ontario Regulation (O. Reg.) 231/08 – Transit Projects and Metrolinx Undertakings, to assess Metrolinx's plan to expand GO Transit rail services from Oshawa to Bowmanville utilizing the Canadian Pacific (CP) Rail corridor.

¹ In October 2022, Metrolinx announced that the Oshawa GO Station has been renamed Durham College Oshawa GO. Therefore, throughout the EPR Addendum and this Project, the Oshawa GO Station is referred to as Durham College Oshawa GO, or DC Oshawa GO.



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Since the completion of the 2011 EPR, Metrolinx has advanced the design of the rail extension project, including updates to the alignment and infrastructure needs of the project. As outlined in Section 15 (1) of O. Reg. 231/08, if a proponent wishes to make a change to a transit project that is inconsistent with a completed EPR, an addendum to the EPR must be prepared. In addition, as per Section 16 of O. Reg. 231/08, should construction of a project not commence within 10 years of the Statement of Completion, a review of the project documentation is required. The Statement of Completion for the 2011 EPR is dated April 13, 2011, and more than 10 years has lapsed since the filing of this document.

The current Project includes the extension of GO rail service from the DC Oshawa GO through to Bowmanville, with four new proposed GO stations. The Project as currently proposed is based on available conceptual information on the design approach, and this may be subject to change as Project planning and design advances. Project components (Figures 1.1-1.3, Appendix A) are proposed to be located on or adjacent to the rail corridor between approximately the DC Oshawa GO and Bowmanville Avenue in the Municipality of Clarington (i.e., GO Subdivision Mile 11.67 in the west to CP Belleville Subdivision Mile 164.8 in the east). The component descriptions and locations are summarized in Table 1.1 below.

Table 1.1: Project Component Descriptions and Associated Proposed Locations

Project Component Description	Proposed Locations
Tracking and supporting track infrastructure	<ul style="list-style-type: none">• Proposed new track within the existing GO Lakeshore East Rail Corridor at the western limit of the Project, crossing Highway 401 via the existing General Motors (GM) Spur bridge. A new bridge will be constructed adjacent to the existing GM Spur bridge for the proposed realigned CP Rail track. The new GO track will extend north to the existing CP Rail corridor, ending at Bowmanville Avenue.• Retaining walls and grading to support track infrastructure as described above.
GO stations	<ul style="list-style-type: none">• Fox Street (B1 Thornton's Corners East)• Front Street (B2 Ritson)• Courtice Road (B3 Courtice)• Bowmanville Avenue (B4 Bowmanville)



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Project Component Description	Proposed Locations
New bridge developments	<ul style="list-style-type: none"> • Highway 401 • GM Spur • Oshawa Creek • Wilson Road • Farewell Creek • Harmony Creek • Green Road
New multi-use crossing (bridge or tunnel, to be determined)	<ul style="list-style-type: none"> • Front Street (Michael Starr Trail)
Bridge replacements	<ul style="list-style-type: none"> • Simcoe Street • Ritson Road • Farewell Street²
Bridge removal	<ul style="list-style-type: none"> • Albert Street
Bridge expansions	<ul style="list-style-type: none"> • DC Oshawa GO (pedestrian bridge) • Stevenson Road • Park Road • Harmony Road • Courtice Road
Widening of at-grade crossings to accommodate GO track(s)	<ul style="list-style-type: none"> • Bloor Street • Prestonvale Road • Private crossing for Dom's Auto • Trulls Road • Baseline Road (two crossings) • Rundle Road • Holt Road • Private crossing west of Maple Grove Road • Maple Grove Road

An EPR Addendum Report is being undertaken to document the changes to the transit project based on refinements to the design approach identified in the EPR, and to consider relevant updates to environmental conditions since the completion of the EPR in 2011.

² Multi-use bridge only. Multi-use bridge can be used by pedestrians and cyclists crossing the rail corridor.



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1.2 Purpose

Metrolinx is in the process of completing preliminary planning studies and developing conceptual designs for the Project. Potential environmental effects of the changes to the Project since completion of the 2011 EPR are being assessed to meet the requirements of O. Reg. 231/08 and the Ontario *Environmental Assessment Act*. A Natural Environment Conditions Report was prepared by AECOM in 2010 in support of the original EPR. This NETR serves to support the EPR Addendum based on the current concept design, as presented in Section 4.0.

The main purpose of the NETR is to update the summary of existing conditions with respect to the natural environment and evaluate potential impacts to natural heritage features and areas which may result from the construction and operational phases of the Project. This NETR assesses potential impacts to the natural heritage features and areas found within the Project Footprint and the adjacent lands (Study Area). The NETR addresses and investigates natural lands associated with designated features and policy areas, vegetation communities, wildlife and wildlife habitat, and aquatic habitats.



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Methods

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2.0 Methods

2.1 Study Area

This NETR evaluates lands within and adjacent to the Project. The scope of field investigations and assessment methodology differs according to anticipated Project impacts to natural heritage features. As such, the following terms are used throughout the report to define the scope of investigation completed in respective areas. Contextual terms in reference to the proposed developments, are defined as follows:

- **Project Footprint** – Lands within the construction limits of the Project and is further defined as including the area of direct disturbance associated with construction activities (including anticipated required construction staging, laydown areas and construction access), and the final location of new infrastructure proposed to support the Project during operation. The Project Footprint surrounding the proposed GO station locations are approximate and based on the most current design concepts reviewed at the time of preparing this report.
- **Adjacent Lands** – Lands outside of the Project Footprint, but within a 120 metre (m) radius of the Project Footprint. This radius takes into account the 120 m Adjacent Lands width as defined by the Provincial Policy Statement (PPS) and the Natural Heritage Reference Manual (NHRM). To account for uncertainty related to the existing concept plans and designs associated with the proposed GO stations, additional buffer beyond the 120 m was added to the Study Area for those locations (500 m radius from the centerline location of the proposed GO station location, see Figures 1.1-1.3, Appendix A for details).
- **Study Area** – Project Footprint and Adjacent Lands (refer to Figure 1, Appendix A for details).

The Project Footprint encompasses approximately 126 ha (312 ac) of land and is illustrated on Figures 1.1-1.3, Appendix A. The Study Area, which includes Adjacent Lands encompasses approximately 772 ha (1,908 ac) of land and is also illustrated on Figures 1.1-1.3, Appendix A.

2.2 Background Review

Background information was gathered and reviewed as part of the preliminary assessment process and prior to completing field investigations to inform targeted field surveys. The following sections outline the methodology for completing the various components of the background review.



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2.2.1 Policy Review

Given the geographic location of the Study Area, the following documents including associated maps and schedules were reviewed to determine the legislative and policy context of the Project as well as ascertain the presence and location of previously identified natural heritage features and areas within the Study Area:

- *Species at Risk Act* (2002) (SARA)
- *Fisheries Act* (1985)
- *Migratory Birds Convention Act* (1994)
- *Endangered Species Act* (2007) (ESA)
- *Environmental Assessment Act* (1990)
- *Conservation Authorities Act* (1990) (CAA)
- Provincial Policy Statement (2020)
- A Place to Grow – Growth Plan for the Greater Golden Horseshoe (Office Consolidation 2020)
- Greenbelt Plan (2017)
- Official Plan of the Regional Municipality of Durham (2020)
- City of Oshawa Official Plan (2003)
- Municipality of Clarington Official Plan (2018)
- Central Lake Ontario Conservation Authority (CLOCA) policies and regulations (CLOCA 2014)
- CLOCA Wildlife Corridor Protection and Enhancement Plan (2022)

2.2.2 Geo-mapping and Database Reviews

Additional sources of information such as soil geology and physiography mapping, wildlife atlas data, watercourse and natural resource mapping were also reviewed prior to commencing field investigations.

In addition to the resources listed above in Section 2.2.1, the following databases and information sources were reviewed as part of the background review:

- Natural heritage and physical feature layers from the Land Information Ontario (LIO) database which includes Ministry of Natural Resources and Forestry (MNRF) resource information (MNRF 2023a)
- The Natural Heritage Information Centre (NHIC) Biodiversity Explorer database, including Provincially Tracked Species Layer (MNRF 2023b)



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- MNRF's Land Information Ontario Digital mapping of Aquatic resource area line segments (MNRF 2023a) and, if applicable, the corresponding Fisheries and Oceans Canada (DFO) drain classification
- DFO's online mapping tool of aquatic species at risk (SAR) (DFO 2023)
- CLOCA technical reports including applicable watershed plans databases and geo-cortex mapping resources
- Aquatic natural heritage records received from CLOCA (2021a)
- Bulk fish data provided to Metrolinx by Curve Lake First Nation (CLFN 2022)
- Species at Risk in Ontario (SARO) provincial range maps (MECP 2023)
- Atlas of the Breeding Birds of Ontario (Cadman et al., 2007)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- eBird Canada Database review for eBird Hotspots within the Study Area as defined in Figure 1 (eBird 2021)
- Insect / Butterfly Atlas (Toronto Entomologist Association 2021)
- Mammalian observation database for Durham Region (iNaturalist 2021)
- High Resolution aerial photography of the Project Footprint and Study Area (Google Earth Pro 2021, MNRF 2023a)

The results of these searches were used to guide field investigations and to identify potential SAR and species of conservation concern (SOCC), aquatic habitats and other natural features and areas that have the potential to overlap with the Study Area. With exception of some hotspots (e.g., eBird), many of the wildlife record database resources generally do not provide the exact locations of a species occurrence record; accuracy generally ranges from 1 km² (e.g., NHIC) to 10 km² for most wildlife atlases. Some databases (e.g., iNaturalist) contain records that span larger areas such as municipal boundaries. As such, the results of the range map and atlas reviews are used to support the SAR and SOCC habitat screening assessments and to help scope the field program and identify areas that can then be targeted for additional field surveys.

2.2.3 Previous Site Documentation

Stantec reviewed previous site documentation and technical studies as relevant to the Study Area in the context of the natural environment. This included reviews of the following documents:

- "Expansion of Rail Service from Oshawa to Bowmanville on the Lakeshore East Corridor: Natural Environmental Conditions Report" prepared by AECOM, dated September 30, 2010 (Project Number: 60115182).



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- “Addendum to Oshawa to Bowmanville Service Expansion EPR: Tree Inventory Technical Report Draft” prepared by Stantec, dated October 5, 2021 (Project Number: 165011019) (Stantec 2021a).
- “Addendum to Oshawa to Bowmanville Service Expansion EPR: Arborist Report Draft” prepared by Stantec, dated July 19, 2021 (Project Number: 165011019) (Stantec 2021b).

Throughout the development of the NETR, information has been provided by Indigenous communities, including observations recorded during a site visit in June 2022. Information and species observations received from Indigenous communities has been incorporated into this NETR.

2.3 Field Investigations

2.3.1 Field Program

Upon completion of the background review, a gap analysis was completed to inform the field program by targeting areas where information was not previously collected, or where additional information was required to inform the impact assessment. Specifically, the results of the background review, as described in Section 2.2.1 and Section 2.2.2 and associated gap analysis were used to strategize field survey data collection locations (as depicted on Figures 3 and 4) to focus efforts on key habitat areas.

The field program was carried out in spring and summer 2021 and included surveys for vegetation, wildlife and wildlife habitat, and aquatic habitat. Further field investigations were completed in 2022 to accommodate a modification to the Project Footprint at the Courtice Road (B3 Courtice) GO Station to incorporate the entire Metrolinx owned property parcel. In 2023, additional field investigations to accommodate modifications to the Project Footprint as well as to complete target surveys for SAR and aquatic habitats were undertaken. Field investigations completed for the Project are summarized in Table 2.1.



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Table 2.1: Field Investigation Summary

Type of Survey	Type of Field Work	Date(s) of Field Work	Personnel
Vegetation Surveys	Ecological Land Classification (ELC) and Botanical Inventory	May 27, 2021	J. Ball
		May 31, June 1 and 3, 2021	J. Ball and L. Cymbaly
		June 13, 2022	L. Uskov
	Butternut Health Assessments	August 17, 2021	J. Ball and K. Ellis
Wildlife Surveys	Breeding Bird Surveys	May 27 and June 14, 16, 17, 28, 29, and 30, 2021	J. Ball
		June 3, 2021	L. Cymbaly
		June 13, 2022	L. Uskov
	Amphibian Call Surveys	May 31 and June 1 and 3, 2021	J. Ball and L. Cymbaly
		June 15, 16 and 18, 2021	L. Cymbaly and T. Den Haas
	Bat Acoustic Surveys (monitor deployments and retrievals)	June 18 to August 10, 2021	J. Ball, N. Burnett, L. Cymbaly, T. Den Haas
		June 5 to June 20, 2023	M. Razzouk and E. Padvaiskas
	Bat Exit Surveys (handheld units)	June 25, 2021	L. Cymbaly and T. Den Haas
		July 19, 2021	J. Ball and L. Cymbaly
		June 5, 2023	M. Razzouk and E. Padvaiskas
		June 19, 2023	M. Razzouk and P. Jagielski
		June 26, 2023	E. Padvaiskas and N. Burnett
		June 28, 2023	M. Razzouk and E. Padvaiskas
		July 10, 2023	M. Razzouk and E. Padvaiskas
		July 12, 2023	M. Razzouk and E. Padvaiskas



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Type of Survey	Type of Field Work	Date(s) of Field Work	Personnel
	Wildlife Habitat Assessments	During all field visits	All Staff
	Incidental Wildlife Observations	During all field visits	All Staff
Fish Habitat Surveys	Fish Habitat Assessment	June 3, July 12-16, 2021	N. Burnett and T. Den Haas
Fish Community and Headwater Drainage Feature Surveys	HDF Survey (window 3) (WC-7 only)	July 16, 2021	T. Den Haas
	HDF Survey (window 1) (WC-7 only)	April 12, 2022	M. Place
	HDF Survey (window 2) (WC-7 only)	May 24, 2022	M. Place
	HDF Survey (window 1)	April 20, 2023	M. Place, M. Jory
	Fish Community Surveys (spring) and HDF Survey (window 2)	May 17, 2023	K. McAllister & M. Ellah
	Fish Community Surveys (spring) and HDF Survey (window 2)	May 18, 2023	K. McAllister & T. Den Haas
	Fish Community Surveys (spring) and HDF Survey (window 2)	May 24 & 25, 2023	K. McAllister & N. Burnett
	Fish Community Surveys (summer) and HDF Survey (window 3)	July 10, 11, 12, 14, 2023	M. Place & T. Den Haas

Motion sensor wildlife movement cameras were deployed at Tooley Creek crossing to record and assess wildlife movement in the area. The camera data will be analyzed following the survey period ending in May 2024 and will be reported under separate cover at that time.

2.3.2 Aquatic Resources

2.3.2.1 Headwater Drainage Feature Surveys

Headwater drainage features (HDF) were surveyed using the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (Toronto Region Conservation Authority [TRCA] and Credit Valley Conservation [CVC] 2014). Seven watercourses were surveyed in accordance with the HDF Guidelines by Stantec in 2021, 2022 and 2023 these are:



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- Unnamed Tributaries of Lake Ontario (WC-5a and WC-5b)
- Unnamed Tributary of Tooley Creek (WC-7)
- Unnamed Tributary of Tooley Creek (WC-9)
- Unnamed Tributary of Darlington Creek (WC-10)
- Unnamed Tributary of Darlington Creek (WC-12)
- Unnamed Tributary of Darlington Creek (WC-13)
- Unnamed Tributary of Darlington Creek (WC-14)

The locations where field studies were completed are referred to in the legend as water crossing (WC) and are shown on Figures 3.1 to 3.10 in Appendix A.

All visits were completed within the windows specified by the HDF Guidelines. Weather conditions were monitored and taken into account for the timing of the field investigations. The first field investigation was completed shortly after the spring freshet. The second (late spring) and third (summer) field investigations were completed after at least 72 hours without precipitation in the catchments of the tributaries under investigation as per the recommendation in OSAP S4. M11. A summary of the survey dates and personnel undertaking the survey visits is provided in Table 2.1 above.

At each WC, observations were made from within the CP right-of-way (ROW). Any relevant visual observations of areas outside the CP ROW that could be made from within the CP ROW were also recorded. Assessed reaches are shown on Figures 3.1 to 3.10 in Appendix A.

2.3.2.2 Aquatic Habitat Survey

Field investigations were completed on June 3 and between July 12 and 16, 2021. A summary of the survey dates and personnel conducting each survey is provided in Table 2.1 above. Fourteen locations were surveyed where mapped watercourses intersected with the Study Area (Figure 3.1-3.10, Appendix A). Aquatic habitat observations were made of physical habitat characteristics using the methods described in the Ontario Stream Assessment Protocol (Stanfield 2017). The following aquatic habitat characteristics were described: stream velocity, bank stability, channel morphology, water quality, substrate, riparian vegetation/ land use, in-stream cover, stream dimension, and fish habitat potential. A photographic record was made of aquatic habitat conditions within the ROW at the watercourse survey locations.



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2.3.2.3 Fish Community Surveys

Fish collection records are available for most watercourses in the Study Area (MNRF 2023a, CLFN 2022, CLOCA 2021a). Fish community sampling was completed at nine locations in the Study Area that were without recent records (i.e., less than 10 years old). The nine locations fished by Stantec in 2023 are:

- Farewell Creek (WC-4)
- Robinson Creek (WC-6)
- Tooley Creek (WC-8)
- Unnamed Tributary of Tooley Creek (WC-9)
- Unnamed Tributary of Darlington Creek (WC-10)
- Darlington Creek (WC-11)
- Unnamed Tributary of Darlington Creek (WC-12)
- Unnamed Tributary of Darlington Creek (WC-13)
- Unnamed Tributary of Darlington Creek (WC-14)

Fish community surveys were completed in May and July 2023. Dates of the fieldwork are listed in Table 2.1 above. Sampling in the spring and summer is an approach described in the Ontario Ministry of Transportation (MTO) Interim Environmental Guide for Fisheries to determine fish community composition. Fish collections were completed under a license to collect fish for scientific purposes from the Ministry of Natural Resources and Forestry (No.1103392). Fish community surveys were completed by staff trained and experienced in the use of backpack electrofishing equipment. Weather forecasts were monitored in advance and fieldwork was planned during low flow conditions to allow for better visibility of bottom substrates and fish habitat features.

Stantec completed a single pass fish community survey in accordance with the methods described in the Ontario Stream Assessment Protocol (Stanfield 2017). The number of seconds applied per square metre equaled or exceeded the OSAP standard for a single pass survey (7-15 sec/m²) except at two locations which were Farewell Creek (May 17 and July 11), Tooley Creek (May 18). The OSAP standard for a screening level survey (2-5 sec/m²) was met or exceeded at these locations. Electrofishing was completed by two staff using a backpack electrofisher, a dipnet, and buckets. Where possible two reaches of at least 50 m were surveyed for a total of at least 100 m of each watercourse. At some locations access to lands adjacent to the CP ROW was restricted



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by private property resulting in shorter sections of the watercourse being sampled. At some locations fishing was hindered by lack of or absence of water. Sampled reaches are shown on Figures 3.1.to 3.10 in Appendix A. The backpack electrofishing level of effort is summarized in Table 2.2 (spring) and 2.3 (summer).

Table 2.2 Summary of Backpack Electrofishing Effort Spring 2023

Date	Start – End Time	Water Course (WC-#)/ Downstream (DS) or Upstream (US) of Railway	Approximate Area Sampled (m²) (length (m) x width (m))	Electrofishing Seconds	Electrofishing Seconds/m²
May 17	0930-1200	Farewell Creek (WC-4)/ DS	360(60 x 6)	3368	9.4
May 17	1200–1500	Farewell Creek (WC-4)/ US	360(60 x 6)	1641	4.6
May 18	945–1300	Tooley Creek (WC-8)/ DS	120(60x2)	878	7.3
May 18	1300–1600	Tooley Creek (WC-8)/ US	120(60x2)	878	7.3
May 18	1400-1430	Tooley Creek (WC-9)/ DS & US	40(40x1)	210	5.3
May 18	1500–1600	Darlington Creek (WC-10)/ DS	4(40x0.1)	88	22
May 24	0850-1030	Darlington Creek (WC-11)/ DS	70(70x1)	1576	22.5
May 24	1030–1100	Darlington Creek (WC-11)/ US	15(10x1.5)	360	24
May 24	0850–1030	Darlington Creek (WC-11)/ US	18(15x1.2)	672	37.3
May 24	1250–1320	Unnamed Tributary of Darlington Creek (WC-12)/ DS & US	15(15x1)	690	46
May 25	0945–1200	Robinson Creek (WC-6)/ DS	54(30x1.8)	1345	24.9
May 25	1200–1300	Robinson Creek (WC-6)/ US	36(20x1.8)	713	19.8
May 25	1230–1300	Unnamed Tributary of Darlington Creek (WC-13)/ DS	21(15x1.4)	361	17.2
May 25	1300–1330	Unnamed Tributary of Darlington Creek (WC-13)/ US	4.2(3x1.4)	196	46.6



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Date	Start – End Time	Water Course (WC-#)/ Downstream (DS) or Upstream (US) of Railway	Approximate Area Sampled (m ²) (length (m) x width (m))	Electrofishing Seconds	Electrofishing Seconds/m ²
May 26	0830–0900	Unnamed Tributary of Darlington Creek (WC-14)/ DS	15(10x1.5)	328	21.9
May 26	0900–0930	Unnamed Tributary of Darlington Creek (WC-14)/ US	15(10x1.5)	282	18.8

Table 2.3 Summary of Backpack Electrofishing Effort Summer 2023

Date	Start – End Time	Water Course (WC-#)/ Downstream (DS) or Upstream (US) of Railway	Approximate Area Sampled (m ²) (length (m) x width (m))	Electrofishing Seconds	Electrofishing Seconds/m ²
July 10	1000–1230	Tooley Creek (WC-8)/ DS	50(50x1)	771	15.42
July 10	1230–1430	Tooley Creek (WC-8)/ US	75(50x1.5)	595	7.9
July 11	0800–0915	Farewell Creek (WC-4)/ DS	300(50x6)	1422	4.7
July 11	1125–1215	Farewell Creek (WC-4)/ US	265(50x5.3)	1175	4.4
July 12	0830–0930	Unnamed Tributary of Darlington Creek (WC-11)/ DS	30(50x0.6)	650	22
July 14	0830–1030	Robinson (WC-6)/ DS	125(50x2.5)	1254	10.0
July 14	1030–1130	Robinson (WC-6)/ US	110(50x2.2)	827	7.5



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2.3.3 Terrestrial Resources

2.3.3.1 Vegetation Surveys

The vegetation surveys were focused on confirmation and refinement of Ecological Land Classification (ELC) units and collecting supplemental data to the existing floral inventories completed within the Study Area by others, as described in Section 2.2. Vegetation community data and general community characteristics were used to support the Significant Wildlife Habitat (SWH), SAR and SOCC Habitat Screening Assessments. Stantec's field assessment also included recording incidental wildlife observations, and evidence of wildlife use.

Vegetation community mapping for the Study Area was completed in general accordance with the ELC system for southern Ontario (Lee et al. 1998) standard procedures and protocols for lands within the Study Area and Project Footprint. Using previously collected data (AECOM 2010, CLOCA 2021b) as well as historic and current high resolution ortho imaging, vegetation communities were delineated on the most recent satellite imagery available for the Study Area. ELC units were subsequently verified in the field by Stantec staff within the Project Footprint, subject to accessibility and safety. Where lands were not safe or accessible, assessments were completed from the existing rail-line ROW. Provincial significance of vegetation communities was based on the rankings assigned by the NHIC (MNR 2023b).

A list of vascular plant species observed in the Study Area was compiled. The nomenclature of all plant species was based on those published by the NHIC (MNR 2023b). Identification of potentially sensitive native plant species was based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity, or ability to thrive in a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

2.3.3.2 Butternut Surveys

Butternut Health Assessments (BHAs) were completed throughout the Study Area on August 17, 2021. BHA surveys were completed in accordance with provincial standards following the "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the ESA" (MNR 2021) and completed by a certified BHA assessor during the leaf-on season. Leaf-on, for the purposes of the ESA, is considered to be between May 15 and August 31 of any given year. Traits of the identified trees were assessed in the field to determine hybrid identification, along with BHA attributes including number of stems, diameter at breast height (DBH), live crown percentage,



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number and distribution of sooty and open cankers on bole of tree, and proximity to badly cankered trees. Assessments determine the category, cultivation and/or hybridity of a tree and subsequent protection measures:

- Category 1: trees may be killed, harmed, or taken after the 30-day period that follows submission of the BHA Report to the MECP, unless the results of an MECP examination indicate that the assessment has not been conducted in accordance with provincial standards.
- Category 2: activities that may kill, harm, or take up to a maximum of fifteen (15) Category 2 trees may be eligible to follow the rules in section 25(1) of O. Reg. 830/21 in accordance with the conditions and requirements set out in that regulation.
- Category 3: activities that may kill, harm, or take up to a maximum of five Category 3 trees may be eligible to follow the rules in section 25(1) of O. Reg. 830/21 in accordance with the conditions and requirements set out in that regulation.
- Cultivated: An activity that involves killing, harming, or taking a cultivated butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by section 25(5) of O. Reg. 830/21.
- Hybrid: Hybrid butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

2.3.3.3 Breeding Bird Surveys

Breeding bird surveys were conducted on May 27, June 3, 14, 16, 17, 28, 29, and 30, 2021; and on June 13, 2022. Breeding Bird Survey Station survey dates, ELC codes and notes identifying approximate station locations are provided in Table 2..

Table 2.4: Breeding Bird Survey Dates

Breeding Bird Survey Station	Dates Surveyed	ELC Code	Notes
BBS1a	May 27, June 14, June 28, 2021	CUM1-c	Fox Street
BBS1b	May 27, June 14, June 28, 2021	CUM1-c	Fox Street
BBS1c	May 27, June 14, June 28, 2021	CUM1-c	Fox Street
BBS2	May 27, June 14, June 28, 2021	CUT1-b	Fox Street



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Breeding Bird Survey Station	Dates Surveyed	ELC Code	Notes
BBS3a	May 27, June 16, 2021	AG (hay)	Courtice GO Station - Mowed prior to 3rd survey
BBS3b	June 16, June 29, 2021	AG (hay)/CUW1-a	Courtice GO Station
BBS3c	June 16, June 29, 2021	AG (hay)	Courtice GO Station
BBS4	May 27, June 16, June 29, 2021	AG (hay)	Courtice GO Station
BBS5	May 27, June 17, June 30, 2021	CUM1	Bowmanville Avenue
BBS6a	May 27, June 17, June 30, 2021	CUM1	Bowmanville Avenue
BBS6b	June 17, June 30, 2021	CUM1	Bowmanville Avenue
BBS7	May 27, June 16, June 29, 2021	AG (Hay)	Bloor Street East
BBS8a	May 27, June 3, June 14, June 28, 2021	CUM1	Fisher Street
BBS8b	June 3, June 14, June 28, 2021	CUM1	Fisher Street
BBS9	June 14, June 28, 2021	CUM1-c	Thornton Road South
BBS10	June 14, June 28, 2021	CUT1-b	Thornton Road South
BBS11	June 14, June 28, 2021	CUT1-b	Thornton Road South
BBS12	June 14, June 28, 2021	FOD7	Oshawa Creek
BBS13	June 14, June 28, 2021	CUM1	Stevenson Road South
BBS14	June 14, June 28, 2021	CUW1-b	Durham Court Park
BBS15	June 16, June 29, 2021	CUM1-c	West of Bloor Street East
BBS16	June 16, June 29, 2021	SWT2/FOD7	Harmony Creek
BBS17	June 16, June 29, 2021	SWD4	Grandview North Park
BBS18	June 16, June 29, 2021	CUW1-c	Robinson Creek
BBS19	June 16, June 29, 2021	FOD/CUT1	East of Courtice Road
BBS20	June 16, June 29, 2021	MAM2-2/CUW1	Tooley Creek
BBS21	June 17, June 30, 2021	SWT2-5	West of Rundle Road
BBS22	June 17, June 30, 2021	CUM1-a	West of Rundle Road
BBS23	June 17, June 30, 2021	AG (Hay)	Rundle Road
BBS24	June 17, June 30, 2021	CUM1-c/SWD4-1	West of Holt Road
BBS25	June 17, June 30, 2021	SWD2-2	East of Maple Grove Road



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Breeding Bird Survey Station	Dates Surveyed	ELC Code	Notes
BBS26	June 17, June 30, 2021	FOD	Tributary to Darlington Creek
BBS27	June 17, June 30, 2021	CUT-a/SWD	Tributary to Darlington Creek at Rundle Road
BBS28	June 17, June 29, 2021	MAM2-2/CUW1-d	Baseline Road
BBS29	June 28, 2021	FOD7	North of Walmart
BBS30	June 13, 2022	AG (Hay)	Courtice GO Station
BBS31	June 13, 2022	AG (Hay)	Courtice GO Station

Thirty-seven (37) point count stations were established along in the Study Area to target the natural features (Figures 4.1-4.10, Appendix A). Point count methods were completed in general accordance with Environment and Climate Change Canada's (ECCC) Breeding Bird Survey (ECCC 2018) and Ontario Breeding Bird Atlas (Federation of Ontario Naturalists 2001) standard procedures and protocols. Stantec expanded the required 3-minute listening period to 5-minute to account for local environment challenges (wind, background noise from the surrounding urban environment). A tally of each bird species was recorded during the 5-minute period that included an approximation of the location and direction of each bird observation within or just beyond a 100 m survey radius. Breeding evidence codes as described by Cadman et al. (2007) were assigned to each of the species observed. All birds seen or heard in suitable habitat during the breeding season were assumed to be breeding.

Where potential SAR grassland bird habitat was identified (e.g., Bobolink or Eastern Meadowlark), a total of three rounds of surveys were completed in general accordance with standard procedures and protocols (MNR 2013) to verify the presence or absence of these species within these areas.

Breeding Bird surveys were completed between a half an hour before sunrise and 10:00 am, to the extent possible. Weather condition parameters (e.g., precipitation and visibility) were within the acceptable range throughout the survey periods. Survey effort and weather conditions recorded during each survey period are summarized in Table 2.5.



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Table 2.5: Breeding Bird Survey Dates, Times, and Weather Conditions

Date	Time	Temp. (°C)	Wind (Beaufort)	Cloud (%)	Precipitation/ Precipitation in Past 24 hrs
May 27, 2021	07:42-10:38	11	2	5	None/Rain
June 3, 2021	7:00 – 9:07	15	2	90-100	Very Light Rain between 07:00-8:00 /None
June 14, 2021	06:45-10:02	17-18	1-2	90-100	Very Light Rain (09:00-10:00) /None
June 16, 2021	06:25-09:55	12	0	0	None/None
June 17, 2021	06:46-10:03	15-18	1	0	None/None
June 28, 2021	06:52-09:51	23	0	10	None/Rain
June 29, 2021	06:24-10:13	24 (humid)	0	50	None/Rain
June 30, 2021	06:36-10:11	22 (humid)	1	100	Light Rain (at 07:20)/Heavy Rain
June 13, 2022	08:00-08:30	21	1	10	None/None

2.3.3.4 Amphibian Surveys

Twenty-five (25) amphibian monitoring stations were established to target potential amphibian habitat present within the Project Footprint or Study Area (Figures 4.1-4.10, Appendix A). The stations were surveyed in May and June in general accordance with the Marsh Monitoring Program (Bird Studies Canada 2009). At each station, Stantec ecologists recorded all calling toads and frogs over a three-minute period. Call levels were described using values of 1, 2, or 3. Level 1 indicated that individuals could be counted, and calls were not simultaneous. Level 2 indicated that calls were distinguishable with some simultaneous calling. Level 3 indicated a full chorus where calls were continuous and overlapping. The distance and direction for each individual or chorus detected was estimated and recorded. A summary of call survey dates, times and weather is provided in Table 2.6.

Table 2.6 Amphibian Call Count Survey Dates, Times, and Weather Conditions

Date	Time	Temp. (°C)	Wind (Beaufort)	Cloud (%)	Precipitation/ Precipitation in past 24 hrs
May 31, 2021	21:42-23:54	13-16	1-3	50	None/None
June 1, 2021	21:40-23:33	15-19	0-1	0-5	None/None
June 3, 2021	21:27-00:03	16-18	0	0	Fog/Rain



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Date	Time	Temp. (°C)	Wind (Beaufort)	Cloud (%)	Precipitation/ Precipitation in past 24 hrs
June 15, 2021	21:35-00:01	16	1	40	None/None
June 16, 2021	21:33-00:05	13	0	25	None/None
June 18, 2021	21:40-22:30	19	0	70	None

2.3.3.5 Bat Surveys

Bat Acoustic Data Collection

In 2021, bat acoustic surveys were conducted at twenty-five (25) Bat Monitoring Stations in the Study Area using Wildlife Acoustics Song Meter SM4BAT detectors (ARU). In 2023, bat acoustic surveys were conducted at an additional four Bat Monitoring Stations in the Study Area, also using ARUs. Bat Monitoring Stations are shown on Figures 4.1-4.10, Appendix A. The detectors were deployed in woodlands that overlap with the Project Footprint and/or woodlands located directly adjacent to the Project Footprint. The detectors recorded individual bat calls from 30 minutes before sunset to 6 hours after sunset. The ARU survey occurred over a number of weeks in order to capture ten (10) warm/mild nights (i.e., ambient temperature >10°C) with low wind and no precipitation as required by MNRF (2017) protocols.

Data was analyzed using Kaleidoscope Pro software by Wildlife Acoustics. The data processing through Kaleidoscope Pro involves running the software's automatic identification, which screens out noise files and provides a suggested species for each bat call file.

For calls identified by Kaleidoscope Pro as non-SAR Bats, the automatic species IDs were used. These IDs were not reviewed. For high frequency calls that were identified as a SAR bat, each call was reviewed by a qualified biologist to confirm the identification, by visually assessing the call file spectrographs to identify if the frequency range and shape were consistent with the species assigned by the software. In addition, calls that were identified as 'No ID' by Kaleidoscope Pro with a minimum frequency of 35 kHz or above were reviewed, as they have the potential to be made by SAR Bats.

It is important to note that the bat detectors cannot distinguish the number of bats flying within the area, as multiple calls often come from the same individual, as they pass the microphone multiple times, however number of calls can be used as an index of bat activity in a given area. Bat call recordings are summarized in Section 4.5.3.3.



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Bat Exit Surveys

In 2021, visual bat maternity roost exit surveys were conducted at an abandoned warehouse south of the CP Rail tracks between Front Street and Howard Street in Central Oshawa.. In 2023, visual bat maternity roost exit surveys were conducted at buildings within the Project Footprint at the following addresses: 399 Simcoe Street South (BES1 and 2), 359 Ritson Road South (BES3 and 4) and 464 Ritson Road South (BES5 and 6). Bat Exit Survey Stations are shown on Figures 4.3, Appendix A.

The surveys followed the methodology outlined by MNRF (2018) for SAR Bats roosting in buildings³. Surveys were conducted as follows:

- Visual exit surveys were conducted over at least two evenings during the month of June or early July with at least one survey being conducted in the month of June in order to estimate the number of SAR Bats using a maternity roosting structure
- Each location was surveyed twice under appropriate weather conditions (i.e., temperatures $\geq 10^{\circ}\text{C}$, no rain, and wind ≤ 30 km/h)
- The surveys commenced at 30 minutes before sunset and continue for 60 minutes
- Acoustic monitoring equipment (i.e., Wildlife Acoustics Echo Meter Touch 2 for iOS) was used in conjunction with visual observations
- The location and number of bats observed entering/exiting the maternity roost structure were recorded

Upon completion of the field program, the recordings collected by the acoustic monitoring equipment were screened using an automated bat acoustic assessment software program (i.e., Wildlife Acoustic Kaleidoscope Pro) using the methods described under the Bat Acoustic Data Collection heading above.

2.3.3.6 Incidental Wildlife Observations

Incidental wildlife observations were recorded during the field investigations. All wildlife species identified by sight, sound or distinctive signs during all field investigations were recorded and summarized in Section 4.5.3.

³ Due to access restrictions, a visual exit survey was conducted at 359 Ritson Road South (BES3 and 4) during one evening only; a second evening survey was not conducted.



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2.4 Habitat Screenings and Impact Assessment

Within the Project Footprint, the methods for screening terrestrial species and their habitats ranged from species-specific surveys using standardized protocols for determining presence/absence, to delineation of potential habitat based on micro-site characteristics and/or associated species presence. This approach was also applied in Adjacent Lands where feasible, in combination with aerial photo interpretation and extrapolated field data were used to assess portions of the Adjacent lands. Using this approach, impacts to species could be assessed on a local scale, to features that may be directly affected by the Project, and on a landscape scale, to connecting features.

2.4.1 Species at Risk and Species of Conservation Concern Habitat Screening Assessments

Special consideration was given to identifying SAR or Species of Conservation Concern (SOCC) within the Project Footprint or Adjacent Lands.

Species At Risk

For the purposes of this report, SAR include species that are listed as Extirpated, Endangered or Threatened on the SARO list as published under Ontario Regulation 230/08 and receive both individual and habitat protection under the ESA (2007). Aquatic SAR also include those that are identified as Extirpated, Endangered or Threatened and are afforded protection under both the provincial ESA and the federal SARA (2002).

Species of Conservation Concern

The Natural Heritage Reference Manual (NHRM) (MNR 2010) was developed to provide technical guidance for implementing the natural heritage policies of the Provincial Policy Statement. Significant Wildlife Habitat includes the habitat of SOCC, which consist of the following:

- Species with Provincial S-rank assigned by the Natural Heritage Information Centre as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable)
- Species listed as Special Concern under the *Endangered Species Act*
- Species identified as nationally Endangered or Threatened by the Committee on the Status of Endangered Wildlife in Canada, which are not protected under the ESA

Although SOCC do not receive legal protection under the *Endangered Species Act*, their habitat is protected under the Provincial Policy Statement, and they may also be afforded protection under the *Migratory Birds Convention Act* (1994) or *Ontario Fish and Wildlife Conservation Act* (1997).



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SAR and SOCC with recent occurrence records (i.e., within the last 20 years) or with overlapping habitat ranges within the Study Area, were considered in the assessment utilizing the data sources described in Section 2.2.2. Species with recorded observations of greater than 20 years old were considered historical in accordance with the standard Conservation Status Assessment Methodology (NatureServe 2019), which Natural Heritage Information Centre (NHIC) uses to evaluate a species' provincial or Subnational Rank (S-Rank).

The potential for SAR and SOCC to occur within the Study Area was assessed by comparing species habitat requirements to the habitat conditions present on-site and using the results of the background information review and results from field investigations, to apply the following rankings:

Low Probability: neither species nor suitable habitat observed through field investigations but there is a known species record in the general area.

Medium Probability: species not observed, however potentially suitable habitat has been identified through field investigations and there is a known species record in the general area.

High Probability: good quality SAR and SOCC habitat identified (e.g., sufficiently large areas of suitable vegetation and presence of key features such as nesting sites) and known species record in the Study Area (either through current or previous field investigations).

2.4.2 Significant Wildlife Habitat Screening Assessment

The Study Area was assessed for the presence of candidate Significant Wildlife Habitat (SWH) features following the Significant Wildlife Habitat Technical Guide (MNR 2000) and in accordance with the evaluation criteria described in the Significant Wildlife Habitat Criteria Schedules appropriate for the Study Area's Ecoregion. In addition, CLOCA's Wildlife Corridor Protection and Enhancement Plan (2022) was reviewed for criteria of core and secondary wildlife habitat, which contribute to SWH features.

The Study Area is located within Ecoregion 6E (Lake Erie-Lake Ontario). The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015) contains information and criteria for identifying SWH. SWH is defined by the province as areas that have important ecological features and functions, and which support sustainable populations of plants, wildlife and other organisms within a particular Ecoregion. The MNRF generally categorizes SWH into the following five categories:

- Seasonal Wildlife Concentration Areas
- Rare Vegetation Communities



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- Specialized Habitat for Wildlife
- Habitats of SOCC
- Animal Movement Corridors

Field data such as general habitat conditions and habitat characteristics were collected to inform the presence of SWH within the Study Area based on the habitat criteria identified in the Ecoregion 6E schedule. Candidate SWH refers to potential habitats that meet the habitat criteria but have not been confirmed as significant through additional detailed studies.

2.4.3 Impact Assessment Methodology

Potential impacts to existing natural heritage were assessed for both the construction and operational phases of the Project (see Section 5.0). The potential impacts have been determined based on an understanding of the Project Footprint and Study Area and anticipated interactions with the existing natural environment during each Project phase. This was accomplished using GIS techniques, which included an analysis of permanent versus temporary disturbance footprints and associated layering with existing natural heritage features, and a qualitative analysis of typical interactions between Project activities and the natural environment. Where potential adverse impacts have been identified, environmental protection, mitigation and/or ecological restoration and subsequent monitoring activities are recommended to reduce these impacts. Mitigation and monitoring recommendations related to vegetation are based on Metrolinx's Vegetation Guideline (Metrolinx 2022).



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3.0 Legislation and Policy Context

Stantec completed a review of relevant legislation and natural heritage policies across tiers of government that are applicable to the construction and operation of the Project. The results of the review are outlined below and further assessed in Section 7.0 of this report to document Project conformity based on the required permits and authorization (obtained or in progress) and in light of the implementation of the mitigation measures recommended, as described in Section 5.0.

3.1 Federal

3.1.1 Species at Risk Act, 2002

The federal SARA (2002), herein referred to as SARA, protects and provides recovery strategies for SAR listed as Extirpated, Endangered or Threatened under Schedule 1. This legislation applies to species residing on federal lands, federally regulated projects, species with critical habitat on non-federal lands in specific circumstances, or if they are aquatic species or migratory birds listed on Schedule 1. The Project does not occur on federal lands and is not generally subject to SARA policies with the exception of aquatic species and migratory birds listed on Schedule 1. Project conformance with SARA is addressed in Section 7.1.1 of this report.

3.1.2 Fisheries Act, R.S.C. 1985

The *Fisheries Act* (1985), amended in 2019, is a federal statute which governs fisheries in Canada. The *Fisheries Act* provides legislation for the management and control of fisheries, the conservation and protection of fish, the protection of fish habitat and pollution prevention. Projects that may affect the movement of aquatic invasive species or have an impact on fish, fish habitat or aquatic SAR may be subject to Fisheries and Ocean Canada (DFO) review.

Project conformance with the *Fisheries Act* is addressed in Section 7.0 of this report.



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3.1.3 Migratory Birds Convention Act, 1994

The federal *Migratory Birds Convention Act* (1994), herein referred to as the ‘MBCA’, is intended to protect migratory birds, their eggs and their active nests. The MBCA prohibits the possession, destruction and harm of migratory birds and/or their active nests and prohibits the release of harmful substances in areas frequented by migratory birds. Under the MBCA, the nesting period for most migratory birds for Nesting Zone C2 that encompasses the Project is from early April to late August, during which time vegetation removal is strongly discouraged to avoid contravention of the MBCA. As such, it is recommended that vegetation clearing does not occur between April 1 and August 31 of any given year. However, if vegetation clearing must occur during this timing window, active nest searches may be conducted in simple habitats defined by ECCC (2019) as “often man-made settings with only a few likely nesting spots or small community of migratory birds.”

The Migratory Birds Regulations were updated and came into force on July 30, 2022. If birds listed on Schedule 1 of the updated regulations are found in the Project Footprint, nests of these species will have to be registered under the Abandoned Nest Registry if they are to be disturbed by Project activities.

Project conformance with the MBCA and associated regulation is addressed in Section 7.0 of this report.

3.2 Provincial

3.2.1 Provincial Policy Statement, 2020

The Provincial Policy Statement (2020), herein referred to as the ‘PPS’, was issued under Section 3 of the *Planning Act* (1990) and all decisions affecting land use planning matters “shall be consistent with” the PPS. The 2020 PPS published by the Ministry of Municipal Affairs and Housing (MMAH 2020a) came into effect on May 1, 2020.

Under Section 2 of the PPS, development and site alteration is not permitted in significant wetlands or significant coastal wetlands. However, development and site alteration may occur adjacent to significant wetlands and significant coastal wetlands, and in or adjacent to significant woodlands, significant valleylands, SWH, areas of natural and scientific interest, and coastal wetlands provided that it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.



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Section 1.6.8.6 of the PPS notes that “when planning for corridors and rights-of-way for significant transportation infrastructure facilities, consideration will be given to the significant resources in Section 2: Wise Use and Management of Resources”. If development of significant transportation infrastructure facilities occurs in or adjacent to natural heritage features (e.g., SWH, areas of natural and scientific interest, provincially significant wetlands, significant woodlands, significant valleylands, fish habitat), Metrolinx must provide consideration to reduce effects, if applicable, on these features to the extent possible.

Project conformance with the PPS is addressed in Section 7.0 of this report.

3.2.2 Growth Plan, 2020

The provincial growth plan is issued under the *Places to Grow Act* (2005). The 2020 provincial growth plan titled: “A Place to Grow – Growth Plan for the Greater Golden Horseshoe” came into effect on August 28, 2020 (the “Growth Plan”). The Study Area is located within the Greater Golden Horseshoe Growth Plan Area.

As stated in the Growth Plan “The implementation of A Place to Grow is supported by Metrolinx (an agency of the Government of Ontario created to improve coordination and integration of all modes of transportation in the GTHA)”.

Each “urban growth centre” is given a minimum density target to achieve by 2031. To support these growth and density targets, “priority transit corridors” are identified with policies for infrastructure development, such as requiring municipalities to recognize these areas in their official plans to implement the policies of the Growth Plan.

According to Section 3.2.5 (d), impacts on key natural heritage features in the Natural Heritage System (NHS) for the Growth Plan, key hydrological features and key hydrologic areas should be avoided or, if not possible, minimized and mitigated to the extent possible as demonstrated through an environmental assessment completed by the province when planning for the development, optimization or expansion of existing or planned infrastructure corridors.

Project conformance with the Growth Plan is addressed in Section 7.0 of this report.



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3.2.3 Greenbelt Plan, 2017

The Greenbelt Plan builds on the PPS and provides a land use planning framework related to urban structure and future growth in Ontario's Greater Golden Horseshoe while providing protection to the agricultural lands, ecological and hydrological features in the Greenbelt Area (MMAH 2017). In the Study Area, Oshawa Creek, Harmony Creek and Farewell Creek are all designated as Urban River Valley under the Greenbelt Plan. The Urban River Valley designation provides connectivity between the Greenbelt and Lake Ontario and directs land use planning in those areas where the Greenbelt occupies river valleys in an urban context (MMAH 2017). Publicly owned lands (i.e., by the province, municipality or conservation authority) are subject to the policies of the Urban River Valley designation and existing, expanded or new infrastructure subject to and approved under the *Environmental Assessment Act* (1990), or similar approval, are permitted within the Urban River Valley Designations provided that the goals of the Growth Plan and Greenbelt Plan are supported (MMAH 2017).

Section 4.2 of the Greenbelt Plan relates to infrastructure whereby it states it is "anticipated that new and/or expanded facilities will be needed in the future to serve the substantial growth projected for the Greater Golden Horseshoe." Further, this section of the Greenbelt Plan directly refers to the Growth Plan, which "provides the policy framework to guide infrastructure planning and investments to support and accommodate forecasted growth in a manner that is integrated with land use planning and environmental protection."

Project conformance with the Greenbelt Plan is addressed in Section 7.0 of this report.

3.2.4 Endangered Species Act, 2007

The provincial *Endangered Species Act* (2007), herein referred to as the 'ESA', came into effect on June 30, 2008, and replaced the former 1971 Act. The ESA protects those species listed on the SARO List (O. Reg. 230/08) as Extirpated, Endangered or Threatened on provincial, crown, or private lands. Sections 9 and 10 of the ESA prohibit the killing, harassment, capture or taking of living individuals of SAR or damaging or destroying their habitat. Therefore, where a proposed activity will impact protected species or habitat, changes to timing, location and methods of the proposed activity should be considered, wherever feasible, to avoid impacts to SAR. Where impacts cannot be avoided or mitigated, a permit process can be initiated.

Project conformance with the ESA and associated regulations is addressed in Section 7.0 of this report.



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3.2.5 Conservation Authorities Act, 1998

The Study Area falls under the jurisdiction of the Central Lake Ontario Conservation Authority (CLOCA). Ontario Regulation 42/06 under Section 28 of the *Conservation Authorities Act* (1998) establishes regulated areas within CLOCA's jurisdiction where development could be subject to flooding, erosion or dynamic beaches, or where interference with wetlands and alterations to shorelines and watercourses might have an adverse effect on those environmental features.

CLOCA Ontario Regulation 42/06

CLOCA regulates hazard lands including watercourses, valleylands, shorelines, and wetlands under O. Reg. 42/06. Portions of the Project Footprint and Study Area are located within the regulated area due to the presence of the various watercourses. Specifically, the Study Area transects regulated areas associated with Goodman Creek, Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek and the various tributaries of Darlington Creek (see Figures 2.1-2.3 in Appendix A for regulated areas mapping details). CLOCA has been engaged regarding restoration considerations.

Project conformance with the CAA and O. Reg. 42/06 is addressed in Section 7.0 of this report.

3.2.6 Fish and Wildlife Conservation Act, 1997

The provincial *Fish and Wildlife Conservation Act* (1997), herein referred to as the 'FWCA', provides protection of wildlife in Ontario including fish, furbearing mammals, game wildlife and specially protected wildlife through regulations for hunting, trapping, and fishing practices. Game and specially protected mammals, birds, reptiles, amphibians and invertebrates are listed on Schedules 1-11 of the FWCA. Definitions provided for hunting including capturing or harassing wildlife (Section 5) include activities that collect or handle wildlife for inventories or other scientific purposes, or to relocate wildlife out of harm's way (e.g., during construction activities), including individuals and eggs. Sections 7 and 8 also provide protection for nest and eggs of specified bird species including raptors, and dens of bears and furbearing animals, and beaver dams. Under the FWCA, the Minister has the authority to authorize activities that would otherwise be prohibited such as the safe capture of wildlife and removal of nests, dens and dams, and impose conditions on an authorization.

Project conformance with the FWCA is addressed in Section 7.0 of this report.



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3.3 Municipal

3.3.1 Durham Region Official Plan, 2020

The Project Footprint and Study Area is located entirely within the Regional Municipality of Durham (herein referred to as the 'Region') upper tier municipality. The Official Plan of the Regional Municipality of Durham (Consolidated May 26, 2020) was reviewed.

Section 2 of the Region's Official Plan (OP) outlines environmental goals and associated policies. As relevant to the Project in the context of natural heritage:

Policy 2.1.1 states:

To ensure the preservation, conservation and enhancement of the Region's natural environment for its valuable ecological functions and for the enjoyment of the Region's residents.

Policy 2.1.4 states:

To undertake planning functions based on the understanding that there is a relationship between the natural and built environments and the principle of preserving resources and protecting the natural environment for future generations.

Key Natural Heritage Features and Key Hydrologic Features

The Region's OP delineates Key Natural Heritage Features (KNHFs) and Key Hydrologic Features (KHF) for the Project Footprint and Study Area on Schedule B – (Maps B1d and B1e). KNHF and KHF are outlined in Table 3.1 below.

Table 3.1: Key Natural Heritage Features and Key Hydrologic Features

Key Natural Heritage Features:	<ul style="list-style-type: none">• Significant habitat of endangered, threatened, special concern and rare species• Fish habitat• Wetlands• Areas of Natural and Scientific Interest• Significant Valleylands• Significant Woodlands• Significant Wildlife Habitat• Sand barrens, savannahs and tallgrass prairies• Alvars
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Key Hydrological Features:	<ul style="list-style-type: none">• Permanent and intermittent streams• Wetlands• Lakes, and their littoral zones• Kettle lakes, and their surface catchment areas• Seepage areas and springs• Aquifers and recharge areas
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KNHFs and KHF's mapped/identified on Maps B1d and B1e of the Region's OP are the corridors associated with Oshawa Creek, Farewell Creek, Harmony Creek, Robinson Creek, Tooley Creek and the various tributaries associated with Darlington Creek.

The Region's OP Policy 2.3.15 states "development and site alteration is not permitted in key natural heritage and/or hydrologic features, including any associated vegetation protection zone...", with six listed exceptions to the policy. Exception 2.3.15(d) cites infrastructure as one of the exceptions, subject to the policies of the Greenbelt Plan and the Region's OP.

Significant Woodlands not located on the Oak Ridges Moraine are identified as "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" by Sub-Section 15A of the Region's OP.

Natural Heritage and Infrastructure

Section 5 of the Region's OP addresses culture, health and community facilities, and infrastructure. Overarching goals for the Region to this effect are "to accommodate opportunities for locating cultural, health and community facilities in the Region" and to "provide adequate Regional municipal services and enable utilities to meet the existing and future needs of orderly growth in the Region in an environmentally and financially sound and efficient manner."

Project conformance with the Region's OP is addressed in Section 7.0.

3.3.2 City of Oshawa Official Plan

The west half of the Study Area is located within the City of Oshawa lower tier municipal boundaries. The City of Oshawa's Official Plan (Oshawa OP) was first approved by the Ministry of Municipal Affairs in 1987. The office consolidation copy last updated August 2021 of the Oshawa OP, was reviewed.



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Section 5 of the OP outlines the City's objectives related to the environment and environmental management that were developed to promote a high-quality living environment for existing and future residents of the City. For example, the objective or intent of Oshawa OP outlined in Policy 5.1.1 (c) is:

To minimize and mitigate the impacts of development and site alteration on the natural environment and its functions to the greatest extent possible, in recognition of the need to balance economic and environmental interests.

This Oshawa OP recognizes that the City is comprised of urban, rural and Greenland areas. Policy 1.3 of the OP communicates that Greenland areas comprise “a connected system of natural and/or recreational open spaces (on and off the Oak Ridges Moraine, including areas along the Lake Ontario waterfront) that weave through and between the City's urban and rural areas, to ensure ecological health and renewal”. Further, Policy 2.6.1.1 states:

It is the intent of this Plan to provide an open space and recreation system which serves the City in relation to recreation and environmental protection, including the protection and enhancement of Greenland areas as a continuous, interconnected system of natural and/or recreational open spaces that weaves through the City from the Oak Ridges Moraine to Lake Ontario.

Greenland areas designated as Open Space and Recreation, as mapped on the Oshawa OP Schedule “A”, Policy 2.6.1.3 states these areas “generally include components of the *Natural Heritage System*, valley lands, conservation areas, marshes, scenic vistas, the Lake Ontario waterfront, parts of the Oak Ridges Moraine and other natural environments, and recreational resources including Regional and City level parks”.

Subsections of Section 5 (Environmental Management) outline more specific policies related to natural heritage. Specifically, sections 5.3 and 5.4 outline policies associated with KNHFs, KHF and the provincial and local NHS systems. The Oshawa OP identifies lands associated with the provincial NHS and associated designations subject to the Greenbelt Plan and Oak Ridges Moraine Conservation Plan (ORMCP), as well as the City's NHS on Schedules D.1 (Environmental Management) and F-1A (NHS Components). KNHF and KHF are features consistent with those outlined in the Region's OP (see Table 3.1) and which occur in the NHS and are shown on Schedule F-1A. Natural Cover Regeneration / Restoration Areas are also shown on Schedule F-1A. Hazard lands as well as other known natural heritage and hydrologic features that are not part of the NHS are shown on Schedule D-1.



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As outlined in section 5.4.1, the City's NHS includes lands with “the highest concentration of the most sensitive and/or significant natural heritage and hydrologic features and functions”. Policies 5.4.1 and 5.4.2 speak to the importance of protecting the NHS to help maintain a connected natural system to achieve a healthy, self-sustaining and resilient watershed, and support terrestrial and aquatic ecosystems and associated habitat for wildlife.

As relevant to the Project, Policy 5.4.4 states:

Development and site alteration shall be prohibited within the following components of the Natural Heritage System:

(a1) Key natural heritage features and key hydrologic features;

(b1) Riparian corridors; and

(c1) High Volume Recharge Areas (HVRAs) or portions thereof located within areas shown as Natural Heritage System on Schedule “D-2”.

Notwithstanding the foregoing, development and site alteration may be permitted in these areas and/or any associated buffers for the following projects/uses, provided that if these areas and/or associated buffers are also identified as Hazards Lands, such development and site alteration will only be permitted to the extent that the policies under Section 5.8 [Hazard Lands] allow:

...

(d2) Infrastructure, including transportation and utilities but excluding stormwater management facilities except in accordance with Policy 5.14.7.1, subject to the policies of the Oak Ridges Moraine Conservation Plan, the Greenbelt Plan and this Plan;

...

Section 5.8 outlines policies related to hazard lands and associated application requirements and considerations in regard to, but not limited to: flooding, erosion and dynamic beach hazards. Hydraulic and fluvial geomorphic assessments were in progress at the time of preparing this report. Project conformance with policies related to hazard lands are not being addressed in this NETR.

Greenland areas, provincial and City NHS, as well as KNHF and KHF's have been mapped by the City of Oshawa in various areas across the Project Footprint and Study Area. The locations of these designated areas within the Project Footprint and/or greater Study Area are detailed in Section 4.2.



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Significant woodlands not located within the Oak Ridges Moraine are identified by the following criteria, outlined in Section 5.1.2(o)(iii):

In regard to woodlands off the Oak Ridges Moraine:

- (a) Any woodland having an area equal to or greater than 0.5 hectares (1.24 ac.) in size; or*
- (b) Any woodland that intersects with another key natural heritage feature; or*
- (c) Any woodland older than 80 years; or,*

Any woodland 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;

Project conformance with the Oshawa OP is addressed in Section 7.0 of this report.

3.3.3 Clarington Official Plan, 2018

The east end of the Study Area is located in the Municipality of Clarington. Specifically, the Project Footprint and greater Study Area are located within the Southwest Clarington Area; an area that extends eastward from Townline Road to the end of the Study Area at Bowmanville Avenue.

The Municipality of Clarington Official Plan (Clarington OP) was first adopted by Council and approved by the Region in 1996. The office consolidation copy last updated June 2018 of the Clarington OP, was reviewed.

Section 3 of the Clarington OP outlines the municipality's objectives related to protecting the natural environment and managing natural resources. The overarching goals in this regard include protecting and enhancing the NHS and its ecological integrity and to "promote responsible stewardship of the *natural heritage system* and wise use of natural resources in order to provide long term and *sustainable* environmental, economic and social benefits."

Section A107-8 of the Clarington OP defines significant woodlands as: "...an old growth woodland, or a woodland, greater than 4 ha located outside of settlement areas, or greater than 1 ha in settlement areas."



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The many and diverse natural heritage features and hydrologically sensitive features found in Clarington, together with their ecological functions, collectively comprise the Municipality's NHS. The Clarington OP consolidates natural heritage planning objectives and provides policy directives to protect and restore natural features and functions associated with the NHS. The list of natural heritage features and hydrologically sensitive features that comprise Clarington's NHS are similar to the Region's and the City of Oshawa's, and include the following:

Table 3.2: Clarington Natural Heritage Features and Hydrologically Sensitive Features

Natural Heritage Features:	<ul style="list-style-type: none">• Wetlands• Areas of Natural and Scientific Interest (ANSI)• Significant Woodlands• All significant Valleylands• Fish habitat and riparian corridors• Habitat of endangered species and threatened species• Rare vegetation communities, including sand barrens, savannahs and tallgrass prairie• Wildlife habitat
Hydrologically Sensitive Features:	<ul style="list-style-type: none">• Wetlands• Watercourses• Seepage areas and springs• Groundwater features• Lake Ontario and its littoral zones

It is noted in Clarington OP Policy 3.4.3, that site-specific studies (through development application or other studies), may identify features that are not currently identified as NHS and shown on Map D1 due to inadequate information.

Clarington OP Policy 3.4.8 prohibits new development and site alteration from within Natural Heritage Features or Hydrologically Sensitive Features and their associated vegetation protection zones (VPZs), with some exceptions for natural resource management, flood and erosion control, infrastructure and utility projects that are subject to an Environmental Assessment, and low intensity recreation such as trails.

As relevant to the Project, Policy 3.4.8 states:

Development and site alteration with respect to land within a natural heritage feature and/or a hydrologically sensitive feature or within its vegetation protection zone is prohibited, except the following:

...



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c) Transportation, infrastructure and utilities, but only if the need for the project has been demonstrated by an Environmental Assessment, there is no reasonable alternative, and it is supported by a project specific Environmental Impact Study;

...

Project conformance with the Oshawa OP is addressed in Section 7.0 of this report.



4.0 Existing Conditions Assessment

4.1 Results of the Background Review – Natural Heritage Features and Areas

Natural heritage features and areas include significant wetlands, significant woodlands, significant valleylands, significant wildlife habitat, Areas of Natural and Scientific Interest (ANSIs), fish habitat and habitat of endangered and threatened species. In accordance with Policy 1.6.8.6 of the PPS, consideration is to be given to natural heritage features and areas when planning for corridors and rights-of-way for significant transportation and infrastructure facilities.

The results of the background review, as described in Section 4.2, have identified a number of natural features within the Project Footprint and/or greater Study Area. These features are summarized below.

- **Wetlands:** Several unevaluated wetlands have been mapped by the MNRF within the Project Footprint and Study Area. The majority of these features are riverine type wetlands located adjacent to existing watercourses which transect the existing rail corridor and include the corridors associated with Harmony Creek, Robinson Creek, Tooley Creek, and Darlington Creek tributaries. All wetlands have a cultural significance to Indigenous communities.
- **Valleylands:** Valleylands have been identified / mapped by the province (Greenbelt Urban River Valley). Urban River Valley valleyland features have been mapped adjacent to Oshawa Creek, Harmony Creek, and Farewell Creek.
- **Watercourses:** Portions of a number of tributaries have been previously identified / mapped within the Project Footprint and Study Area. Many of these features transect the existing rail corridor, including Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek, and Darlington Creek. All watercourses have a cultural significance to Indigenous communities.
- **Fish Habitat:** Fish habitat has been identified through review of watershed studies associated with some of the creek systems within the Project Footprint and Study Area (CLOCA 2021a).
- **Woodlands:** Woodlands have been mapped within the Project Footprint and Study Area by the province (MNRF 2023a). No woodlands have been specifically identified by the upper or lower tier municipalities within the Project Footprint or Study Area, however criteria for significant woodlands that are not located within the Oak Ridges Moraine are provided by the applicable Official Plans (see Section 3.3). Based on



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these criteria, significant woodlands would be considered present where mature forest ecosites intersect with other significant habitat features or meet the minimum size and stand age requirements, especially along creek corridors as discussed in Section 4.2, below.

The results of the background review, as described in Section 2.2, did not identify the presence of any of the following natural heritage features or areas within the Project Footprint or Study Area, as summarized below.

- No PSWs have been identified within the Project Footprint or Study Area. Farewell Creek and Harmony Creek connect to the Oshawa Second Marsh PSW approximately 1 km south of the Project Footprint. An unnamed watercourse approximately 500 m west of Prestonvale Road connects to the McLaughlin Bay Coastal PSW Complex approximately 300 m south of the Project Footprint.
- No coastal wetlands have been identified within the Project Footprint or Study Area.
- No ANSIs have been identified within the Project Footprint or Study Area.
- No SWH areas have been previously identified within the Project Footprint or Study Area.
- No Significant Woodlands have been previously identified within the Project Footprint or Study Area.

Figures 2.1-2.3 in Appendix A depict the location and extent of previously identified natural heritage features and areas within the Project Footprint or Study Area.

4.2 Results of Background Review – Natural Heritage Designated Areas

The results of the background review, as described in Section 4.2, have identified a number of designated areas related to natural heritage within the Project Footprint and/or larger Study Area. These designated areas relate to areas within the upper and lower tier official plans, planning policy, approvals and potential permitting requirements, as detailed in Section 3.

- **Greenbelt Urban River Valley:** Oshawa Creek, Harmony Creek, and Farewell Creek valleylands are designated by the province as Urban River Valley under Greenbelt Plan.
- **CLOCA Regulatory Areas:** Goodman Creek, Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek, Darlington Creek tributaries and associated hazard lands within the Project Footprint and Study Area are mapped and regulated by CLOCA under O. Reg. 42/06.



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- **Greenlands System:** Lands surrounding Oshawa Creek, Harmony Creek, Farewell Creek, as well as a block of rural land located at the east end of the Project Footprint / Study Area (generally between Rundle Road and Maple Grove Road) have been designated by Regional Municipality of Durham as Major Open Space Areas under their Greenlands System. Similarly, the City of Oshawa has identified Open Space and Recreation (under their Greenland Areas designation) for similar areas within their jurisdiction (surrounding Oshawa Creek, Harmony Creek, and Farewell Creek).
- **Key Natural Heritage Features and Key Hydrological Features:** KNHFs and KHF's have been mapped / identified by the Regional Municipality of Durham (Maps B1d and B1e of the Durham Regional Official Plan) and by the City of Oshawa (Schedule F1-A of the Oshawa OP) for lands within the Project Footprint and Study Area. These designated areas are associated with Oshawa Creek, Farewell Creek, Harmony Creek, Robinson Creek, Tooley Creek and Darlington Creek main corridors and in some cases, connected woodlands and associated tributaries.
- **Natural Heritage System:** Lands surrounding various creek systems within the Project Footprint or Study Area have been identified by CLOCA and the lower tier municipalities as NHS (CLOCA's Open Data; Schedule D-1 of the City of Oshawa's OP; Map D1 of the Clarington OP). Specifically, Oshawa Creek, Goodman Creek, Harmony Creek and the Farewell Creek corridors have been designated as NHS by the City of Oshawa and Robinson Creek, Tooley Creek and tributaries of Darlington Creek have been designated as NHS by the Municipality of Clarington. All of these areas are also identified as part of CLOCA's NHS.
- **Environmental Protection Area:** Lands surrounding the various creek systems (Robinson Creek, Tooley Creek, Darlington Creek and associated tributaries) have been designated by the Municipality of Clarington as Environmental Protection Area.
- **Green Space:** Lands within the Project Footprint and Study Area surrounding Prestonvale Road has been designated by the Municipality of Clarington as Green Space.

In accordance with the Greenbelt Plan, Durham Regional OP and lower tier municipal OPs, designated areas within the provincial NHS (Greenbelt Urban Valley) and additional NHS systems identified by the upper and lower tier municipalities are known to encompass land or water with the highest concentration of sensitive and/or significant natural features and functions, including natural heritage features and areas. These defined areas may encompass natural features and areas (e.g., woodlands, wetlands, or significant features including SWH, habitat of endangered and threatened species, etc.) not previously mapped or identified through detailed assessments.

Natural features and areas are further addressed in Section 7.0.



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4.3 Local Site Context – Biophysical Environment

The Project Footprint covers an area of approximately 49 ha (121 ac). It includes portions of two major watersheds, Oshawa Creek and Farewell Creek, which includes Black and Harmony Creeks and three smaller watersheds: Robinson Creek, Tooley Creek and Darlington Creek.

The Study Area occurs within the South Slope physiographic region (Chapman and Putnam, 1984). This physiographic feature extends southward from the Oak Ridges Moraine (ORM) to the Iroquois Plain (an east-west trending band of fine-grained sand to silt beach deposits laid down by the former Glacial Lake Iroquois). Drumlinized till plain characterizes the South Slope, with the glacial till surface being covered in some areas by thin glaciolacustrine deposits of sand.

The topography across the landscape is characterized as gently rolling, dissected by the stream valleys (CLOCA 2004). Regionally, groundwater flows from the Oak Ridges Moraine southward towards Lake Ontario (CLOCA 2004).

The Oshawa Creek Watershed extends from the Oak Ridges Moraine at its northerly (most upstream) extent and drains in a southerly direction before ultimately discharging into Lake Ontario at Oshawa Harbour. The Oshawa Creek Watershed measures approximately 120 square kilometres (km²). The watershed is primarily located within the City of Oshawa but also includes lands partially located within the Municipality of Clarington (east), Town of Whitby (west) and Township of Scugog (north).

The Farewell Creek (including Black and Harmony Creeks) watershed drains southerly from its headwaters in the south slope till plain of the Oak Ridges Moraine (ORM) and empties into Lake Ontario through a diversion channel adjacent to Oshawa Second Marsh, a Provincially Significant Wetland. Black/Harmony/Farewell Creeks and its tributaries drain a combined area of approximately 108 km² (CLOCA 2013a). The urban areas of the City of Oshawa and Courtice in the Municipality of Clarington occupy most of the south, while the northern part of the watershed is dominated by agricultural land uses. A large portion of the mid-eastern section of the watershed is covered by the Harmony-Farewell Iroquois Beach Provincially Significant Wetland Complex, representing important groundwater and natural heritage resources (CLOCA 2013a).

The Robinson Creek watershed is situated almost completely within the Urban Area of Courtice. The Robinson Creek watershed drains an area of approximately 578 hectares (ha) (AECOM 2011). The Robinson Creek drains into Lake Ontario through the McLaughlin Bay Wetland Complex. Robinson Creek may receive groundwater discharge from the Iroquois Beach deposits and the lower sediments (CLOCA 2004).



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The urban area of the Towns of Courtice occupies a part of the watershed in the north while the southern part is dominated by agricultural land uses.

The Tooley Creek watershed drains an area of approximately 1,040 ha (AECOM 2011). The Tooley Creek drains into Lake Ontario through the Tooley Creek Coastal Wetland. Tooley Creek may receive groundwater discharge from the Iroquois Beach deposits and the lower sediments (CLOCA 2004). The Tooley Creek Watershed is located in the Regional Municipality of Durham, entirely within the local Municipality of Clarington. The Tooley Creek watershed is dominated by agricultural land uses.

The Darlington Creek watershed drains an area of approximately 1782 ha (City of Pickering 2021). Darlington Creek drains into Lake Ontario at the Darlington Nuclear Generating Station. Darlington Creek may also receive groundwater discharge from the Iroquois Beach deposits and the lower sediments (CLOCA 2004). The Darlington Creek Watershed is located entirely within the local Municipality of Clarington. The urban areas of the Towns of Bowmanville occupy most of the south, while the northern part of the watershed is dominated by agricultural land uses.

4.4 Aquatic Resources

The Study Area intersects the Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek and Darlington Creek watersheds. These creeks all drain south towards Lake Ontario which is located between 0.5 and 3.5 km south of the Study Area. Historically, these watersheds supported coldwater fish communities featuring Brook Trout and Atlantic Salmon. With increasing urbanization and changing land use patterns, many of the coldwater streams have become coolwater or warmwater systems (CLOCA 2007). Many streams in the Study Area continue to support coldwater fishes such as Rainbow Trout (*Oncorhynchus mykiss*).

The following subsections summarize the fish and fish habitat observations made by Stantec at 14 water crossing locations (WC) in the Study Area. Crossing locations are shown on Figures 3.1 to 3.10 in Appendix A. Results of the fish community survey and the review of fish collection records are summarized in Table 4.1. Minor watercourses are assessed as headwater drainage features and the classifications and assessment of these features are summarized in Table 4.2. Representative photographs of the fish habitat conditions at each crossing are exhibited in a photographic record (Appendix G). Appendix H summarizes in-situ water quality measurements and air temperature during aquatic habitat surveys in 2021. Appendix I-1 summarizes weather conditions prior to and during the fish community field surveys. Appendix I-2 summarizes the backpack electro-fisher effort. Aquatic habitat conditions observations and measurements are included in Appendix I-3. Fish catches are summarized in Appendix I-4.



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4.4.1 Goodman Creek WC-1

Goodman Creek flows through Warne Park north of the railway alignment and east of Stevenson Road South. Goodman Creek is in the Oshawa Creek watershed. Within the Study Area, Goodman Creek is mapped as a warmwater watercourse by MNRF (MNRF 2023a) (Figures 3.1 and 3-2, Appendix A). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLGN01 [within the Study Area]) and classifies this reach of Goodman Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach five times between 2017 and 2019 (Table 4.1). Seven species of fish were captured including Western Blacknose Dace (*Rhinichthys obtusus*), Brook Stickleback (*Culaea inconstans*), Creek Chub (*Semotilus atromaculatus*), Fathead Minnow (*Pimephales promelas*), Johnny Darter (*Etheostoma nigrum*), Pumpkinseed (*Lepomis gibbosus*), and White Sucker (*Catostomus commersonii*). These species are considered secure common, widespread, and abundant in Ontario (S5) (MNRF 2023b). There are no MNRF fish records available for Goodman Creek (MNRF 2023a). During surveys completed by Stantec in July 2021, fish were observed visually in this reach including Fathead Minnow (*Pimephales promelas*), Creek Chub, and Brook Stickleback. Table 4.1 provides a summary of records including the number of fish species and thermal regime.

Fish Habitat

The following fish habitat characteristics were noted at this WC:

- Fast flow and high stream stage conditions were observed on July 16, 2021, following periods of rainfall in the previous 24 hours. Water was a turbid-brown colour. Water temperature and water quality parameters measured at WC are shown in Appendix H.
- In-stream cover was sparse (<10%) and provided by undercut banks, boulders embedded in the bank, logs embedded in the banks, Canada Waterweed (*Elodea Canadensis*) and terrestrial grasses overhanging the channel.
- Banks were generally steep. Outer bend banks showed signs of recent erosion. Inner bend banks were vegetated and protected by shrubs (i.e., Red-osier Dogwood) and terrestrial grasses and herbaceous plants.
- Substrate was dominated by sand with sparse boulders which were embedded in the outer banks.
- Morphology at this WC was entirely 'Run'.



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- Stream dimensions - Mean wetted width: 2.3 m; Mean bankfull width: 2.3 m; Mean depth 42 cm; Maximum pool depth: 78 cm.
- Canopy was 100% open.
- Riparian vegetation within 5 m was wetland and meadow dominated by *Phragmites* and other grass species.
- Adjacent land use was a municipal park with multi-use trails, commercial retail buildings with parking lots, the railway corridor and municipal roads.
- No critical habitat for fish was observed. No migratory obstructions for fish were observed.

Summary

Within the Study Area, Goodman Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater fish habitat. There are no records of provincially or federally protected aquatic SAR.

4.4.2 Oshawa Creek WC-2

Oshawa Creek flows under the railway bridge between Regional Road 56 and Regional Road 2. Within the Study Area Oshawa Creek is mapped as a coldwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at stations within this reach (the nearest stations to the Project Footprint are CLOCA Station TLOA05 [outside of the Study Area] and TLOA13 [inside of the Study Area]) and classifies this reach of Oshawa Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach five times between 2011 and 2019 (Table 4.1). In total, eleven fish species were captured including: Brown Trout (*Salmo trutta*), Creek Chub, Johnny Darter, Longnose Dace (*Rhinichthys cataractae*), Mottled Sculpin (*Cottus bairdii*), Pumpkinseed, Rainbow Trout (*Oncorhynchus mykiss*), Sea Lamprey (*Petromyzon marinus*), Smallmouth Bass (*Micropterus dolomieu*), Western Blacknose Dace, and White Sucker. These species represent a diversity of warmwater, coolwater and coldwater preferences. These species are common, widespread and abundant in Ontario except for Brown Trout (*Salmo trutta*), Rainbow Trout, and Sea Lamprey (*Petromyzon marinus*) which have no conservation status (SNA) as they are not native to Ontario. During surveys completed by Stantec in July 2021, Mottled Sculpin were observed visually.



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American Eel (*Anguilla rostrata*), an endangered species in Ontario, has been captured in Lake Ontario and also a section of Oshawa Creek north (upstream) of the Study Area (MNRF 2023b). As such it is reasonable to assume that American Eel may occur in the reaches of Oshawa Creek in the Study Area. Within the Study Area, there are no records of American Eel in the NHIC database (MNRF 2023b).

Fish Habitat

At this WC, Oshawa Creek is within a 100 - 150 m wide valley. East of the creek, the valley is steep and treed. West of the creek, there is a municipal multi-use recreational trail in a park setting. The railway bridge spans the width of the active channel and part of the floodplain. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 15, 2021, following dry conditions in the previous 24 hours. Water was clear and without colour. Water temperature and water quality parameters measured at WC are shown in Appendix H below.
- In-stream cover was moderate (40-50%) and provided by undercut banks, deep pools, boulders, cobble, logs and branches along the shoreline.
- 40% of the banks were depositional, 30% were vulnerable, 25% were eroding, and 5% were protected by angular stone along the multi-use trail on the west side of the creek.
- Substrate was dominated by sand (33%) and silt (33%), followed by gravel (25%), cobble (8%) and boulders (1%).
- Morphology at this WC was 80% run, 10% riffle, and 10% pool.
- Stream dimensions - Wetted width: 8.4 - 13.7 m; Mean bankfull width: 17.6 - 17.7 m; Mean depth 36 cm; Maximum pool depth: 84 cm.
- Canopy was 90% open: 10% partly open.
- Riparian vegetation within 5 m was treed valley and a multi-use trail in a park setting.
- Sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The railway bridge spanning the channel does not pose a migratory obstruction for fish. No other migratory obstructions were observed.



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Summary

Within the Study Area, Oshawa Creek provides direct coldwater fish habitat based on review of MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater habitat. There are no records of provincially or federally protected aquatic SAR within the Study Area. Records of American Eel in Oshawa Creek upstream and downstream of the Study Area (MNRF 2023b) suggest that this species also inhabits Oshawa Creek within the Study Area.

4.4.3 Harmony Creek WC-3

Harmony Creek flows under the railway bridge between Harmony Road South and Bloor Street East. Within the Study Area, Harmony Creek is mapped as a warmwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLHA02 [within the Study Area]) and classifies this reach of Harmony Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach four times between 2013 and 2016 (Table 4.1). In total, 13 fish species were captured including: Western Blacknose Dace, Creek Chub, Green Sunfish (*Lepomis cyanellus*), Johnny Darter, Longnose Dace, Rainbow Darter (*Etheostoma caeruleum*), Rainbow Trout, and White Sucker. These fish species have warmwater, coolwater and coldwater preferences (Coker et. al. 2001). Most fish species captured are common, widespread and abundant in Ontario (S5). Green Sunfish and Rainbow Darter are apparently secure, uncommon but not rare (S4). Rainbow Trout has no conservation status (SNA). During surveys completed by Stantec in July 2021, fish were observed visually including Rainbow Trout (immature), Longnose Dace, Western Blacknose Dace, Johnny Darter.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).



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Fish Habitat

At this WC, Harmony Creek is within a 75 - 125 m wide valley. East and west of the creek, the valley is steep and treed. The railway bridge spans the width of the active channel and part of the floodplain. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 15, 2021, following dry conditions in the previous 24 hours. Water was clear and without colour. Water temperature and water quality parameters measured at WC are shown in Appendix H below.
- In-stream cover was moderate (40-50%) and provided by deep pools and boulders.
- 64% of the banks were eroding, 23% were depositional, and 13% were vulnerable.
- Substrate was dominated by sand (60%), followed by gravel (33%), cobble (4%) and boulders (3%).
- Morphology at WC-3 was 60% flat, 16% pool, 12% riffle, and 12% run.
- Stream dimensions - Wetted width: 3.1 - 8.7 m; Mean bankfull width: 9.9 - 11.4 m; Mean depth 19 cm; Maximum pool depth: 50 cm.
- Canopy was 45% open; 55% partly open.
- Riparian vegetation within 5 m of the stream was treed valley.
- Limited areas of sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The railway bridge spanning the channel does not pose a migratory obstruction for fish. No other migratory obstructions were observed.

Summary

Within the Study Area, Harmony Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperatures monitoring indicates this reach provides coolwater habitat. Coldwater species such as Rainbow Trout have been recorded in Harmony Creek. There are no records of provincially or federally protected aquatic SAR.



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4.4.4 Farewell Creek WC-4

Farewell Creek flows under the railway between Harmony Road South and Bloor Street. Within the Study Area, Farewell Creek is mapped as a coldwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLFA02 [outside of the Study Area]) and classifies this reach of Farewell Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach 3 times in 2013 (Table 4.1). In total, 13 fish species were captured including: Western Blacknose Dace, Bluntnose Minnow (*Pimephales notatus*), Brown Bullhead (*Ameiurus nebulosus*), Brown Trout, Creek Chub, Green Sunfish, Johnny Darter, Longnose Dace, Mottled Sculpin, Rainbow Darter, Rainbow Trout, Rock Bass (*Ambloplites rupestris*), and Round Goby (*Neogobius melanostomus*). These species represent warmwater, coolwater and coldwater preferences (Coker et. al. 2001) all occurring in the same system. Most fishes captured are common, widespread and abundant in Ontario (S5). Two species (i.e., Green Sunfish and Rainbow Darter) are apparently secure, uncommon but not rare (S4). Three species (i.e., Brown Trout, Rainbow Trout, and Round Goby) have no conservation status (SNA). During surveys completed by Stantec in July 2021, two fish species were observed visually including: Johnny Darter (young of the year) and Creek Chub.

During spring, water depth was between 10 centimetres (cm) to 60 cm, with fast-moving and clear water. Water depth in summer was between 10 cm to 80 cm, with baseflow velocity and visually clear water.

Thirteen species of fish were captured in the spring survey, with Longnose Dace and Blacknose Dace as the most abundant at this location (collectively representing approximately 49% of the total catch). Nine species were captured in the summer survey, with Blacknose Dace and Rainbow Darter as the most abundant species (approximately 57% of the total catch).

Thirteen species of fish were captured at this location in total during spring and summer sampling events. Most (8) fishes captured are classified as cool water species (Coker et al. 2001). Four warm water species and one cold water species were captured which was Rainbow Trout (*Oncorhynchus mykiss*). Most species captured (8) are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. Two species, Rainbow Darter (*Etheostoma caeruleum*) and Green Sunfish (*Lepomis cyanellus*), are ranked by NHIC as S4 which indicates they are apparently



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secure, uncommon but not rare with some cause for long-term concern due to declines or other factors. A conservation status rank does not apply (SNA) to three species because the species is not a suitable target for conservation activities. These are Goldfish (*Carassius auratus*), Rainbow Trout, and Round Goby (*Neogobius melanostomus*). Goldfish and Round Goby are considered invasive in Ontario. Rainbow Trout is valued by anglers as a game fish. The presence of juvenile Rainbow Trout indicates that Farewell Creek provides suitable conditions for spawning and rearing for this species. No fish SAR were captured.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).

Fish Habitat

At WC-4, Farewell Creek is within a 170 – 260 m wide valley. East and west of the creek, the valley is moderately steep and treed. The railway crosses the watercourse over twin arches with closed bottom. Each arch is 4.2 m wide and 3.7 m high. The footing between the arches is 1.6 m wide. During normal flow conditions flow is diverted through the west arch. Wetted depth in the western arch was 55 cm. The following fish habitat characteristics were noted at WC-4:

- Moderate flow at 0.3 m/s and normal stream stage conditions were observed on July 14 following a period with thundershowers in the previous 24 hours. Water was clear and without colour. Water temperature and water quality parameters measured at WC-4 are shown in Appendix H and Appendix I-3.
- In-stream cover was moderate (50%) and provided by deep pools, boulders, cobble, logs and branches, and overhanging vegetation.
- Most of the banks were eroding (55%), followed by vulnerable (35%), depositional (5%), and protected (5%).
- Substrate was dominated by cobble (65%), while other substrates present were gravel (10%), sand (10%), silt (10%) and boulders (5%).
- Morphology was predominantly riffle (80%), with the remainder comprised of pool (10%) and run (10%).
- Stream dimensions – Wetted width: 5.9 – 6.8 m; Mean bankfull width: 7.8 – 10.2 m; Mean depth 25 cm; Maximum pool depth: 68 cm.
- Canopy was almost entirely open (85%), and the remainder was partly open (15%).
- Riparian vegetation within 5 m of the stream was treed valley (i.e., willow species and Black Walnut [*Juglans nigra*]).



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- Limited areas of sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The railway bridge spanning the channel does not pose a migratory obstruction for fish. No other migratory obstructions were observed.

Summary

This section of Farewell Creek provides direct coldwater fish habitat based on records provided by MNRF (2021a). CLOCA long-term water temperature monitoring indicates this reach provides coolwater habitat. There are no records of provincially or federally protected aquatic SAR.

4.4.5 Unnamed Tributary WC-5a and WC-5b

Two unnamed tributaries of Lake Ontario flow under the railway approximately 365 m and 470 m west of Prestonvale Road. Tributary 5a is mapped without thermal classification south of the railway by MNRF (MNRF 2023a). The tributary at WC-5b is not mapped by MNRF (2023a). No water temperature data for these tributaries are available from CLOCA. These HDF were assessed as a headwater drainage features according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014), and the description of these features below is in accordance with those criteria.

Hydrology

On July 14, 2021, the watercourse was dry, and no flow was observed following a period with thundershowers in the previous 24 hours. On April 20, 2023, the poorly defined feature had minimal surface flow (<0.5 l/s). The feature had an average wetted width of 0.2 m and an average depth of 2 cm. The water temperature south of the railway was 9.5°C. Tributary 5b to the east also had minimal surface flow, with an average wetted width of 0.2 m and a maximum depth of 5 cm. On May 17, 2023, minimal surface flow was also observed with an average depth of 1 cm and an average wetted width of 0.2 m. A 1 m by 1 m pool of water was present south of the culvert; however, the downstream channel was dry with no flow. Some flow was observed in the secondary unmapped feature (WC-5b) although the flow was not continuous and had an average depth of 1 cm. On July 12, 2023, both features were observed to be dry with no pools or standing water. No fish habitat was present.

Water temperature and water quality parameters measured at WC-5a are shown in Appendix H and Appendix I-3.



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Based on these observations the classification for the hydrology function of the HDF at WC-5a and WC-5b within the CP Rail ROW is Valued or Contributing in accordance with the HDF guidelines.

Riparian

North of the rail corridor the ELC communities are comprised largely of active agriculture (AG) and maintained lawn features. Small, disturbed pockets of mineral cultural thicket (CUT1), mineral cultural meadow (CUM1), and linear treed deciduous hedgerows (HE1) are also present representing current land disturbance. South of the railway the communities are comprised of a coniferous plantation (CUP3), mineral cultural meadow (CUM1), and mineral cultural thicket (CUT1).

Current land use that is occupied by infrastructure and active agricultural, suggests riparian habitat is limited at WC-5a and WC-5b. Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW was classified as Important, meaning the riparian corridor is dominated with thicket/scrubland communities as well as natural areas influenced by human activities such as plantations and regenerating woodlands.

Fish Community

There are no fish records available for WC-5a and WC-5b (MNRF 2023a; CLFN 2022; CLOCA 2021a).

No suitable fish habitat was present during Stantec's field investigations on July 14, 2023, May 17, 2023, and July 12, 2023, as the channel was dry. On April 20, 2023, no fish were observed and use by fish was unlikely. This intermittent or ephemeral system may contain fish during seasonally wet periods.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023c).

Fish Habitat

At WC-5a there is a poorly defined channel located within thicket communities to the north and the south of the railway. Twin 60 centimeter (cm) diameter corrugated steel pipe (CSP) culverts are in place under the railway. The culverts are perched on the south side with a height of 0.5 m and 0.25 m. The culverts convey drainage south from an HDF as well as drainage east and west from the railway crossing.

At WC-5b approximately 100 m east of WC 5b there are twin 60 cm CSP culverts, conveying drainage south from a thicket community adjacent to an agricultural field.



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South of the railway, the feature is poorly defined draining into a wetland thicket community with cattails, willows, and dogwood species.

No direct fish habitat is present within at WC-5a and WC-5b. These features provide contributing fish habitat by supplying surface water and nutrients to McLaughlin Bay and Lake Ontario. Using the criteria of the HDF Guideline the fish and fish habitat functions of these features within the CP ROW were classified as Contributing.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as a movement corridor for small animals. The habitat available is unlikely to function as amphibian breeding habitat due to the fragmentation of the surrounding landscape and lack of connectivity between upstream and downstream habitat features. For example, active agriculture occurs north of WC 5a and WC-5b, while the railway is adjacent to the tributary, and Highway 401 is directly south of the feature. As such, the feature is unlikely to be used as a stepping-stone habitat for mobile amphibians but may be utilized by other small wildlife species.

Based on the criteria within the HDF Guidelines, terrestrial habitat functions within the CP ROW were classified as Contributing, meaning the riparian habitat may not provide movement opportunities for amphibian species due to the absence of wetland habitat, but may provide a corridor for other terrestrial wildlife species.

Summary

This unnamed tributary provides contributing fish habitat only by supplying surface water to McLaughlin Bay / Lake Ontario. There are no records of provincially or federally protected aquatic SAR for this unnamed tributary. The tributaries do provide riparian and terrestrial functions that influence the decision-making process to arrive at a management option.

These unnamed tributaries are linked with the management option Protection using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014). HDF Assessments are summarized in Table 4.2.



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4.4.6 Robinson Creek WC-6

Robinson Creek crosses the railway approximately 370 m east of Prestonvale Road. Within the Study Area, Robinson Creek is mapped as a warmwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLROB01 [outside of the Study Area]) and classifies this reach of Robinson Creek as coolwater habitat based on the most current monitoring data (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach nine times between 2011 and 2015. In total, 13 fish species were captured including: Western Blacknose Dace, Brook Stickleback, Brown Bullhead, Creek Chub, Fathead Minnow, Green Sunfish, Johnny Darter, Largemouth Bass, Longnose Dace, Pumpkinseed, Threespine Stickleback (*Gasterosteus aculeatus*), White Sucker, and Yellow Perch (Table 4.1). These species represent a diversity of warmwater, coolwater and coldwater preferences. Most species captured are common, widespread and abundant in Ontario (S5). Threespine Stickleback is apparently secure, uncommon but not rare (S4). During surveys completed by Stantec in July 2021, three fish species were observed visually including, Brown Bullhead, Creek Chub and Johnny Darter.

Five species were captured at this location during the spring survey. Creek Chub and Blacknose Dace were the most abundant and collectively represented approximately 90% of the total catch. Five species were captured at this location during the summer survey. However, Brown Bullhead, which were previously captured in the spring, were not captured in the summer survey. Pumpkinseed Sunfish were captured in the summer but not the spring. Creek Chub was the most abundant species in the summer (approximately 50% of the total catch) followed by Johnny Darter and Blacknose Dace.

Six species of fish were captured at this location in total during spring and summer sampling events (Table 3). Cool water species (3) as well as warm water (3) species were captured (Coker et al. 2001). All six species captured are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario.

There are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b) within the Study Area.



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Fish Habitat

At this WC, Robinson Creek is within a 75-100 m wide valley. East and west of the creek, the valley is low gradient. North of the railway, the valley is vegetated by a meadow. South of the railway the vegetation includes thicket and meadow. Robinson Creek is diverted under the railway through a closed bottom arch culvert. The culvert is 2.3 m wide and 2.2 m high. Wetted depth in the culvert was 9 cm. Wetted width was 1.9 m. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 14, 2021 following a period with thundershowers in the previous 24 hours. Water was clear and without colour. Water temperature and water quality parameters measured at WC-6 are shown in are shown in Appendix H and Appendix I-3.
- In-stream cover is low (30%) and provided by deep pools, boulders, aquatic vegetation including Canada Waterweed, Watercress and overhanging terrestrial grasses and herbaceous vegetation.
- Most of the banks were protected (60%), followed by depositional (25%), and eroding (15%).
- Substrate was mostly silt (31%) and boulders (28%) followed by clay (21%), sand (15%) and gravel (5%).
- Morphology was predominantly run (63%), with the remainder comprised of pool (21%) and riffle (16%).
- Stream dimensions – Wetted width: 2.2 - 3.0 m; Mean bankfull width: 2.9 - 4.3 m; Mean depth 20 cm; Maximum pool depth: 52 cm.
- Canopy was almost entirely open (85%), and the remainder is partly open (15%).
- Riparian vegetation within 5 m of the stream includes meadow and thicket communities, terrestrial grasses and herbs overhanging the edge of the channel.
- No critical habitat for fish was observed. The arch culvert was perched by 27 cm and poses a barrier to upstream fish migration. No other migratory obstructions were observed.

Summary

This section of Robinson Creek provides direct warmwater fish habitat based on review of MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater habitat, however coldwater species such as Rainbow Trout have been recorded in Robinson Creek. There are no records of provincially or federally protected aquatic SAR.



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4.4.7 Unnamed Tributary of Tooley Creek WC-7

Tooley Creek flows under the railway approximately 360 m west of Courtice Road. Within the Project Footprint, there is no mapped drainage feature (MNRF 2023a). A coldwater watercourse is mapped starting more than 300 m south of the railway alignment, south of Baseline Road. No water temperature data for this tributary was available from CLOCA. This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014), and the description of this feature below is in accordance with those criteria.

Hydrology

On July 16, 2021 trickle flow was observed at the south side of the agricultural field north of the rail following a period with thundershowers in the previous 24 hours. Water was clear and colourless.

On April 12, 2022 trickle flow was observed in a 5 m section in the north side of the agricultural field where this drainage feature emerges. No defined channel or flow was observed in the remainder of this drainage feature. The drainage feature is densely vegetated by grasses.

On May 24, 2022 no flow was observed in the north end of this feature or throughout most of this feature within the agricultural field. A trickle of flow was observed from the SWM pond located adjacent to the existing Courtice GO Station bus terminal parking lot.

Water temperature and water quality parameters measured at WC-7 are shown in Appendix H and Appendix I-3.

Based on these observations the classification for the hydrology function of WC-7 within the Courtice Road (B3 Courtice) GO Station property is Valued or Contributing in accordance with the TRCA and CVC (2014) guidelines.

Riparian Vegetation

The HDF traverses the meadow west of Courtice Road (B3 Courtice) GO Station and a thicket north of the railway.

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW are classified as Important.



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Fish Community

There are no fish records for this tributary by MNRF (2023a), CLFN (2022), or CLOCA (2021a). The channel was dry during surveys completed by Stantec in July 2021.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).

This HDF originates in the northern part of the lands west of the existing Courtice GO Station bus terminal. There is no channel in the lands to the north of the Courtice Road (B3 Courtice) GO Station property. Within the property this drainage feature can be characterized as a swale or a shallow trough like depression. It is up to 10 m wide and approximately 0.5 m deep. It is densely vegetated by grasses and no defined channel was observed.

Fish Habitat

A stormwater treatment facility (i.e., stormwater management [SWM] pond) located in the southwest corner of the Courtice GO Station bus terminal contributes flow to this HDF.

At the south end of the property there is an actively eroding gully with a knick-point where the channel drops by approximately 0.5 m.

The HDF continues as a poorly defined channel through a thicket north of the rail corridor towards an open bottom arch CSP culvert. The existing culvert is 1 m tall and 1.1 m wide. South of the rail corridor there is a constructed ditch which is 3.3 m wide through a hedgerow approximately 12 m wide. The ditch empties into a 60 cm diameter CSP which diverts water under the industrial property to the south.

Using the criteria of the HDF Guideline the fish and fish habitat functions of this feature within the CP Rail ROW were classified as Contributing.

Terrestrial Habitat

No amphibians were observed in the CP Rail ROW during surveys completed in 2021. The feature likely functions as a movement corridor for more mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area is classified as Valued, meaning that wetland habitat occurs but amphibian breeding is absent.



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Summary

This unnamed tributary provides contributing fish habitat only by supplying surface water to Tooley Creek. There are no records of provincially or federally protected aquatic SAR for this unnamed tributary. The tributary does provide riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: Protection using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014). HDF Assessments are summarized in Table 4.2.

4.4.8 Tooley Creek WC-8

Tooley Creek flows under the rail corridor approximately 290 m east of Courtice Road. Within the Study Area, Tooley Creek is mapped as a coolwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLTY04 [within the Study Area]) and classifies this reach of Tooley Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach nine times between 2011 and 2015 (Table 4.1). In total, 16 fish species were captured including: Western Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Brown Bullhead, Common Carp (*Cyprinus carpio*), Creek Chub, Fathead Minnow, Green Sunfish, Johnny Darter, Largemouth Bass (*Micropterus salmoides*), Northern Redbelly Dace (*Chrosomus eos*), Pumpkinseed, Rainbow Trout, Threespine Stickleback, White Sucker, and Yellow Perch (*Perca flavescens*). These species have warmwater, coolwater and coldwater preferences. Most fish species captured are common, widespread and abundant in Ontario (S5). Two species (i.e., Green Sunfish and Threespine Stickleback) are apparently secure, uncommon but not rare (S4). Two species (Rainbow Trout and Common Carp) have no conservation status (SNA). During surveys completed by Stantec in July 2021, one species was observed visually (i.e., Brook Stickleback).

Seven species were captured at this location in the spring, with Fathead Minnow the most abundant species (approximately 53% of the total catch). Eleven species were captured at this location in the summer. White Sucker was the most abundant species (38% of the total catch), which were mostly young of the year.



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Nine species were captured at this location in total during spring and summer sampling events. Most (5) are classified as cool water species (Coker et al. 2001). Three are warm water species and one is a coldwater species which was Rainbow Trout. Most (7 of 9) fish species captured are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. As previously mentioned, Green Sunfish are ranked by NHIC as S4. A conservation status rank does not apply to one species which is Rainbow Trout. The presence of juvenile Rainbow Trout and White Sucker (*Catostomus commersonii*) indicates that Tooley Creek provides suitable conditions for spawning and rearing for this species. A previous record for Rainbow Trout in Tooley Creek was in 2015 (CLOCA 2022). No fish SAR were captured at WC-8.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).

Fish Habitat

At this WC, Tooley Creek is within a 150-200 m wide valley. East and west of the creek, the valley is low gradient. North of the railway, the valley is vegetated by thicket west of the creek, and agricultural crops east of the creek. South of the railway, the vegetation includes thicket and meadow. Robinson Creek is diverted under the railway through a large, closed-bottom arch culvert. The culvert is 3.1 m wide and 3.0 m high. Wetted width through the culvert was 2.1 m. Wetted depth in the culvert was 14 cm. Wetted width was 1.9 m. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 13, 2021, following a period without precipitation in the previous 24 hours. Water was clear and without colour. Water temperature and water quality parameters measured at WC-8 are shown in Appendix H and Appendix I-3.
- In-stream cover was low (15%) and provided by a deep pool, sparse boulders, cobbles, and large organic debris.
- Most of the banks were eroding (37%), followed by depositional (25%), protected (25%) and the remainder was vulnerable (13%).
- Substrate was mostly detritus (40%), followed by cobble (30%), silt (15%), gravel (10%) and sand 5%.
- Morphology was predominantly riffle (50%), with the remainder comprised of pool (25%) and run (25%).
- Stream dimensions - Wetted width: 1.0 - 2.3 m; Mean bankfull width: 3.0 - 3.3 m; Mean depth 20 cm; Maximum pool depth: 70 cm.
- Canopy was almost entirely open (60%), and the remainder was partly open (40%).



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- Riparian vegetation within 5 m of the stream included grasses and herbaceous vegetation, trees and shrubs (forested).
- Limited areas of sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The arch culvert is not perched. No migratory obstructions were observed.

Summary

This section of Tooley Creek provides direct coolwater fish habitat based on review of both MNRF and CLOCA records. Coldwater species such as Rainbow Trout have been recorded in Tooley Creek. There are no records of provincially or federally protected aquatic SAR for this reach of Tooley Creek.

4.4.9 Unnamed Tributary of Tooley Creek WC-9

An unnamed tributary of Tooley Creek flows under the rail corridor approximately 120 m north of Baseline Road West (Figure 3.7 in Attachment 1). Within the Study Area, this tributary is mapped as a coolwater watercourse (MNRF 2023a). This tributary is not mapped as a classified drain (MNRF 2023b). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLTY03 [outside of the Study Area]) and classifies this reach of Tooley Creek as coolwater habitat (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014), and the description of this feature below is in accordance with those criteria.

Hydrology

On July 14, 2021, trickle flow was observed following a period of dry hot humid weather. The water temperature was 15.7°C. No instream cover was present for fish at the time of surveys.

On April 20, 2023, the feature was observed to be flowing with a slow velocity. The feature had an average wetted width of 0.3 – 2 m with a maximum pool depth of 0.3 m at the south (downstream) culvert outlet. The water temperature was 7.3°C.

On May 18, 2023, the feature was observed to have trickle flow. A stagnant pool with a biofilm layer was present at the culvert with a maximum depth of 0.3 m. Shallow isolated pools were also observed in a poorly defined swale/wetland. The average depth of the feature was 3 cm and the wetted width ranged from 0.1 – 1.5 m. The water temperature was 11.5°C.



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On July 10, 2023, no flow was present; a dry channel with damp soils and mosses throughout was observed. A 1 m wide pool of stagnant water was present at the culvert south of the railway. The water temperature was 14.2°C.

Water temperature and water quality parameters measured at WC-9 are shown in Appendix H and Appendix I-3.

Using the criteria of the HDF Guidelines the hydrology function of the HDF at WC-9 within the CP Rail ROW was classified as Important.

Riparian Vegetation

North of the railway the vegetation communities were comprised of many small pockets of cultural influence such as active agriculture, roadways, mineral cultural thickets (CUT1), mineral cultural woodland (CUW1), and mineral cultural meadows (CUM1). The watercourse feature runs throughout a larger deciduous swamp (SWD) community.

South of the railway the vegetation communities were also comprised of small pockets that are a result of cultural influence and include mineral cultural thicket (CUT1), mineral cultural woodlands (CUW1), deciduous forest (FOD), and a deciduous swamp (SWD). Commercial land use was also present immediately south of the railway.

The adjacent riparian corridor was vegetated. Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as Important, meaning the riparian corridor is dominated with thicket/scrubland communities as well as natural areas influenced by human activities such as plantations and regenerating woodlands.

Fish Community

There are no fish records for this tributary from MNRF (2023a), CLFN (2022) or CLOCA (2021a).

During Stantec's field investigations, no fish were visually observed on July 13, 2021, April 20, May 18, or July 12, 2023. No fish were captured during fish community surveys on May 18, 2023, and suitable fish habitat was not present on July 12 2023, to conduct further assessments.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).



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Fish Habitat

At WC-9, there is a poorly defined channel in the thicket communities to the north and the south of the rail corridor. A round 0.5 m CSP culvert is in place under the railway at the north of the rail corridor. South of the rail corridor, a 1 m CSP exits with a 45-degree angle. The culvert crossing appears to have been previously redirected.

This tributary of Tooley Creek provides coolwater fish habitat based on a review of both MNRF and CLOCA records. There are no records of provincially or federally protected aquatic SAR. Based on Stantec's field investigations, the tributary may provide fish habitat at times of high flow; however, no fish were captured or observed during the survey. The feature likely functions as contributing fish habitat, conveying drainage to Tooley Creek.

Using the criteria of the HDF Guideline the fish and fish habitat function of this feature within the CP Rail ROW is classified as Contributing.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary likely functions as general amphibian habitat as there is a vegetation community of deciduous swamp immediately south of the railway as well as north of the Study Area outside of the CP Rail ROW. The feature, therefore, may provide a stepping-stone habitat between these areas. No amphibians were observed in the CP Rail ROW during surveys completed in 2021. The feature likely also functions as a movement corridor for more mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area is classified as Valued, meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This tributary of Tooley Creek provides coolwater fish habitat based on review of both MNRF and CLOCA records. There are no records of provincially or federally protected aquatic SAR for this unnamed tributary of Tooley Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: Protection using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014). HDF Assessments are summarized in Table 4.2.



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4.4.10 Unnamed Tributary of Darlington Creek WC-10

A tributary of Darlington Creek flows under the railway approximately 50 m south of Baseline Road West. Within the Study Area, this tributary is mapped as a warmwater watercourse by MNR (MNR 2023a). CLOCA has completed water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN05 [inside of the Study Area]) and classifies this reach of Darlington Creek as coolwater habitat (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014), and the description of this feature below is in accordance with those criteria.

Hydrology

On July 12, 2021, trickle flow was observed with an approximate depth of 2 cm within the culvert at the crossing. Filamentous algae was present. North of the rail corridor at the Baseline Road culvert, trickle flow was observed with an average depth of 8 cm and an average wetted width of 0.6 m.

On April 20, 2023, the feature was observed to be flowing north from a pooled area at the southern agricultural field. The maximum depth in the channel was 0.1 m. A larger pooled area was also present north of the rail corridor before Baseline Road, with a maximum depth of 0.15 m. The water temperature was 6.9°C. On May 18, 2023, the feature had trickle flow and an isolated pool before Baseline Road. The feature had an average wetted width of 0.10 m and an average depth of 5 cm. The water temperature was 13.8°C.

On July 12, 2023, the feature was dry, and no standing pools or flows were present at the railway crossing. The substrates were damp, and algae was present on the surface. A small amount of standing water was present under the culvert at Baseline Road.

Using the criteria of the HDF Guidelines the hydrology function of this feature within the CP Rail ROW were classified as Important.

Riparian Vegetation

North of the rail corridor the vegetation communities within the riparian zone of the tributary were comprised of treed deciduous hedgerow (HE1), cultural deciduous thicket (CUT), and reed-corn grass meadow marsh (MAM2-2). South of the railway, the vegetation communities in the riparian zone consisted of cultural meadow (CUM1), cultural coniferous plantation (CUP3), and active agricultural lands.



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Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as Important, meaning the riparian corridor is dominated with thicket/scrubland communities as well as natural areas influenced by human activities such as plantations and meadows.

Fish Community

This unnamed tributary of Darlington Creek provides direct warmwater fish habitat, according to MNRF (2023a) records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater fish habitat. One species of fish, Brook Stickleback, has been reported by CLOCA (2021a). There are no records of provincially or federally protected aquatic SAR for this unnamed tributary of Darlington Creek.

During Stantec's field investigations, no fish were observed on July 12, 2021, April 20, or May 18, 2023. No fish were captured during fish community surveys on May 18, 2023, and suitable fish habitat was not present on July 12, 2023, to conduct a fish community assessment.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023c).

Fish Habitat

A poorly defined channel was observed draining north at this WC-10 in a meadow vegetation community, with cattails at the beginning of the feature. No channel was visible in the cropped agricultural field to the south of the rail corridor. A concrete open-bottom culvert is in place under the railway that is 1 m wide and 0.5 m tall. North of the railway, this tributary is diverted under Baseline Road through a 60 cm diameter round CSP culvert.

Using the criteria of the HDF Guidelines the fish and fish habitat functions within the CP Rail ROW were classified as Important due to the presence of fish as documented by CLOCA (2021).

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as general amphibian habitat as wetland habitat is present upstream and downstream of WC-10 in meadow marsh (MAM2-2) and deciduous thicket swamp (SWT) where amphibians were observed outside of the CP Rail ROW. The feature may provide a stepping-stone habitat between these areas; however, there is low potential for this to occur as the transportation corridors of Rundle Road, Baseline Road, and the railway intersect the two wetland habitats and tributary. No amphibians were observed in the CP Rail ROW during surveys completed in 2021; however, individuals of Green



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Frog, Spring Peeper, and American Toad were heard approximately 130 m southwest of WC-10 in the deciduous thicket swamp. The feature likely also functions as a movement corridor for more mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area is classified as Important, meaning that wetland habitat occurs, and amphibian breeding is present within 400 m.

Summary

At WC-10 this unnamed tributary of Darlington Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater fish habitat. There are no records of provincially or federally protected aquatic SAR for this unnamed tributary of Darlington Creek.

This unnamed tributary is linked with the management option: Protection using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014). HDF Assessments are summarized in Table 4.2.

4.4.11 Darlington Creek WC-11

Darlington Creek flows generally from west to east in this area and is located close to or in the ROW of the rail corridor and/or Baseline Road West. The creek appears to have been realigned in sections. A culvert diverts flow under both the railway and Baseline Road West. There are two other crossings of Baseline Road West in this 300 m stretch of the road. At WC-11, Darlington Creek is mapped as a warmwater watercourse by MNRF (MNRF 2023a). CLOCA has completed water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN05 [within the Study Area]) and classifies this reach of Darlington Creek as coolwater habitat (CLOCA 2021a).

Fish Community

There are no recent records (<10 years) for this reach available from the MNRF (2023a), CLFN (2022), and CLOCA (2021a). In 2015, CLOCA surveyed a reach approximately 2.5 km downstream of the Study Area. In total, six fish species were captured including: Brook Stickleback, Creek Chub, Green Sunfish, Largemouth Bass, Rainbow Trout, and White Sucker. These species have warm, cool and coldwater thermal preferences. Most species are common, widespread and abundant in Ontario (S5). Rainbow Trout has no conservation status (SNA) as this species is not native to Ontario. No fish were observed visually during the aquatic habitat survey completed on July 13, 2021.



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Five species were captured at this location in the spring. Brook Stickleback was the most abundant species (approximately 43% of total catch). Three species were captured at this location in the summer. Brook (young of the year) made up 93% of the total catch.

Five fish species were captured at this location in during spring and summer sampling events. In addition, a separate record of a single mature Rainbow Trout was made at this location by Stantec staff completing a hydrological survey on April 13, 2023. On this day high flow was observed with depths between 20 cm to 40 cm.

Six fish species were captured at this location by Stantec in 2023 during fish community sampling and hydrology fieldwork. Most fish species (4) documented at this location are classified as cool water species (Coker et al. 2001). One cold water species (Rainbow Trout) was documented and one warm water species (Sunfish). Most fish species (4) are ranked by NHIC as S5, which indicates they are secure, common, widespread, and abundant in Ontario. A conservation status rank does not apply (SNA) to one (1) species which is Rainbow Trout. The presence of mature Rainbow Trout in the Study Area indicates that this species successfully migrates upstream from Lake Ontario to the upper reaches of this watershed to spawn. There were no previous observations of Rainbow Trout in the records that Stantec reviewed. No fish SAR were captured.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).

Fish Habitat

North of the railway (and Baseline Road West) the channel is in a 25 – 35 m wide valley that is vegetated by meadow community. The creek is diverted under the railway and Baseline Road West through a closed bottom box culvert that is 1.8 m wide and 1.4 m tall. The north side of the culvert connects to a concrete closed bottom channel that is also 1.8 m wide and 6.5 m long. South of the railway (and Baseline Road West), there is an open natural channel that loops back north and connects to another culvert under Baseline Road West. This culvert is a 2.0 m diameter round CSP culvert that is embedded in the substrate and not a permanent barrier to fish migration. Water depth in the culvert was 60 cm and fish were observed visually on June 3, 2021. The channel continues east within the rail ROW for approximately 240 m. The channel enters a wooded area that is approximately 50 m wide, and turns south and away from the railway towards Baseline Road West. There is a concrete open box culvert at this location that had standing water but no flow on July 12, 2021. The culvert is 1.4 m wide and 1.1 m tall. No defined channel was observed north of this culvert in the cropped agricultural field. The following fish habitat characteristics were noted at this WC:



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- Moderate flow and normal stream stage conditions were observed on July 12, 2021 following a period without precipitation in the previous 24 hours. Water was clear and without colour. Water temperature and water quality parameters measured at WC-11 are shown in Appendix H and Appendix I-3.
- In-stream cover was low (15%), and provided by small organic debris such as twigs, branches and terrestrial overhanging vegetation.
- The banks were depositional (100%).
- Substrate was mostly silt (80%), followed by clay (20%).
- Morphology was mostly run (75%), with the remainder comprised of riffles (10%), flat (10%) and pool (5%).
- Stream dimensions – Wetted width: 1.5 m; Mean bankfull width: 2.6 m; Mean depth 16 cm; Maximum pool depth: 20 cm.
- Canopy was almost entirely open (90%), and the remainder was partly open (10%).
- Riparian vegetation within 5 m of the stream included grasses and herbaceous vegetation, vines and shrubs. Vegetation adjacent to the Creek appeared to be trimmed for routine railway maintenance.

Summary

This reach of Darlington Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat, however coldwater species such as Rainbow Trout have been recorded in Darlington Creek. There are no records of provincially or federally protected aquatic SAR in Darlington Creek.

4.4.12 Darlington Creek Tributary WC-12

WC-12 was at the existing railway crossing over a Tributary of Darlington Creek 50 m east of Holt Road. At WC-12, this tributary is mapped as a warmwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN01 [outside the Study Area]) and classifies this reach of Darlington Creek as coolwater habitat based on the most current monitoring data (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014), and the description of this feature below is in accordance with those criteria.



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Hydrology

On July 13, 2021, slow water velocity and normal stream stage conditions were observed following a period without precipitation in the previous 24 hours. The feature had an average wetted width of 1.6 m, an average depth of 0.2 m and a maximum pool depth of 0.6 m. The water was clear and without colour. The water temperature was 17.3°C.

On April 20, 2023, moderate water velocity and normal stream stage conditions were observed. The feature had a wetted width ranging from 1 – 7 m with a maximum pool depth at the culvert of 0.65 m (0.2 m max. otherwise). An agriculture tile drain outlet was actively flowing from placed cobbles by the northeast field. The water was clear and without colour. The water temperature was 6.5°C. On May 24, 2023, the feature was flowing with an average depth of 0.2 m and a maximum depth of 1.3 m at the culvert outlet. The feature had a vegetated island with a flowing channel on either side, each with a 1 m wetted width. In-situ water quality parameters were collected.

On July 12, 2023, the feature was dry with no flow, isolated pools were present upstream (north) with an average depth of 5 cm. A large volume of stagnant water was present within the culvert.

Water temperature and water quality parameters measured at WC-12 are shown in Appendix H and Appendix I-3.

Using the criteria of the HDF Guidelines the hydrology function within the Study Area was classified as Important.

Riparian Vegetation

North and south of the rail corridor the vegetation communities were mainly comprised of willow mineral deciduous swamp (SWD4-1) surrounded by active agriculture (AG). A mineral cultural meadow (CUM1) was also present northwest of Holt Road.

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as Important as the riparian corridor is dominated with wetlands.

Fish Community

There are no recent (<10 years) fish records available for this tributary (MNRF 2023a, CLFN 2022, CLOCA 2021a).



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During Stantec's field investigations, no fish were observed on July 13, 2021, April 20, May 24 or July 12, 2023. No fish were captured during fish community surveys on May 24, 2023, and suitable fish habitat was not present on July 12, 2023, to conduct further assessments.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).

Fish Habitat

This reach of Darlington Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat.

North of the rail corridor, the creek is a 30 m wide valley dominated by a thicket community. The creek is diverted under the railway through an open-bottom concrete arch culvert that is 1.2 m high and 1.2 m wide. The culvert is not a barrier to upstream fish migration. South of the rail corridor the creek continues in a 30 m wide valley with deciduous forest vegetation.

Using the criteria of the HDF Guidelines the fish and fish habitat function of this unnamed tributary of Darlington Creek at WC-12 within the Study Area was classified as Contributing.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as general amphibian habitat as there are vegetation communities of willow deciduous swamp immediately south and north of the railway. The feature also connects to Darlington Creek 250 m south of the railway. Amphibian surveys completed in 2021 at WC-12 did not detect any evidence of breeding amphibians. However, this feature may function as a movement corridor for other mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area is classified as Valued, meaning that wetland habitat occurs but amphibian breeding is absent.



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Summary

This reach of Darlington Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: Protection using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014). HDF Assessments are summarized in Table 4.2.

4.4.13 Tributary of Darlington Creek WC-13

WC-13 was at the existing railway crossing over a Tributary of Darlington Creek 390 m east of Holt Road. At WC-13, this tributary is mapped as a warmwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN01 [outside the Study Area]) and classifies this reach of Darlington Creek as coolwater habitat based on the most current monitoring data (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014), and the description of this feature below is in accordance with those criteria.

Hydrology

On July 13, 2021, slow water velocity and normal stream stage conditions were observed following a period without precipitation in the previous 24 hours. The water was clear and without colour. The water temperature was 18.0°C.

On April 20, 2023, the feature was moderately flowing. The average wetted width ranged from 1 to 3.5 m, the average depth was 5 cm. A large pool was present south (downstream) of the rail corridor with a maximum depth of 1 m and the top of the culvert was submerged below the surface of the water by 0.1 m. Brown algae and sparse watercress were present. The water temperature was 6.5°C.



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On May 25, 2023, the feature was flowing with a wetted width ranging from 0.2 to 2.5 m and a depth ranging from 0.1 to 1.5 m (max depth at culvert north and south of the railway). The water temperature was 10.1 °C. On July 12, 2023, the channel was dry with no flow. A pool at the south of the culvert crossing measured 2.5 m wide by 3.5 m in length, with a maximum depth of 0.4 m.

Using the criteria of the HDF Guidelines the hydrology function within the Study Area was classified as Important.

Riparian Vegetation

North of the rail corridor the vegetation communities are comprised of active agriculture (AG), a treed deciduous hedgerow (HE1), and a mineral cultural thicket (CUT1). South of the railway, the communities are mainly comprised of deciduous forest (FOD) and active agriculture (AG).

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW was classified as Important, meaning the riparian corridor is dominated with forests and thicket/scrubland communities.

Fish Community

There are no recent (<10 years) fish records available for this tributary (MNRF 2023a, CLFN 2022, CLOCA 2021a). There are no records of provincially or federally protected aquatic SAR in Darlington Creek.

On May 25, 2023, three fish species were captured: Brook Stickleback (*Culaea inconstans*), Johnny Darter and Sunfish (immature). Suitable fish habitat was not present on July 12, 2023, to conduct further assessments.

Two fish species documented at this WC-13 are classified as cool water species, Brook Stickleback and Johnny Darter (Coker et al. 2001), while one species is warmwater, sunfish young of the year. Most fishes (i.e., two) are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. The sunfish young of the year were not ranked as the species could not be confirmed during sampling.

Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).



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Fish Habitat

North of the rail corridor, the creek is a 20 m wide valley dominated by meadow and thicket communities. Adjacent land use is comprised of cropped agricultural fields. The creek is diverted under the railway through an open-bottom concrete arch culvert that is 0.8 m high and 1 m wide. The culvert is likely a barrier to upstream fish migration due to the incline of the culvert and shallow water conditions in the culvert. South of the rail corridor, the creek continues in a 40 m wide valley with deciduous forest vegetation.

Using the criteria of the HDF Guidelines, the fish and fish habitat functions of this unnamed tributary of Darlington Creek (WC-13) within the Study Area were classified as Important.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as a stepping-stone amphibian habitat for mobile amphibians as there is an online pond approximately 500 m north of the railway crossing. The feature also connects directly to Darlington Creek approximately 1 km south of the rail crossing, and a forested area approximately 500 m south of the ROW. No amphibians were observed in the CP Rail ROW at WC-13 during surveys completed in 2021. The feature likely also functions as a movement corridor for other mobile non-amphibian species as well.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area was classified as Valued, meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This reach of Darlington Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: Protection using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014). HDF Assessments are summarized in Table 4.2.



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4.4.14 Unnamed Tributary of Darlington Creek WC-14

WC-14 was at the existing railway crossing over a Tributary of Darlington Creek 215 m east of Maple Grove Road. At WC-14, this tributary is mapped as a warmwater watercourse by MNRF (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN02 [outside of the Study Area]) and classifies this reach of Darlington Creek as coldwater habitat based on the most current monitoring data (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014), and the description of this feature below is in accordance with those criteria.

Hydrology

On July 12, 2021, moderate water velocity and normal stream stage conditions were observed following a period without precipitation in the previous 24 hours. The water was clear and without colour. The stream had a wetted width of 1.4 m, an average depth of 0.1 m and a maximum pool depth of 0.3 m. The water temperature was 21.5°C.

On April 20, 2023, the feature was flowing well. The stream had an average wetted width of 2.5 m and a maximum pool depth of 0.35 m. Algae was present within the feature. The water temperature was 10.1°C.

On May 26, 2023, the stream continued to flow with an average depth of 0.5 m (0.1-0.7 m) and had a wetted width ranging from 1 to 2 m. The water temperature was 11.1°C.

July 12, 2023, both the upstream and downstream channels were dry and without flow. A stagnant standing pool of water was present on the south of the culvert (downstream), with a maximum depth of 0.2 m. A secondary pool was present south of the rail corridor, with a wetted width of 2.5 m by 3.5 m and a maximum depth of 0.40 m. The soils of the channel were damp, and the channel had moss growing throughout.

Water temperature and water quality parameters measured at WC-14 are shown in Appendix H and Appendix I-3.

Using the criteria of the HDF Guidelines the hydrology function within the Study Area was classified as Important.



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Riparian Vegetation

North of the rail corridor the vegetation communities within the riparian zone of the tributary were comprised of deciduous swamp (SWD) adjacent to moist graminoid meadow (CUM1-b), and active agriculture (AG). South of the rail corridor, the vegetation communities within the riparian zone of the tributary were also comprised of deciduous swamp (SWD) adjacent to a green ash deciduous swamp (SWD2-2) on the east side followed by active agriculture (AG) on the west side.

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as Important as the riparian corridor is dominated with wetlands.

Fish Community

There are no recent (<10 years) fish records available for this tributary (MNRF 2023a, CLFN 2022, CLOCA 2021a).

During Stantec's field investigations, no fish were observed on July 13, 2021, nor April 20 or July 12, 2023. During fish community surveys on May 26, 2023, one fish species, Creek Chub (*Semotilus atromaculatus*), was captured. Suitable fish habitat was not present on July 12, 2023 to conduct further assessments.

Creek Chub are classified as a cool water species (Coker et al. 2001). This species is ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b).

Fish Habitat

This reach of Darlington Creek provides direct warmwater fish habitat, according to MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coldwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek.

North of the rail corridor, this creek is a 40 m wide valley dominated by meadow and thicket communities. Adjacent land use is comprised of cropped agricultural fields. There is a large (11,750 square metre (m²)) online pond approximately 225 m north of the rail corridor. The creek is diverted under the railway through an open-bottom concrete arch culvert that is 1.7 m high and 2.0 m wide. The culvert is likely a barrier to upstream fish migration due to the incline of the culvert and shallow water conditions in the culvert. South of the rail corridor, the creek continues in an 80 m wide valley with deciduous forest vegetation. Riparian vegetation within 5 m of the stream includes mature deciduous trees and shrubs, grasses and herbaceous vegetation, and mature trees (i.e., willow (*Salix* spp.) species).



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Using the criteria of the HDF Guidelines, the fish and fish habitat functions of this unnamed tributary of Darlington Creek (WC-14) within the Study Area was classified as Valued.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as general amphibian habitat as there are vegetation communities of deciduous swamp wetlands immediately north and south of the rail corridor. The feature also contains a large, pond approximately 250 m north of the ROW as well as connects to Darlington Creek approximately 250 m south of the rail corridor. No amphibians were observed in the CP Rail ROW at WC-14 during surveys completed in 2021.

The feature likely functions as a movement corridor for other mobile, non-amphibian species as there is a continuous forested area south of the railway that may facilitate wildlife movement toward Darlington Creek.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area was classified as Valued, meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This reach of Darlington Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coldwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: Protection using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014). HDF Assessments are summarized in Table 4.2.

Table 4.1: Fish Community Records (2012 -current) and Fish Catches 2023

Common Name	Scientific Name	Thermal Preference ¹	Status	WC# ^c (Year) MNRF Data ^d	WC# (Year) CLOCA Data ^e	WC# 2023- May Stantec ^f	WC# 2023- July Stantec ^g
Bluntnose Minnow	<i>Pimephales notatus</i>	Warm	S5	-	8(2015)		



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Common Name	Scientific Name	Thermal Preference ¹	Status	WC# ^c (Year) MNRF Data ^d	WC# (Year) CLOCA Data ^e	WC# 2023-May Stantec ^f	WC# 2023-July Stantec ^g
Brook Stickleback	<i>Culaea inconstans</i>	Cool	S5	-	1 (2017; 2018; 2019) 6 (2012; 2013; 2015); 8 (2011; 2012; 2013; 2015); 11-14 (2015)	8,11,13	8,11
Brown Bullhead	<i>Ameiurus nebulosus</i>	Warm	S5	4 (2013)	4 (2013) 6 (2011; 2012; 2013; 2015) 8 (2011; 2012; 2013; 2015)	6	
Brown Trout	<i>Salmo trutta</i>	Cold	SNA	4 (2013)	2 (2011) 4 (2013)		
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Cold	SNA	-	2 (2012)		
Common Carp	<i>Cyprinus Carpio</i>	Warm	SNA	-	8 (2012)		
Common Shiner	<i>Luxilus cornutus</i>	Warm	S5	-	1 (2018;2019)		
Creek Chub	<i>Semotilus atromaculatus</i>	Cool	S5	1 (2013)	1 (2017; 2018; 2019) 2 (2014) 3 (2013; 2015; 2016) 4 (2013) 6 (2011; 2012; 2013; 2015) 8 (2011; 2012; 2013; 2015) 11-14 (2015)	4, 6, 8, 11, 14	4, 6, 8



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Common Name	Scientific Name	Thermal Preference ¹	Status	WC# ^c (Year) MNR Data ^d	WC# (Year) CLOCA Data ^e	WC# 2023-May Stantec ^f	WC# 2023-July Stantec ^g
Fathead Minnow	<i>Pimephales notatus</i>	Warm	S5	1 (2013) 3 (2013)	1 (2017; 2018; 2019) 6 (2011; 2012; 2015) 8 (2011; 2012; 2015) 11-14 (2015)	4, 6, 8	6, 8
Goldfish	<i>Carassius auratus</i>	Warm	SNA	1 (2013)		4	
Green Sunfish	<i>Lepomis cyanellus</i>	Warm	S4	3 (2013) 4 (2013)	4 (2013) 3 (2013) 6 (2012) 8 (2013) 11-14 (2015)	4, 8	8
Johnny Darter	<i>Etheostoma nigrum</i>	Cool	S5	1 (2013) 2 (2013) 3 (2012; 2013)	1 (2017; 2018; 2019) 2 (2011; 2012; 2013; 2015; 2016) 4 (2013) 6 (2012; 2015) 8 (2011; 2012; 2015)	4, 6, 13	4, 6
Largemouth Bass	<i>Micropterus Salmoides</i>	Warm	S5	-	6 (2013; 2014) 8 (2015) 11-14 (2015)		
Longnose Dace	<i>Rhinichthys cataractae</i>	Cool	S5	2 (2013) 3 (2012; 2013) 4 (2013)	2 (2011; 2012; 2013; 2014; 2015; 2016) 3 (2013; 2015; 2016) 4 (2013) 6 (2015)	4	4



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Common Name	Scientific Name	Thermal Preference ¹	Status	WC# ^c (Year) MNRF Data ^d	WC# (Year) CLOCA Data ^e	WC# 2023-May Stantec ^f	WC# 2023-July Stantec ^g
Mottled Sculpin	<i>Cottus bairdii</i>	Cool	S5	2 (2013) 4 (2013)	2 (2011; 2012; 2013; 2014; 2015; 2016) 4 (2013) 8 (2011; 2013; 2015)	4	4
Northern Redbelly Dace	<i>Chrosomus eos</i>	Cool	S5			8	8
Pumpkinseed	<i>Lepomis gibbosus</i>	Warm	S5	1 (2013)	1 (2017; 2019) 2 (2011; 2012) 6 (2011; 2012; 2013; 2015) 8 (2011; 2012; 2013)	4	4,6,8
Rainbow Darter	<i>Etheostoma caeruleum</i>	Cool	S4	3 (2012) 4 (2013)	2 (2013; 2015; 2016) 4 (2013)	4	4
Rainbow Trout	<i>Oncorhynchus mykiss</i>	Cold	SNA	2 (2013) 4 (2013)	1 (2019) 2 (2013; 2016) 3 (2011; 2012; 2013; 2014; 2016) 4 (2013) 11-14 (2015)	4, 11 ^h	4, 8
Rock Bass	<i>Ambloplites rupestris</i>	Warm	S5	4 (2013)	4 (2013)		
Round Goby	<i>Neogobius melanostomus</i>	Cool	SNA	-	4 (2013)	4	
Sea Lamprey	<i>Petromyzon marinus</i>	Cool	SNA	-	2 (2014)		



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Common Name	Scientific Name	Thermal Preference ¹	Status	WC# ^c (Year) MNR Data ^d	WC# (Year) CLOCA Data ^e	WC# 2023-May Stantec ^f	WC# 2023-July Stantec ^g
Smallmouth Bass	<i>Micropterus dolomieu</i>	Warm	S5	-	2 (2011;2012)		
Sunfish Family (juvenile)	<i>Lepomis</i> spp.	Warm				11, 13	
Threespine Stickleback	<i>Gasterosteus aculeatus</i>	Cool	S4	-	6 (2011; 2012) 8 (2011; 2012)		
Western Blacknose Dace	<i>Rhinichthys obtusus</i>	Cool	S5	1 (2013) 2 (2013) 3 (2012 & 2013) 4 (2013) 4 (2013) 6 (2015) 8 (2015) 11-14 (2015)	1 (2017; 2018; 2019) 2 (2011; 2012; 2013; 2014; 2015) 3 (2013; 2015; 2016) 4 (2013) 6 (2015) 8 (2015) 11-14 (2015)	4, 6, 8, 11	4, 6, 8, 11
White Sucker	<i>Catostomus commersonii</i>	Cool	S5	1 (2013) 2 (2010; 2013) 3 (2009; 2013) 6 (2009) 11-14 (2007; 2008; 2009)	1 (2017; 2018; 2019) 2 (2012; 2013; 2014) 3 (2016) 6 (2011; 2012; 2013; 2015) 8 (2011; 2012; 2013; 2015) 11-14 (2015)	4, 8	4, 8, 11
Yellow Perch	<i>Perca flavescens</i>	Cool	S5	-	6 (2012; 2013; 2015) 8 (2012; 2013; 2015)		



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Notes:

a – Source: Coker, G.A., C.B. Portt, and C.K. Minns. 2001. Morphological and ecological characteristics of Canadian freshwater fishes. Can. MS Rpt. Fish. Aquat. Sci. 2554:iv+89p.

b – Conservation Status: S4 — Apparently Secure Uncommon but not rare; some cause for long-term concern due to declines or other factors;

S5 — Secure Common, widespread, and abundant in the state or province; SNA — Not Applicable. A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

c – WC-1 Goodman Creek; WC-2 Oshawa Creek; WC-3 Harmony Creek; WC-4 Farewell Creek; WC-6 Robinson Creek; WC-8 Tooley Creek; WC-9 unnamed tributary of Tooley Creek; WC-10 unnamed tributary of Darlington Creek; WC-11 Darlington Creek; WC-12 unnamed tributary of Darlington Creek; WC-13 unnamed tributary of Darlington Creek; WC-14 unnamed tributary of Darlington Creek.

d – MNRF [Ministry of Natural Resources and Forestry]. 2021a. Land Information Ontario Digital mapping of Aquatic resource area line segment, Ontario Ministry of Natural Resources. Available Online: <https://geohub.lio.gov.on.ca/datasets/>

e – CLOCA [Central Lake Ontario Conservation Authority] 2021a. Long term aquatic monitoring data received from CLOCA in August 2021.

f – Stantec fish community survey completed between May 17 and May 26, 2023 at WC 4,6,8,9,10,11,12,13,14.

g – Stantec fish community survey completed between July 10 and July 14, 2023 at WC 4,6,8,11 (WC 9,10,12,13, &14 were dry).

h – One (1) mature Rainbow Trout was observed on April 13, 2023 by Stantec hydrology staff downstream of the culvert under Baseline Road W.

Table 4.2: Summary of Classifications and Management Recommendations

Water Crossing	Step 1 Hydrology (<i>Modifiers</i>)	Step 2 Riparian	Step 3 Fish Habitat	Step 4 Terrestrial Habitat	Recommended Management
Unnamed tributary of Darlington Creek (WC-5a and 5b)	Valued or Contributing (<i>agriculture nutrient inputs/ culverts</i>)	Important	Contributing	Contributing	Protection
Unnamed tributary of Tooley Creek (WC-7)	Valued or Contributing (<i>agriculture nutrient inputs/ culverts</i>)	Important	Contributing	Valued	Protection
Unnamed tributary of Tooley Creek (WC-9)	Important (<i>agriculture nutrient inputs/ culverts</i>)	Important	Contributing	Valued	Protection
Unnamed tributary of Darlington Creek (WC-10)	Important (<i>agriculture nutrient inputs/ culverts</i>)	Important	Important	Important	Protection
Unnamed tributary of Darlington Creek (WC-12)	Important (<i>agriculture nutrient inputs/ culverts</i>)	Important	Contributing	Valued	Protection



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Water Crossing	Step 1 Hydrology (<i>Modifiers</i>)	Step 2 Riparian	Step 3 Fish Habitat	Step 4 Terrestrial Habitat	Recommended Management
Unnamed tributary of Darlington Creek (WC-13)	Important (<i>agriculture nutrient inputs/ culverts</i>)	Important	Important	Valued	Protection
Unnamed tributary of Darlington Creek (WC-14)	Important (<i>agriculture nutrient inputs / In-line Pond within feature upstream/ culverts</i>)	Important	Valued	Valued	Protection

4.5 Terrestrial Resources

The terrestrial resources include the results of investigation for flora (vegetation communities and botanical observations), fauna (wildlife and wildlife habitat) and SAR and SOCC for both fauna and flora.

Based on a review of wildlife atlases, there are records of 147 bird species, 19 herpetofauna species, 36 mammal species, 80 insect species and 27 fish species in the Study Area (refer to Appendix D for comprehensive species lists). The majority of the wildlife are common in the province and tolerant to anthropogenic disturbances, while a small proportion is comprised of sensitive or rare species (refer to Sections 4.4 for discussions on SAR and SOCC). Fish and fish habitat are protected under the *Fisheries Act*, many bird species are protected under the MBCA and SAR are protected under the ESA.

4.5.1 Ecological Land Classification

The results of the aerial photographic analysis and ELC surveys completed, are described in Table 4.2 and presented on Figure 4 in Appendix A.

The Study Area is located partially within an urban environment comprised of residential, commercial and recreational properties in Oshawa and Bowmanville and partially within a rural environment comprised of agricultural fields, rural residences and light industry. The Project Footprint encompasses approximately 126 ha (312 ac). The Project Footprint and adjacent lands (Study Area) encompass 772 ha (1,908 ac). Developed portions associated with these lands were assigned the “DEV” code to depict building or road developments, asphalted lands or otherwise non-vegetated areas. Greater than 50% of the Project Footprint (~54%) and adjacent lands (~57%)



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were determined to be developed. Developed lands included residential developments, mixed-use developments, as well as commercial and industrial areas.

Where vegetation was found on properties with existing developments, vegetation was often limited to hedgerows between properties or along fence lines, manicured lawns, landscaped gardens / features and planted (streetscaping, boulevard or otherwise) trees. Undeveloped lands were classified into vegetation types in accordance with ELC standard procedures and protocols, as described below in Table 4.3.

Natural vegetation features throughout the Project Footprint and Study Area show signs of disturbance with an abundance of invasive species including Common Reed (*Phragmites* sp.) and European Swallowwort, also known as Dog-strangling Vine, (*Vincetoxicum rossicum*). Forest and swamp communities are concentrated along the 14 creeks and tributaries in the Study Area. Meadow, thicket and woodland cultural communities are abundant throughout the Study Area in both urban and rural environments. The vegetation communities identified in the Study Area are common in Ontario based on the rankings assigned by the NHIC (MNRF 2023b).

Table 4.3: Ecological Land Classification Vegetation Communities Identified within the Project Footprint and Study Area

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Study Area
Forest (FO) Communities	FOD	Deciduous Forest	The FOD forest communities are comprised of a canopy of deciduous tree cover >60%. Tree species composition is variable between the individual FOD communities and may include native and/or non-native tree species. The FOD ELC code is a high-level classification used to assign a generic vegetation community description for forest communities located further from the Project Footprint where property access was not granted.
Forest (FO) Communities	FOD7	Fresh - Moist Lowland Deciduous Forest Ecosite	The FOD7 forest communities are located in tableland areas and along watercourses in the Study Area. Trees present in these communities are comprised of species that are tolerant of wetter soil conditions including Manitoba Maple (<i>Acer negundo</i>), Trembling Aspen (<i>Populus tremuloides</i>), White Birch (<i>Betula papyrifera</i>), Black Walnut (<i>Juglans nigra</i>) and American Basswood (<i>Tilia americana</i>).



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ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Study Area
Forest (FO) Communities	FOD9-1	Fresh - Moist Oak - Sugar Maple Deciduous Forest Type	The FOD9-1 forest community is located on the south side of Highway 401 between Townline Road South and Prestonvale Road. There is only a portion of this community located in the Study Area, and it will not be impacted since it is on the opposite side of Highway 401 from the Project Footprint.
Cultural (CU) Communities	CUM1	Mineral Cultural Meadow	The CUM1 meadow communities occur throughout the Study Area. Communities varied in size from larger areas of meadow to linear areas of meadow adjacent to the railroad tracks. The CUM1 ELC code is a high-level classification that was used to assign a generic vegetation community description for meadow communities where a definitive composition (graminoid, forb or mixed meadow) was not determined. Common species in the meadow communities in the Study Area included Kentucky Bluegrass (<i>Poa pratensis</i>), Smooth Brome (<i>Bromus inermis</i>), asters and goldenrods, Smooth Bedstraw (<i>Galium mollugo</i>) and Wild Carrot (<i>Daucus carota</i>).
Cultural (CU) Communities	CUM1/CUT1	Mineral Cultural Meadow/Mineral Cultural Thicket	The CUM1/CUT1 ELC description was used to describe communities that were a complex of meadow and thicket (see descriptions for CU1 and CUT1). These communities included a linear area along the Highway 401 corridor and two smaller communities further from the Project Footprint.



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ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Study Area
Cultural (CU) Communities	CUM1-1	Dry - Fresh Old Field Meadow	The CUM1-1 meadow communities are comprised of former agricultural lands that have recently been left to naturally regenerate. Species composition in these types of fields are generally comprised of non-native species that easily invade fallow fields including Lamb's Quarters (<i>Chenopodium album</i>), Canada Horseweed (<i>Erigeron canadensis</i>) and Canada Thistle (<i>Cirsium arvense</i>), although native species such as goldenrods and asters can also be present.
Cultural (CU) Communities	CUM1-a	Dry - Fresh Graminoid Meadow Ecosite	There are three CUM1-a meadow communities identified in the Study Area. One very small community and two larger communities. These communities were dominated by grasses including Kentucky Bluegrass and Smooth Brome, with a lower occurrence of forb species including goldenrods, asters and Wild Carrot.
Cultural (CU) Communities	CUM1-b	Fresh - Moist Graminoid Meadow Ecosite	There was one CUM1-b meadow community identified in the Study Area along the Tributary to Darlington Creek 14 (east of Maple Grove Road). This community was comprised of grass species more tolerant of a wetter soil moisture regime including Reed Canarygrass (<i>Phalaris arundinacea</i>); however, there were sufficient upland terrestrial species identified (goldenrod and asters), that the community did not qualify as wetland.
Cultural (CU) Communities	CUM1-c	Dry - Fresh Mixed Meadow	There are several CUM1-c meadow communities identified in the Study Area. These communities are equally dominated by grasses and forb species. Common grass species included Kentucky Bluegrass and Smooth Brome, and common forb species included goldenrods, asters and Wild Carrot.



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ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Study Area
Cultural (CU) Communities	CUP3	Coniferous Plantation	The CUP3 plantation communities are comprised of planted coniferous tree species, larger in size than a planted hedgerow. Plantations in the Study Area were comprised of Austrian Pine (<i>Pinus nigra</i>), Norway Spruce (<i>Picea abies</i>) and Scot's Pine (<i>Pinus sylvestris</i>).
Cultural (CU) Communities	CUS1	Mineral Cultural Savanna	There are four CUS1 savanna communities in the Study Area. These communities are comprised of cultural meadow species on the ground layer with a tree cover between 25% to ≤35%. Tree species in the savanna communities in the Study Area are comprised mostly of successional species including Manitoba Maple, Green Ash (<i>Fraxinus pennsylvanica</i>), Trembling Aspen and Black Walnut.
Cultural (CU) Communities	CUT1	Mineral Cultural Thicket	The CUT1 thicket communities occur throughout the Study Area. Communities varied in size from larger areas of thicket to linear areas of thicket adjacent to the railroad tracks. The CUT1 ELC code is a high-level classification that was used to assign a generic vegetation community description for thicket communities where a definitive composition (deciduous, coniferous or mixed thicket) was not determined. Common shrub species in the thicket communities in the Study Area included Common Buckthorn (<i>Rhamnus cathartica</i>) and Staghorn Sumac (<i>Rhus typhina</i>).
Cultural (CU) Communities	CUT1-a	Dry - Fresh Deciduous Shrub Thicket Ecosite	There are two CUT1-a thicket communities in the Study Area. These deciduous communities are comprised of Common Buckthorn, Staghorn Sumac and successional tree species including Green Ash and Manitoba Maple.



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Cultural (CU) Communities	CUT1--b	Dry - Fresh Deciduous Regeneration Thicket	There are two CUT1-b thicket communities at the west end of the Study Area. These deciduous communities are comprised of young successional tree species including Green Ash, Manitoba Maple and Trembling Aspen. Common Buckthorn is also abundant.
Cultural (CU) Communities	CUT1-c	Fresh - Moist White Cedar Coniferous Thicket Type	There is one CUT1-c thicket community at the west end of the Study Area, directly adjacent to the CP Rail tracks. This community was comprised of young Eastern White Cedar (<i>Thuja occidentalis</i>) trees.
Cultural (CU) Communities	CUW1	Mineral Cultural Woodland	The CUW1 woodland communities are comprised of a canopy of tree cover of 35% to ≤60%. These communities occur throughout the Study Area and varied in size from larger areas of woodland to linear areas of woodland adjacent to the railroad tracks. The CUW1 ELC code is a high-level classification that was used to assign a generic vegetation community description for woodland communities where a definitive species composition was not determined. Common tree species in the woodland communities in the Study Area included Manitoba Maple, Trembling Aspen and Black Walnut.
Cultural (CU) Communities	CUW1-a	Dry - Fresh Deciduous Woodland Ecosite	There are two linear CUW1-a woodland communities in the Study Area. The smaller community adjacent to the north yard is dominated by Trembling Aspen. The larger community along Highway 401 is comprised of hawthorn (<i>Crataegus</i> species), Trembling Aspen and Austrian Pine.



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Cultural (CU) Communities	CUW1-b	Fresh - Moist Deciduous Woodland Ecosite	The CUW1-b woodland community was a unique combination of mature silver maple and successional species in Durham Court Park. Successional species were comprised of Trembling Aspen, Manitoba Maple. Willow (<i>Salix</i> species) shrubs, Red-osier Dogwood (<i>Cornus sericea</i>) and Common Buckthorn were present in the understory, and Dog-strangling Vine and goldenrod dominated the ground layer.
Cultural (CU) Communities	CUW1-c	Fresh - Moist Manitoba Maple Deciduous Woodland Type	There are two CUW1-c woodland communities in the Study Area. These deciduous communities are dominated by Manitoba Maple.
Cultural (CU) Communities	CUW1-d	Dry - Fresh Mixed Cultural Woodland	The CUW1-d woodland community was a unique combination of Scot's Pine and Green Ash west of Highway 418.
Swamp (SW) Communities	SWD	Deciduous Swamp	The SWD swamp communities are wetlands comprised of a canopy of tree cover >25%. The SWD swamp communities are located along watercourses in the Study Area. The SWD ELC code is a high-level classification that was used to assign a generic vegetation community description for SWD communities where a definitive species composition was not determined. Common tree species in the swamp communities in the Study Area include Crack Willow (<i>Salix euxina</i>), Manitoba Maple, Trembling Aspen, Green Ash and Black Walnut.
Swamp (SW) Communities	SWD2-2	Green Ash Mineral Deciduous Swamp Type	There is one SWD2-2 swamp community identified in the Study Area east of the Tributary to Darlington Creek 14 (east of Maple Grove Road). Green ash is the dominant tree species in this community. Trembling Aspen and American Elm (<i>Ulmus americana</i>) were also present in lower abundance.



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ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Study Area
Swamp (SW) Communities	SWD4	Mineral Deciduous Swamp Ecosite	The SWD4 swamp community is located along Farewell Creek north and south of the CP Rail tracks. The canopy is dominated by White Willow (<i>Salix alba</i>) and Manitoba Maple. Green ash, Eastern White Cedar and Common Buckthorn are also present in lower abundance. Ostrich Fern (<i>Onoclea struthiopteris</i>) is abundant in the ground layer.
Swamp (SW) Communities	SWD4-1	Willow Mineral Deciduous Swamp Type	The SWD4-1 swamp communities are located south of the CP Rail tracks at the Tributary to Darlington Creek 11 and north and south of the CP Rail tracks at the Tributary to Darlington Creek 12. The canopy is dominated by Crack Willow (<i>Salix euxina</i>) and the subcanopy is comprised of Manitoba Maple.
Swamp (SW) Communities	SWT	Thicket Swamp	The SWT thicket swamp communities are wetlands comprised of shrub cover >25%. There is one small SWT swamp community in the Study Area located between Rundle Road and Holt Road. The SWT ELC code is a high-level classification that was used to assign a generic vegetation community description for SWT communities where a definitive species composition was not determined. Common shrub species in the SWT communities in the Study Area include Gray Dogwood (<i>Cornus racemosa</i>), Red-osier Dogwood, young Green Ash and willow shrubs.
Swamp (SW) Communities	SWT2	Willow Mineral Deciduous Thicket Swamp Ecosite	The SWT2 thicket swamp communities are located west of Harmony Creek and north of the CP Rail tracks and east of Robinson Creek and north the CP Rail tracks. The community adjacent to Harmony Creek is dominated by Sandbar Willow (<i>Salix interior</i>), the willow thicket swamp community east of Robinson Creek was not identified to species.



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Swamp (SW) Communities	SWT2-5	Red-osier Dogwood Mineral Deciduous Thicket Swamp Type	The SWT2-5 thicket swamp community is located west of Rundle Road and south of the CP Rail tracks. The community is dominated by Red-osier Dogwood. Manitoba Maple and Green Ash are also present in lower abundance.
Marsh (MA) Communities	MAM	Meadow Marsh	There are five MAM meadow marsh communities located in the Study Area. Three small MAM communities are located along the Tributary to Darlington Creek 11, one MAM community is located along a swale that extends from the SWM Pond at the Courtice Go Station and a larger MAM community is located along the restored delineated of Goodman Creek. The MAM ELC code is a high-level classification that was used to assign a generic vegetation community description for meadow marsh communities where a definitive composition (graminoid, forb or mixed meadow marsh) was not determined. Common species in the meadow marsh communities in the Study Area include Reed Canarygrass and Common Reed.
Marsh (MA) Communities	MAM2-2	Reed-canary Grass Graminoid Mineral Meadow Marsh Type	There are four MAM2-2 meadow marsh communities in the Study Area. There is one MAM2-2 community located south of the CP Rail tracks at Tooley Creek, one MAM2-2 community east of Robinson Creek and north of the CP Rail tracks, one MAM2-2 community east of McKnight Road and north of the CP Rail tracks and north of the CP Rail tracks between Rundle Road and Holt Road. Reed Canarygrass dominates these communities.
Marsh (MA) Communities	MAM2-a	Common Reed Mineral Meadow Marsh Type	There is one MAM2-a meadow marsh community in the Study Area. It is located on the north side of Baseline Road east of McKnight Road. The community is dominated by Common Reed. Reed Canarygrass is also present in this community in lower abundance.



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ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Study Area
Marsh (MA) Communities	MAS2-1	Cattail Mineral Shallow Marsh Type	There is one MAS2-1 shallow marsh community in the Study Area. It is located north of the CP Rail tracks on the west side of Trulls Road. The MAS2-1 community was dominated by Narrow-leaved Cattail (<i>Typha angustifolia</i>).
Shallow Water (SA) Communities	SA	Shallow Water	There is one SA shallow water community in the Study Area. It is located in the golf course west of Farewell Creek and south of the railroad tracks. Although stormwater management ponds also contain shallow water, they have been classified with the unofficial ELC code "SWM" since these features are considered infrastructure and do not qualify as SWH features.
Unofficial ELC Community Codes	AG	Agriculture	The AG community code describes agricultural fields comprised of corn, soybeans and alfalfa.
Unofficial ELC Community Codes	AG-Hay	Agriculture - Hay	The AG-Hay community code describes agricultural fields comprised of hay.
Unofficial ELC Community Codes	DEV	Development	The DEV community code includes developed lands (e.g., residential, commercial and industrial land uses).
Unofficial ELC Community Codes	HE1	Treed Deciduous Hedgerow	The HE1 community code is assigned to deciduous treed hedgerows. These communities are comprised mainly of naturalized treed areas that are too narrow to qualify as a forest or woodland ELC community. Naturalized HE1 communities are comprised of similar species identified in the FOD and CUW1 communities.
Unofficial ELC Community Codes	HE2	Treed Coniferous Hedgerow	The HE2 community code is assigned coniferous treed hedgerows. Unlike the HE1 communities, the coniferous hedgerows in the Study Area are planted. Species in these hedgerows are comprised of Norway Spruce and Austrian Pine.



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Unofficial ELC Community Codes	HE3	Fencerow	The HE3 community code is assigned to fencerows. Fencerow communities are sparsely vegetated linear features comprised of trees or shrubs, usually along fencelines that delineate property boundaries. Common species in these communities include successional species including Common Buckthorn, Gray Dogwood, Green Ash and Manitoba Maple.
Unofficial ELC Community Codes	LAWN	Lawn	The LAWN community code is assigned to manicured lawn with planted trees associated with developed lands.
Unofficial ELC Community Codes	SWM	Stormwater Management Pond	The SWM community code is assigned to stormwater management pond infrastructure in the Study Area. There are seven SWM ponds throughout the Study Area.

4.5.2 Flora

The followings subsections outline the results of the botanical surveys and follow up assessments carried out in spring and summer of 2021, as detailed in Section 2.3.3. A vascular plant list, including relevant federal, provincial and local species rankings and statuses is provided in Appendix C.

4.5.2.1 Vascular Plant Species

A list of vascular plant species documented during botanical field investigations is located in Appendix C. One hundred thirty-eight (138) distinctive vascular plants were recorded in the Project Footprint / Study Area, of which 62 species (45%) were native. All but two of the native plants documented had a provincial rank of S4 or S5, indicating they are common in Ontario. No highly sensitive plant species (CC = 9-10) were documented during the botanical inventory.

Butternut (*Juglans cinerea*), a provincially and federally endangered species (provincially ranked S2?), was identified in the Study Area. An assessment of seven butternut trees identified in the Study Area is provided in Section 4.5.2.2.

Common Reed and Dog-strangling Vine, two highly invasive plant species, were abundant in the Project Footprint and Study Area.



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Black Ash (*Fraxinus nigra*) was added to the SARO list on January 26, 2022. Although it is listed as Endangered, MECP has suspended protections for the species for two (2) years from the date it was added to the list. Black Ash was not found in the Study Area during field surveys. Nevertheless, if it is identified that any phase of the Project works may negatively impact this species, compensation planting and mitigation plans will be developed, which will include protection of trees to the extent possible. Compensation and mitigation plans will be developed in consultation with Indigenous communities.

4.5.2.2 Butternut Surveys / Butternut Health Assessments

Butternut is a provincially and federally endangered species requiring assessment from a qualified BHA assessor to determine category, cultivation and/or hybridity of a tree and subsequent protection measures. A total of seven trees were identified in the Study Area during the field investigations. These trees were assessed for hybridity and Butternut Canker.

Of the seven trees, B-002 is located within the Project Footprint and has been visually identified as pure with a Category of 3 (retainable). Genetic testing is underway to confirm purity. This individual is located adjacent to the Harmony Creek Golf Centre in Oshawa, Ontario. Authorization through a Registration of Notice of Activity under the ESA will need to be pursued if this individual will be killed, harmed, or taken. Harm is typically delineated within a 50 m radius from the base of the tree.

Genetic testing was performed to determine if the trees B-001 and B-003, located within the Project Footprint, are pure specimens or hybrids. It was confirmed that B-001 is a hybrid species of butternut (*Juglans cinerea*) and Japanese Walnut (*Juglans ailantifolia*), while B-003 is a Japanese Walnut (*Juglans ailantifolia*). The remaining trees (B-004, B-005, B-006, and B-007) located within the Study Area, but outside of the Project Footprint, were visually identified as hybrids. Hybrid trees do not receive protection under the ESA. This species is discussed further in Section 4.5.4.

4.5.3 Fauna

The following is a summary of observations and wildlife occurrence data for the Study Area, as detailed in Section 2.2.2 and Section 2.3.3. The results of the surveys and records reviews, including associated federal, provincial and local species rankings and statuses and reference details are provided in Appendix C.



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4.5.3.1 Avifauna

A total of 147 avifauna species were recorded within or near the Study Area based on the results of the wildlife records review and Stantec 2021 field program, as detailed in Section 2.2.2 and Section 2.3.3. Of these species, 141 (96%) were native and 6 (4%) were non-native species. Twelve SAR and seven SOCC species were recorded for the area. These species were included in the SAR and SOCC Habitat Screening Assessments, see Section 2.4 and Section 4.5.4 for details.

Breeding Bird Survey Results

Fifty-one avian species were recorded during Stantec's 2021 and 2022 breeding bird surveys (Appendix C). All species, with the exception of Ring-billed Gull (*Larus delawarensis*), Great Blue Heron (*Ardea Herodias*), Osprey (*Pandion haliaetus*) and Red-tailed Hawk (*Buteo jamaicensis*), are presumed to be breeding in the Study Area. These four species were excluded due to the absence of suitable breeding habitat (i.e., stick nests, colonial breeding sites).

Eastern Meadowlark (*Sturnella magna*), a provincially and federally threatened species, was observed singing at BBS7 during the May 27 breeding bird survey in a fallow field south of Bloor Street East and west of the CP Rail tracks (see Figure 4 in Appendix A for details). This species was not observed in this location during the second or third round of surveys.

Bobolink (*Dolichonyx oryzivorus*), a provincially and federally threatened species, was observed singing at BBS3c and BBS4 during the third round of 2021 breeding bird surveys, and at BBS30 during the 2022 breeding bird survey. Two males were observed singing at BBS3c immediately west of the Project Footprint in a mainly graminoid section of a hay field that was half-plowed at the time of the site visit. One singing male was observed at BBS4 in a hedgerow along the boundary of the Project Footprint.

Barn Swallow (*Hirundo rustica*), a federally threatened species and a provincial special concern species, was observed foraging during the first round of breeding bird surveys at BBS1a and BBS1c, during the second round of breeding bird surveys at BBS10, BBS18, BBS20, BBS23 and BBS24, during the third round of breeding bird surveys at BBS4, BBS3c, BBS9, BBS18, BBS 20 and BBS26, and during the 2022 breeding bird survey at BBS 31. Further, there were suitable barns and buildings adjacent to the Project Footprint that likely provide Barn Swallow nesting habitat.

All bridges, overpasses and culverts were inspected for nesting structures throughout the field program. Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road.



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Barn Swallow was reclassified on January 25, 2023 on the SARO List (Ontario Regulation 230/08) as a special concern species. The change in classification means that the prohibitions in subsections 9 (1) and 10 (1) of the ESA that apply in respect of endangered and threatened species and their habitats no longer apply to Barn Swallow. Barn Swallow observations continue to be relevant as they are related to SOCC under the criteria for SWH.

Eastern Wood-Pewee (*Contopus virens*) was observed calling in a tree at the edge of the CUM1-a meadow situated on the west side of the Study Area during the third round of breeding bird surveys. This is outside of suitable woodland/forest habitat preferred by Eastern Wood-Pewee and the CUM1-a meadow is not considered suitable habitat for this species.

Wild Turkey (*Cathartes aura*), Tree Swallow (*Tachycineta bicolor*) and Belted Kingfisher (*Megasceryle alcyon*) were observed in the Study Area as incidental observations outside of the breeding bird survey; however, these species were observed during surveys conducted during the breeding bird window and are presumed to be breeding in the Study Area.

4.5.3.2 Herpetofauna

A total of 19 herpetofauna species were recorded within or near the Study Area based on the results of the wildlife records review and Stantec 2021 field program, as detailed in Section 2.2.2 and Section 2.3.3. Of these species, 18 (95%) were native and 1 (5%) was a non-native species. One (1) SAR and four (4) SOCC species were recorded for the area. These species were included in the SAR and SOCC Habitat Screening Assessments, see Section 2.4 and Section 4.5.4 for details.

Amphibian Call Survey Results

Four species of amphibians were observed (visual or auditory) during the amphibian surveys: American Toad (AMTO; *Anaxyrus americanus*), Green Frog (GRFR; *Lithobates clamitans*), Gray Treefrog (GRTR; *Dryophytes versicolor*) and Spring Peeper (SPPE; *Pseudacris crucifer*). These species observations were confined to amphibian call stations AMP06, AMP07, AMP16, AMP18, and AMP19 (See Figure 4 in Appendix A for details).

Call codes ranged from 1 to 2 for all stations. Three visual observations of Green Frog were recorded at station AMP07 on the pedestrian path adjacent to the channelized watercourse and associated meadow marsh wetland.



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4.5.3.3 Mammals

A total of 36 mammalian species were recorded within or near the Study Area based on the results of the wildlife records review and Stantec 2021 field program, as detailed in Section 2.2.2 and Section 2.3.3. Of these species, 33 (92%) were native and 3 (8%) were non-native species. One SAR species was confirmed through recordings, and one is assumed to be present based on a lack of confirmatory markers in the calls. These species were included in the SAR Habitat Screening Assessments, see Section 2.4 and Section 4.5.4 for details. No SOCC species were observed or recorded within or near the Study Area.

Bat Acoustic Monitoring Survey Results

In 2021, five confirmed bat species were recorded during the acoustic monitoring surveys including one provincially and federally endangered species; Little Brown Myotis (*Myotis lucifugus*). The remaining four species recorded and confirmed to species level were Big Brown Bat (*Eptesicus fuscus*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*) and Eastern Red Bat (*Lasiurus borealis*).

Eastern Red Bat and Tri-colored Bat (*Perimyotis subflavus*) have similar calls and can be difficult to distinguish, as such, some calls were placed into a category called “Tri-colored Bat/Eastern Red Bat”. Tri-colored Bat is a provincially and federally endangered species. Where a positive identification could not be made, it was assumed the species was a SAR Bat.

The total number of calls over the 10-day data subsets ranged from 94 (BMS5) to 2913 (BMS2). Four species (Big Brown, Hoary, Silver-haired and Eastern Red Bats) were observed at every detector location. Big Brown Bat and Hoary Bat were the most commonly recorded species, respectively.

Only one SAR was confirmed – Little Brown Myotis. This species was identified at 12 of the 25 ARUs (BMS2, BMS6, BMS11, BMS12, BMS14, BMS16, BMS17, BMS18, BMS19, BMS22, BMS23, and BMS24) with a total of 43 calls. The number of calls per ARU ranged from 1 to 33. In addition, one call at BMS19 was identified as Myotis sp. This call was very short, and as such the species could not be confirmed. A total of 37 calls from 8 different ARUs were identified as Eastern Red Bat/Tri-colored Bat. Due to the similarity of the calls of these two species, they could not be differentiated in these instances. Therefore, there is potential for a second SAR, Tri-colored Bat to occur on the site, but it could not be confirmed.

The number of Little Brown Myotis detected suggest that the Study Area may provide both foraging and roosting habitat for SAR bats.



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In 2023, five confirmed bat species were recorded during the acoustic monitoring surveys and included Big Brown Bat, Eastern Red Bat, Hoary Bat, and Silver-haired Bat. As discussed above, Eastern Red Bat and Tri-colored Bat have similar calls and can be difficult to distinguish, as such, some calls were placed into a category called “Tri-colored Bat/Eastern Red Bat”. Tri-colored Bat is a provincially and federally endangered species. Where a positive identification could not be made, it was assumed the species was a SAR bat.

The total number of calls over the 15-day data subsets ranged from 70 (BMS27) to 567 (BMS28). Four species (Big Brown, Hoary, Silver-haired and Eastern Red Bats) were observed at each detector location. Big Brown Bat and Silver-haired Bat were the most commonly recorded species, respectively.

A total of two calls from BMS26 were identified as Eastern Red Bat/Tri-colored Bat. Due to the similarity of the calls of these two species, they could not be differentiated in these instances. Therefore, there is potential for a SAR, Tri-colored Bat to occur on the site, but it could not be confirmed.

Bat Exit Survey Results

In 2023, one confirmed bat species was recorded during the bat exit surveys. The recording was identified as a Big Brown Bat. This species was present at 399 Simcoe Street South (BES2) and 359 Ritson Road South (BES4). No other species were recorded. As such, target exit surveys completed in 2021 and 2023 did not detect SAR bats and therefore, suggests that anthropogenic roosting habitat for SAR bats is absent from the Study Area.

4.5.3.4 Insects

A total of 80 insect species were recorded within or near the Study Area based on the results of the wildlife records review and Stantec 2021 field program, as detailed in Section 2.2.2 and Section 2.3.3. Of these species, 78 (98%) were native and two (2%) were non-native species. Three SAR species and three SOCC species were recorded for the area. These species were included in the SAR and SOCC Habitat Screening Assessments, see Section 2.4 and Section 4.5.4 for details.



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4.5.3.5 Incidental Wildlife Observations

Wildlife recorded as incidental observations during field site visits included Belted Kingfisher, Tree Swallow, Wild Turkey, Chimney Swift (*Chaetura pelagica*), Eastern Chipmunk (*Tamias striatus*), Eastern Cottontail (*Sylvilagus floridanus*), Eastern Grey Squirrel (*Sciurus carolinensis*), Coyote (*Canis latrans*), White-tailed Deer (*Odocoileus virginianus*) and Snapping Turtle (*Chelydra serpentina*). These species are included in the comprehensive wildlife species lists in Appendix D.

Two of the incidental species observed are designated as provincial and federal SAR and ranked as Threatened (Chimney Swift) and Special Concern (Snapping Turtle). The Chimney Swift was observed during the Bat Exit Surveys in 2023 adjacent to BES2 (Simcoe Street South), Figure 4.3, Appendix A. Individuals were visually observed as flyovers and foraging throughout the Study Area. No chimneys were confirmed as roosting/breeding habitat within the Study Area. The Snapping Turtle was observed on July 11, 2023 during aquatic surveys at Farewell Creek, approximately 50 m north of the CP Rail corridor (Figure 4.5, Appendix A).

The remainder of incidental species observed are ranked common and secure in Ontario, with no provincial status or conservation rank.

4.5.4 Species at Risk and Species of Conservation Concern Habitat Screening Assessments

Habitat screenings for SAR and SOCC were completed for the Project Footprint and greater Study Area using the methodology detailed in Section 2.4. The full results of the assessment are provided in Appendix E. The following sub-sections provide a brief discussion on the probability of SAR occurring within the Study Area.

The following SAR have been confirmed within the Project Footprint and Study Area:

- **SAR Bats, including Little Brown Myotis and Tri-colored Bat**
SAR Bats were observed within the Study Area based on the results of the bat acoustic monitoring program as described in Section 2.3.3.5.



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- **Bobolink**

Bobolink is listed provincially and federally as Threatened and receives protection under the ESA, as well as the MBCA. Bobolink nest primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures. Preferred ground cover species include grasses such as Timothy and Kentucky bluegrass and forbs such as clover and dandelion. Bobolink is an area-sensitive species, with reported lower reproductive success in small habitat fragments (COSEWIC 2010). Bobolink was observed singing at BBS3c and BBS4 during the third round of 2021 breeding bird surveys, and at BBS 30 during the 2022 breeding bird survey. There were two males observed singing at BBS3c immediately west of the Project Footprint in a mainly graminoid section of a hay field that was half-plowed. There was one singing male observed at BBS4 in a hedgerow along the boundary of the Project Footprint.

- **Eastern Meadowlark**

Eastern Meadowlark is listed provincially and federally as Threatened and receives protection under the ESA, as well as the MBCA. Meadowlarks are ground nesting birds (Harrison, 1975), which are often associated with human-modified habitats where they sing from prominent perches such as roadside wires, trees, and fenceposts. As a grassland species the Eastern Meadowlark typically occurs in meadows, hayfields and pastures. However, it will utilize a wider range of habitat than most grassland species, including mown lawn (e.g. golf course, parks), wooded city ravines, young conifer plantations and orchards (Peck and James 1983). This species is generally tolerant of habitat with early succession of trees or shrubs. Eastern Meadowlark was observed singing during the May 27 breeding bird survey in a fallow field south of Bloor Street East and west of the CP Rail tracks; however, it was not observed in this location during the second and third round of surveys.

- **Chimney Swift**

Chimney Swift is listed provincially and federally as Threatened and receives protection under the ESA, as well as the MBCA. Chimney Swift use chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs (Cadman et al. 2007). The main limiting factor contributing to the species' decline is the reduction of suitable breeding and roosting habitat through logging, removal of abandoned buildings and particularly the reduction in use of traditional chimneys; poor weather conditions during breeding season, pesticide use, chimney sweeping during breeding season and intolerance of some building owners are also contributing factors (COSEWIC 2007). Chimney Swift was observed foraging and flying over the Project Footprint during the June 19, 2023, bat exit surveys at 399 Simcoe Street South. However, individuals were not observed entering/exiting chimneys and breeding/roosting habitat cannot be confirmed at this location.



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- **Snapping Turtle**

Snapping Turtle is listed provincially and federally as Special Concern and do not receive protection under the ESA. Snapping Turtles inhabit ponds, sloughs, streams, rivers, and shallow bays that are characterized by slow moving water, aquatic vegetation, and soft bottoms. Females show strong nest site fidelity and nest in sand or gravel banks at waterway edges in late May or early June (COSEWIC 2008). One Snapping Turtle was observed in Farewell Creek on July 11, 2023, during aquatic surveys along the rocky shoreline.

- **Butternut**

Butternut is listed provincially and federally as Endangered and receives protection under the ESA. Butternut was identified in the Study Area during field investigations south of the railroad tracks and west of Bloor Street East. One tree out of the 7 butternut trees observed was visually identified as a pure butternut. This tree was categorized as a Category 3, retainable tree. Genetic testing is underway to confirm purity.

The following species have a medium to high probability of occurring within the Study Area:

- **Blanding's Turtle**

Blanding's Turtle is listed provincially and federally as Threatened and receives protection under the ESA. Blanding's Turtle frequents lakes, ponds, and marshes, and prefers shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch 2002). They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults usually occupy open or partially vegetated sites, whereas juveniles occupy areas with thick aquatic vegetation including sphagnum, water lilies and algae. Nesting occurs in dry conifer or mixed hardwood forests, up to 410 m from any body of water, in loose substrates including sand, organic soil, gravel and cobblestone, nesting may also occur along gravel roadways (COSEWIC 2016). Oshawa Creek, Harmony Creek, the seven stormwater management ponds and two small shallow aquatic features in the Study Area have the potential to support Blanding's Turtle. This may include overwintering in these features.

4.6 Significant Wildlife Habitat

The following sub-sections identify candidate and confirmed SWH within the Study Area. SWH, including habitats for SOCC receive protection under the PPS and should thus be considered when corridors and rights-of-way for significant transportation are being planned according to Section 1.6.8.6 of the PPS. SOCC may also be afforded protection under the MBCA or Ontario *Fish and Wildlife Conservation Act* (1997).



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A SWH screening for the Study Area is provided in Appendix F. A habitat screening for SOCC was completed for the Study Area and is provided in Appendix E.2. Applicable ELC vegetation communities for each candidate or confirmed SWH feature are mapped in Figures 4.1 to 4.10, Appendix A.

Confirmed SWH includes the following features:

- **Habitat for Bat Maternity Colonies**

Forest and swamp communities along the existing rail corridor have been confirmed to support maternity roosting habitat for bats. Bats were recorded at all 25 bat monitoring stations that targeted forest and swamp communities across the Study Area/Project Footprint.

- **Special Concern and Rare Wildlife Species**

Barn Swallow (*Hirundo rustica*)

Barn Swallow is listed provincially as Special Concern and federally as Threatened and receives protection under the MBCA. Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Barn Swallow was observed foraging and nesting within the Study Area.

Monarch (*Danaus plexippus*)

Monarch, a provincially and federally designated Special Concern species, was observed in the Study Area during field investigations. An abundance of Monarch's larval host, common milkweed, was observed in the large CUM1 meadow at the east side of the Study Area south of the railroad tracks and east of Bowmanville Avenue. There were five Monarch observations in this meadow during field investigations conducted on June 15, 2021; however, there was no breeding evidence observed (i.e., caterpillars or chrysalises).

Eastern Wood-Pewee (*Contopus virens*)

Eastern Wood-Pewee, a provincially and federally designated Special Concern species, was observed in the Study Area during field investigations. This species receives protection under the MBCA. Eastern Wood-Pewee was observed calling in a tree at the edge of the CUM1-a meadow on the west side of the Study Area during the third round of breeding bird surveys. This is outside of suitable woodland/forest habitat preferred by Eastern Wood-Pewee and therefore, the CUM1-a meadow is not considered suitable habitat for this species. Eastern Wood-Pewee is more likely to be nesting in the adjacent FOD7 woodland or treed inclusions in the adjacent CUT1-b thicket community.



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Snapping Turtle (*Chelydra serpentina*)

Snapping Turtle, a provincially and federally designated Special Concern species, was observed in the Study Area during 2023 field investigations. This species receives protection under the *Fish and Wildlife Conservation Act, 1997* (FWCA). This species was observed in Farewell Creek and is therefore, confirmed habitat. This species also has the potential to occur in Oshawa Creek, Harmony Creek, the seven stormwater management ponds and two small shallow aquatic features in the Study Area. This may include overwintering in these features. There is also potential for Snapping Turtle to use the watercourses as a movement corridor.

Candidate SWH includes the following features:

- **Turtle Wintering Areas**

Oshawa Creek and Harmony Creek provide permanent standing water in the Study Area that has the potential to support turtle wintering areas. Stormwater management ponds in the Study Area may support turtle wintering areas; however, they do not qualify as SWH.

- **Shrub/Early Successional Bird Breeding Habitat**

There is one thicket in the Study Area > 10 ha in size east of Bloor Street East and south of the railroad tracks. The thicket was dominated by invasive shrub species including Common Buckthorn, Autumn Olive (*Elaeagnus umbellata*) and Tartarian Honeysuckle (*Lonicera tatarica*). There were no shrub/early successional indicator species (as per the Criteria Schedule) identified during field investigations. Out of the common listed bird species in the Criteria Schedule, only Willow Flycatcher (*Empidonax traillii*) was observed during field investigations. Although the thicket qualifies as SWH due to its size, the non-native composition of the feature reduces the quality of the habitat and may impact the suitability of the habitat for certain bird species.

- **Terrestrial Crayfish**

Terrestrial crayfish burrows were not observed during field investigations from the CP ROW; however, there is a potential for terrestrial crayfish to occur in the Study Area adjacent to marsh and swamp communities outside of the railway ROW.

- **Special Concern and Rare Wildlife Species**

Yellow-banded Bumble Bee (*Bombus terricola*)

Candidate habitat for Yellow-banded Bumble Bee, a provincially and federally designated Special Concern species, was present throughout the urban and rural landscape of the Study Area.



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Eastern Milksnake (*Lampropeltis triangulum*)

Candidate habitat for Eastern Milksnake, a federally designated Special Concern species, was present throughout the rural landscape of the Study Area. This includes meadows, agricultural lands, thickets, savannas and woodlands, especially in proximity to older buildings and water.

Northern Map Turtle (*Graptemys geographica*)

Candidate habitat for Northern Map Turtle, a provincially and federally designated Special Concern species, has the potential to occur in Oshawa Creek, Harmony Creek. This may include overwintering in these features. There is also potential for Northern Map Turtle to use the watercourses as a movement corridor.

Midland Painted Turtle (*Chrysemys picta marginate*)

Candidate habitat for Midland Painted Turtle, a federally designated Special Concern species, has the potential to occur in Oshawa Creek, Harmony Creek, the seven stormwater management ponds and two small shallow aquatic features in the Study Area. This may include overwintering in these features. There is also potential for Midland Painted Turtle to use the watercourses as a movement corridor.

Snapping Turtle (*Chelydra serpentina*)

Candidate habitat for Snapping Turtle, a provincially and federally designated Special Concern species, has the potential to occur in Oshawa Creek, Harmony Creek, the seven stormwater management ponds and two small shallow aquatic features in the Study Area. This may include overwintering in these features. There is also potential for Snapping Turtle to use the watercourses as a movement corridor.

4.7 Existing Conditions Summary

The following provides a summary of the natural heritage features, designated natural areas and conditions and recommendations for the Study Area.

- There are several unevaluated wetlands, most of which are located adjacent to existing watercourses which transect the existing rail corridor including the corridors associated with Harmony Creek, Robinson Creek, Tooley Creek, and Darlington Creek tributaries. There are no Provincially Significant Wetlands in the Study Area.
 - Designated Natural Areas identified in the Study Area include: Greenbelt Urban River Valleys – Includes Oshawa Creek, Harmony Creek, and Farewell Creek valleylands.



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- CLOCA Regulatory Areas – Includes Goodman Creek, Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek, Darlington Creek tributaries and associated hazard lands.
- KNHFs and KHF: Regional Municipality of Durham and the City of Oshawa – Includes lands associated with Oshawa Creek, Farewell Creek, Harmony Creek, Robinson Creek, Tooley Creek and Darlington Creek.
- NHS: City of Oshawa, Municipality of Clarington and CLOCA - Oshawa Creek, Goodman Creek, Harmony Creek and the Farewell Creek corridors (City of Oshawa); Robinson Creek, Tooley Creek and tributaries of Darlington Creek (Municipality of Clarington); CLOCA NHS includes all of the above features.
- There were no provincially significant vegetation communities identified in the Study Area. The Study Area is located partially within an urban environment comprised of residential, commercial and recreational properties in Oshawa and Bowmanville and partially within a rural environment comprised of agricultural fields, rural residences and light industry. Natural vegetation features throughout the Study Area show signs of disturbance with an abundance of invasive species including Common Reed and Dog-strangling Vine. Forest and swamp communities are concentrated along the 14 creeks and tributaries in the Study Area. Meadow, thicket and woodland cultural communities are abundant throughout the Study Area in both urban and rural environments.
- The natural areas in the Study Area provide habitat for breeding bird species protected under the MBCA.
- SWH features identified in the Study Area include:
 - Confirmed habitat for bat maternity colonies (woodlands)
 - Confirmed habitat for SOCC (Barn Swallow, Monarch, Eastern Wood-Pewee and Snapping Turtle)
 - Candidate habitat for turtle wintering areas
 - Candidate habitat for shrub/early successional bird breeding
 - Candidate habitat for Terrestrial Crayfish
 - Candidate habitat for SOCC (Yellow-banded Bumblebee, Eastern Milksnake, Map Turtle, Midland Painted Turtle and Snapping Turtle)
- The following SAR have been confirmed in the Study Area:
 - Butternut – One pure, retainable butternut was visually identified in the Study Area west of Bloor Street East and south of the railroad tracks on Figure 4.5, Appendix A. Genetic testing is underway to confirm purity.
 - Little Brown Myotis – Confirmed as occurring within woodlands units within the Study Area



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- Bobolink – Observed in the hay fields west of Courtice Road and north of the railroad tracks.
- Eastern Meadowlark – Observed in the hay field east of Bloor Street East and south of the railroad tracks.
- Chimney Swift – Visually observed foraging over 399 Simcoe Street South, north of railroad tracks.
- The following SAR have a medium to high probability of occurring in the Study Area:
 - Blanding's Turtle – Oshawa Creek, Harmony Creek, stormwater management ponds and small shallow aquatic features have the potential to support Blanding's Turtle.
 - Little Brown Myotis, Northern Myotis and Tri-colored Bat – Anthropogenic roosting habitat in the form of buildings with potential entry/exit points may provide habitat for SAR Bats in the Study Area outside of the Project Footprint.
- The Study Area intersects the Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek and Darlington Creek watersheds. These creeks all drain south towards Lake Ontario which is located between 0.5 and 3.5 km south of the Study Area. No habitat classified as Critical Habitat by the SARA and no aquatic SAR that are afforded protection under the ESA or SARA were identified within the Study Area.
- Fish habitat was identified at 14 watercourse crossing locations in the Study Area. Twelve of the watercourses provide direct fish habitat (i.e., frequented by fish). Two unnamed tributaries (WC-5 and WC-7) provide indirect fish habitat (i.e., not frequented by fish but provides functions for fish to carry out their life processes). Thermal regimes identified by MNRF and CLOCA differ at several of the WC. Further consultation will be undertaken within MNRF and CLOCA to determine the appropriate restricted timing window for in-water activities for construction. There are no records of provincially or federally protected aquatic SAR in the Study Area.



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5.0 Project Description

The Project includes the proposed addition of new tracks, four proposed GO stations, bridges, at-grade crossing widenings, and modifications to structures and utilities. Key Project components are shown in Figure 1, Appendix A. Further details are provided in the following sections. The Project details provided herein are considered conceptual and are subject to refinement as planning progresses. Measures and dimensions are approximate and may vary as they are refined during the detailed design process.

5.1 Linear Facilities

5.1.1 Trackwork

Trackwork will be required within the existing GO Lakeshore East Rail Corridor at the western limit of the Project Footprint and within the CP Belleville Subdivision throughout the Study Area. One GO track will be constructed east of the DC Oshawa GO, within the Lakeshore East Rail Corridor, crossing Highway 401 and extending north to the existing CP Rail corridor. The CP Rail corridor currently has two CP Rail tracks from the western point where the GO track will join with the CP Rail corridor, extending to Park Road where the two CP Rail tracks transition into a single track throughout the remainder of the Study Area. The new GO track will continue within the CP Belleville Subdivision until Bowmanville Avenue, Municipality of Clarington.

Commencing east of Simcoe Street in the City of Oshawa, a second GO track will be constructed for a distance of approximately 8.3 km, ending to the west of Courtice Road, Municipality of Clarington. At this point, the two tracks will return to a single track until east of Green Road, Municipality of Clarington, where the tracks will again be doubled and extend until Bowmanville Avenue. For all work within the CP Belleville Subdivision, the new GO trackwork will be located to the south of the existing CP Rail track.

In order to facilitate the Project, changes will also be made to the GM Spur. The GM Spur track will be realigned to the east of its existing location, crossing Highway 401 on a new bridge. North of Highway 401, the GM Spur track will cross beneath the proposed GO track and connect with the existing GM Spur track.

Grading and drainage construction, material removal and importation, and signal installation and testing, will be required to complete the trackwork. Property acquisitions will be required in some locations and will be confirmed as design progresses.



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5.1.2 Ancillary Structural Work

Ancillary structures such as retaining walls, grading and drainage modifications, culvert extensions, and load crossings will be required to facilitate the Project. Other upgrades such as electric, communication and mechanical systems will be required.

Retaining walls are required to provide track protection and to accommodate variations in grading along the length of the corridor. Retaining wall locations will be refined based on the alignment design and may be required on the north and/or south side of the rail corridor as necessary to facilitate the Project. Metrolinx will determine the appropriate finish(es) for the retaining walls based on municipal planning and urban design policies and objectives, surrounding land uses, adjacent built form, and pedestrian, cycle and automobile traffic levels. At a minimum, exterior wall facings that are visible to the public will receive a permanent concrete facing and a plain finish.

5.1.3 Utilities

There are a number of utilities located within proximity to the Project (Table 5.1) and the Project may result in conflicts with existing utilities. Recommendations to address these conflicts will be confirmed as the Project progresses into subsequent phases.

Table 5.1: Utilities in the Study Area

Utility Type	Owners
Watermains, Culverts, Sanitary Sewers and Storm Sewers	Regional Municipality of Durham, City of Oshawa, Municipality of Clarington, Canadian Pacific Railway, and private ownership
Pipelines and Gas	Enbridge Gas Inc.
Hydro, Railway Lighting, and Street Lighting	Hydro One Networks Inc., Oshawa Public Utilities Company, Canadian Pacific Railway, and Canadian National Railway Company
Communications	Rogers Communications Canada, Zayo Canada, and Bell Canada

5.2 GO Stations

Four new GO stations are being planned as part of the Project (refer to Table 5.2 for locations). The proposed GO stations will be delivered through Metrolinx's Transit Oriented Communities (TOC) Program where third parties will fund the design and construction of new GO Station infrastructure for Metrolinx to own and operate. The TOC Program allows for unique GO stations to be integrated with higher density, mixed use development with funding from private partners. This type of development is



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designed to increase transit ridership and reduce traffic congestion, increase housing supply and jobs with access to transit, create complete communities based on good planning principles and provide positive value capture for the Province to maximize transit investment while reducing tax payer burden. The rigorous requirements that back all Metrolinx infrastructure projects will be met for service and design of the GO stations in accordance with Metrolinx's standards and requirements.

GO station locations will be accessible, integrated with surrounding land uses to facilitate transit access with residential and commercial use, and provide convenient use for all passengers. The GO stations will provide a connection for passengers transferring from adjacent bus routes and associated stops.

The new GO stations will include typical station infrastructure, which may include parking, passenger pick-up and drop off (PPUDO), a bus access point and loop facility, bike shelters and pedestrian access infrastructure. The Bowmanville GO Station may include facilities to allow for parking trains overnight while not in service. The Bowmanville GO Station will include wayside power infrastructure and may include protective measures for fueling considerations. The final outcome and configuration of the proposed GO stations is subject to delivery by third parties through Metrolinx's TOC Program and is to be confirmed as the design process progresses in accordance with Metrolinx's standards and requirements. Further details on new stations and transit-related infrastructure will be confirmed as the design progresses under the established planning and Environmental Assessment process. Preliminary details are presented in the table below (Table 5.2).

Table 5.2: GO Station Location Summary

GO Station Name	Location
Fox Street (B1 Thornton's Corners East)	The proposed Thornton's Corners East GO Station is located south of the CP Rail corridor, east of Thornton Road South and north of Highway 401.
Front Street (B2 Ritson)	The proposed Ritson GO Station is close to the center of Oshawa. The GO station will be bounded south of Olive Avenue, east by Albert Street, west of Ritson Road and north of First Street. A new multi-use crossing will be constructed to provide access to the Michael Starr Trail and Front Street.
Courtice Road (B3 Courtice)	The existing Courtice GO Station bus terminal will be redeveloped into the new Courtice GO Station with train service and expanded facilities. This GO station is between the main downtown areas of Oshawa and Bowmanville at the northwest quadrant of the Courtice Road and CP Rail intersection, with direct access to Highway 401.



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GO Station Name	Location
Bowmanville Avenue (B4 Bowmanville)	The existing Bowmanville GO bus terminal located at Highway 2 and Bowmanville Avenue will be redeveloped into the new Bowmanville GO Station with train service and expanded facilities.

5.3 At-Grade Crossing Widenings

Modifications to at-grade crossings will also be required to accommodate the additional tracks. Existing at-grade crossings at the following locations will be widened:

- Prestonvale Road
- Trulls Road
- Bloor Street⁴
- Private Crossing for Dom's Auto
- Baseline Road (at two locations)
- Rundle Road
- Holt Road
- Private Crossing west of Maple Grove Road
- Maple Grove Road

As part of the widening, roadways will be reprofiled and warning system and signage for the crossings will need to be modified to accommodate future configurations. Prestonvale Road, Maple Grove Road and the two private crossings currently do not have crossing protection (i.e., gates); new gates will be installed at these locations.

5.4 Bridges

The trackwork will require modifications or construction of bridges at several locations along the alignment. Table 5.3 summarizes the proposed bridge modifications. Bridge modifications on CP Rail's Belleville Subdivision will occur to the south of existing bridge structures.

⁴ The Regional Municipality of Durham completed an Environmental Study Report under the Municipal Class Environmental Assessment process in 2022 for the realignment and widening of Bloor Street, including a new grade separation (i.e., road over rail crossing) at Bloor Street. Metrolinx has and will continue to coordinate with the Regional Municipality of Durham during detailed design for the proposed work at Bloor Street.



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Rail bridges will accommodate one or two tracks (depending on location) in addition to the existing CP Rail tracks. Design and type will be confirmed as design progresses; however, Table 5.3 presents the bridge type identified in preliminary design work. The bridge design will address standard maintenance issues. As required and in accordance with applicable standards, lighting will be placed to improve visibility for traffic, pedestrians and cyclists. Artificial lighting will be incorporated as per applicable lighting standards.

Reconstructed / replaced overpasses are required at two locations (i.e., Simcoe Street, Ritson Road) and the existing pedestrian bridge at Farewell Street will be replaced with a multi-use bridge. Sidewalks will be provided on both sides of the road overpasses. The road overpasses and the multi-use bridge will be designed to municipal and *Accessibility for Ontarians with Disabilities Act* (AODA) standards. Bridge removal and road closure at the rail corridor is proposed at Albert Street.

Expansion of the existing bridges at five locations (i.e., DC Oshawa GO (pedestrian bridge), Stevenson Road, Park Road, Harmony Road, and Courtice Road) is also required. Existing road-over-rail bridges expanded southward to accommodate proposed GO tracks will be maintained at existing elevations and grades. Seven new bridges are proposed including at Highway 401, the GM Spur, Oshawa Creek, Wilson Road, Harmony Creek, Farewell Creek and Green Road. Multi-use (i.e., pedestrian and/or cycling) ramps and crossings will be designed to a minimum width of 3 m. The design of the multi-use crossings will be further refined during detailed design. The crossing will be compliant with the AODA and will meet municipal standards, at a minimum. Design will address standard maintenance issues.

Modifications to the design of the GM Spur and connecting track may be required during future design phases in order to accommodate the Regional Municipality of Durham's proposed extension of Stellar Drive, which will provide an east-west connection between the existing Laval Drive and Stellar Drive. Metrolinx infrastructure is expected to remain within the Project Footprint.

Table 5.3: Proposed Bridge Modifications within the Study Area

Location	Description	Specifications
DC Oshawa GO	Pedestrian bridge extension to access the VIA platform	Enclosed bridge over the new GO track, similar to the existing, with elevators and stairs
Highway 401	New bridge to be located to the east of the existing bridge.	Accommodates one new rail track
GM Spur	The new GO Track will pass over the realigned GM Spur track	Accommodates one new rail track



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Location	Description	Specifications
Stevenson Road Bridge	Widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track	Overpass will accommodate existing four lanes of traffic. One new track to pass beneath.
Park Road Bridge	Widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track	Overpass will accommodate existing four lanes of traffic. One new track to pass beneath.
Oshawa Creek Bridge	New bridge on separate alignment south of the existing bridge to carry 1 new GO Track	Accommodates one new rail track
Simcoe Street Bridge	Remove existing structure and reconstruct road overpass	Overpass will accommodate existing four lanes of traffic. One new track to pass beneath.
Albert Street Bridge	Bridge removal	Closure of Albert Street at the rail corridor with barricades at the terminus of Albert Street, both north and south of the rail corridor.
Front Street Pedestrian Crossing (Michael Starr Trail)	New non-vehicular grade separation	Accommodates two new tracks.
Ritson Road Bridge	Remove existing structure and reconstruct road overpass	Overpass will accommodate existing four lanes of traffic. Two new tracks to pass beneath.
Wilson Road Bridge	New bridge on separate alignment south of the existing bridge to carry 2 new GO Track	Accommodates two new rail tracks
Farewell Street Multi-use Bridge	Replace non-vehicular multi-use crossing (bridge)	Accommodates two new tracks.
Harmony Road	Widen road over pass and replacement of existing south abutment to accommodate 2 new GO Tracks	Overpass will accommodate existing four lanes of traffic. Two new tracks to pass beneath.
Harmony Creek Bridge	New bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks	Accommodates two new tracks.



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Location	Description	Specifications
Farewell Creek Bridge	New bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks	Accommodates two new tracks.
Courtice Road Bridge	Widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track	Overpass will accommodate existing two lanes of traffic. One new track to pass beneath.
Green Road Bridge	New bridge on separate alignment south of the existing bridge to carry 1 new GO Track	Accommodates one new track.

5.5 Temporary Areas of Disturbance

Several construction laydown and staging areas have been proposed for the Project, including laydown areas near or at each of the four proposed GO station locations. Final sites required for laydown and staging will be confirmed during detailed design.

Other areas may be temporarily disturbed to facilitate construction activities, including but not limited to areas required for construction of bridges and at-grade crossing widenings.

5.6 Construction

Construction of the rail bridges will occur over several stages. Abutments and piers are built first, including pile foundations. The spans and deck are then constructed, followed by road surface, track, and track drainage.

Reconstructed road overpasses (i.e., Simcoe Street, Ritson Road) will require the demolition of the existing bridge prior to the construction of the new, longer span bridge. Bridge removal at Albert Street, will require the existing bridge to be demolished, and the road closed in accordance with municipal requirements.

Modification of existing road overpasses (i.e., Stevenson Road, Park Road, Harmony Road, and Courtice Road) involves demolition of the existing south bridge abutment and construction of a new abutment along with associated retaining walls, if required based on site specific conditions.



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Construction of a new or replacement multi-use bridge will commence with the footings and piers for the bridge and the ramps. The bridge superstructure, consisting of a prefabricated steel truss, will be placed onto the piers by crane. The concrete decking for both the bridge and the ramps would then be placed, followed by railings and joint systems. For a multi-use tunnel, a staged construction would likely be required under the tracks with the tunnel constructed in two stages with a track protection system (shoring) between the stages. Excess soil removal is required for the ramps and for tunneling beneath the rail corridor and retaining walls (final height dependent on design) would be required adjacent to the rail corridor.

At-grade crossing widening involves reconstruction of the road in the area of the crossing to accommodate the new track(s) and adjust the road profile. Crossing protection and signage is relocated and/or revised as required.

Track construction starts with earthworks to build the subgrade and drainage. The track is assembled on the subgrade, followed by ballasting and lifting to the final position.

Details regarding the construction of the GO stations and associated infrastructure are currently in development.

Affected utilities will be relocated and/or protected as required. The method for installing or re-instating utilities will be determined during future design phases and in coordination with the affected utility owners, as appropriate.

Road detours may be required to accommodate construction of bridges / overpasses and at-grade crossing widenings. Final construction sequencing will be determined during detailed design and is subject to change.

Activities associated with construction are described in Table 5.4. Further refinements to the construction activities may be made as detailed design progresses.

Table 5.4: Anticipated Construction Activities

Activity	Description	Associated Equipment
Site Preparation	<ul style="list-style-type: none">• Delivery of equipment and materials to the laydown area• Removal of vegetation, buildings and infrastructure• Installation of erosion and sediment control measures• Installation of temporary fencing	<ul style="list-style-type: none">• Grading and grubbing equipment (if required)• Excavation equipment including backhoe, dump trucks, and soil removal equipment



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Activity	Description	Associated Equipment
Modifications to Utilities	<ul style="list-style-type: none"> Removal and realignment of the utilities as required Encasement where needed for protection 	<ul style="list-style-type: none"> Concrete pouring equipment Excavation equipment including backhoe, dump trucks, soil removal equipment, jack hammers
Excavation and Grading	<ul style="list-style-type: none"> Excavation of soils Grading, sloping and contouring Grading of areas associated with track detours Progressive excavation for retaining walls 	<ul style="list-style-type: none"> Grading equipment Excavation equipment including backhoe, dump trucks, and soil removal equipment
Construction of Bridges / Overpasses	<ul style="list-style-type: none"> Installation of temporary and permanent barriers for track and road safety Excavation and pile driving Construction of new bridge / overpass and trackwork Construction of sidewalks Reconstruction of road (for overpasses) Removal of temporary shoring and barriers 	<ul style="list-style-type: none"> Small cranes Pile driving rigs Excavators, Backhoes, Loaders, Dump trucks. Concrete mixer trucks Truck cranes. Bulldozers, Compaction rollers, Road rollers Road paving machines
Bridge removal at Albert Street	<ul style="list-style-type: none"> Installation of permanent barriers for track and road safety Removal of the existing overpass Construction of road terminus segments 	<ul style="list-style-type: none"> Small cranes Excavators, Backhoes, Loaders, Dump trucks Concrete mixer trucks Bulldozers, Compaction rollers, Road rollers Road paving machines
Construction of a Multi-Use Bridge Crossing	<ul style="list-style-type: none"> Removal of the existing crossing Installation of appropriate foundations and piers Assembly and launching of the main bridge structure Installation of ramps and associated retaining walls (if necessary) 	<ul style="list-style-type: none"> Pile driving rigs, cranes, concrete trucks Excavator Bulldozer
Construction of a Multi-Use Tunnel Crossing	<ul style="list-style-type: none"> Removal of the existing crossing Installation of retaining walls Excavation (local areas with limited disturbance) Installation of concrete caissons Concrete work for tunnel construction 	<ul style="list-style-type: none"> Backhoes, loaders, dump trucks, concrete trucks Augering machines for caisson construction, concrete mixer trucks Bulldozer, compaction rollers Concrete pouring equipment



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Activity	Description	Associated Equipment
Temporary Lane Closures/Detours	<ul style="list-style-type: none"> • Temporary lane closures, realignments and detours • Lane closures will follow standard traffic control management guidelines 	<ul style="list-style-type: none"> • Temporary traffic control devices such as signs, signals, barriers, traffic barrels
Construction of Retaining Walls	<ul style="list-style-type: none"> • Local excavations • Installation of soldier piles and caissons • Construction of cap beams and permanent struts where required • Temporary struts where required and excavation to final track levels • Installation of drive points and construction of facing between walls • Track work and drainage • Construction of exterior facing, drainage, and barriers (e.g., fencing) 	<ul style="list-style-type: none"> • Backhoes, loaders, dump trucks • Cranes for soldier pile installation, augering machines for caisson construction, concrete mixer trucks • Bulldozer, compaction rollers
Laydown Areas	<ul style="list-style-type: none"> • Designation of areas to be used for laydown of materials and construction staging • As appropriate, use of gravel or other materials for the areas 	<ul style="list-style-type: none"> • Grading and grubbing equipment (if required) • Excavation equipment including backhoe, dump trucks, and soil removal equipment • Generator for site trailers
Groundwater Dewatering	<ul style="list-style-type: none"> • The need for dewatering during construction activities will be confirmed during detailed design 	<ul style="list-style-type: none"> • Groundwater pumping
Management of Stormwater	<ul style="list-style-type: none"> • During construction, stormwater management will follow best management practices and align with applicable standards, municipal standards and requirements, and regulatory requirements • Surface flows will be discharged to municipal storm sewers • Installation of erosion and sediment control measures 	<ul style="list-style-type: none"> • Grading equipment



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5.7 Operations

Operational activities associated with the Project are listed in Table 5.5.

These activities have the potential to interact with the existing environment and are used to determine the potential environmental effects of the Project during operations. Mitigation measures and monitoring requirements are described in Section 6.0. Further refinements to the operations activities may be made as detailed design progresses and during operations.

Once modified (i.e., through relocation or encasement), the operations associated with utilities will revert back to the applicable owner and any potential effects associated with operations are not evaluated in this report.

Table 5.5: Anticipated Operations Activities

Activity	Description
General Operations	Maintenance of the: <ul style="list-style-type: none">• rail bridges• multi-use crossings• retaining walls• drainage features (e.g., grading, culverts)• vegetation• snow clearing• debris/garbage clean-up• graffiti management and trespass control



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6.0 Potential Impacts Assessment, Mitigation Measures and Monitoring Activities

This impact assessment identifies potential natural heritage impacts associated with the construction and operations phases of the Project and proposes mitigation and monitoring measures where potential effects are predicted, aiming to reduce these adverse effects in consideration of applicable legislation and policies.

Potential impacts, mitigation measures, and monitoring activities for the environmental components of the Project, including vegetation communities and wildlife habitat have been assessed based on the proposed developments, as described in Section 5.0.

The vegetation communities within the Study Area are outlined in Table 6.1.

Table 6.1: Areas of Overlap of ELC Vegetation Communities Within the Study Area

ELC Type	ELC Community Code	Area of Overlap with Project Footprint (ha)	Area of Overlap with the Study Area outside the Project Footprint (ha)
Agriculture	AG	6.09	97.66
	AG-Hay	4.88	20.66
Meadow	CUM1	15.04	25.54
	CUM1/CUT1	-	2.68
	CUM1-1	0.06	2.26
	CUM1-a	0.32	7.67
	CUM1-b	0.01	0.28
	CUM1-c	7.16	8.81
Plantation	CUP3	1.41	11.49
Savannah	CUS1	0.42	3.45
Thicket	CUT1	2.22	3.53
	CUT1-a	0.11	6.21
	CUT1-b	3.35	7.27
	CUT1-c	-	0.93
Woodland	CUW1	2.44	6.96
	CUW1-a	1.61	1.47
	CUW1-b	0.15	1.78



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ELC Type	ELC Community Code	Area of Overlap with Project Footprint (ha)	Area of Overlap with the Study Area outside the Project Footprint (ha)
	CUW1-c	0.09	1.68
	CUW1-d	0.01	1.98
Forest	FOD	1.44	4.26
	FOD7	2.92	7.34
	FOD9-1	-	0.11
Hedgerow	HE1	8.89	4.02
	HE2	0.33	0.62
	HE3	0.10	0.03
Marsh	MAM	0.11	3.15
	MAM2-2	-	0.45
	MAM2-a	0.02	0.22
	MAS2-1	0.11	3.15
Aquatic	SA	-	0.17
	SWM	0.42	1.99
Swamp	SWD	0.14	6.00
	SWD2-2	0.00	2.12
	SWD4	0.45	1.99
	SWD4-1	0.19	0.84
	SWT	0.05	0.14
	SWT2	0.17	1.00
	SWT2-5	0.04	2.45

Wildlife habitat and its subcategories related to SAR and Significant Wildlife Habitat (includes habitat of SOCC) have been considered in the assessment of conditions and associated impacts and mitigation. These habitat features and observed species occurrences have either been confirmed or have been identified as candidate habitats in both the Project Footprint or larger Study Area. Table 6.2 summarizes the confirmed and candidate wildlife habitat based on the results of the field surveys and assessments completed as part of this NETR, as detailed in Section 2.0. These measures are in keeping with provincial and local best practices and policies, including CLOCA's Wildlife Corridor Protection and Enhancement Plan (2022).



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Table 6.2: Summary of Candidate and Confirmed Wildlife Habitat and Habitat Description in the Study Area

Wildlife Habitat - General	Wildlife Habitat - Subcategory	Candidate Habitat			Confirmed Habitat		
		SAR ¹	SWH ²	Habitat Description (ELC Type) ³	SAR	SWH	Habitat Description (ELC Type) ³
Bat Maternity Colonies	-					X	Forest and Treed Swamp
Turtle Wintering Areas	-		X	Aquatic, Marsh, Swamp			
Shrub/Early Successional Bird Breeding Habitat	-		X	Meadow, Thicket, Savannah, Woodland			
Terrestrial Crayfish	-		X	Marsh, Treed Swamp, Thicket Swamp			
Species Concern and Rare Wildlife Species	Monarch					X	Meadow
	Barn Swallow					X	Meadow/Structures
	Eastern Wood-Pewee					X	Forest
	Yellow-banded Bumblebee		X	Meadow			
	Eastern Milksnake		X	Habitat Generalist ⁴			
	Map Turtle		X	Aquatic			
	Midland Painted Turtle		X	Aquatic			
	Snapping Turtle			Aquatic		X	Watercourse



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Wildlife Habitat - General	Wildlife Habitat - Subcategory	Candidate Habitat			Confirmed Habitat		
		SAR ¹	SWH ²	Habitat Description (ELC Type) ³	SAR	SWH	Habitat Description (ELC Type) ³
Species at Risk	Little Brown Myotis				X		Forest
	Northern Myotis	X					Forest
	Tri-colored Bat				X		Forest
	Butternut ⁵				X		Generalist ²
	Bobolink				X		Meadow, Agriculture – Hay
	Eastern Meadowlark				X		Meadow, Agriculture – Hay
	Chimney Swift				X		Constructed lands/traditional chimneys
	Blanding's Turtle	X		Aquatic, Forest ⁴			

Notes:

1. Threatened or Endangered designated species that receive protection under the ESA
2. Species designated as Special Concern under the ESA (but do not receive protection) and considered Species of Conservation Concern (SOCC)
3. See Table 6.1 for species ELC codes
4. See Appendix E.1 for details.
5. Tree B-002 has been visually identified as pure. Genetic testing is underway to confirm purity.

Impacts during construction and operation are presented in Table 6.3. The environmental components in the tables are grouped into three primary categories: designated features and policy areas, vegetation communities and wildlife and wildlife habitat. There are associated sub-components for each category.



Table 6.3: Potential Impacts, Mitigation Measures and Monitoring During Construction

Environmental Component	Potential Impacts	Mitigation Measure(s)	Monitoring Activities
Designated Features and Policy Areas			
Designated Natural Areas – Unevaluated wetlands associated with Harmony Creek, Robinson Creek, Tooley Creek, and Darlington Creek Tributaries 11 and 14. Policy Areas - CLOCA Regulated Areas, Greenbelt Urban River Valley, Regional Municipality of Durham KNHFs and KHF, City of Oshawa NHS and KNHFs and KHF, Municipality of Clarington NHS	<ul style="list-style-type: none">Removal of vegetation communitiesDisturbance, displacement or mortality of wildlife or habitat loss/degradation, including potential SWH and SARSoil or water contamination as a result of spills (e.g., grease and/or fuel) from equipment useIntroduction or spread of invasive speciesIncreased erosion and sedimentationReduction in ecological function and integrity	<ul style="list-style-type: none">Refer below to mitigation measures described for vegetation communities.Refer below to mitigation measures described for wildlife and wildlife habitat.Refer below to mitigation measures described for SARCompensation for tree removals will be undertaken in accordance with provisions outlined in the Metrolinx Vegetation Guideline (2022, and subsequent updates prior to construction).Further consideration to reduce potential impacts on Designated Natural Areas and Policy Areas will be undertaken during detailed design, to the extent possible.	<ul style="list-style-type: none">Refer below to monitoring described for vegetation communities.Refer below to monitoring described for wildlife and wildlife habitat.Refer below to monitoring described for SARRefer below to monitoring described for aquatic environmentRecommendations for additional monitoring related to vegetation removal within regulated areas may be determined through consultation with CLOCA.
Vegetation Communities			
Vegetation communities – vegetation community removal and wetland compensation plans	<ul style="list-style-type: none">Removal of vegetation communitiesDamage to adjacent vegetation or ELC communities as a result of accidental intrusionThe areas of overlap of ELC vegetation communities with the Project Footprint and the Study Area are outlined in Table 6.1.	<ul style="list-style-type: none">Vegetation removal will be reduced to the extent possible and limited to the construction footprint.Construction fencing and/or silt fencing, where appropriate, will be installed and maintained to clearly define the construction footprint and prevent accidental damage or intrusion to adjacent vegetation or ELC communities.Provide compensation for the removal of vegetation in accordance with Metrolinx’s Vegetation Guideline (2022, and subsequent updates prior to construction).Provide compensation for disturbed or removed wetlands based on Metrolinx guidelines and in consultation with CLOCA and indigenous communities.Temporarily disturbed areas will be re-vegetated using non-invasive, native plantings and/or seed mix, appropriate to the site conditions and adjacent vegetation communities. Seed mixes will be used in conjunction with an appropriate non-invasive cover crop as needed.Vegetation removals will also consider and mitigate potential impacts to sensitive species (e.g., migratory birds and SAR) and features (e.g., significant wildlife habitat).Refer to the wildlife, SWH and SAR mitigation measures described below.	<ul style="list-style-type: none">Onsite inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.If required as a condition of a permit or approval associated with governing by-laws/regulations, vegetation compensation activities will be monitored in accordance with Metrolinx’s Vegetation Guideline (2022, and subsequent updates prior to construction).
Vegetation communities – tree removal and compensation plans	<ul style="list-style-type: none">City and private tree removal	<ul style="list-style-type: none">An Arborist Report by an I.S.A. Certified Arborist will be prepared with regard to the Ontario <i>Forestry Act</i> R.S.O. 1990, and other regulations and best management practices as applicable.The Arborist Report will include, but not be limited to, the individual identification of trees within the Study Area, including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Study Area may include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws dictate the minimum area	<ul style="list-style-type: none">Regular inspection in areas of vegetation removal will be undertaken as required during construction to confirm that fencing is intact; only specified trees are removed; and no damage is caused to the remaining trees and adjacent vegetation communities.Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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		<p>buffers to be inventoried and diameter at breast height that requires inventory.</p> <ul style="list-style-type: none">• Prior to the undertaking of tree removals, a tree removal strategy/tree preservation plan will be developed during detailed design to document tree protection and mitigation measures that follow municipal by-laws, and adherence with best practices, standards and regulations on safety, environmental, and wildlife protections.• Compensation for tree removals will be undertaken in accordance with the Metrolinx Vegetation Guideline (2022, and subsequent updates prior to construction).• Pruning of branches will be conducted by staff trained to employ proper pruning techniques as identified by the International Society of Arboriculture and Landscape Ontario.• Tree Protection Zone (TPZ) fencing will be established to protect and prevent tree injuries. TPZs will be clearly staked prior to construction using barriers in accordance with local by-law requirements.• The Arborist Report will include information needed to establish compensation ratios and tree end use (including identification of high value trees) as per the Metrolinx Vegetation Guideline (2022, and subsequent updates prior to construction).• Vegetation restoration and planting plans will be shared with Indigenous communities for feedback.• Upon receiving the necessary Project approvals and prior to the commencement of tree removals, all trees designated for preservation must be flagged in the field. All designated preservation areas must be left standing and undamaged during site works. If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx’s Vegetation Guideline (2022, and subsequent updates prior to construction). Applicable bylaws will be followed for tree removals outside of Metrolinx properties.• Vegetation removal will be avoided and reduced to the extent possible and limited to Metrolinx properties and ROW• Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and SAR, and features, e.g., designated natural areas and SWH. Refer to the wildlife, SWH and SAR mitigation measures described below.• Removals are to be completed outside of migratory bird nesting season from, approximately, April 1 to August 31. Removals may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., Wildlife Biologists).	<ul style="list-style-type: none">• If required, the success of vegetation compensation activities will be monitored in accordance with Metrolinx’s Vegetation Guideline (2022, and subsequent updates prior to construction) and conditions of permits and approvals as determined by property ownership, applicable governing by-laws/regulations, and location with respect to ecological functioning.• Monitoring requirements will be undertaken in accordance with conditions of permits and approvals.• Monitoring and management of trees/vegetation within the rail corridor ROW will be undertaken in accordance with the IVM Program.



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		<ul style="list-style-type: none">The following is the process that shall be carried out if tree removals are requested during the restricted time indicated in the MBCA:<ul style="list-style-type: none">Contact a qualified individual (i.e., wildlife biologist or ornithologist) to determine if nesting birds are within the tree removal disturbance area.If the wildlife biologist/ornithologist has determined that there are nesting birds onsite, there will be no tree removals/chipping conducted within the boundary set out by the specialist. Tree removals can resume within this area at the end of the nesting season, August 31, or if the wildlife biologist/ornithologist has determined the birds have left the nest.If the wildlife biologist/ornithologist determines there are no migratory birds nesting within the disturbance area, the Contractor has 7 days to conduct removals. At the end of 7 days, if removals and chipping is not complete, the wildlife biologist/ornithologist will return to the site and proceed with another assessment. If there are still no birds, work can resume for another 7 days. This process will continue until all removals and chipping is complete.Upon completion of the tree removals, all felled trees are to be removed from the site. No lumber or brush from the clearing is to be stored on the site. Any chipping, cutting or brush cleanup are to be completed outside of the bird nesting season. These works may take place during this restricted time only if the requirements of the MBCA are met and nesting.	
Vegetation Communities – integrated vegetation management (IVM)	<ul style="list-style-type: none">Footprint Impacts and potential for the establishment of invasive species and other incompatible species	<ul style="list-style-type: none">An IVM Plan will be developed and implemented that is in adherence with the Metrolinx Vegetation (2022, and subsequent updates prior to construction) and the IVM Program. The Guideline’s selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and enhances cost-effectiveness.	<ul style="list-style-type: none">The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring Program within the Metrolinx Vegetation Guideline (2022, and subsequent updates prior to construction). The Bi-Annual Monitoring Program is made up of pre-treatment and post-treatment monitoring that will be carried out by field survey, by aerial survey, and by high-rail vehicle or train surveys conducted by qualified specialists.
Vegetation communities – tree removal strategy	<ul style="list-style-type: none">Potential for the spread of Emerald Ash Borer, <i>Agilus planipennis</i> (Fairmaire) associated with removal, handing and transport of ash trees	<ul style="list-style-type: none">Removal of ash trees, or portions of ash trees, will be carried out in compliance with the Canada Food and Inspection Agency Directive D03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer (2014), as amended from time to time. To comply with this Directive, ash trees requiring removal, including wood, bark or chips, will be restricted from being transported outside of the emerald ash borer regulated areas of Canada.Confirm precautions are being taken to reduce the risk of the spread of invasive species by cleaning equipment prior to moving sites.	<ul style="list-style-type: none">On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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Vegetation communities – erosion and sedimentation	<ul style="list-style-type: none">Increased erosion and sedimentation	<ul style="list-style-type: none">Construction fencing will be installed and maintained to clearly define the construction footprint and prevent accidental damage or intrusion into adjacent designated natural heritage features, vegetation / ecological communities or habitat features as shown on Figures 2 to 4. Further, silt fencing will be installed and maintained surrounding any potential watercourses or swales to prevent soil erosion / sedimentation to surrounding sensitive features such as valleylands, watercourses and/or wetland features.Monitoring of the fencing will be conducted in accordance with the best practices outlined in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019). The Erosion and Sediment Control Guide for Urban Construction (TRCA 2019) recommends inspections be conducted on weekly basis at minimum during active construction. Other recommendations for inspections are also outlined in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019).As specified in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), it is recommended that “damaged erosion and sediment control measures be repaired and/or replaced within 48 hours or sooner if environmental receptors are at imminent and foreseeable risk of adverse impact”.An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019) will be prepared prior to and implemented during construction to reduce the risk of sedimentation to the vegetation communities.Stockpiled materials or equipment will be stored within the construction footprint but shall be kept at least 30 m away from any watercourse; signs will be put up on site to so indicate the setback.The Environmental Inspector shall possess a Certified Inspector of Sediment and Erosion Control (CISEC) or Certified Professional in Erosion and Sediment Control (CPESC) certificate, and the preparation and implementation of Erosion and Sediment Control Plan(s) shall be in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019).	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. All erosion and sediment control measures should be inspected weekly. All damaged erosion and sediment control Measures will be repaired and/or replaced within 48 hours of the inspection. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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Environmental Component	Potential Impacts	Mitigation Measure(s)	Monitoring Activities
Vegetation communities – environmental contamination and invasive species	<ul style="list-style-type: none">• Soil or water contamination as a result of spills (e.g., grease and/or fuel) from equipment use• Introduction or spread of invasive species	<ul style="list-style-type: none">• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the Spill Prevention and Response Plan.• Refuelling of equipment will occur at least 30 m away from any watercourse. Signs will be put up on site to indicate the 30 m setback from any watercourse.• Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge.• All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free of fluid leaks, soils containing seeds of plant material from invasive species) and inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al., 2013) prior to arriving and leaving the construction site. This will reduce the risk of the spread of invasive species to other locations.	<ul style="list-style-type: none">• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include training for on-site personnel, additional site maintenance and alteration of activities to reduce impacts.• Precautions are being taken to reduce the risk of the spread of invasive species by implementing the Clean Equipment Protocol for Industry (Halloran et al. 2013) on equipment and machinery prior to arriving on a site.
Wildlife and Wildlife Habitat			
Wildlife and wildlife habitat – general	<ul style="list-style-type: none">• Disturbance, displacement, or mortality of wildlife	<ul style="list-style-type: none">• If wildlife is encountered, measures will be implemented to avoid death, injury, or interference with the species, and its habitat. For example, construction activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified biologist will be contacted to advise on the appropriate actions for the situation.• Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken by a qualified biologist, as appropriate.• The contractor will be in adherence with DFO's Code of Practice: Beaver Dam Breaching and Removal.	<ul style="list-style-type: none">• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
Wildlife and wildlife habitat – significant wildlife habitat	<ul style="list-style-type: none">• Disturbance, displacement, or mortality of wildlife or habitat loss for the following SWH:<ul style="list-style-type: none">– Candidate habitat for bat maternity colonies– Candidate habitat for turtle wintering areas– Candidate shrub/early successional bird breeding habitat– Candidate terrestrial crayfish habitat– Confirmed habitat for SOCC [Barn Swallow, Eastern Wood-Pewee, Snapping Turtle (at Farewell Creek) and Monarch]– Candidate habitat for SOCC (Yellow-banded Bumble Bee, Eastern Milksnake, Map Turtle, Midland Painted Turtle and Snapping Turtle)	<ul style="list-style-type: none">• Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate.• Mitigation measures specific to each SWH are detailed in the Wildlife and Wildlife Habitat sections below.• Mitigation measures to reduce impacts to candidate bat maternity colonies are discussed under the SAR Bats section below.• Impacts to candidate shrub/early successional bird breeding habitat, candidate terrestrial crayfish habitat and candidate Yellow-banded Bumble Bee habitat can be addressed using the mitigation measures described above in the Vegetation Communities section. Impacts to candidate shrub/early successional bird breeding habitat can also be mitigated using measures outlined below for migratory birds.	<ul style="list-style-type: none">• Monitoring activities specific to each SWH are detailed in the wildlife and wildlife habitat sections below, and in the section references for candidate bat maternity colonies, candidate shrub/early successional bird breeding habitat, candidate terrestrial crayfish habitat and candidate Yellow-banded Bumble Bee habitat in the adjacent column.



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Environmental Component	Potential Impacts	Mitigation Measure(s)	Monitoring Activities
Wildlife and wildlife habitat – significant wildlife habitat – monarch (SOCC)	<ul style="list-style-type: none">Disturbance or destruction of habitat used by monarchs	<ul style="list-style-type: none">Identify opportunities to promote pollinator species and habitat in accordance with the Metrolinx Vegetation Guideline (2022, and subsequent updates prior to construction). This may include planting or seeding native flowering plants in temporarily disturbed areas.Opportunities to plant milkweed or forage vegetation outside and within the rail ROW will be undertaken, where possible, and in accordance with the Metrolinx Vegetation Guideline (2022, and subsequent updates prior to construction).If vegetation clearing proceeds when monarch larvae may be present (April 1 to September 30), then milkweed plants should be inspected by a qualified professional for monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other milkweed plants; for other larval stages (i.e., eggs and chrysalis), entire milkweed plants will be transplanted.	<ul style="list-style-type: none">Regular monitoring will be undertaken during construction to prevent unauthorized impacts to habitats used by monarchs.
Wildlife and wildlife habitat – significant wildlife habitat – turtles and turtle habitat, including turtle wintering areas for turtle SOCC (Map Turtle, Midland Painted Turtle and Snapping Turtle)	<ul style="list-style-type: none">Potential for impacts to turtles and/or turtle habitat	<ul style="list-style-type: none">Work within turtle habitat will be planned in consideration of turtle overwintering period which occurs from October 1 to April 30. Mitigation measures to prevent turtles from nesting on site may need to be implemented prior to work activities.Wildlife exclusionary fencing will be installed and maintained around the construction zone near any potential sensitive herpetofauna habitat such as valleylands, watercourses and/or wetland features. The contract specifications will follow best management practices (MNR 2013).The contractor will develop an Amphibian and Reptile Management Plan.The Amphibian and Reptile Management Plan will be circulated to Indigenous communities for comment.Fencing designs will be circulated to Indigenous communities for comment.Post-construction habitat restoration will be implemented, as required.	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
Wildlife and wildlife habitat – significant wildlife habitat – SOCC (Eastern Milksnake)	<ul style="list-style-type: none">Potential for direct impacts to Eastern Milksnake	<ul style="list-style-type: none">Snake species, including Eastern Milksnake, have the potential to enter the work area during the active season for snakes (April 1 to October 31)Mitigation measures for wildlife encounters (as outlined in the General Wildlife and Wildlife Habitat section above) will be implemented, as required.	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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Wildlife and wildlife habitat – migratory breeding birds and nests, including candidate shrub/early successional breeding bird habitat and bird SOCC (Barn Swallow, Eastern Wood-Pewee)	<ul style="list-style-type: none">Disturbance or destruction of migratory bird nests	<ul style="list-style-type: none">All works must comply with the MBCA, including timing windows for the nesting period (April 1 to August 31).If activities must occur during the general nesting period, then a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity.If a nest of a migratory bird is found outside of this nesting period (including a ground nest), it still receives protection.Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Nests must be protected (works will not occur that may damage or destroy the nest) between May 1 and August 31 (residency occupancy period).	<ul style="list-style-type: none">Regular monitoring will be undertaken by a qualified biologist to confirm that activities do not encroach into nesting areas or disturb active nesting sites.
Wildlife and wildlife habitat – wildlife habitat connectivity	<ul style="list-style-type: none">Decrease of habitat connectivity for wildlife	<ul style="list-style-type: none">Refer to mitigation measures described for vegetation communities, wildlife and wildlife habitat and aquatic environment.Opportunities to enhance the natural environment and provide a connection to the surrounding natural areas will be explored, to the extent possible.Indigenous communities will be invited to provide input to discussions regarding potential habitat connectivity opportunities, as part of vegetation restoration planning.	<ul style="list-style-type: none">Refer to monitoring described for vegetation communities, wildlife and wildlife habitat and aquatic environment.
SAR			
SAR – general	<ul style="list-style-type: none">Disturbance, displacement, or mortality of SAR or SAR habitat.	<ul style="list-style-type: none">Requirements of theESA (2007), Fisheries Act (1985) and SARA (2002) will be met. Species-specific mitigation measures will be implemented based on any recommended surveys undertaken prior to construction, and consultation with Ministry of the Environment, Conservation and Parks (MECP) and MNRF.If SAR is present and a recovery strategy has been developed by MNRF and MECP, Metrolinx will follow the commitments in the recover strategy.On-site personnel will be provided with information (e.g., factsheets and training) that addresses the existence of potential SAR on site, the identification of the SAR species and the procedure(s) to follow if an individual is encountered or injured.Mitigation measures to reduce adverse impacts of Project activities on SAR will comply with the ESA.If SAR are encountered, construction activities in the area will cease immediately and a qualified biologist will be contacted. The SAR must be allowed to leave the area on its own accord. Construction activities will not proceed until the SAR is safely away from the area. If the SAR does not leave the area on its own in a timely manner, a qualified biologist with training in proper handling of SAR may be permitted to relocate the SAR safely away from the construction area.	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional mitigation measures may also be implemented if those proposed are not effective.Species-specific monitoring activities will be developed in accordance with any registration and permitting requirements under the ESA.Monitoring activities to reduce adverse impacts of Project activities on SAR will comply with the ESA.



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		<ul style="list-style-type: none">Any SAR individual that is encountered in the Study Area must be reported to the MECP (SAROntario@ontario.ca) within 48 hours of the observation.Prior to construction, investigation of the Project Footprint for SAR that may have established following the completion of previous surveys may be undertaken by a qualified biologist, as appropriate.	
SAR – Bobolink and Eastern Meadowlark	<ul style="list-style-type: none">Habitat loss, disturbance, and/or mortality to Bobolink and Eastern Meadowlark	<ul style="list-style-type: none">Additional monitoring, mitigation and compensation for removal of suitable Bobolink and Eastern Meadowlark habitat may be required, based on consultation with the MECP.Mitigation measures to reduce adverse impacts of Project activities on Bobolink and Eastern Meadowlark will comply with the ESA.Disturbance to Bobolink and Eastern Meadowlark habitat will be avoided during the breeding bird window between May 1 to July 31, as per O. Reg. 242/08 of the ESA.	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.Monitoring activities to reduce adverse impacts of Project activities on Bobolink and Eastern Meadowlark will comply with the ESA.
SAR – Chimney Swift	<ul style="list-style-type: none">Habitat loss, disturbance, and/or mortality to Chimney Swift	<ul style="list-style-type: none">Additional monitoring, mitigation and compensation for removal of suitable anthropogenic roosting habitat may be required, based on consultation with the MECP.Mitigation measures to reduce adverse impacts of Project activities on Chimney Swift will comply with the ESA.Disturbance to Chimney Swift habitat will be avoided during the active season, which includes breeding, nesting, rearing and roosting, beginning end of April and to the middle of October, as per O. Reg. 242/08 of the ESA.	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.Monitoring activities to reduce adverse impacts of Project activities on Chimney Swift will comply with the ESA.
SAR – Blanding’s Turtle	<ul style="list-style-type: none">Potential for impacts to Blanding’s Turtle and/or Blanding’s Turtle habitat	<ul style="list-style-type: none">Requirements of the ESA will be met as noted in Section 7.2.4.Species-specific mitigation measures will be implemented based on any recommended surveys undertaken prior to construction, and consultation with MECP and MNRF.Work within potential Blanding’s Turtle habitat should consider the turtle overwintering period which occurs from October 1 to April 30, and the nesting period which occurs from late May to early July.Mitigation measures to reduce adverse impacts of Project activities on Blanding’s Turtle will comply with the ESA.	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.Monitoring activities to reduce adverse impacts of Project activities on Blanding’s Turtle will comply with the ESA.
SAR – SAR Bats	<ul style="list-style-type: none">Habitat loss, disturbance, and/or mortality to SAR Bats	<ul style="list-style-type: none">Requirements of the ESA will be met as noted in Section 7.2.4.Species-specific mitigation measures will be implemented based on any recommended surveys undertaken prior to construction, and consultation with MECP and MNRF.Additional monitoring, mitigation and compensation for removal of suitable treed or anthropogenic roosting habitat may be required, based on the results of additional surveys and consultation with the MECP.As requested, regular updates regarding bat mitigation and monitoring activities will be provided to the Mississaugas of Scugog Island First Nation.	<ul style="list-style-type: none">Onsite inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.Monitoring activities to reduce adverse impacts of Project activities on SAR bats will comply with the ESA.



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		<ul style="list-style-type: none">Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1 to September 30, in accordance with MECP requirements.Mitigation measures to reduce adverse impacts of Project activities on SAR bats will comply with the ESA.	
SAR – Butternut (Tree B-002 has been visually identified as pure. Genetic testing is underway to confirm purity.)	<ul style="list-style-type: none">Habitat loss, disturbance, and/or mortality of Butternut	<ul style="list-style-type: none">As Part of the Arborist Report, trees within or adjacent to the Project Study Area that will be removed or injured as part of the Project will be inventoried, including butternut and other SAR vegetation. SAR vegetation will be subject to permitting and approval requirements under the ESA, prior to the commencement of construction.If any works are proposed within the critical root zone (i.e., 25 m radius from stem) or its regulated habitat (i.e., 50 m radius from stem) of a butternut, mitigation, monitoring and compensation to address impacts to butternuts will be required based on the results of a Butternut Health Assessment in accordance with the ESA.Each butternut that may potentially be removed or impacted must be assessed by a Butternut Health Expert (BHE), in accordance with MECP Butternut Assessment Guidelines (2021). The BHE will prepare a Butternut Health Expert Report and document the mitigation monitoring and corrective actions implemented.Mitigation measures to reduce adverse impacts of Project activities on butternut will comply with the ESA, 2007.	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.Monitoring activities to reduce adverse impacts of Project activities on butternut will comply with the ESA.
Aquatic Habitat			
Aquatic environment – wetlands, waterbodies and headwater drainage features	<ul style="list-style-type: none">Removal or impacts to wetland; aquatic and riparian vegetation; degradation of wetlands as result of dewatering and discharge activities; erosion and sedimentation to wetlands/waterbodies from construction; and risk of contamination to wetlands/waterbodies as a result of spills.	<ul style="list-style-type: none">Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to wetlands and waterbodies. Shorelines or banks disturbed by construction activities will be immediately stabilized by any activity associated with the Project to prevent erosion and/or sedimentation, through re-vegetation with native species suitable for the site.An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), will be prepared prior to and implemented during construction to reduce the risk of sedimentation to the waterbody.A Spill Prevention and Response Plan will be developed before work commences so that procedures and policies are in place during construction to reduce impacts to wetlands and watercourses.In wetland areas where vernal pooling occurs, prior to dewatering isolated work areas, wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector’s Authorization from the MNRF. If applicable, fish will be collected in accordance with the Fisheries Act.Vegetation removals will also consider and mitigate potential impacts to wetland communities. Until such a time, that an	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include alteration of activities to reduce impacts and enhance mitigation measures.



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		<p>Ontario Wetland Evaluation System (MNR 2014) evaluation is completed and evaluated by MNRF, unevaluated wetlands will be considered as significant for the purposes of assessing impacts.</p> <ul style="list-style-type: none">Wetland communities potentially affected by the Project will be clearly staked out on site.If dewatering is proposed, then it is recommended to be undertaken during the winter when the potential impacts of changes in water levels are less significant in wetland communities. During detailed design, the need for a dewatering zone of influence assessment and dewatering monitoring plan should be evaluated. The dewatering monitoring plan, if required, will monitor for potential negative impacts on nearby wetlands and adjacent vegetation communities to confirm if they would be affected due to dewatering activities. An adaptive management plan will be prepared if negative impacts are observed.Prior to dewatering isolated work areas, fish will be captured and relocated to suitable habitat outside of the work area under a Licence to Collect Fish for Scientific Purposes from the MNRF. Similarly, wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector's Authorization from the MNRF.	
Aquatic environment – fish and fish habitat	<ul style="list-style-type: none">Dewatering activities and water discharge resulting in changes in water velocity or temperature; changes in soil and erosion; release of contaminated and sediment-laden water; changes in fish habitat structure and cover; changes in food supply, changes in nutrient concentration; changes in access to habitat leading to the displacement or stranding of fish.	<ul style="list-style-type: none">All requirements of the <i>Fisheries Act</i> will be met.Headwater Drainage Features will be protected in accordance with the PPS (2020) and CLOCA Policies and Regulations.Consideration will be given to mitigating short and long-term water quality impacts to the McLaughlin Bay will be mitigated through, for example, the implementation of an erosion and sediment control plan, adequate stormwater management measures and riparian vegetation planting.In the event that in-water and/or near water construction works are required, appropriate mitigation measures will be followed, as identified in Applicable Law and through consultation with the relevant authorities including DFO. In-water works will be planned to consider timing windows to protect fish, including their eggs, juveniles, community composition, spawning adults, and/or the organisms upon which they feed. The timing windows were confirmed with MNRF and CLOCA. Based on guidance from the MNRF (2013) and CLOCA's Fishery Management Plan (CLOCA 2013b) the restricted timing windows for in-water activities (i.e., when in-water work is not permitted) are as follows:<ul style="list-style-type: none">Goodman Creek (WC-1) – March 15 to July 15Oshawa Creek (WC-2) – September 15 to July 15Harmony Creek (WC-3) – September 15 to July 15Farewell Creek (WC-4) – September 15 to July 15Unnamed Tributary of Lake Ontario in proximity to the rail corridor and west of Prestonvale Road (WC-5a and 5b) – March 15 to July 15	<ul style="list-style-type: none">Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.Monitoring of dewatering activities will be undertaken to confirm sediment-laden discharge and changes in visible scour/erosion.



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		<ul style="list-style-type: none">– Robinson Creek (WC-6) – September 15 to July 15– Tooley Creek and tributaries in proximity to the rail corridor and west of Courtice Road and north of Baseline Road West (WC-7 and WC-9) – March 15 to July 15– Tooley Creek (WC 8) – September 15 to July 15– Darlington Creek (WC-11) – September 15 to July 15– Darlington Creek tributaries in proximity to the rail corridor and south of Baseline Road West; east of Holt Road; and east of Maple Grove Road (WC-10, WC-12, WC-13 and WC-14) – March 15 to July 15• MNRF guidelines for spring and fall spawning fishes have been applied as applicable.• Any changes to the restricted timing windows indicated above should be confirmed with MNRF during detail design.• Design water management system and dewatering operations to prevent erosion and/or release of sediment-laden or contaminated water to the waterbody or adjacent wetlands.• Prior to dewatering isolated work areas, fish will be captured and relocated to suitable habitat outside of the work area under a Licence to Collect Fish for Scientific Purposes from the MNRF. Similarly, wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector's Authorization from the MNRF.• A Permit to Take Water or Environmental Activity and Sector Registry (EASR) may be required prior to dewatering.	
Stormwater Management and Drainage			
Floodplain	<ul style="list-style-type: none">• Potential to impact flooding conditions in the CLOCA Regulatory Floodplain• Potential for flooding impacts on-site during construction	<ul style="list-style-type: none">• Floodplain impact assessment will be conducted during detailed design following CLOCA guidelines once details on the pier configuration and other detailed bridge design information are available. Design optimizations on abutment, pier, and embankment placement shall be considered to reduce hydraulic impacts.• CLOCA staff will be consulted during detailed design to avoid potential infrastructure conflicts and impacts to flood protection measures/initiatives.• In addition, all necessary studies such as fluvial geomorphic process studies, meander belt and erosion studies, and geotechnical and slope stability assessments will be completed.• Prior to construction, develop a Flood Contingency Plan with specific mitigation measures for any proposed works or temporary laydown and staging areas, as required. The Flood Contingency Plan may include risk mapping, and a monitoring strategy.• Include construction site on CLOCA flood warning system to prepare site in advance of possible flood events.	<ul style="list-style-type: none">• Develop and undertake a monitoring program of the Floodplain, as required, in consultation with CLOCA.• Include a monitoring strategy in the Flood Contingency Plan to monitor surface water levels during construction activities



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Surface water / Stormwater and Drainage	<ul style="list-style-type: none">Change in stormwater quality and quantity, including:<ul style="list-style-type: none">Erosion of exposed soil and increased sediment loading which may impact receiving waterbodies and/or municipal stormwater drainage systemIncreased surface water/stormwater runoff.	<ul style="list-style-type: none">Prior to construction, a Stormwater Management Plan that will outline stormwater discharges management associated with construction activities, and an Erosion and Sediment Control plan will be developed.The overall stormwater quality and quantity control strategy will be developed in accordance with all relevant municipal, provincial, and federal requirements, as amended, and outlined in a Stormwater Management Report. Stormwater management design will consider guidance provided by the MECP, formerly the Ministry of the Environment and Climate Change Stormwater Management Planning and Design Manual (2003) and Ontario Ministry of Transportation Drainage Management Manual (2008), Toronto and Region Conservation Authority Stormwater Management Criteria (2012).The following stormwater management best management practices will be considered and implemented, as required:<ul style="list-style-type: none">Reduce clearing and amount of exposed soil;Install key sediment control before grading/land alterations begin;Sequence construction activities so that the soil is not exposed for long periods of times;Protect storm drain inlets to filter out debris; and,Stabilize all exposed soil areas as soon as land alterations have been completed.	<ul style="list-style-type: none">Monitoring activities will be implemented as outlined in the Stormwater Management Plan and/or Erosion and Sediment Control Plan and may include regular inspections and reporting on the performance of implemented erosion and sediment control measures, best management practices, and other monitoring activities, as required.All monitoring procedures should stay in place throughout construction.



Table 6.4: Potential Impacts, Mitigation Measures and Monitoring Activities During Operations

Environmental Component	Potential Impacts	Mitigation Measure(s)	Monitoring Activities
Designated Features and Policy Areas			
Designated Natural Areas – Unevaluated wetlands associated with Harmony Creek, Robinson Creek, Tooley Creek, and Darlington Creek Tributaries 11 and 14. Policy Areas – CLOCA Regulated Areas, Regional Municipality of Durham KNHFs and KHF’s, City of Oshawa NHS and Key Natural Heritage and Hydrological Features, Municipality of Clarington NHS	<ul style="list-style-type: none">Localized losses of habitat which may support local wildlife populations and SARReduction in habitat quality resultant from increases in light, noise pollution and dust generationPotential reduction in habitat quality and NHS ecosystem resilience related to edge habitat and invasive species introduction and proliferationPotential reduction in species movement throughout the NHS corridor	<ul style="list-style-type: none">Compensatory habitat and mitigation measures including invasive species introduction as well as on-going invasive species management will be determined during consultation with agency stakeholders (Municipalities and CLOCA).The contractor will develop an Invasive Species Management Plan.The Invasive Species Management Plan will be circulated to Indigenous communities for comment.Fencing designs will be circulated to Indigenous communities for comment.	<ul style="list-style-type: none">Monitoring restoration areas and follow up management will be determined during consultation with agency stakeholders (Municipalities and CLOCA).
Vegetation Communities			
Vegetation communities	<ul style="list-style-type: none">Removal of vegetation during operational vegetation maintenance activities, if applicableRemoval and/or damage to adjacent vegetation or ELC communities as a result of accidental intrusion during vegetation maintenance activities, if applicable	<ul style="list-style-type: none">Vegetation removal will be avoided reduced to the extent possible and limited to the Metrolinx ROW.Sensitive wildlife timing restrictions will be followed for construction activities and operational maintenance activities (e.g., removal of vegetation outside of the breeding bird season).Herbicide applications will be administered subject to the Pesticides Act.Temporarily disturbed areas will be re-vegetated using non-invasive, preferable native plantings and/or seed mix	<ul style="list-style-type: none">On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.Monitoring and management of trees/vegetation in the rail corridor ROW will be undertaken in accordance with the IVM Program within the Metrolinx Vegetation Guideline (2022, and subsequent updates prior to construction).
Vegetation communities	<ul style="list-style-type: none">Soil or water contamination as a result of spills (e.g., grease and/or fuel) from equipment use during maintenance activities	<ul style="list-style-type: none">A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the Spill Prevention and Response Plan.Refuelling of equipment will occur at least 30 m away from any watercourse.Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge.All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free from fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al. 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations.	<ul style="list-style-type: none">On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
Wildlife and Wildlife Habitat			
Wildlife and wildlife habitat – general	<ul style="list-style-type: none">Disturbance, displacement or mortality of wildlife during operational vegetation maintenance activities, if applicable	<ul style="list-style-type: none">If wildlife is encountered, measures will be implemented to avoid destruction, injury, or interference with the species, and/or its habitat. For example, operational vegetation maintenance activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the work area on its own. A qualified biologist will be contacted to define the appropriate buffer required.	<ul style="list-style-type: none">On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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Wildlife and wildlife habitat – migratory breeding birds and nests, including SOCC (birds)	<ul style="list-style-type: none">Disturbance or destruction of migratory bird nests during operational vegetation maintenance activities, if applicable	<ul style="list-style-type: none">All works must comply with the MBCA, including timing windows for the nesting period (April 1 to August 31).Operations will occur outside of the nesting period where feasible. However, if operations or vegetation maintenance activities must occur during the general nesting period, a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity.If a nest of a migratory bird is found outside this nesting period (including a ground nest), it still receives protection.If the nest of a bird listed under Schedule 1 of the Migratory Birds Regulations (2022) is found in the Project area, the nest will be registered under the Abandoned Nest Registry.Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Nests must be protected (works will not occur that may damage or destroy the nest) between May 1 and August 31 (residency occupancy period).	<ul style="list-style-type: none">Regular monitoring by a qualified biologist will be undertaken to confirm that activities do not encroach into nesting areas or disturb active nesting sites.
SAR			
SAR – Bats	<ul style="list-style-type: none">Habitat loss, disturbance and/or mortality to SAR bats during operational vegetation maintenance activities, if applicable	<ul style="list-style-type: none">Removal of identified roosting structure/habitat would be discussed in advance with the MECP and requirements of the ESA will be met.Additional monitoring, mitigation and compensation for the removal of suitable treed or anthropogenic roosting habitat may be required based on the results of the additional surveys and consultation with the MECP.	<ul style="list-style-type: none">On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.
Aquatic Habitat			
Aquatic environment – wetlands, waterbodies, and headwater drainage features	<ul style="list-style-type: none">Potential for temporary impact to wetlands waterbodies and fish habitat during culvert maintenance or culvert replacements	<ul style="list-style-type: none">Prepare and implement sediment and erosion control plan for any maintenance activities in or adjacent to wetlands, waterbodies, and headwater drainage features.Wildlife passage analysis (e.g., openness ratio) of all structures within natural heritage systems will be conducted to determine existing conditions to help guide detailed design of new structures (including extensions).	<ul style="list-style-type: none">Regular on-site inspections during in-water construction by a qualified environmental inspector.Post construction monitoring to confirm conditions with respect to wildlife passage opportunities.
Aquatic environment – fish and fish habitat	<ul style="list-style-type: none">Potential for temporary impact to fish and fish habitat during culvert maintenance or culvert replacements	<ul style="list-style-type: none">Prepare and implement sediment and erosion control plan for any maintenance activities below the ordinary high water mark.Implement measures to protect fish and fish habitat during in-water construction activities i.e., restricted timing window, fish relocation.Fish passage analysis (e.g., 2-year storm event/bankfull) of all structures in the study area will be conducted to determine existing conditions to help guide detailed design of new structures (including extensions).	<ul style="list-style-type: none">Regular on-site inspections during in-water construction by a qualified environmental inspector.Post construction monitoring to confirm conditions with respect to fish passage.



7.0 Policy Conformance

7.1 Federal

7.1.1 Species at Risk Act, 2002

The proposed development does not occur on federal lands. Further, the results of the background review and existing conditions assessment did not identify aquatic species covered under the SARA (2002) in the Study Area. Species identified federally as endangered, threatened or special concern that are not listed under the ESA are applicable to the assessment of SOCC. These species have been documented in the Existing Conditions Summary in Section 4.7 and assessed for impacts and considered in the development of appropriate mitigation measures and monitoring activities in Table 6.3 and Table 6.4 in Section 6.0.

Migratory bird species listed in the MBCA and listed as extirpated, endangered or threatened on Schedule 1 of the SARA are regulated under the SARA. Should construction result in potential impacts to a regulated migratory bird species, consultation with ECCC is recommended to confirm authorization requirements under the SARA. Contravention of the SARA can be avoided by implementing measures (i.e., construction and operational maintenance activities outside of breeding bird timing window) to prevent the disturbance, destruction or taking of a nest as described for the MBCA (see Section 7.1.3).

7.1.2 Fisheries Act, R.S.C. 1985

The new track line will require improvements and/or new bridge developments at Oshawa Creek, Harmony Creek and Farewell Creek. New bridge crossings require review by DFO based on their potential to impact fish habitat. Review by DFO is initiated through a Request for Review (RfR) process. The RfR Form is to include details on the activities such as detailed designs, mitigation measures, schedules and potential impacts and habitat compensation measures.

7.1.3 Migratory Birds Convention Act, 1994

In accordance with the MBCA, mitigation measures for the Project are included in the impact, mitigation, and monitoring tables in Section 6.0 to avoid impacts on migratory breeding birds. No nests identified under Schedule 1 of the Migratory Birds Regulations (2022) were identified in the Project area.



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7.2 Provincial

7.2.1 Provincial Policy Statement, 2020

The PPS outlines policies to protect natural heritage features and areas. Valleylands, wetlands, woodlands, watercourses and associated fish habitat have been identified within the Project Footprint. Habitat of endangered species has been identified within the Project Footprint. Habitat for additional endangered and threatened species may be present within the Project Footprint or Adjacent Lands. Candidate SWH and portions of the NHS are present within the Project Footprint and greater Study Area. Mitigation measures outlined in Section 6.0 are provided to address potential impacts to natural heritage features and areas, in accordance with Policy 2.1.5.

In accordance with Policy 2.1.2 of the PPS, the connectivity of natural features in the Project Footprint will be maintained, restored, or where possible, improved, such that the ecological function of these features (e.g., NHS, fish habitat, wildlife corridors) remain.

7.2.2 Growth Plan, 2020

The Project is consistent with the relevant policies of the Growth Plan by extending the higher-order transit network into existing residential and employment areas, which optimizes the efficiency and viability of existing and planned transit and helps develop more vibrant and complete communities.

The Project promotes the Growth Plan's policies by providing Oshawa and Bowmanville with improved regional connections that will accommodate the increased population and employment to be achieved by the density targets while minimizing impacts on natural heritage and hydrological features.

The natural heritage policies of the Growth Plan regarding Key Natural Heritage Features and Key Hydrological Features apply to lands within the Growth Plan Natural Heritage System with respect to *development* and *site alteration*. In accordance with the Growth Plan, the Project qualifies as activities that create or maintain infrastructure authorized under an environmental assessment process. *Site alteration* includes activities "such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site".

Policy 4.2.2.3 (a) states:

- (i) *there are no negative impacts on key natural heritage features or key hydrologic features or their functions;*



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- (ii) *connectivity along the system and between key natural heritage features and key hydrologic features located within 240 metres of each other will be maintained or, where possible, enhanced for the movement of native plants and animals across the landscape;*

Negative Impact is defined, in regard to water as “degradation to the quality or quantity of surface or groundwater, key hydrologic features or vulnerable areas and their related hydrologic functions due to single, multiple or successive development or site alteration activities”. In regard to fish habitat, “any permanent alteration to or destruction of fish habitat, except where, in conjunction with the appropriate authorities, it has been authorized under the *Fisheries Act*. In regard to other natural heritage features and areas, “degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities”.

The Project will be submitted to DFO for review regarding fish habitat.

7.2.3 Greenbelt Plan, 2017

The Greenbelt Plan comes into consideration for the Study Area as it relates to the designation of the Oshawa Creek, Harmony Creek and Farewell Creek as Urban River Valleys. It is subject to assessment under the *Environmental Assessment Act*, provided that the goals of the Growth Plan for the Greater Golden Horseshoe and Greenbelt Plan are supported in the EA. This NETR applies and considers the policies of these plans in the assessment of impacts and is consistent with the mitigation measures that are adopted in these planning areas to protect the natural heritage features and designated features. These principles are imbedded in the principles of reducing the extent of impacts, where feasible, by applying mitigation techniques and restoring natural areas to the extent possible during post-construction for maintaining the integrity and function of natural heritage features and areas.

7.2.4 Endangered Species Act, 2007

In accordance with the ESA, permitting with the MECP will be required to address butternut, Bobolink, and Little Brown Myotis identified within the Study Area. Candidate habitat for additional SAR has been identified. In consultation with the MECP, additional surveys may be required to verify the presence or absence of SAR and identify additional permitting requirements under the ESA.



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7.2.5 Conservation Authorities Act, 1998

The Project is not subject to the provisions of *Conservation Authority Act*. However, the Project is committed to the goals and guiding principles of the *Conservation Authority Act* and associated regulation 42/06 for the CLOCA. Metrolinx has and continues to engage the CLOCA in the development of design opportunities and refinements to avoid, mitigate and restore habitats in the watersheds within the flood regulated areas of CLOCA. An important component of this consultation process is the development of compensatory opportunities within the watershed to address the loss for vegetated areas and aquatic environments in light of the design of the rail corridor.

Compensation for aquatic and terrestrial environment impacts is subject to design refinements and agency consultation (CLOCA in concert with DFO).

7.2.6 Fish and Wildlife Conservation Act, 1997

In accordance with the FWCA, during isolation of flow, fish recovery and transfer will need to be conducted in accordance with a License to Collect Fish for Scientific Purposes obtained from the MNRF.

7.3 Municipal

The City of Oshawa and the Municipality of Clarington Official Plans encompasses the above noted provincial natural heritage policies and guiding principles, in addition to a suite of policies specific to the City and the Municipality.

Metrolinx, as a Provincial Agency, is not subject to municipal permits and approvals (Metrolinx Act, 2006); however, Metrolinx will endeavour to adhere to the intent of the relevant municipal permits/approvals where feasible and will submit applications for review and information. Metrolinx will continue to communicate and engage with the City and Municipality during detailed design and construction planning to address municipal concerns.



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Summary and Conclusions
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8.0 Summary and Conclusions

Natural environment field investigations were conducted by AECOM in 2010 as part of the Natural Environmental Conditions Report in support of the original EPR. This NETR updates existing conditions with respect to the natural environment and evaluates potential impacts to natural heritage features and areas which may result from the construction and operational phases of the Project. Natural heritage features that were identified in the Study Area are summarized in the sections below.

Natural Features and Designated Areas

Natural features in the Study Area include 14 watercourses, fish habitat, valleylands, woodlands, wetlands and wildlife habitat. Most of the natural features and designated areas are concentrated around the watercourses and associated valleyland systems. For example, most woodland and wetland features are predominantly located adjacent to existing watercourse corridors associated with Harmony Creek, Robinson Creek, Tooley Creek, and Darlington Creek tributaries.

The Oshawa Creek, Harmony Creek, and Farewell Creek corridors are designated as Urban River Valleys under the Greenbelt Plan. Further, Greenlands System and KNHFs and KHF's have been designated by the Regional Municipality of Durham. Lands surrounding various creek systems have been designated by the City of Oshawa as KNHFs and KHF's, and by CLOCA and the lower tier municipalities as NHS. Additional lower tier natural heritage designations surrounding these features include Green Space and Environmental Protection Area. Lands surrounding the watercourses and wetlands within the Project Footprint and Adjacent Lands are also within CLOCA's regulated area (O. Reg. 42/06).

Impacts to natural features and designated areas are embodied under the following feature components:

Vegetation Communities

There were no provincially significant vegetation communities identified in the Study Area. The Study Area is located partially within an urban environment comprised of residential, commercial and recreational properties in Oshawa and Bowmanville and partially within a rural environment comprised of agricultural fields, rural residences and light industry. Greater than 50% of the Project Footprint (~54%) and adjacent lands (~57%) were determined to be developed. Developed lands included residential developments, mixed-use developments, as well as commercial and industrial areas.



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Natural vegetation features throughout the Study Area show signs of disturbance with an abundance of invasive species including Common Reed and Dog-strangling Vine. Forest and swamp communities are concentrated along the 14 creeks and tributaries in the Study Area. Meadow, thicket and woodland cultural communities are abundant throughout the Study Area in both urban and rural environments.

Wildlife and Wildlife Habitat

Based on the results of the wildlife records review and field program, as detailed in Sections 2.2 and 2.3, a total of 147 avifauna species, 19 herpetofauna species, 36 mammalian species, 80 insect species and 27 fish species were recorded within or near the Study Area. The majority of the wildlife (~90%) are common in the province and considered generally tolerant to anthropogenic disturbances, with the remainder comprised of SAR or SOCC.

Confirmed SWH features identified in the Project Footprint or Study Area include:

- Confirmed habitat for bat maternity colonies in forest and woodland communities in the Project Footprint and Study Area.
- Confirmed habitat for SOCC (Monarch) in the Project Footprint and Study Area meadow communities, especially meadows with an abundance of Common Milkweed.
- Confirmed habitat for SOCC (Eastern Wood-Pewee) in the forest and woodland communities.
- Confirmed habitat for SOCC (Barn Swallow) in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road.
- Confirmed habitat for SOCC (Snapping Turtle) in Farewell Creek, approximately 50 m north of CP Rail corridor.

Candidate SWH features identified in the Project Footprint or Study Area include:

- Candidate habitat for turtle wintering areas in Oshawa Creek, Harmony Creek and two small shallow aquatic ponds in the Study Area.
- Candidate habitat for SOCC (Map Turtle, Snapping Turtle and Midland Painted Turtle) in the wetlands, waterbodies and watercourses.
- Candidate habitat for SOCC (Yellow-banded Bumble Bee and Eastern Milksnake) throughout the Study Area.
- Candidate habitat for shrub/early successional bird breeding in thicket and savanna communities.
- Candidate habitat for Terrestrial Crayfish in and adjacent to marsh communities.



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SAR confirmed in the Study Area include:

- Bobolink – Observed in the hay fields west of Courtice Road and north of the railroad tracks.
- Eastern Meadowlark – Observed in the hay field east of Bloor Street East and south of the railroad tracks.
- Chimney Swift – Observed foraging over residential properties at 399 Simcoe Street South, north of railroad tracks.
- Butternut – One pure, retainable butternut was visually identified in the Study Area west of Bloor Street East and south of the railroad tracks. Genetic testing is underway to confirm purity.

SAR Bats – Natural roosting habitat is potentially present in the forest and swamp communities in the Study Area. Anthropogenic roosting habitat in the form of buildings with potential entry/exit points that may also be present in the Study Area; however, target exit surveys in 2021 and 2023 did not detect SAR bats and therefore, suggests that anthropogenic roosting habitat for SAR bats is absent from the Study Area.

SAR that have not been confirmed in the Study Area but have the potential to occur include:

- Blanding's Turtle – Oshawa Creek, Harmony Creek, stormwater management ponds and two small shallow aquatic features have the potential to support Blanding's Turtle.

Additionally, natural vegetation and anthropogenic structures throughout the Study Area have the potential to support migratory breeding birds protected under the MBCA.

Aquatic Habitat

The Study Area includes two major watersheds (Oshawa Creek and Farewell Creek which includes Black and Harmony Creeks and three smaller watersheds: Robinson Creek, Tooley Creek and Darlington Creek. The railway alignment intersects with fish habitat in 14 locations. All of the 14 locations investigated provide direct habitat or contributing habitat. These locations provide warmwater, coolwater and coldwater habitat.

Walleye and Pike have not been observed or recorded based on our review of CLOCA (2021), MNR (2023a), CLFN (2022) datasets over the last 10 years, however these species may occur in the ecoregion based on information from Indigenous communities.



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Within the Study Area, there are no records of provincially or federally protected aquatic SAR (DFO 2023; MNRF 2023b). American Eel was also not recorded in the NHIC database (MNRF 2023b) or in any fish collection records (MNRF 2023a, CLOCA 2021a). American Eel has been captured in Lake Ontario and also a section of Oshawa Creek north (upstream) of the Study Area (MNRF 2023b). As such it is reasonable to assume that American Eel may occur in the reaches of Oshawa Creek in the Study Area.

Juvenile Rainbow Trout were captured at Tooley Creek in the spring and summer of 2023, where they had previously not been documented since 2015. Since there is the potential for Tooley Creek to contain salmonid spawning, spawning surveys are recommended for Tooley Creek along with some of the other nearby creeks in the fall season. Spawning surveys are recommended at the following creeks:

- Harmony Creek (WC-3)
- Farewell Creek (WC-4)
- Robinson Creek (WC-6)
- Tooley Creek (WC-8)
- Darlington Creek (WC-10)

Potential impacts on the above natural environment features, and recommended mitigation measures and monitoring activities are included in the tables in Section 6.0 of this NETR based on the current design.



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Approvals and Permitting
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9.0 Approvals and Permitting

The results of the NETR have identified potential impacts to natural heritage features within the Study Area. The following approvals and permits are required to bring the Project into conformity with the applicable natural heritage legislation and policies, as outlined in Section 3.0.

- If the Project Footprint is modified during detailed design, a screening review for potential SAR should be undertaken and, if required, targeted SAR surveys be undertaken prior to commencing construction preparation activities or construction to determine presence/absence of potential (but not confirmed to date) SAR habitat as identified in Section 4.5.4.
- Removal of SAR habitat requires consultation with the MECP to determine mitigation, compensation and/or permit requirements under the ESA.
- DFO review is recommended for activities that occur at or below the high-water level of waterbodies that are considered fish habitat. Fish habitat includes all waterbodies that contain fish at any time of the year or that contribute to waterbodies that contain fish. DFO review is requested through the submission of a RfR form.
- Tree removals timing windows and nest sweeps are required in accordance with the MBCA.

With the implementation of the identified mitigation measures, follow-up surveys (i.e., fish spawning, wildlife crossing/trail camera) and approvals, as outlined in Sections 8.0 and 9.0, impacts to the natural environment can be managed to comply with regulatory and policy requirements.



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10.0 References

AECOM 2010. Expansion of Rail Service from Oshawa to Bowmanville on the Lakeshore East Corridor: Natural Environmental Conditions Report. Prepared by AECOM, dated September 30, 2010 (Project Number: 60115182).

AECOM 2011. Robinson Creek and Tooley Creek Watershed Management Plan. Prepared by AECOM for the Municipality of Clarington.

Bird Studies Canada 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. 2009 Edition. 13 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii + 318pp

Central Lake Ontario Conservation (CLOCA). 2004. Regional Groundwater Mapping Study.

Central Lake Ontario Conservation (CLOCA). 2007. Aquatic Monitoring Program 2007 Annual Report.

Central Lake Ontario Conservation (CLOCA). 2013a. Black/Harmony/Farewell Creek Watershed Plan. CLOCA January 2013.

Central Lake Ontario Conservation (CLOCA). 2013b. Fisheries Management Plan. CLOCA. Available at:
<https://drive.google.com/file/d/1tINyUwfRdNy0Nrtww51oIhdOWLDVbCZu/view>.

Central Lake Ontario Conservation (CLOCA). 2014. Policy and Procedural Document for Regulation and Plan Review. Available at: https://03879a07-372c-443e-997e-ae65078d7559.filesusr.com/ugd/b3995f_a7bfa9064ccc40df9573ee2e4ed43652.pdf

Central Lake Ontario Conservation Authority (CLOCA). 2021a. Long term aquatic monitoring data received from CLOCA in August 2021.

Central Lake Ontario Conservation Authority (CLOCA). 2021b. CLOCA Regulation Limit Public Browser. Available at:
<https://maps.cloca.com/Html5Viewer/Index.html?configBase=https://maps.cloca.com/Geocortex/Essentials/REST/sites/GenericRegulations/viewers/genregs/virtual/directory/Resources/Config/Default>



Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Natural Environment Technical Report

References

September 26, 2023

- Central Lake Ontario Conservation Authority (CLOCA). 2022. Wildlife Corridor Protection and Enhancement Plan. Available at: <https://www.cloca.com/action-plans>.
- Chapman, L.J., and Putnam, D.F. 1984: Physiography of Southern Ontario; Ontario Geological Survey, Map. P.2715 (coloured). Scale 1:600 000.
- City of Pickering. 2021. Open Data CLOCA Watersheds GIS Layer Updated May 2021 accessed November 2021.
- Coker, G.A., C.B Portt and C.K. Minns. 2001. Morphological and ecological characteristics of Canadian freshwater fishes. Can. Dept. Fish. Oceans, Ottawa, ON. Canadian Manuscript Report of Fisheries and Aquatic Sciences, 2554. 86 p. (2001).
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2007. COSEWIC assessment and status report on the Chimney Swift *Chaetura pelagica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 49pp.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2010. COSEWIC assessment and status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC assessment and status report on the Snapping Turtle *Chelydra serpentina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2016 COSEWIC assessment and update status report on the Blanding's Turtle *Emydoidea blandingii* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. viii + 40 pp
- Conservation Authorities Act, 1990. Conservation Authorities Act, 1990, R.S.O. 1990, c. C.27. Accessed November 2021 from: <https://www.ontario.ca/laws/statute/90c27>
- Curve Lake First Nation (CLFN) 2022. Oshawa to Bowmanville Bulk Fish Data Provided to Metrolinx by Curve Lake First Nation in October 2022.
- eBird. 2021. eBird. An online database of bird distribution and abundance [web application]. eBird, Cornell Laboratory of Ornithology, Ithaca, New York. Available at: <http://www.ebird.org>.



Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Natural Environment Technical Report

References

September 26, 2023

Endangered Species Act (ESA), 2007. Endangered Species Act, 2007, S.O. 2007, c. 6. Accessed November 2021 from: <https://www.ontario.ca/laws/statute/07e06>

Environmental Assessment Act, 1990. Environmental Assessment Act, 1990, R.S.O. 1990, c. E.18. Accessed November 2021 from: <https://www.ontario.ca/laws/statute/90e18>

Environment and Climate Change Canada (ECCC). 2018. North American Breeding Bird Survey Instructions and Safety Guidelines. Available at: <https://www.canada.ca/en/environment-climate-change/services/bird-surveys/landbird/north-american-breeding/overview.html>

Environment and Climate Change Canada (ECCC). 2019. Avoidance Guidelines – Technical Information. Available at: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html>

Fish and Wildlife Conservation Act, 1997. Fish and Wildlife Conservation Act, 1997, S.O. 1997, c. 41. Accessed November 2021 from: <https://www.ontario.ca/laws/statute/97f41>

Fisheries Act, 1985. Fisheries Act, 1985, R.S.C., 1985, c. F-14. Accessed August 2023 from: <https://laws-lois.justice.gc.ca/eng/acts/f-14/>

Fisheries and Oceans Canada (DFO). 2023. Aquatic SAR Map. Available at: <http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm>

Halloran, J., H. Anderson and D. Tassie. 2013. Clean Equipment Protocol for Industry. Prepared for the Peterborough Stewardship Council and Ontario Invasive Plant Council. Peterborough, ON. Printed April 2013. Updated May 2016.

iNaturalist. 2021. iNaturalist species observation database. Available online: https://www.inaturalist.org/observations?place_id=any

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC 005.

MacCulloch, R.D. 2002. The ROM Field Guide to Amphibians and Reptiles of Ontario. Royal Ontario Museum: Toronto, ON. 168 p.

Metrolinx. 2022. Vegetation Guideline. Final Draft. July 17, 2020. Prepared by Morrison Hershfield Limited for the exclusive use of Metrolinx.



Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Natural Environment Technical Report

References

September 26, 2023

- Migratory Birds Convention Act, 1994. Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22) Accessed November 2021 at: <https://laws-lois.justice.gc.ca/eng/acts/m-7.01/>
- Ministry of Municipal Affairs and Housing (MMAH). 2017. Greenbelt Plan. Available at: <https://www.ontario.ca/document/greenbelt-plan-2017>
- Ministry of Municipal Affairs and Housing (MMAH). 2020. Provincial Policy Statement. Issued under section 3 of the Planning Act. May 1, 2020.
- Ministry of Natural Resources (MNR). 2000. Significant Wildlife Habitat Technical Guide. 151 pp.
- Ministry of Natural Resources (MNR). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the PPS, 2005.
- Ministry of Natural Resources (MNR). 2013. Survey Protocol for Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Ministry of Natural Resources, Species at Risk Branch, Peterborough. ii + 20pp.
- Ministry of Natural Resources (MNR). 2013. Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. SAR Branch Technical Note. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. 11 pp.
- Ministry of Natural Resources (MNR). 2014. Ontario Wetland Evaluation System, Southern Manual, 3rd Edition, Version 3.3. © Queen's Printer for Ontario.
- Ministry of Natural Resources and Forestry (MNRF). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January 2015. MNRF Southern Region Resources Section, Peterborough, Ontario. 41 pp.
- Ministry of Natural Resources and Forestry (MNRF). 2017. Survey Protocol for SAR Bats within Treed Habitats – Little Brown Myotis, Northern Myotis & Tri-Colored Bat. April 2017. MNRF Guelph District.
- Ministry of Natural Resources and Forestry (MNRF). 2018. Use of Buildings and Isolated Trees by SAR Bats. Survey Methodology. Unpublished draft.
- Ministry of Natural Resources and Forestry (MNRF). 2023a. Land Information Ontario Digital mapping of Aquatic resource area line segment. Available Online: <https://geohub.lio.gov.on.ca/datasets/5e67132418f24488980fd19b4cbb0972/expl ore?location=49.291899%20C-84.834657%20C5.30>
- Ministry of Natural Resources and Forestry (MNRF). 2023b. Natural Heritage Information Centre (NHIC) Natural Areas and Species records search.



Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Natural Environment Technical Report

References

September 26, 2023

- Biodiversity explorer. Accessed August 22 2023 at:
<https://www.lioapplications.lrc.gov.on.ca/>
- Ministry of the Environment, Conservation and Parks. 2023. Species at Risk in Ontario (SARO) List, including provincial range maps. Accessed November 2021 at:
<https://www.ontario.ca/page/species-risk-ontario>
- Ministry of the Environment, Conservation and Parks. 2021. Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the Endangered Species Act, 2007. Queen's Printer for Ontario. December 2021 (Version 3). 21 pp.
- Municipality of Clarington. 2018. Municipality of Clarington Official Plan. June 2018 Office Consolidation. Available at: <https://www.clarington.net/en/do-business/current-official-plan.asp>
- Ontario Nature. 2019. Reptiles and Amphibians of Ontario. Ontario Reptile and Amphibian Atlas.
http://www.ontarionature.org/protect/species/reptiles_and_amphibians/index.php
- Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.
- Species at Risk Act. 2002. Species at Risk Act (S.C. 2002, c. 29) Accessed November 2021 at: <https://laws.justice.gc.ca/eng/acts/S-15.3/>
- Stanfield, L. (Editor) 2017. Ontario Stream Assessment Protocol. Version 10.0, Fish and Wildlife Branch. Ontario Ministry of Natural Resources. Peterborough, Ontario. 546 pp.
- Stantec. 2021a. Addendum to Oshawa to Bowmanville Service Expansion EPR: Tree Inventory Technical Report Draft. Prepared by Stantec, dated October 5, 2021 (Project Number: 165011019).
- Stantec. 2021b. Addendum to Oshawa to Bowmanville Service Expansion EPR: Arborist Report Draft. Prepared by Stantec, dated July 19, 2021 (Project Number: 165011019).
- Toronto Entomologists' Association. 2021. Ontario Insect Atlas database review as published by the Toronto Entomologists' Association. Retrieved November 2021 from <https://www.ontarioinsects.org/atlas/>
- Toronto and Region Conservation Authority and Credit Valley Conservation. 2014. Evaluation, Classification and Management of Headwater Drainage Features



Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Natural Environment Technical Report

References

September 26, 2023

Guideline. Toronto and Region Conservation Authority and Credit Valley Conservation, TRCA Approval July 2013 (Finalized January 2014).

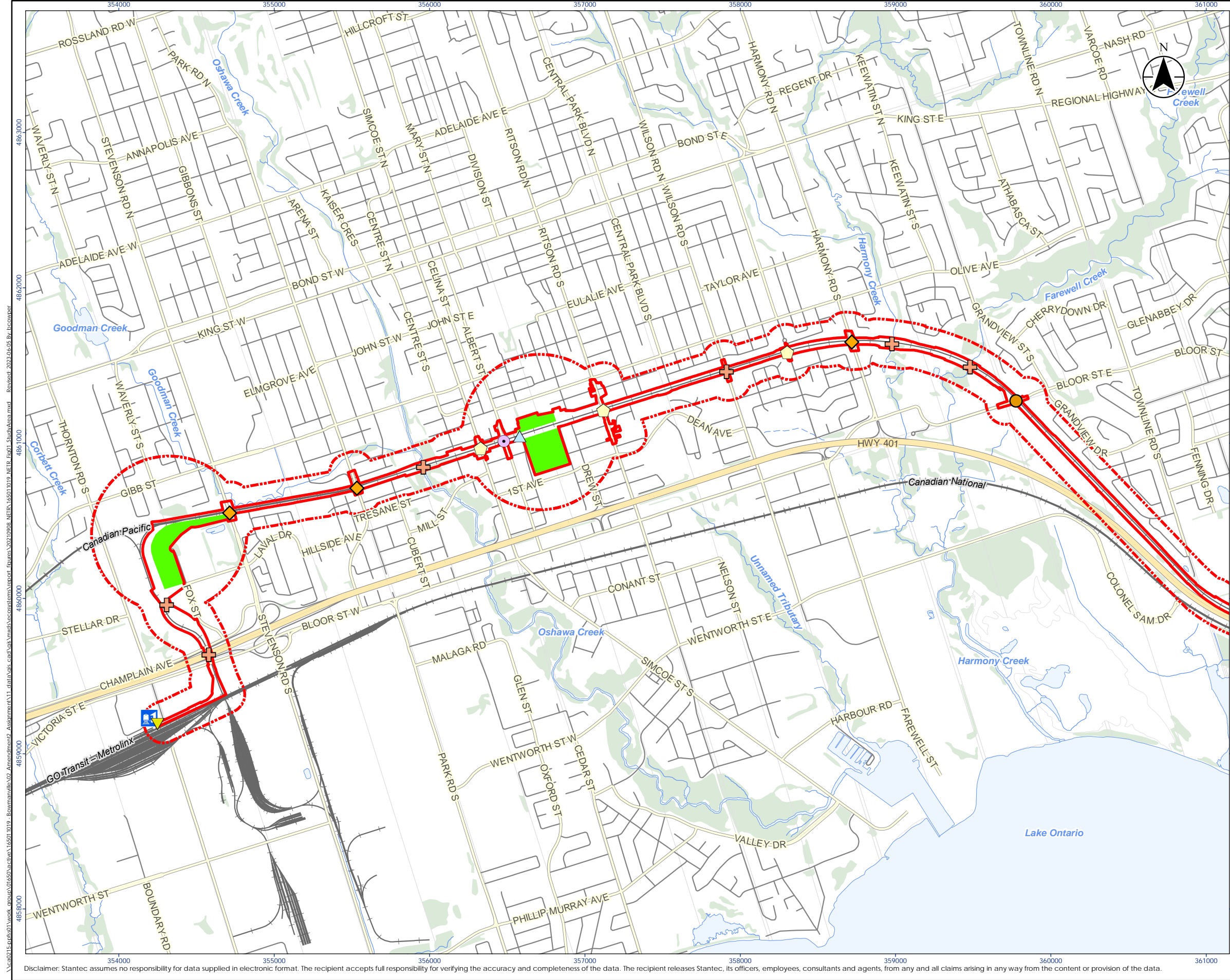
Toronto and Region Conservation Authority. 2019. Erosion and Sediment Control Guide for Urban Construction. Available online: https://s3-ca-central-1.amazonaws.com/trcaca/app/uploads/2020/01/30145157/ESC-Guide-for-Urban-Construction_FINAL.pdf



Appendix A

Figures

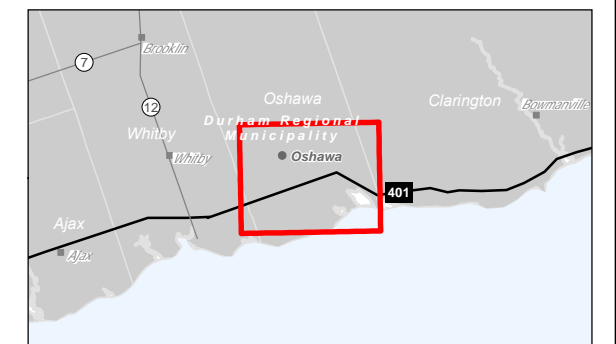




- Legend
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Existing Durham College Oshawa GO Station
 - Proposed Pedestrian Bridge Extension
 - Proposed New Bridge
 - Proposed Bridge Replacement
 - Proposed Bridge Removal
 - Proposed New Multi-Use Grade-Separated Crossing
 - Proposed Upgrades to At-Grade Crossing
 - Proposed Bridge Expansion
 - Highway
 - Major Road
 - Minor Road
 - Railway
 - Watercourse (Intermittent)
 - Watercourse (Permanent)
 - Waterbody
 - Wooded Area
 - Lot

0 1 km
1:25,000 (At original document size of 11x17)

- Notes
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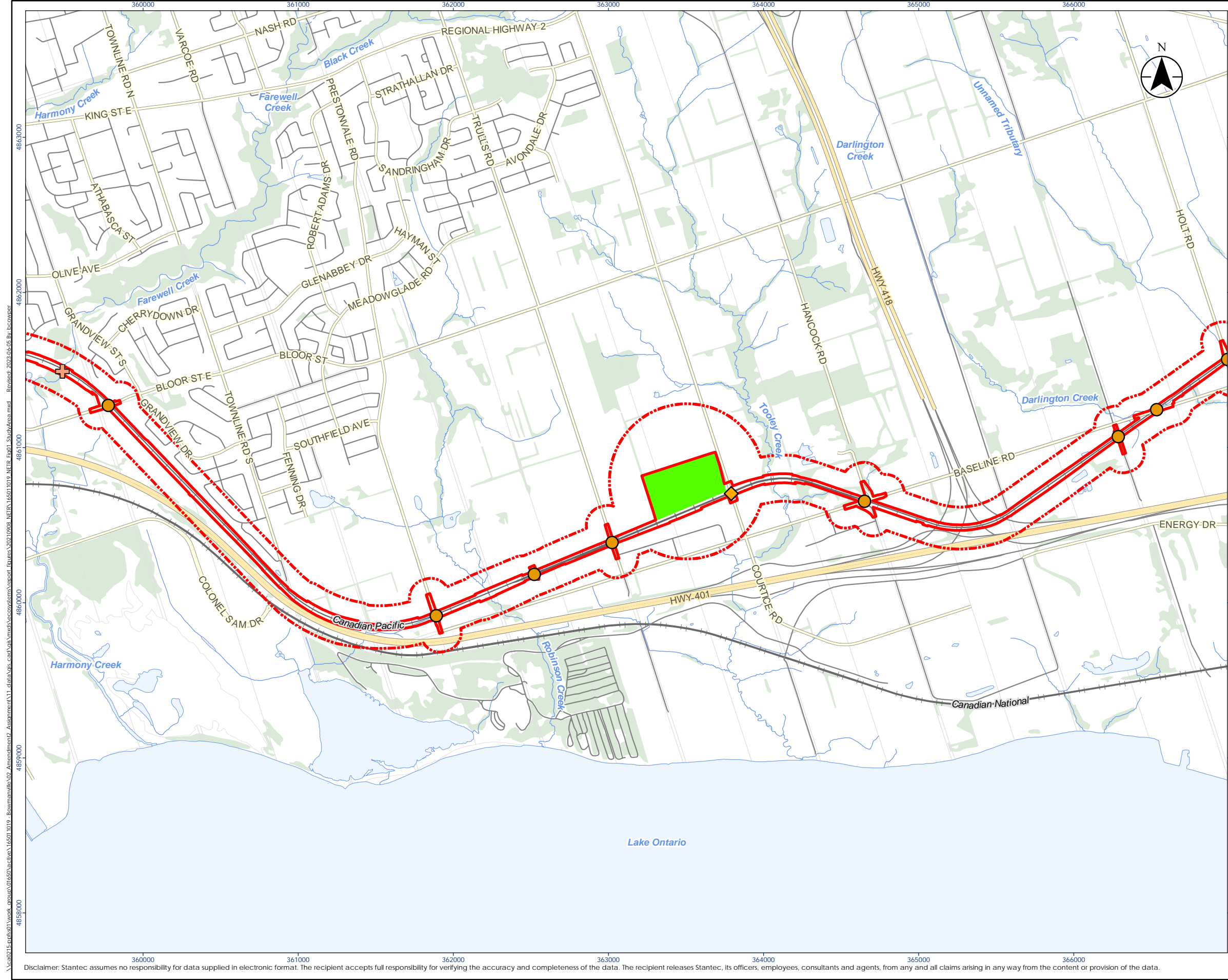
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Regional Municipality
of Durham

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Prepared by BCC on 2023-06-05

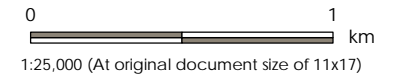
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION
PROJECT

Figure No.
1.1

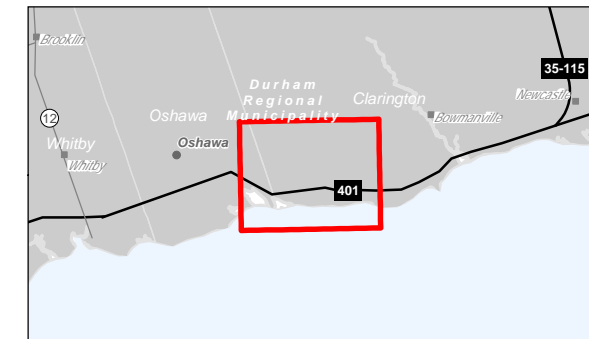
Title
Project Footprint and Study Area



- Legend
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Proposed New Bridge
 - Proposed Upgrades to At-Grade Crossing
 - Proposed Bridge Expansion
 - Highway
 - Major Road
 - Minor Road
 - Railway
 - Watercourse (Intermittent)
 - Watercourse (Permanent)
 - Waterbody
 - Wooded Area
 - Lot



- Notes
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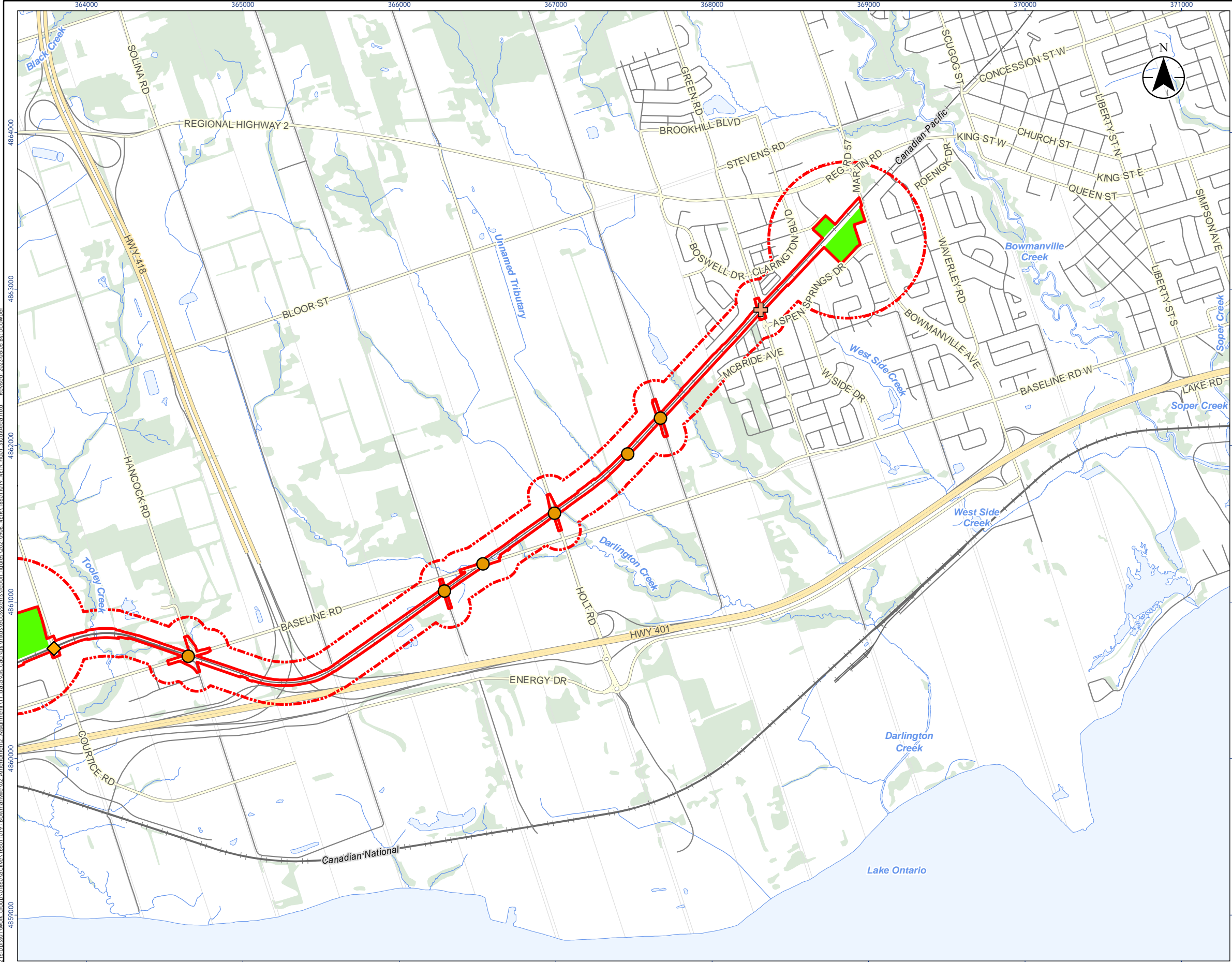
Project Location
Regional Municipality of Durham

165011019 REV4
Prepared by BCC on 2023-06-05

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2

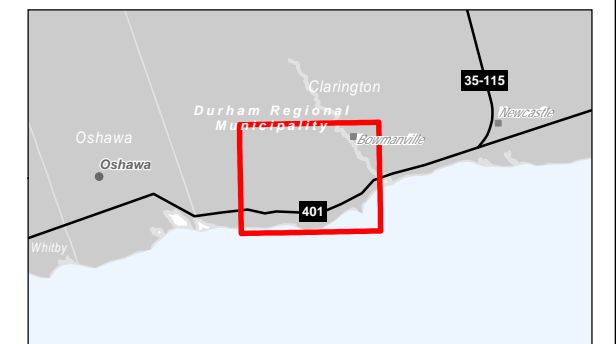
Title
Project Footprint and Study Area



- Legend
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Proposed New Bridge
 - Proposed Upgrades to At-Grade Crossing
 - Proposed Bridge Expansion
 - Highway
 - Major Road
 - Minor Road
 - Railway
 - Watercourse (Intermittent)
 - Watercourse (Permanent)
 - Waterbody
 - Wooded Area
 - Lot

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- Notes
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Project Location
Regional Municipality of Durham

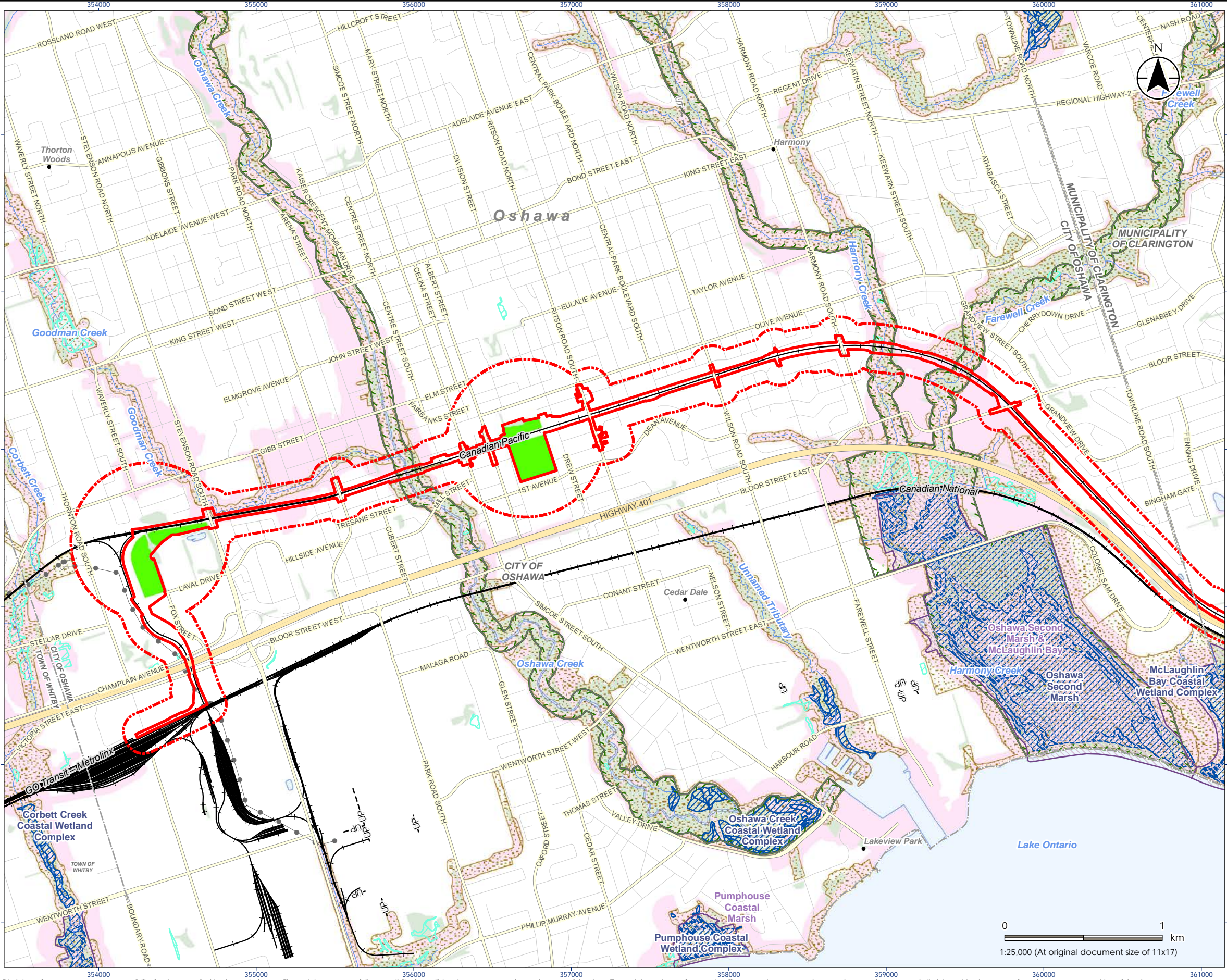
165011019 REV4
Prepared by BCC on 2023-06-05

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.3

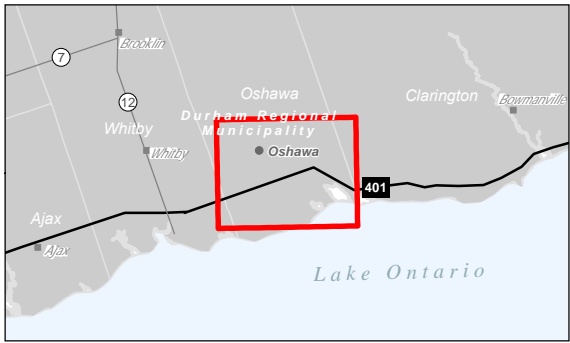
Title
Project Footprint and Study Area

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- Legend
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Railway
 - Hydro Line
 - Unknown Pipeline
 - Unknown Transmission Line
 - Watercourse (Intermittent)
 - Watercourse (Permanent)
 - ANSI, Life Science
 - Candidate ANSI, Life Science
 - Waterbody
 - Wetland, Provincially Significant
 - Wetland, Not evaluated per OWES
 - Wooded Area
 - Greenbelt Natural Heritage System
 - Natural Heritage System (CLOCA)
 - Regulated Area (CLOCA)
 - Municipal Boundary, Lower

- Notes
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Project Location
Regional Municipality of Durham

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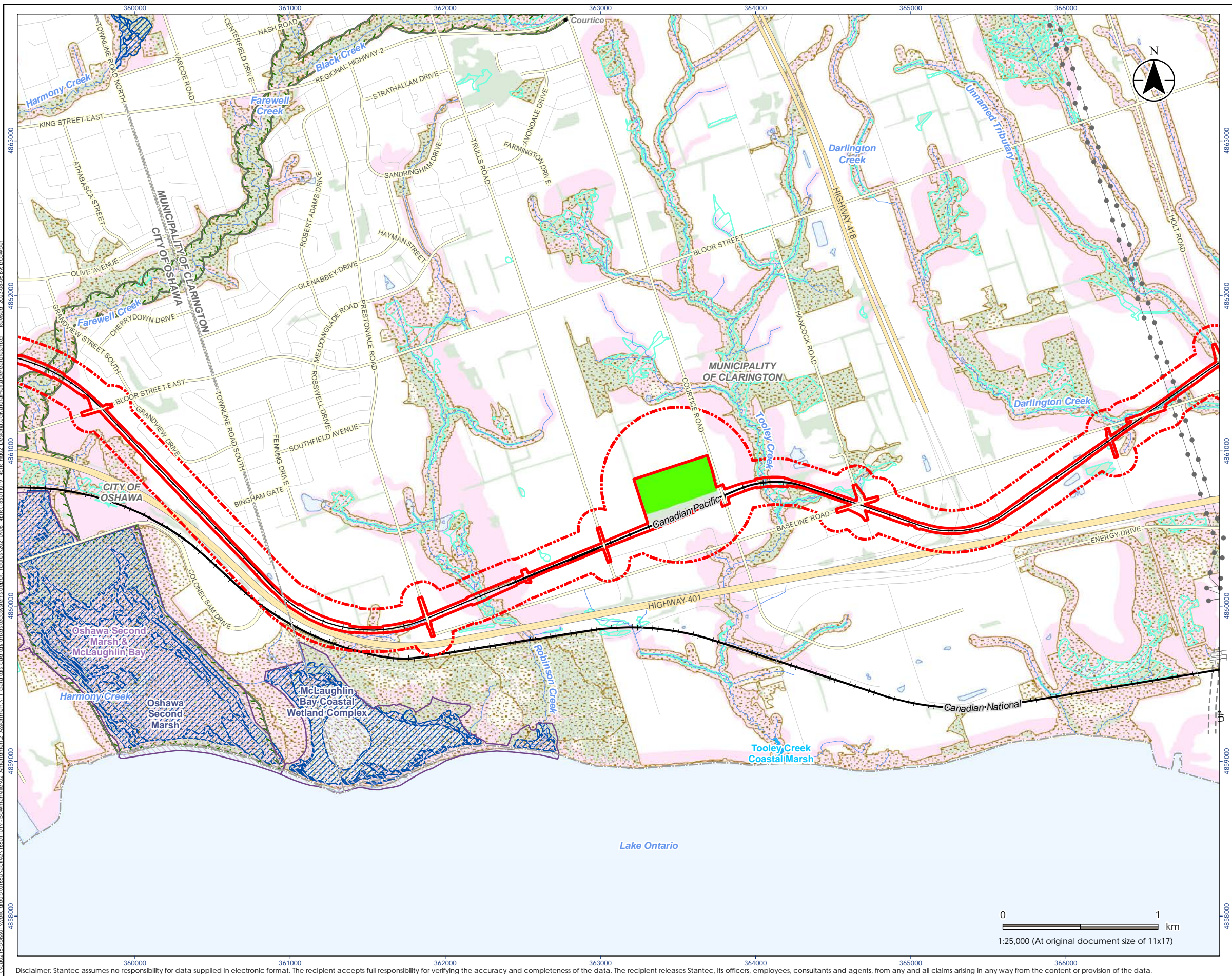
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1

Title
Designated Areas: Natural Heritage

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Legend

- Project Footprint
- Study Area Boundary (120 - 500 m radius from Project Footprint)
- Proposed GO Station Location
- Railway
- Hydro Line
- Unknown Transmission Line
- Watercourse (Intermittent)
- Watercourse (Permanent)
- ANSI, Life Science
- Candidate ANSI, Life Science
- Waterbody
- Wetland, Provincially Significant
- Wetland, Other Evaluated
- Wetland, Not evaluated per OWES
- Wooded Area
- Greenbelt Natural Heritage System
- Natural Heritage System (CLOCA)
- Regulated Area (CLOCA)
- Municipal Boundary, Lower

Notes

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Project Location

Regional Municipality of Durham

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Client/Project

METROLINX

OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

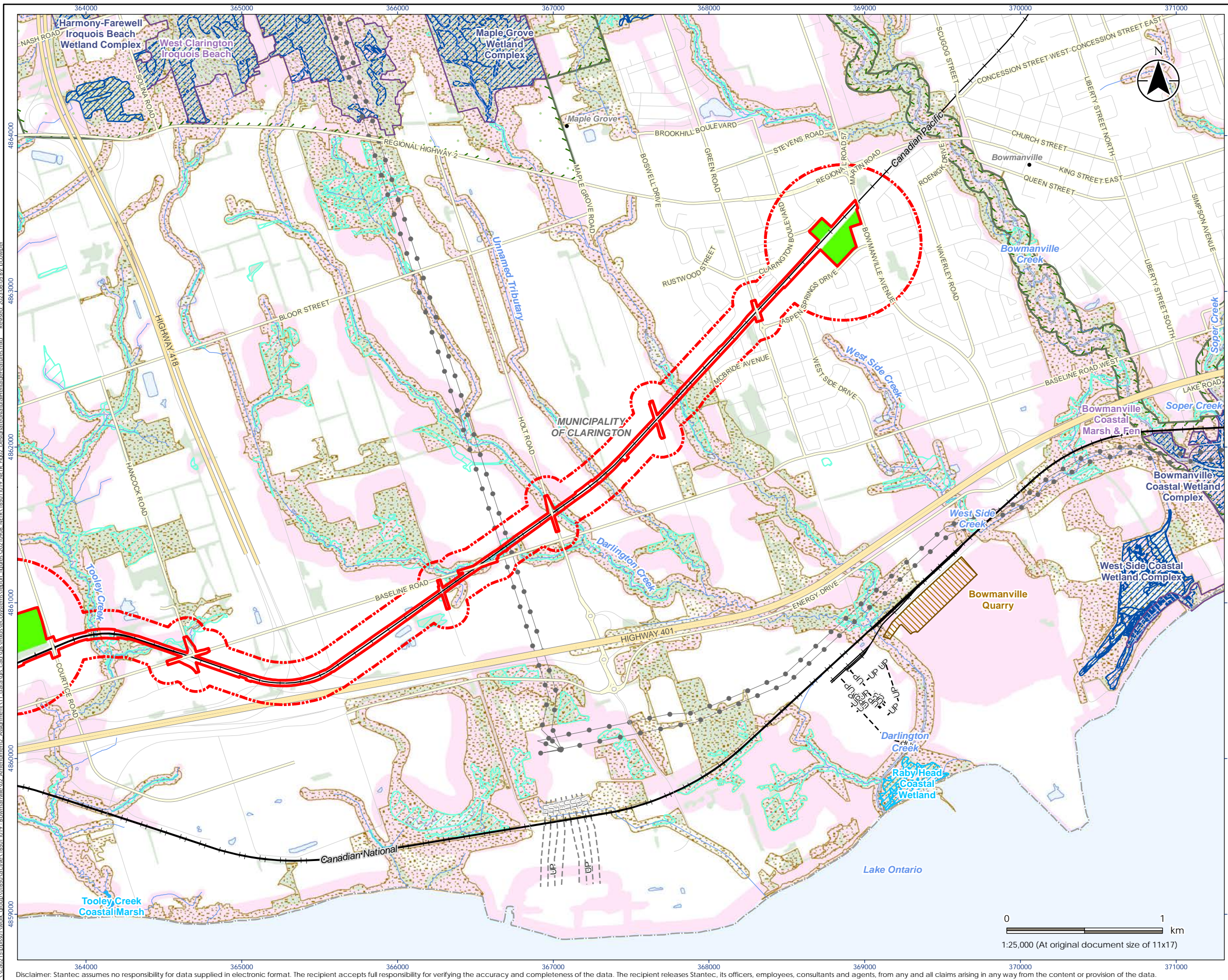
Figure No.

2.2

Title

Designated Areas: Natural Heritage

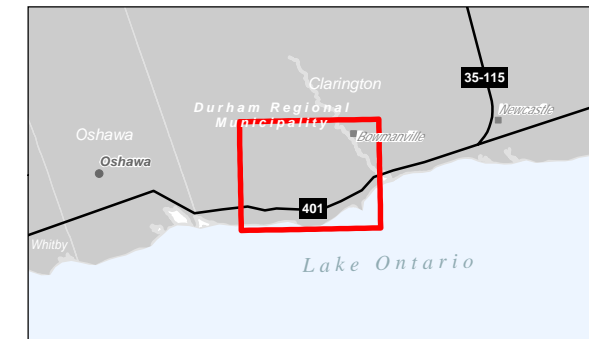
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- Legend
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Railway
 - Hydro Line
 - Unknown Pipeline
 - Unknown Transmission Line
 - Watercourse (Intermittent)
 - Watercourse (Permanent)
 - ANSI, Earth Science
 - Candidate ANSI, Life Science
 - Waterbody
 - Wetland, Provincially Significant
 - Wetland, Other Evaluated
 - Wetland, Not evaluated per OWES
 - Wooded Area
 - Greenbelt Natural Heritage System
 - Natural Heritage System (CLOCA)
 - Regulated Area (CLOCA)
 - Municipal Boundary, Lower

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Regional Municipality of Durham

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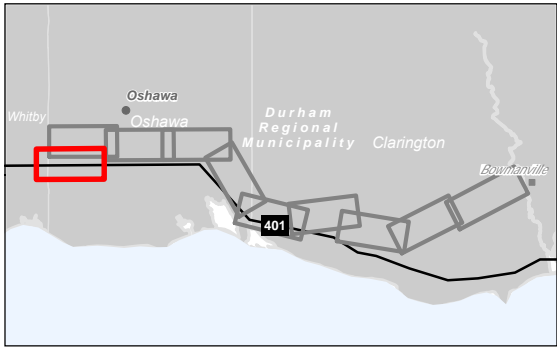
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.3

Title
Designated Areas: Natural Heritage

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- Legend**
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Railway
 - Hydro Line
 - Watercourse (Permanent)
 - Thermal Regime, Warm
 - Wetland, Not evaluated per OWES
 - Wooded Area
 - Regulated Area (CLOCA)

Notes

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Project Location
Regional Municipality
of Durham

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Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

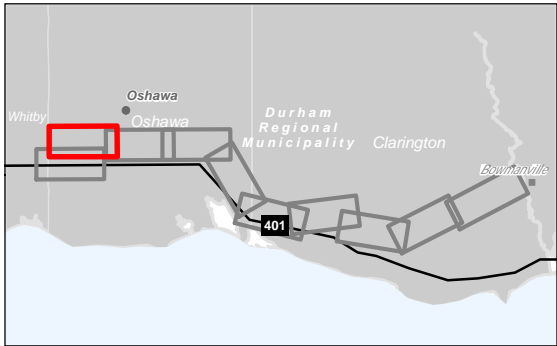
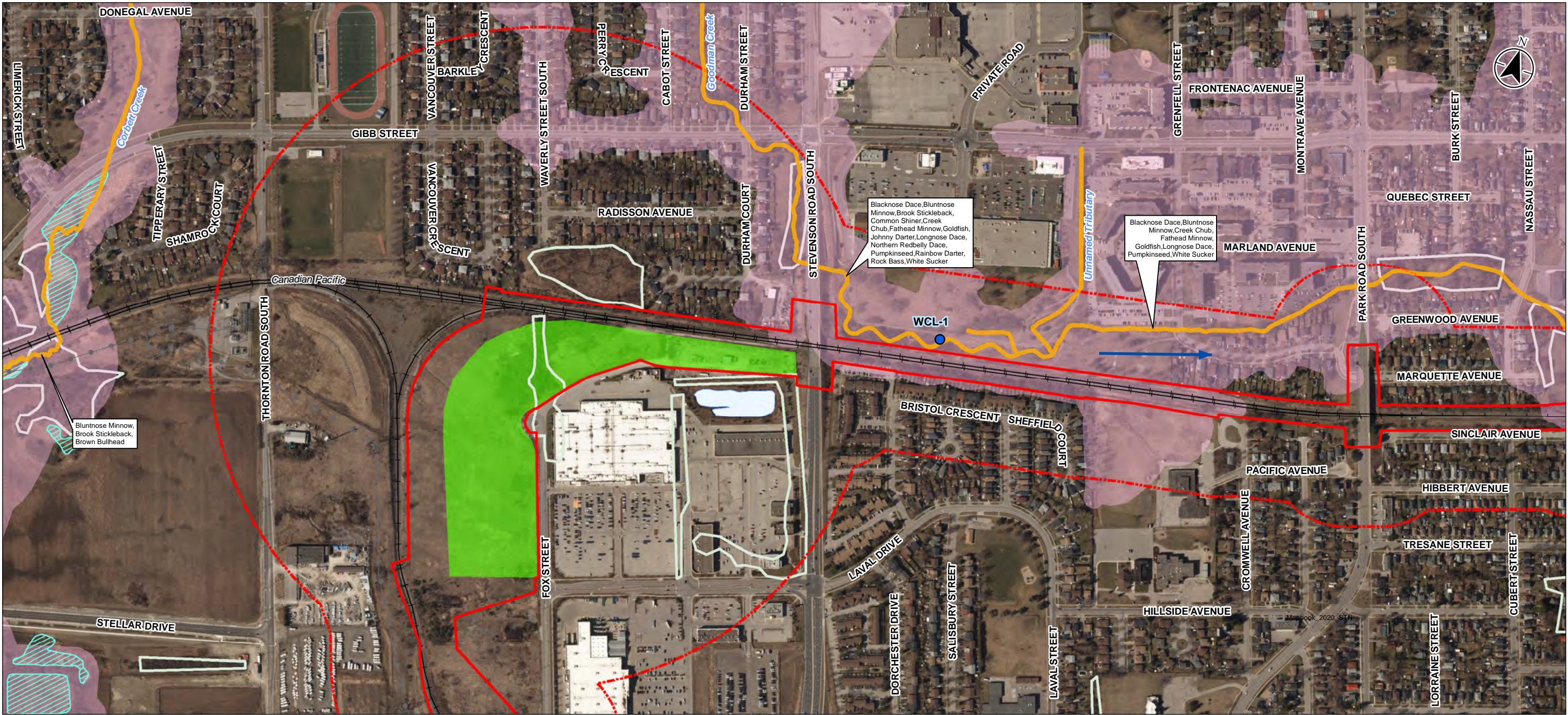
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3.1

Title
Aquatic Existing Conditions

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- Legend**
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Water Crossing
 - Railway
 - Hydro Line
 - Water Flow Direction
 - Watercourse (Permanent)
 - Thermal Regime, Warm
 - Waterbody
 - Wetland, Not evaluated per OWES
 - Wooded Area
 - Regulated Area (CLOCA)

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Project Location
Regional Municipality of Durham

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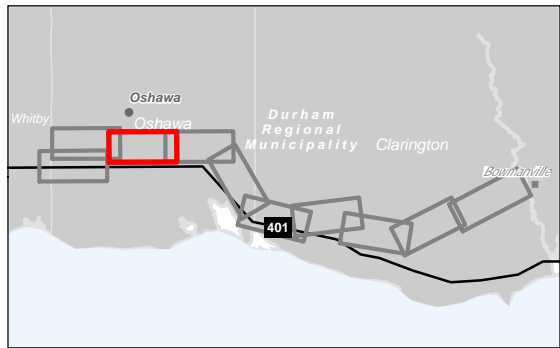
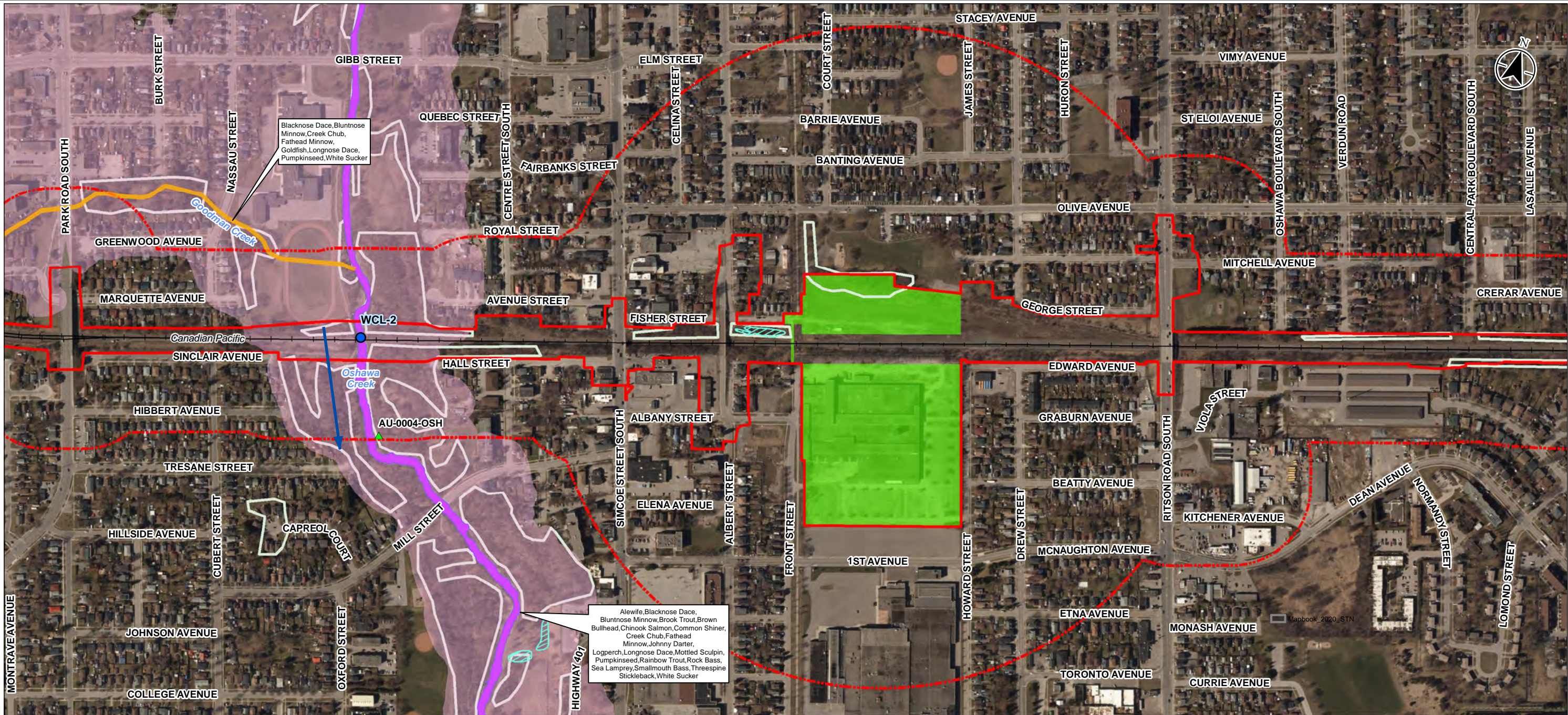
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

Figure No.
3.2

Title
Aquatic Existing Conditions

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Metres
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Legend

- Project Footprint
- Study Area Boundary (120 - 500 m radius from Project Footprint)
- Proposed GO Station Location
- Fish Survey Point (ARA)
- Water Crossing
- Railway
- Water Flow Direction
- Watercourse (Permanent)
- Thermal Regime, Warm
- Thermal Regime, Cold
- Waterbody
- Wetland, Not evaluated per OWES
- Wooded Area
- Regulated Area (CLOCA)

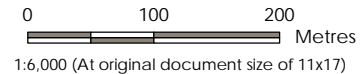


Project Location
Regional Municipality of Durham
165011019 REV4
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Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

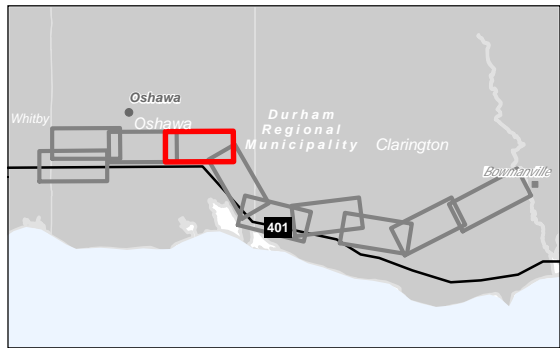
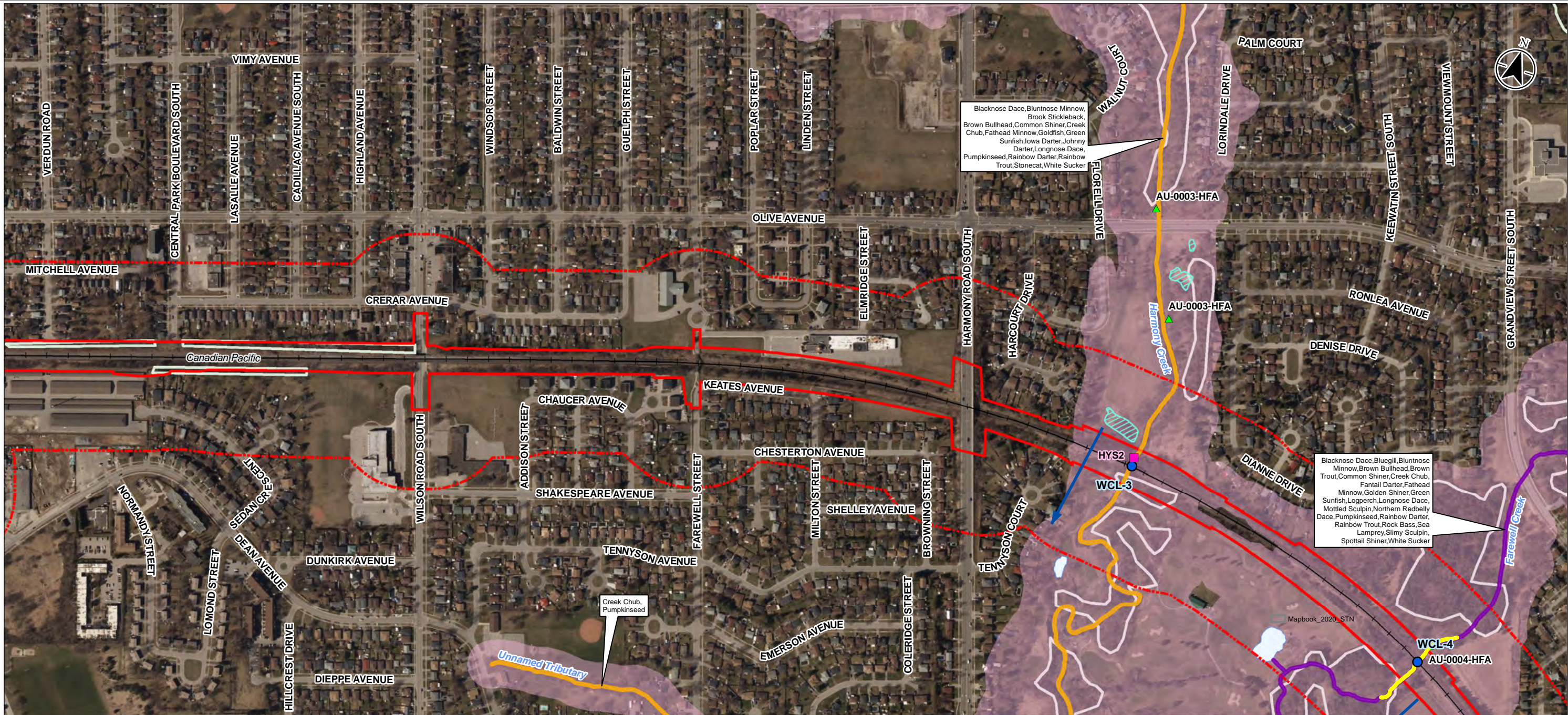
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Title
Aquatic Existing Conditions



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- Legend**
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Fish Survey Point (ARA)
 - Fish Data
 - Water Crossing
 - Fish Community Field Study Limits (Stantec 2023)
 - Railway
 - Water Flow Direction
 - Watercourse (Intermittent)
 - Watercourse (Permanent)
 - Thermal Regime, Cold
 - Thermal Regime, Warm
 - Waterbody

- Wetland, Not evaluated per OWES
- Wooded Area
- Regulated Area (CLOCA)



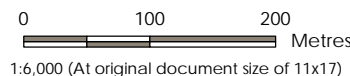
Project Location
Regional Municipality of Durham

165011019 REV4
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Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

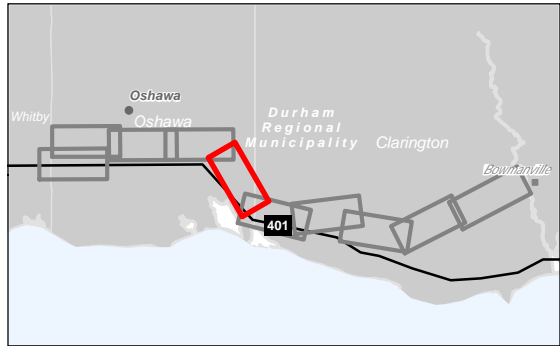
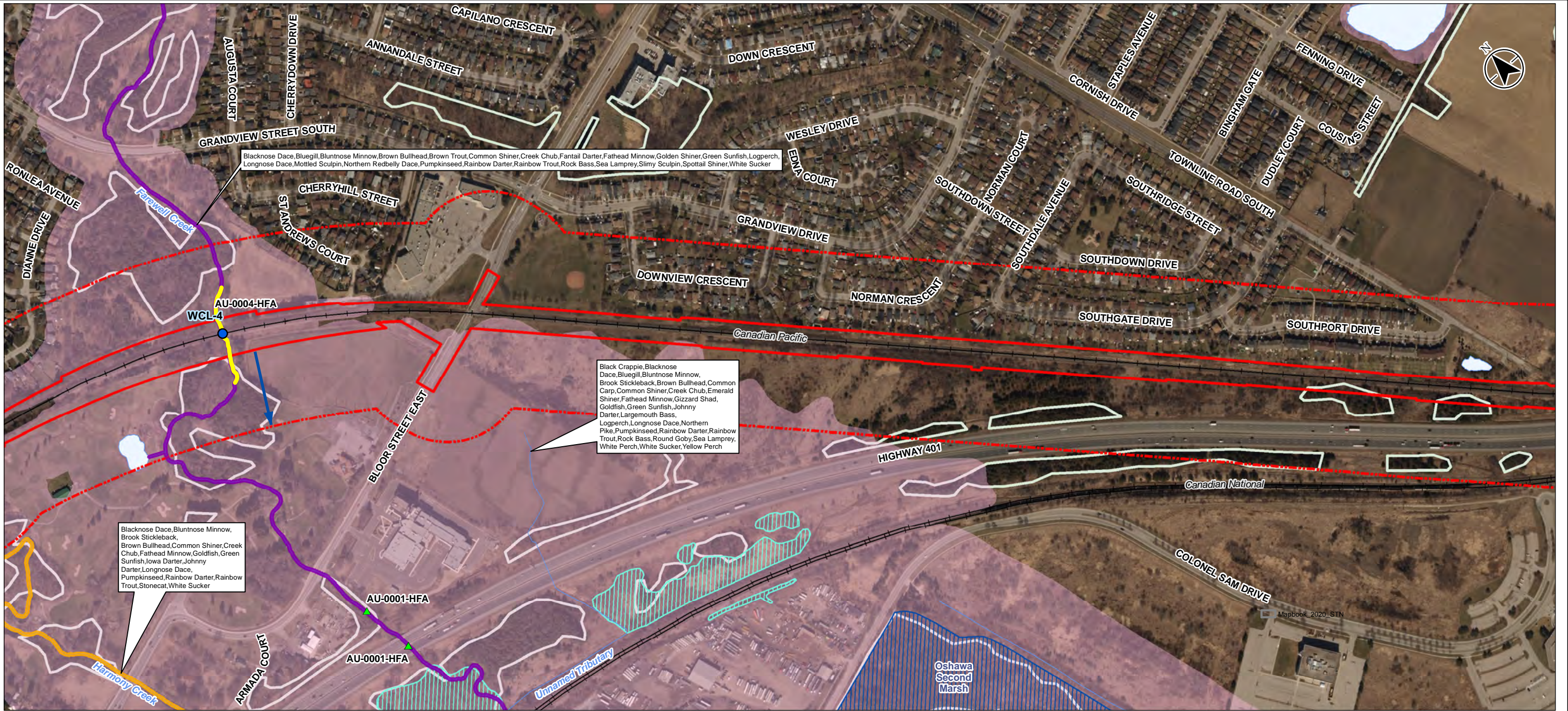
Figure No.
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Title
Aquatic Existing Conditions



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Revised: 2023-09-25 By: bcooper



- Legend**
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Fish Survey Point (ARA)
 - Water Crossing
 - Fish Community Field Study Limits (Stantec 2023)
 - Railway
 - Water Flow Direction
 - Watercourse (Permanent)
 - Thermal Regime, Cold
 - Thermal Regime, Warm
 - Waterbody
 - Wetland, Provincially Significant
 - Wetland, Not evaluated per OWES
 - Wooded Area
 - Regulated Area (CLOCA)

Notes

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Project Location
Regional Municipality of Durham

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Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

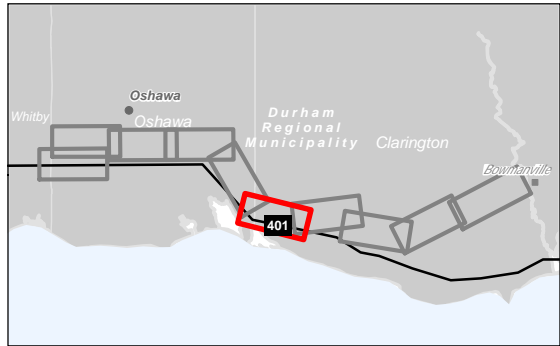
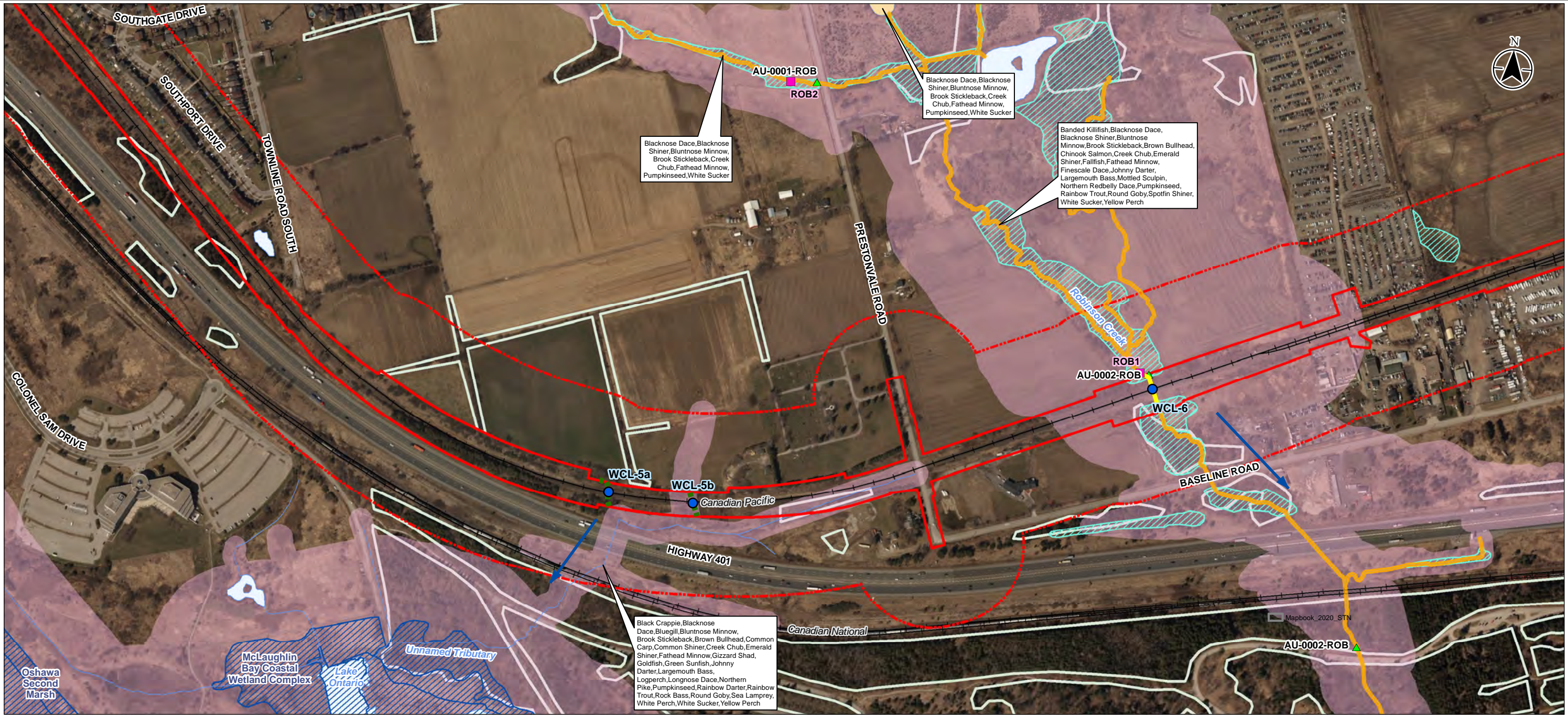
Figure No.
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Title
Aquatic Existing Conditions

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Notes

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Legend

- Project Footprint
- Study Area Boundary (120 - 500 m radius from Project Footprint)
- Fish Survey Point (ARA)
- Fish Data
- Water Crossing
- HDF Assessment Field Study Limits (Stantec 2023)
- Fish Community Field Study Limits (Stantec 2023)
- Railway
- Water Flow Direction
- Watercourse (Permanent)
- Thermal Regime, Warm
- Thermal Regime, Warm
- Waterbody

- Wetland, Provincially Significant
- Wetland, Not evaluated per OWES
- Wooded Area
- Regulated Area (CLOCA)

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Metres
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Project Location
Regional Municipality
of Durham

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Prepared by BCC on 2023-09-25

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

Figure No.

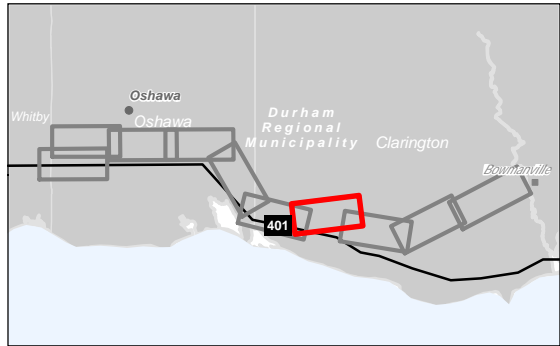
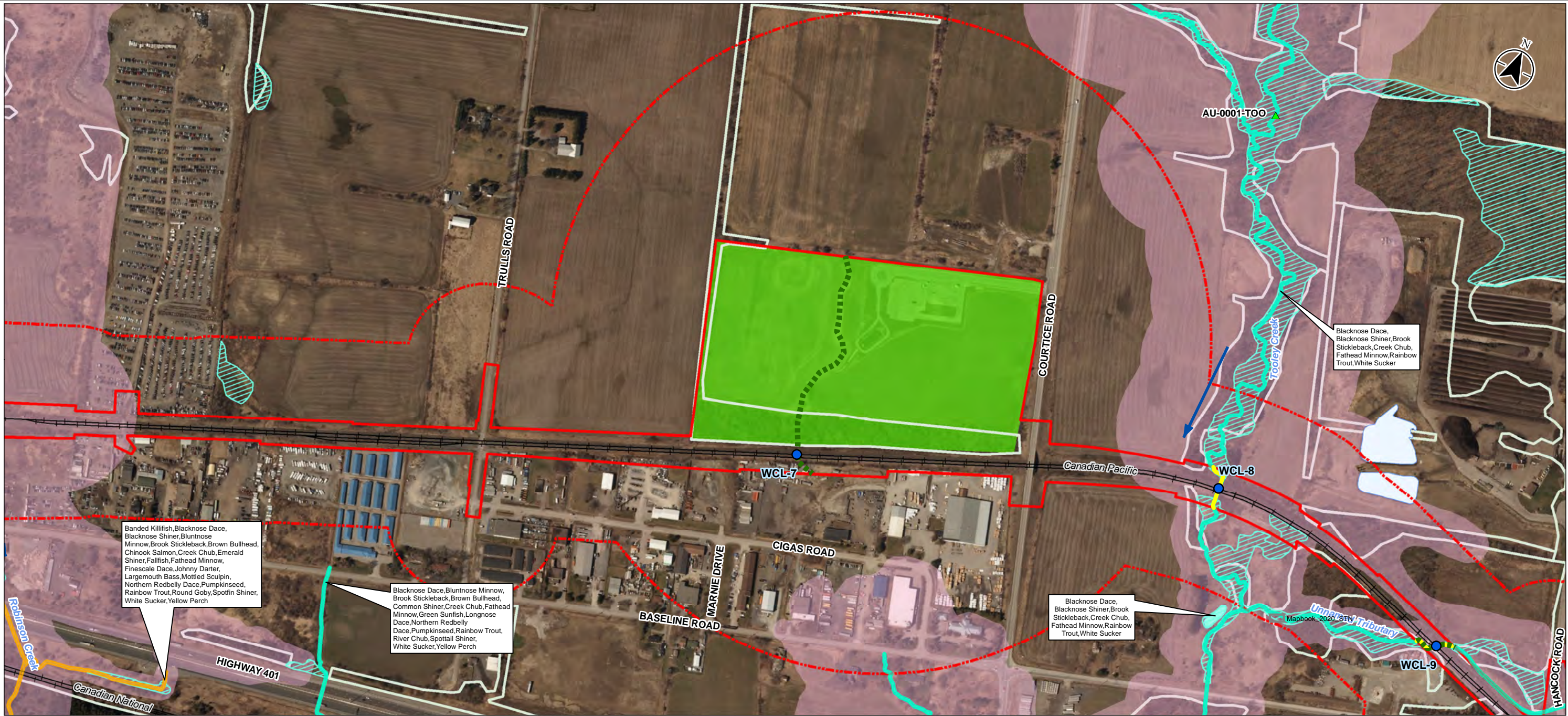
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Title

Aquatic Existing Conditions

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- Legend**
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Proposed GO Station Location
 - Fish Survey Point (ARA)
 - Water Crossing
 - HDF Assessment Field Study Limits (Stantec 2023)
 - Fish Community Field Study Limits (Stantec 2023)
 - Railway
 - Water Flow Direction
 - Watercourse (Permanent)
 - Thermal Regime, Cool
 - Thermal Regime, Warm
 - Thermal Regime, Cool

- Waterbody**
- Waterbody
 - Wetland, Not evaluated per OWES
 - Wooded Area
 - Regulated Area (CLOCA)



Project Location
Regional Municipality
of Durham

165011019 REV4
Prepared by BCC on 2023-09-25

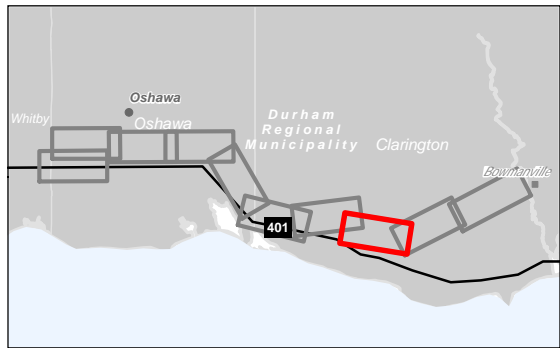
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

Figure No.
3.7

Title
Aquatic Existing Conditions

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Metres
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Notes

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Legend

- Project Footprint
- Study Area Boundary (120 - 500 m radius from Project Footprint)
- Water Crossing
- HDF Assessment Field Study Limits (Stantec 2023)
- Fish Community Field Study Limits (Stantec 2023)
- Railway
- Water Flow Direction
- Watercourse (Permanent)
- Thermal Regime, Cool
- Thermal Regime, Warm
- Thermal Regime, Cool
- Waterbody
- Wetland, Not evaluated per OWES

- Wooded Area
- Regulated Area (CLOCA)

0 100 200
Metres
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Project Location
Regional Municipality
of Durham
165011019 REV4
Prepared by BCC on 2023-09-25

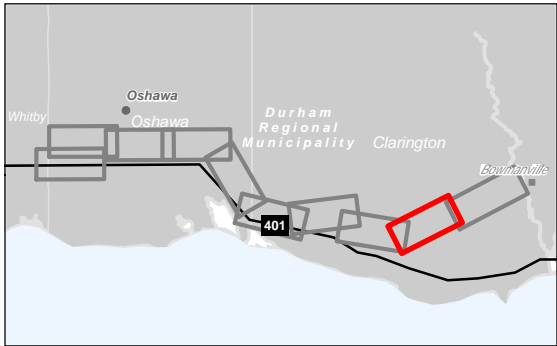
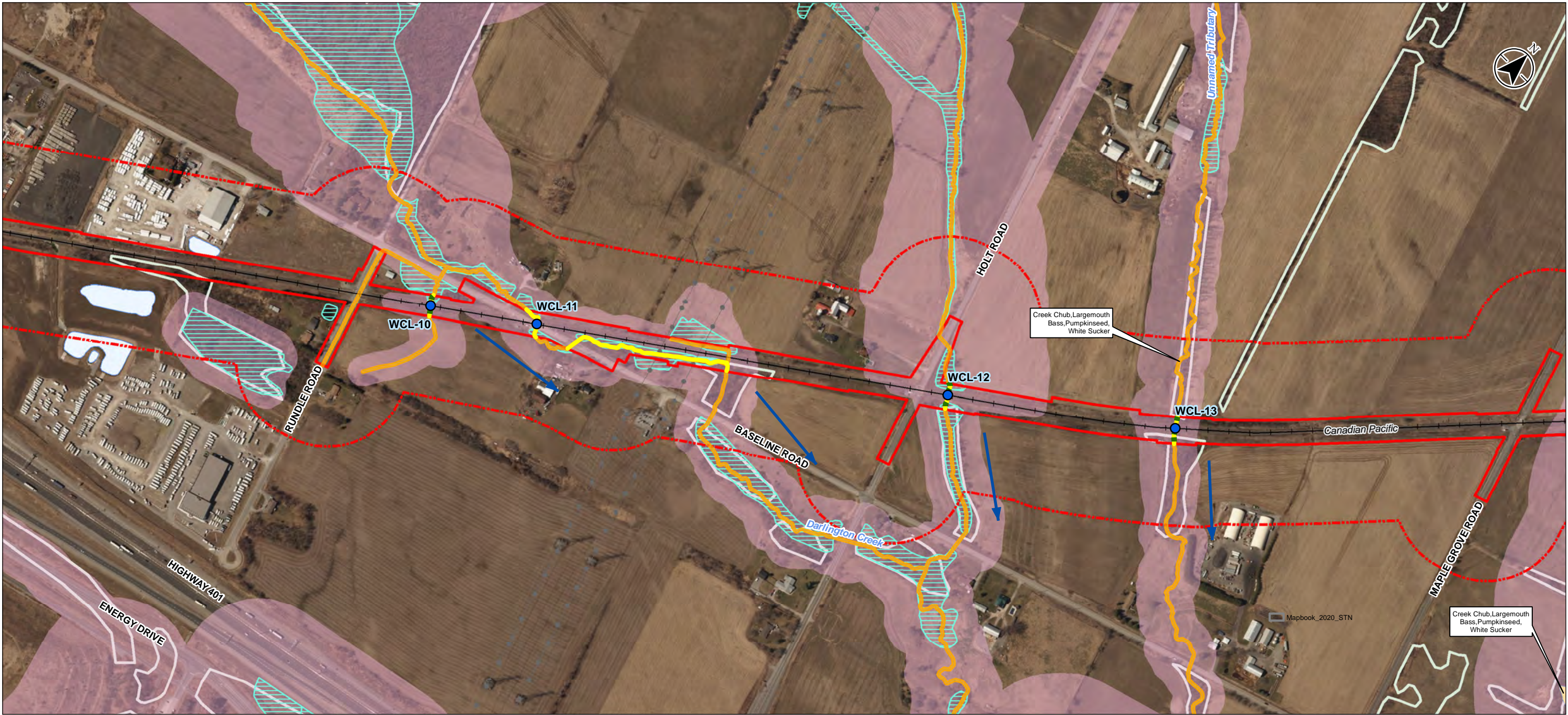
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

Figure No.
3.8

Title
Aquatic Existing Conditions

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- Legend**
- Project Footprint
 - Study Area Boundary (120 - 500 m radius from Project Footprint)
 - Water Crossing
 - HDF Assessment Field Study Limits (Stantec 2023)
 - Fish Community Field Study Limits (Stantec 2023)
 - Railway
 - Hydro Line
 - Water Flow Direction
 - Watercourse (Permanent)
 - Thermal Regime, Warm
 - Thermal Regime, Warm
 - Waterbody
 - Wetland, Not evaluated per OWES

- Wooded Area
- Regulated Area (CLOCA)

Notes

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Project Location
Regional Municipality
of Durham

165011019 REV4
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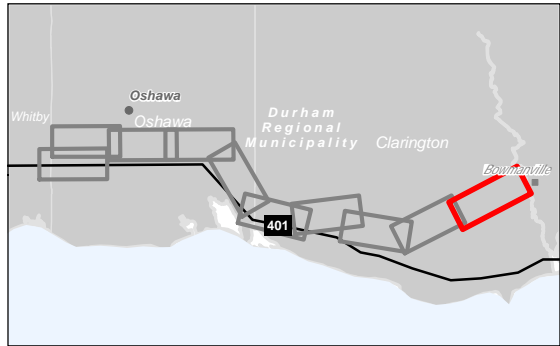
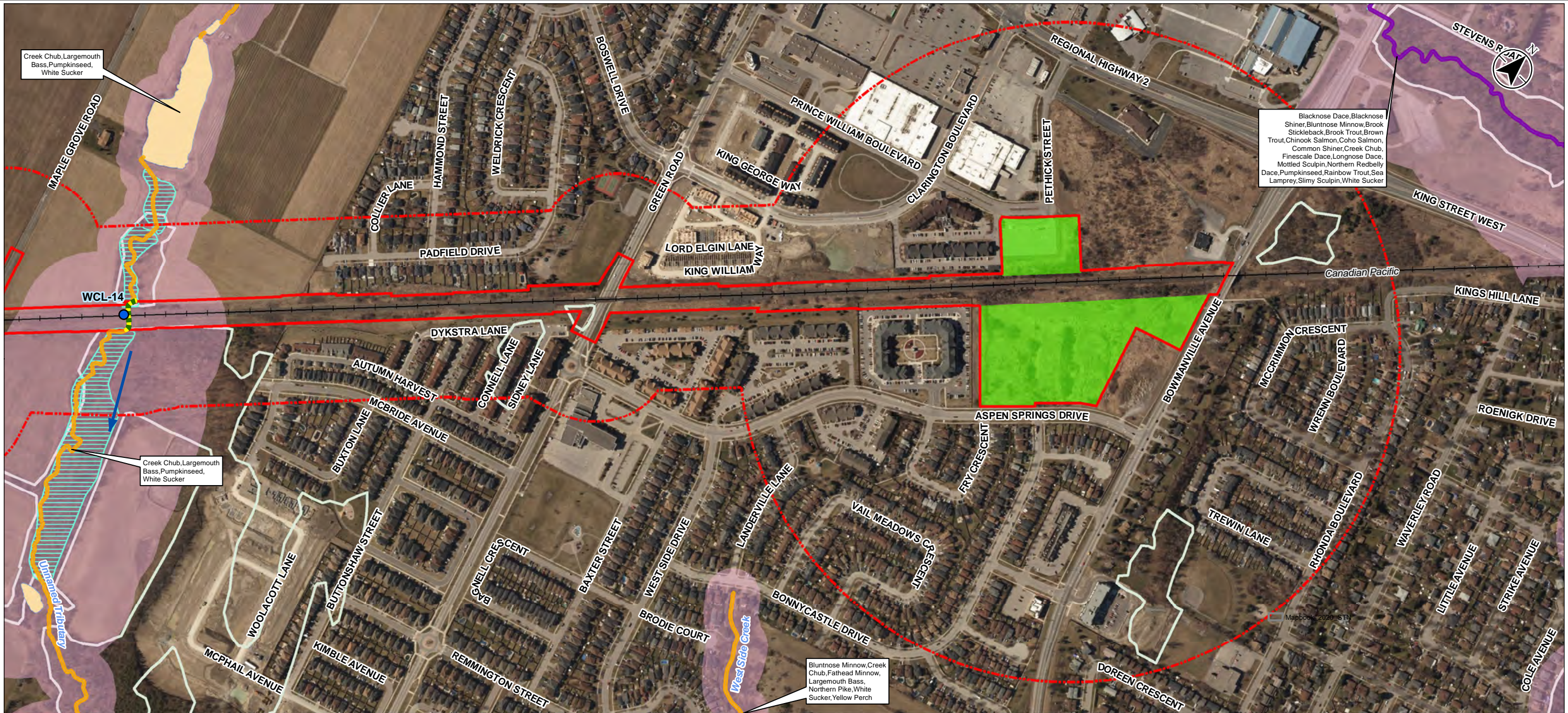
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

Figure No.
3.9

Title
Aquatic Existing Conditions

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Legend

- Project Footprint
- Study Area Boundary (120 - 500 m radius from Project Footprint)
- Proposed GO Station Location
- Water Crossing
- HDF Assessment Field Study Limits (Stantec 2023)
- Fish Community Field Study Limits (Stantec 2023)
- Railway
- Water Flow Direction
- Watercourse (Permanent)
- Thermal Regime, Cold
- Thermal Regime, Warm
- Waterbody

- Wetland, Not evaluated per OWES
- Wooded Area
- Regulated Area (CLOCA)

0 100 200
Metres
1:6,000 (At original document size of 11x17)



Project Location
Regional Municipality
of Durham

165011019 REV4
Prepared by BCC on 2023-09-25

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION

Figure No.

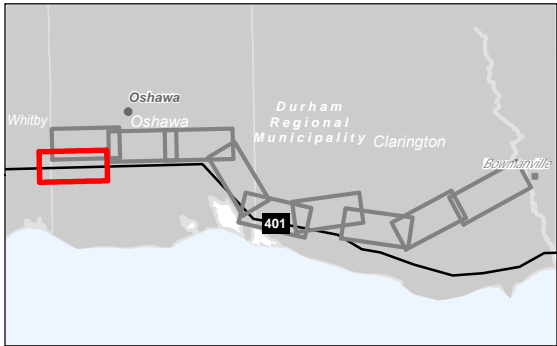
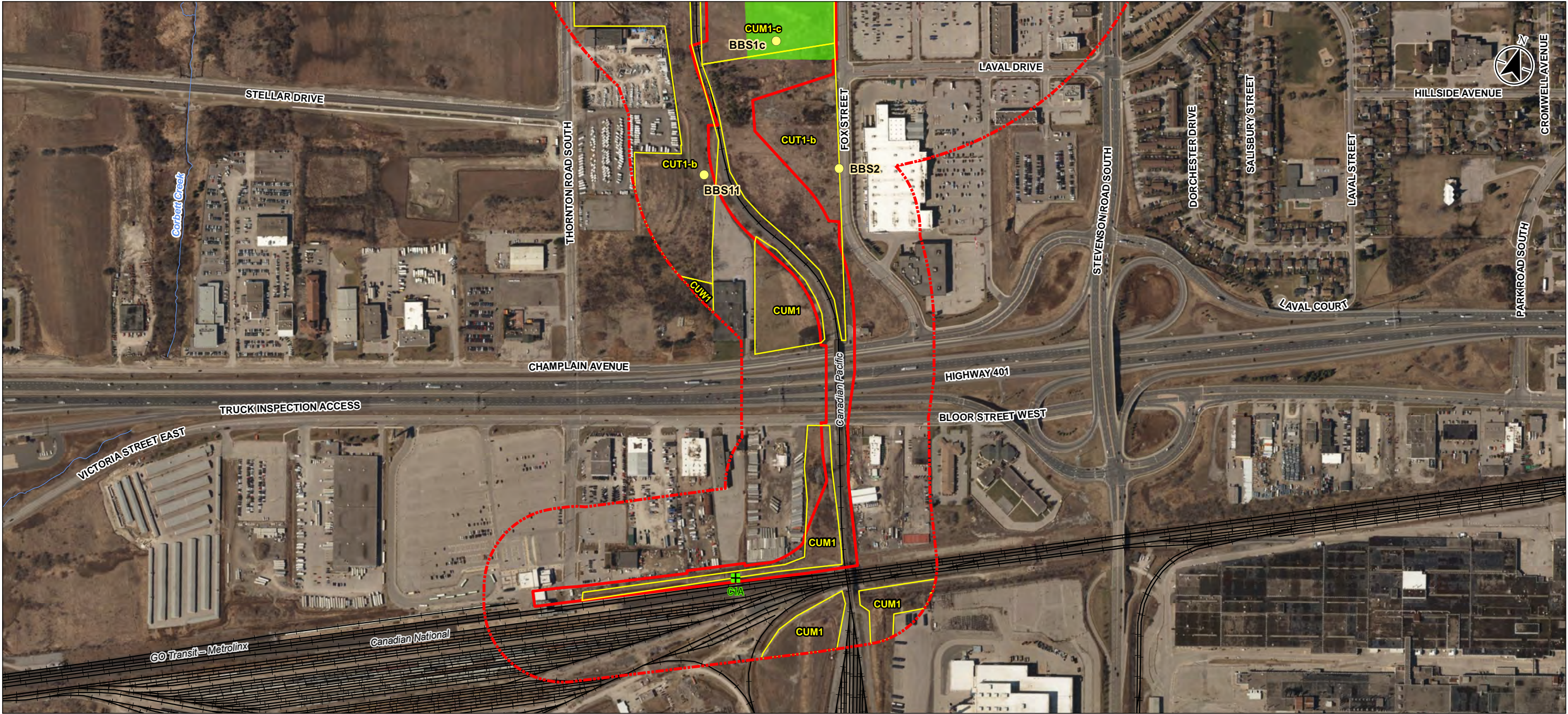
3.10

Title

Aquatic Existing Conditions

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Reviewed: 2023-09-26 By: bcooper



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Legend

- Project Footprint
- Study Area Boundary
- Proposed GO Station Location
- Railway
- Watercourse (Permanent)
- BBS (Breeding Bird Station)
- Proposed Culvert Replacement
- Proposed Culvert Removal
- ELC

ELC Description

- AG – Agriculture
- CUM1 – Mineral Cultural Meadow

- CUM1-c – Dry - Fresh Mixed Meadow
- CUT1-b – Dry - Fresh Deciduous Regeneration Thicket
- CUW1 – Mineral Cultural Woodland
- DEV – Development



Project Location
Regional Municipality
of Durham

165011019 REVA
Prepared by BCC on 2023-09-26

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE
EXTENSION PROJECT

Figure No.

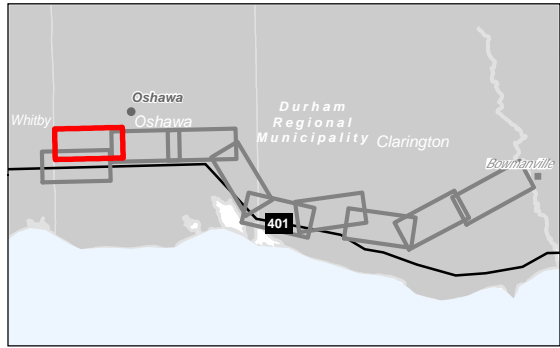
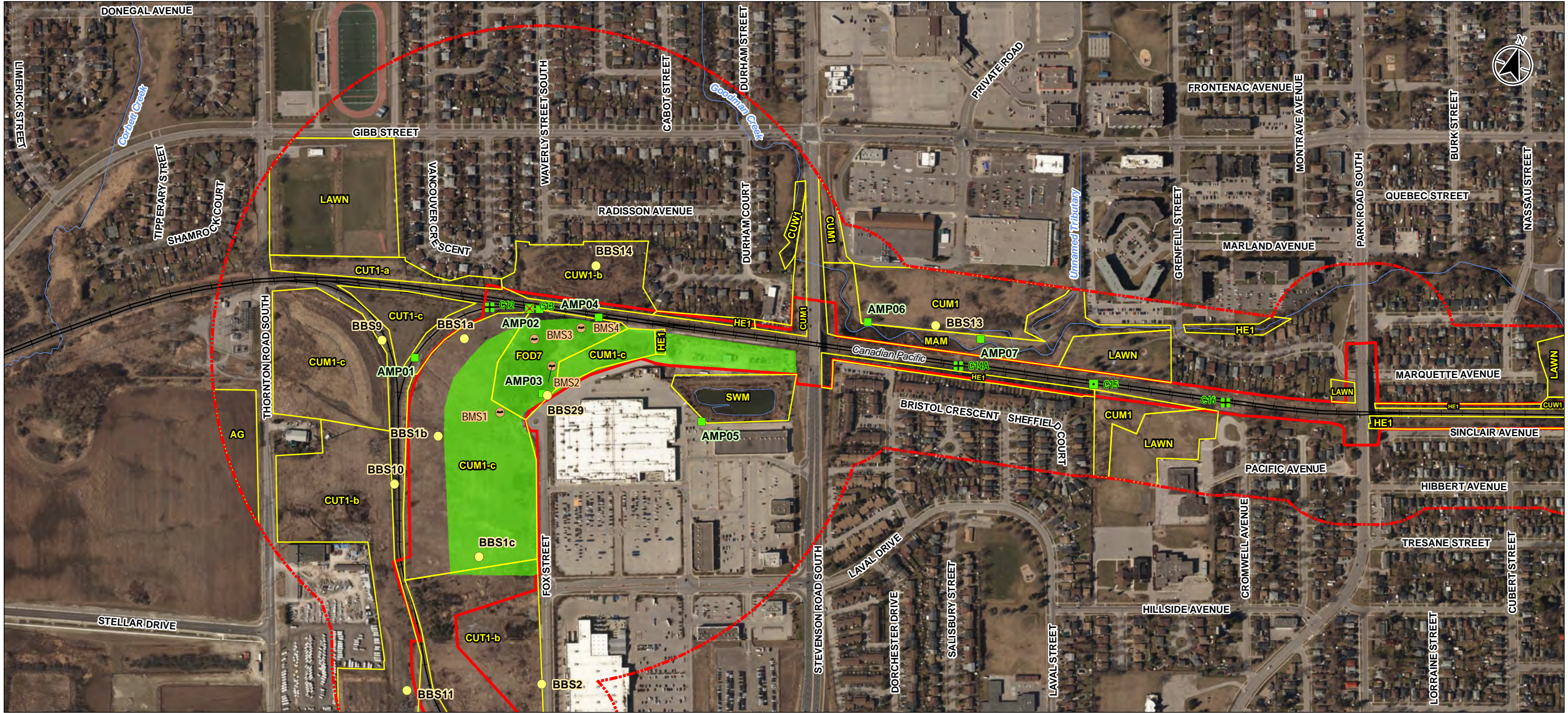
4.1

Title

Terrestrial Existing Conditions

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Metres
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Legend

- Project Footprint
- Study Area Boundary
- Proposed GO Station Location
- Railway
- Watercourse (Permanent)
- Waterbody
- AMP (Amphibian Call Station)
- BBS (Breeding Bird Station)
- BMS (Bat Monitoring Station)
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Proposed Culvert Removal

ELC

ELC Description

- AG – Agriculture
- CUM1 – Mineral Cultural Meadow
- CUM1-c – Dry - Fresh Mixed Meadow
- CUT1-a – Dry - Fresh Deciduous Shrub Thicket Ecosite
- CUT1-b – Dry - Fresh Deciduous Regeneration Thicket
- CUT1-c – Fresh - Moist White Cedar Coniferous Thicket Type
- CUW1 – Mineral Cultural Woodland
- CUW1-b – Fresh - Moist Deciduous Woodland Ecosite
- DEV – Development
- FOD7 – Fresh – Moist Lowland Deciduous Forest Ecosite

- HE1 – Treed Deciduous Hedgerow
- LAWN – Lawn
- MAM – Meadow Marsh
- SWM – Stormwater Management Pond



Project Location 165011019 REVA
Regional Municipality of Durham Prepared by BCC on 2023-09-26

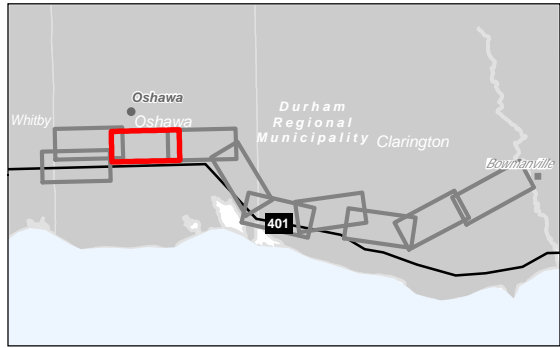
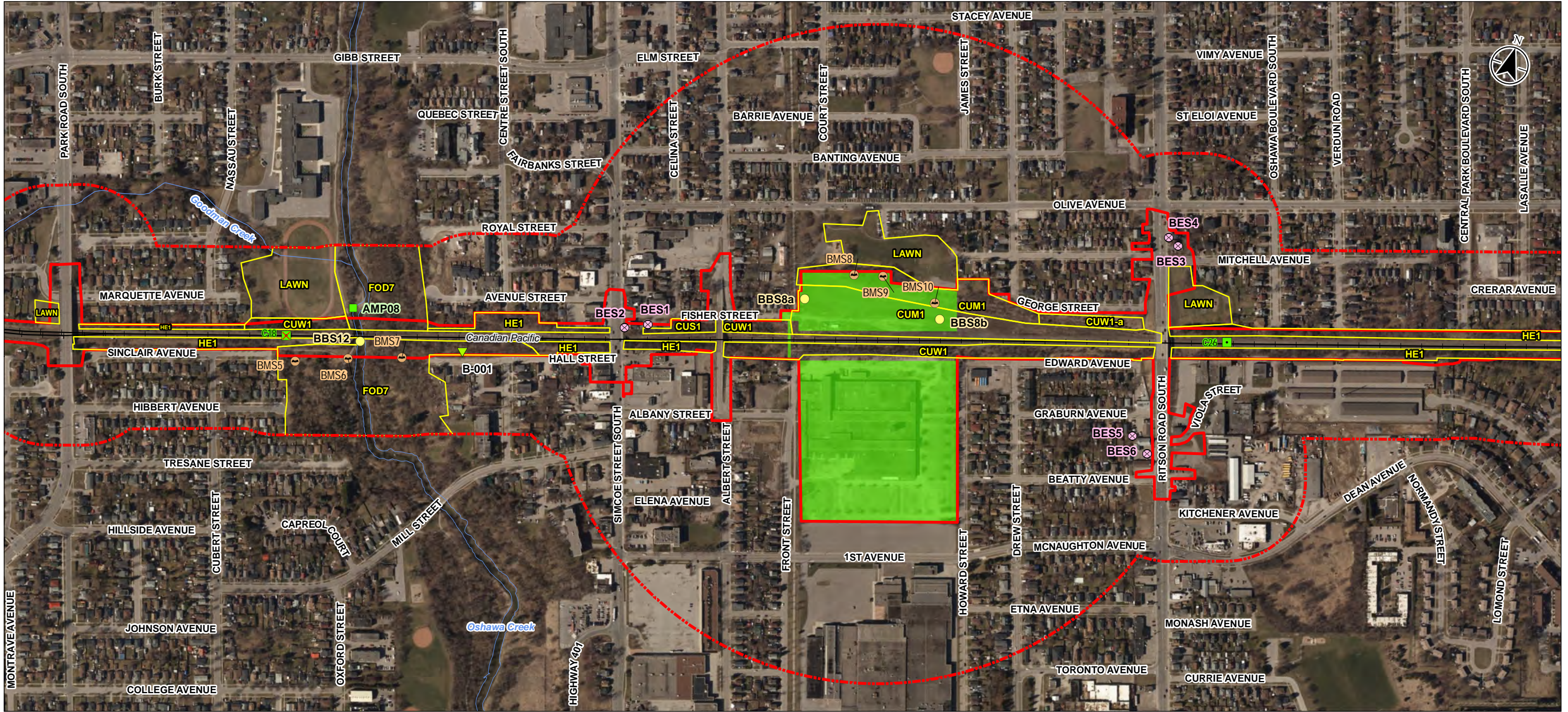
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE
EXTENSION PROJECT

Figure No.
4.2
Title
Terrestrial Existing Conditions

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Reviewed: 2023-09-26 By: bcooper



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Legend

- Project Footprint
- Study Area Boundary
- Proposed GO Station Location
- Railway
- Watercourse (Permanent)
- Waterbody
- Potential Butternut Location
- AMP (Amphibian Call Station)
- BBS (Breeding Bird Station)
- BMS (Bat Monitoring Station)
- BES (Bat Exit Survey) (Stantec 2023)
- Proposed Culvert Modification

- Proposed Culvert Replacement
- Proposed Culvert Removal
- ELC

ELC Description

- CUM1 – Mineral Cultural Meadow
- CUS1 – Mineral Cultural Savanna
- CUW1 – Mineral Cultural Woodland
- CUW1-a – Dry - Fresh Deciduous Woodland Ecosite
- DEV – Development
- FOD7 – Fresh – Moist Lowland Deciduous Forest Ecosite
- HE1 – Treed Deciduous Hedgerow
- LAWN – Lawn



Project Location
Regional Municipality
of Durham

165011019 REVA
Prepared by BCC on 2023-09-26

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE
EXTENSION PROJECT

Figure No.

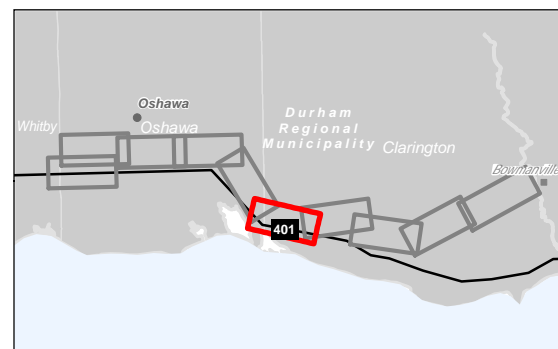
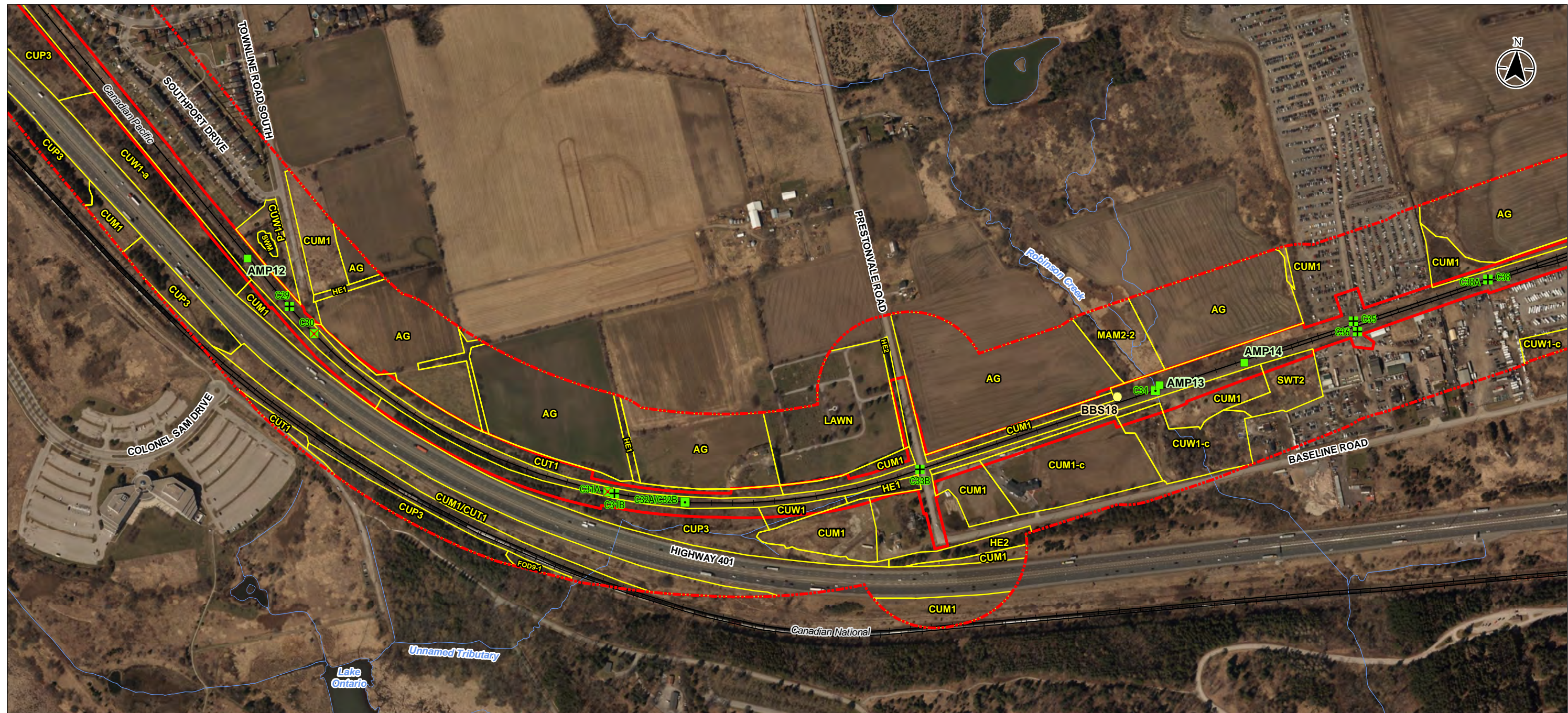
4.3

Title












Terrestrial Existing Conditions

0 100 200
Metres
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Legend

-  Project Footprint
-  Study Area Boundary
-  Railway
-  Watercourse (Permanent)
-  Waterbody
-  AMP (Amphibian Call Station)
-  BBS (Breeding Bird Station)
-  Proposed Culvert Modification
-  Proposed Culvert Replacement
-  Proposed Culvert Removal
-  ELC

ELC Description

- AG – Agriculture
CUM1 – Mineral Cultural Meadow
CUM1-c – Dry - Fresh Mixed Meadow
CUM1/CUT1 – Mineral Cultural Meadow/Mineral Cultural Thicket
CUP3 – Coniferous Plantation
CUT1 – Mineral Cultural Thicket
CUW1 – Mineral Cultural Woodland
CUW1-a – Dry - Fresh Deciduous Woodland Ecosite
CUW1-c – Fresh - Moist Manitoba Maple Deciduous Woodland Type
CUW1-d – Mixed Cultural Woodland

- DEV – Development
- FOD9-1 – Fresh – Moist Oak – Sugar Maple Deciduous Forest Type
- HE1 – Treed Deciduous Hedgerow
- HE2 – Treed Coniferous Hedgerow
- LAWN – Lawn
- MAM2-2 – Reed-canary Grass Graminoid Mineral Meadow Marsh Type
- SWM – Stormwater Management Pond
- SWT2 – Willow Mineral Deciduous Thicket Swamp Ecosite



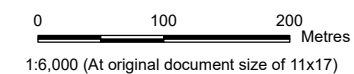
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Regional Municipality of Durham	Prepared by BCC on 2023-09-26

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE
EXTENSION PROJECT

Figure No.

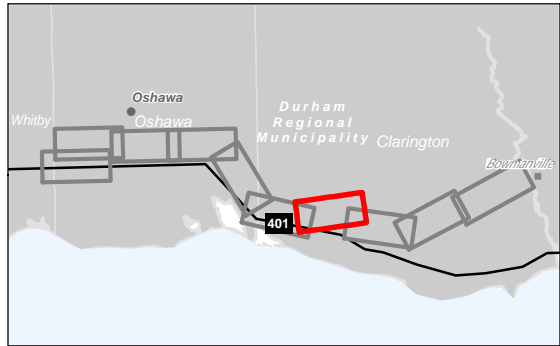
4.6

Title
Terrestrial Existing Conditions



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Reviewed: 2023-09-26 By: bcowper



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- Legend**
- Project Footprint
 - Study Area Boundary
 - Proposed GO Station Location
 - Railway
 - Watercourse (Permanent)
 - Waterbody
 - Potential Butternut Location
 - AMP (Amphibian Call Station)
 - BBS (Breeding Bird Station)
 - BMS (Bat Monitoring Station)
 - BMS (Bat Monitoring Station) (Stantec 2023)
 - Proposed Culvert Replacement
 - Proposed Culvert Modification

- ELC Description**
- AG – Agriculture
 - AG-Hay – Agriculture - Hay
 - CUM1 – Mineral Cultural Meadow
 - CUM1-1 – Dry-Fresh Old Field Meadow
 - CUM1/CUT1 – Mineral Cultural Meadow/Mineral Cultural Thicket
 - CUS1 – Mineral Cultural Savanna
 - CUT1 – Mineral Cultural Thicket
 - CUW1 – Mineral Cultural Woodland
 - CUW1-a – Dry - Fresh Deciduous Woodland Ecosite

- CUW1-c – Fresh - Moist Manitoba Maple Deciduous Woodland Type
- DEV – Development
- FOD – Deciduous Forest
- HE1 – Treed Deciduous Hedgerow
- HE2 – Treed Coniferous Hedgerow
- MAM – Meadow Marsh
- MAM2-2 – Reed-canary Grass Graminoid Mineral Meadow Marsh Type
- MAS2-1 – Cattail Mineral Shallow Marsh Type
- SWD – Deciduous Swamp
- SWM – Stormwater Management Pond
- SWT2 – Willow Mineral Deciduous Thicket Swamp Ecosite

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Stantec

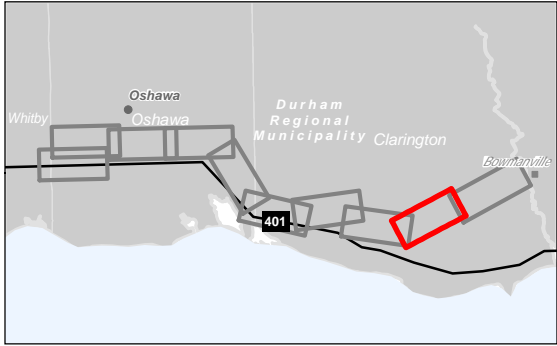
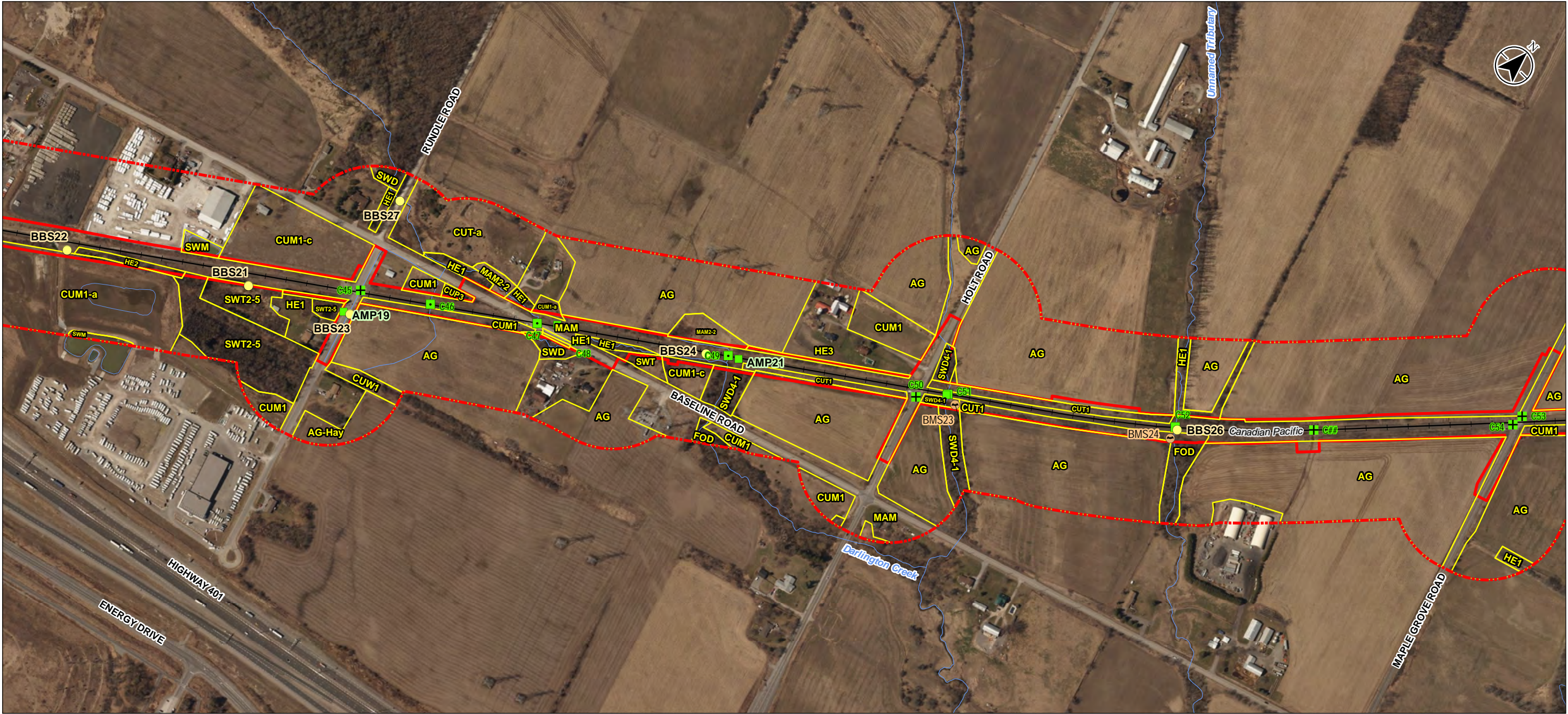
Project Location: 165011019 REVA
Regional Municipality of Durham
Prepared by BCC on 2023-09-26

Client/Project:
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE
EXTENSION PROJECT

Figure No.
4.7

Title
Terrestrial Existing Conditions

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Legend

- Project Footprint
- Study Area Boundary
- Railway
- Watercourse (Permanent)
- Waterbody
- AMP (Amphibian Call Station)
- BBS (Breeding Bird Station)
- BMS (Bat Monitoring Station)
- Proposed Culvert Modification
- + Proposed Culvert Replacement
- ELC

ELC Description

- AG – Agriculture
- AG-Hay – Agriculture - Hay
- CUM1 – Mineral Cultural Meadow
- CUM1-a – Dry - Fresh Graminoid Meadow Ecosite
- CUM1-c – Dry - Fresh Mixed Meadow
- CUP3 – Coniferous Plantation
- CUT-a – Deciduous Thicket
- CUT1 – Mineral Cultural Thicket
- CUW1 – Mineral Cultural Woodland
- DEV – Development
- FOD – Deciduous Forest
- HE1 – Treed Deciduous Hedgerow
- HE2 – Treed Coniferous Hedgerow
- HE3 – Fencerow
- MAM – Meadow Marsh
- MAM2-2 – Reed-canary Grass Graminoid Mineral Meadow Marsh Type
- SWD – Deciduous Swamp
- SWD4-1 – Willow Mineral Deciduous Swamp Type
- SWM – Stormwater Management Pond
- SWT – Thicket Swamp
- SWT2-5 – Red-osier Dogwood Mineral Deciduous Thicket Swamp Type



Project Location 165011019 REVA
Regional Municipality of Durham Prepared by BCC on 2023-09-26

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE
EXTENSION PROJECT

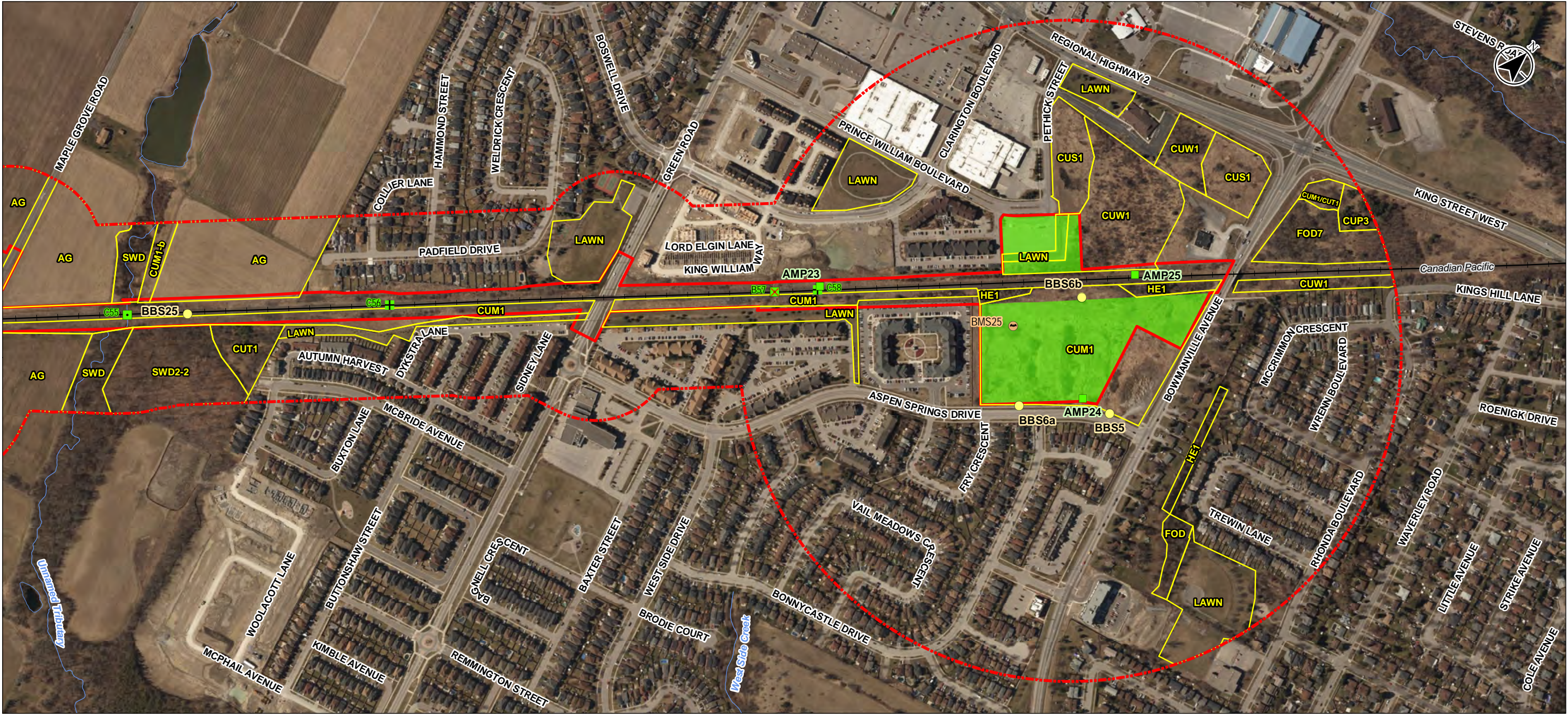
Figure No.
4.9

Title
Terrestrial Existing Conditions

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Reviewed: 2023-09-26 By: bcooper



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Legend

- Project Footprint
- Study Area Boundary
- Proposed GO Station Location
- Railway
- Watercourse (Permanent)
- Waterbody
- AMP (Amphibian Call Station)
- BBS (Breeding Bird Station)
- BMS (Bat Monitoring Station)
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Proposed Culvert Removal

ELC

ELC Description

- AG – Agriculture
- CUM1 – Mineral Cultural Meadow
- CUM1-b – Fresh - Moist Graminoid Meadow Ecosite
- CUM1/CUT1 – Mineral Cultural Meadow/Mineral Cultural Thicket
- CUP3 – Coniferous Plantation
- CUS1 – Mineral Cultural Savanna
- CUT1 – Mineral Cultural Thicket
- CUW1 – Mineral Cultural Woodland
- DEV – Development
- FOD – Deciduous Forest

- FOD7 – Fresh – Moist Lowland Deciduous Forest Ecosite
- HE1 – Treed Deciduous Hedgerow
- LAWN – Lawn
- SWD – Deciduous Swamp
- SWD2-2 – Green Ash Mineral Deciduous Swamp



Project Location 165011019 REVA
Regional Municipality of Durham Prepared by BCC on 2023-09-26

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE
EXTENSION PROJECT

Figure No.
4.10

Title
Terrestrial Existing Conditions

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Appendix B

Agency Correspondence



Cymbaly, Lauren

From: Bryan Mistak <bmistak@cloc.ca>
Sent: Thursday, August 19, 2021 9:07 AM
To: Den Haas, Taco
Cc: Dan Moore; Jamie Davidson; Rod Wilmot; Frith, Lindsay; Eusebi, Daniel; Cymbaly, Lauren
Subject: RE: Metrolinx Oshawa to Bowmanville Rail Service Expansion - Natural Heritage Information Request

Good morning Taco,

Please use the link below to download a copy of your requested data:

<https://1drv.ms/u/s!AserlZuul3JPoxemDdc2g21PkeYg?e=ONVMGy>

For payment, your easiest option is to pay by credit card by calling into CLOCA's main line and leaving a message stating that you want to pay for a data request. Please quote IMS# NGIA566. One of our Admin staff will call you back to take your credit card number and process a payment.

Let me know if you have any other questions or issues with the download package.

Thanks,
Bryan

Bryan Mistak | Senior GIS Analyst

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Thank you.

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Merci!

From: Bryan Mistak
Sent: August 12, 2021 9:09 AM
To: Den Haas, Taco <Taco.DenHaas@stantec.com>
Cc: Dan Moore <dmoore@cloc.ca>; Jamie Davidson <jdavidson@cloc.ca>; Rod Wilmot <rwilmot@cloc.ca>; Frith, Lindsay <Lindsay.Frith@stantec.com>; Eusebi, Daniel <dan.eusebi@stantec.com>; Cymbaly, Lauren <Lauren.Cymbaly@stantec.com>
Subject: RE: Metrolinx Oshawa to Bowmanville Rail Service Expansion - Natural Heritage Information Request

Thanks Taco.

I'm still waiting on the aquatics/fisheries memo. I spoke with Aquatics staff about it late yesterday and was told that I should expect to have it by early next week. I'm on vacation after today until the 17th, so the earliest that you could receive the data package would be next Wednesday.

Regards,
Bryan

Bryan Mistak | Senior GIS Analyst

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Merci!

From: Den Haas, Taco <Taco.DenHaas@stantec.com>

Sent: August 11, 2021 4:12 PM

To: Bryan Mistak <bmistak@cloc.ca>

Cc: Dan Moore <dmoore@cloc.ca>; Jamie Davidson <j davidson@cloc.ca>; Rod Wilmot <rwilmot@cloc.ca>; Frith, Lindsay <Lindsay.Frith@stantec.com>; Eusebi, Daniel <dan.eusebi@stantec.com>; Cymbaly, Lauren <Lauren.Cymbaly@stantec.com>

Subject: RE: Metrolinx Oshawa to Bowmanville Rail Service Expansion - Natural Heritage Information Request

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Bryan:

As requested please find the signed estimate, IP agreement and Schedule A attached.
Thanks for all your assistance and we will look forward to receiving the data from CLOCA.

Taco

Taco Den Haas M.Sc., CISEC #0377
Senior Fisheries Biologist

Mobile: 647 205-5738
Taco.DenHaas@stantec.com



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From: Bryan Mistak <bmistak@cloc.ca>

Sent: Tuesday, August 3, 2021 11:36 AM

To: Den Haas, Taco <Taco.DenHaas@stantec.com>

Cc: Dan Moore <dmoore@cloc.ca>; Jamie Davidson <j davidson@cloc.ca>; Rod Wilmot <rwilmot@cloc.ca>; Frith, Lindsay <Lindsay.Frith@stantec.com>; Eusebi, Daniel <dan.eusebi@stantec.com>; Cymbaly, Lauren <Lauren.Cymbaly@stantec.com>

Subject: RE: Metrolinx Oshawa to Bowmanville Rail Service Expansion - Natural Heritage Information Request

Good morning Taco,

I'm just waiting on the fisheries data. In the meantime, please review the attached PDFs. If you agree to the estimate, please sign, and return the IP Agreement and Schedule A and let me know if you have any questions or concerns.

Thank you,
Bryan

Bryan Mistak | Senior GIS Analyst

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Merci!

From: Den Haas, Taco <Taco.DenHaas@stantec.com>

Sent: July 29, 2021 9:50 AM

To: Bryan Mistak <bmistak@cloca.com>

Cc: Dan Moore <dmoore@cloca.com>; Jamie Davidson <jdavidson@cloca.com>; Rod Wilmot <rwilmot@cloca.com>; Frith, Lindsay <Lindsay.Frith@stantec.com>; Eusebi, Daniel <dan.eusebi@stantec.com>; Cymbaly, Lauren <Lauren.Cymbaly@stantec.com>

Subject: Metrolinx Oshawa to Bowmanville Rail Service Expansion - Natural Heritage Information Request

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Hello Bryan:

I've completed the information request form, see attached. I've also attached a map showing the study area. Thanks for looking into this request and let me know if you have any questions.

Regards,
Taco

Taco Den Haas M.Sc., CISEC #0377
Senior Fisheries Biologist

Mobile: 647 205-5738
Taco.DenHaas@stantec.com



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From: Bryan Mistak <bmistak@cloca.com>

Sent: Tuesday, July 27, 2021 12:20 PM

To: Den Haas, Taco <Taco.DenHaas@stantec.com>

Cc: Dan Moore <dmoore@cloca.com>; Jamie Davidson <jdavidson@cloca.com>; Rod Wilmot <rwilmot@cloca.com>

Subject: RE: Metrolinx Bowmanville Line _Fisheries Background Data

Hi Taco,

Please fill out the attached Data Request form to provide us with additional information on your request and let me know if you have any questions.

Thank you,
Bryan

Bryan Mistak | Senior GIS Analyst



Admin Office 100 Whiting Avenue, Oshawa ON L1H 3T3
Phone 905 579 0411 ext 123 | **Fax** 905 579 0994
Email bmistak@cloca.com | **Website** cloca.com

Healthy watersheds for today and tomorrow.



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Merci!

From: Jamie Davidson <jdavidson@cloca.com>
Sent: July 27, 2021 11:49 AM
To: Den Haas, Taco <Taco.DenHaas@stantec.com>; DataRequests <DataRequests@cloca.com>
Cc: Dan Moore <dmoore@cloca.com>
Subject: RE: Metrolinx Bowmanville Line _Fisheries Background Data

Hi Taco,

I am forwarding your request to Bryan Mistak who coordinates our data requests. He will be in touch with you to formalize the request and will then be asking technical staff to pull the appropriate data for you. If you have any issues, don't hesitate to reach out.

Jamie

Jamie Davidson | Director, Watershed Planning & Natural Heritage



Admin Office 100 Whiting Avenue, Oshawa ON L1H 3T3
Phone 905 579 0411 ext 114 | **Fax** 905 579 0994
Email jdavidson@cloca.com | **Website** cloca.com

Healthy watersheds for today and tomorrow.



From: Den Haas, Taco <Taco.DenHaas@stantec.com>
Sent: July 27, 2021 10:34 AM
To: Jamie Davidson <jdavidson@cloca.com>
Subject: FW: Metrolinx Bowmanville Line _Fisheries Background Data

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Hello Jamie:

I received the out of office reply from Ian. I'm forwarding the request below to you. Can you please look into this request for me when you have a chance?

Thanks,
Taco

Taco Den Haas M.Sc., CISEC #0377
Senior Fisheries Biologist
Mobile: 647 205-5738
Taco.DenHaas@stantec.com



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From: Den Haas, Taco
Sent: Tuesday, July 27, 2021 10:18 AM
To: Ian Kelsey - CLOCA (ikelsey@cloca.com) <ikelsey@cloca.com>
Subject: Metrolinx Bowmanville Line _Fisheries Background Data

Hello Ian:

How are you doing?

I'm preparing the existing aquatic conditions writeup for a natural heritage technical report for the environmental assessment of Metrolinx Project between Oshawa and Bowmanville. I want to make a request for fish records (if available) for the following CLOCA Aquatic Monitoring Stations:

#1 Farewell Creek
#2 Black Creek
#3 Tooley Creek
#4 Westside Creek
#19 Oshawa Creek
#20 Harmony Creek
#22 Harmony Creek
#23 Goodman Creek

#30 Corbett Creek

Thanks and let me know if you have any question about this request.
Taco

Taco Den Haas M.Sc., CISEC #0377
Senior Fisheries Biologist

Direct: 905 944-7777
Mobile: 647 205-5738
Fax: 905 474-9889
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Appendix C

Vascular Plant Species List



Appendix C: Vascular Plant Observations

GYMNOSPERMS (Conifers)

Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Equisetum arvense</i>	Field Horsetail	S5	-	-	0	0
<i>Matteuccia struthiopteris</i> var. <i>pensylvanica</i>	Ostrich Fern	S5	-	-	5	0
<i>Juniperus virginiana</i>	Eastern Red Cedar	S5	-	-	4	3
<i>Larix laricina</i>	Tamarack	S5	-	-	7	-3
<i>Picea abies</i>	Norway Spruce	SE3	-	-	-	5
<i>Picea glauca</i>	White Spruce	S5	-	-	6	3
<i>Pinus nigra</i>	Austrian Pine	SE3	-	-	-	5
<i>Pinus resinosa</i>	Red Pine	S5	-	-	8	3
<i>Pinus strobus</i>	Eastern White Pine	S5	-	-	4	3
<i>Pinus sylvestris</i>	Scots Pine	SE5	-	-	-	3
<i>Thuja occidentalis</i>	Eastern White Cedar	S5	-	-	4	-3

ANGIOSPERMS (Dicots)

Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Acer ginnala</i>	Amur Maple	SE1	-	-	-	5
<i>Acer negundo</i>	Manitoba Maple	S5	-	-	0	0
<i>Acer platanoides</i>	Norway Maple	SE5	-	-	-	5
<i>Acer rubrum</i>	Red Maple	S5	-	-	4	0
<i>Acer saccharinum</i>	Silver Maple	S5	-	-	5	-3
<i>Acer saccharum</i>	Sugar Maple	S5	-	-	4	3
<i>Acer x freemanii</i>	(<i>Acer rubrum</i> X <i>Acer saccharinum</i>)	SNA	-	-	6	-5



Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Achillea millefolium</i>	Common Yarrow	SE5?	-	-	-	3
<i>Alliaria petiolata</i>	Garlic Mustard	SE5	-	-	-	0
<i>Ambrosia artemisiifolia</i>	Common Ragweed	S5	-	-	0	3
<i>Amelanchier sp.</i>	Serviceberry species	-	-	-	-	-
<i>Anemone canadensis</i>	Canada Anemone	S5	-	-	3	-3
<i>Apocynum cannabinum</i>	Hemp Dogbane	S5	-	-	3	0
<i>Arctium minus</i>	Common Burdock	SE5	-	-	-	3
<i>Asclepias syriaca</i>	Common Milkweed	S5	-	-	0	5
<i>Barbarea vulgaris</i>	Bitter Wintercress	SE5	-	-	-	0
<i>Betula papyrifera</i>	Paper Birch	S5	-	-	2	3
<i>Carya sp.</i>	Hickory Species	-	-	-	-	-
<i>Centaurea jacea</i>	Brown Knapweed	SE5	-	-	-	5
<i>Chenopodium album</i>	Common Lamb's-quarters	SE5	-	-	-	3
<i>Cichorium intybus</i>	Wild Chicory	SE5	-	-	-	5
<i>Circaea canadensis</i>	Broad-leaved Enchanter's Nightshade	S5	-	-	2	3
<i>Cirsium arvense</i>	Canada Thistle	SE5	-	-	-	3
<i>Cirsium sp.</i>	Thistle species	-	-	-	-	-
<i>Cornus racemosa</i>	Grey Dogwood	S5	-	-	2	0
<i>Cornus sericea</i>	Red-osier Dogwood	S5	-	-	2	-3
<i>Crataegus monogyna</i>	English Hawthorn	SE4	-	-	-	3
<i>Crataegus sp.</i>	Hawthorn species	-	-	-	-	-
<i>Daucus carota</i>	Wild Carrot	SE5	-	-	-	5
<i>Dipsacus fullonum</i>	Common Teasel	SE5	-	-	-	3
<i>Echinocystis lobata</i>	Wild Cucumber	S5	-	-	3	-3



Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Echium vulgare</i>	Common Viper's Bugloss	SE5	-	-	-	5
<i>Elaeagnus angustifolia</i>	Russian Olive	SE3	-	-	-	3
<i>Elaeagnus umbellata</i>	Autumn Olive	SE3	-	-	-	3
<i>Erigeron strigosus</i>	Rough Fleabane	S5	-	-	4	3
<i>Euonymus alatus</i>	Winged Euonymus	SE2	-	-	-	5
<i>Eutrochium maculatum</i>	Spotted Joe Pye Weed	S5	-	-	3	-5
<i>Fragaria virginiana</i>	Wild Strawberry	S5	-	-	2	3
<i>Fraxinus americana</i>	White Ash	S4	-	-	4	3
<i>Fraxinus pennsylvanica</i>	Red Ash	S4	-	-	3	-3
<i>Fraxinus sp.</i>	Ash Species	-	-	-	-	-
<i>Galium mollugo</i>	Smooth Bedstraw	SE5	-	-	-	5
<i>Geum urbanum</i>	Wood Avens	SE3	-	-	-	5
<i>Geum sp.</i>	Avens Species	-	-	-	-	-
<i>Geranium robertianum</i>	Herb-Robert	S5	-	-	2	3
<i>Gleditsia triacanthos var. inermis</i>	Thornless Honey Locust	SE	-	-	-	-
<i>Gymnocladus dioica</i>	Kentucky Coffee-tree	S2	-	THR	6	3
<i>Hesperis matronalis</i>	Dame's Rocket	SE5	-	-	-	3
<i>Hieracium sp.</i>	Hawkweed species	-	-	-	-	-
<i>Impatiens capensis</i>	Spotted Jewelweed	S5	-	-	4	-3
<i>Inula helenium</i>	Elecampane	SE5	-	-	-	3
<i>Juglans cinerea</i>	Butternut	S2?	END	END	6	3
<i>Juglans nigra</i>	Black Walnut	S4?	-	-	5	3
<i>Juglans regia</i>	English Walnut	SE1	-	-	-	5
<i>Leucanthemum vulgare</i>	Oxeye Daisy	SE5	-	-	-	5



Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Linaria vulgaris</i>	Butter-and-eggs	SE5	-	-	-	5
<i>Liriodendron tulipifera</i>	Tulip Tree	S4	-	-	8	3
<i>Lonicera morrowii</i>	Morrow's Honeysuckle	SE3	-	-	-	3
<i>Lonicera tatarica</i>	Tatarian Honeysuckle	SE5	-	-	-	3
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	SE5	-	-	-	3
<i>Malus pumila</i>	Common Apple	SE4	-	-	-	5
<i>Malus sp.</i>	Malus Species	-	-	-	-	-
<i>Medicago sativa</i>	Alfalfa	SE5	-	-	-	5
<i>Melilotus albus</i>	White Sweet-clover	SE5	-	-	-	3
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	S4?	-	-	6	3
<i>Parthenocissus vitacea</i>	Thicket Creeper	S5	-	-	4	3
<i>Populus alba</i>	White Poplar	SE5	-	-	-	5
<i>Populus deltoides</i>	Eastern Cottonwood	S5	-	-	4	0
<i>Populus tremuloides</i>	Trembling Aspen	S5	-	-	2	0
<i>Potentilla recta</i>	Sulphur Cinquefoil	SE5	-	-	-	5
<i>Prunus sp.</i>	Cherry Species	-	-	-	-	-
<i>Prunus serotina</i>	Black Cherry	S5	-	-	3	3
<i>Prunus virginiana</i>	Chokecherry	S5	-	-	2	3
<i>Pyrus communis</i>	Common Pear	SE4	-	-	-	5
<i>Quercus rubra</i>	Northern Red Oak	S5	-	-	6	3
<i>Ranunculus acris</i>	Common Buttercup	SE5	-	-	-	0
<i>Rhamnus cathartica</i>	Common Buckthorn	SE5	-	-	-	0
<i>Rhus typhina</i>	Staghorn Sumac	S5	-	-	1	3
<i>Ribes sp.</i>	Currant species	-	-	-	-	-
<i>Robinia pseudoacacia</i>	Black Locust	SE5	-	-	-	3



Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Rosa multiflora</i>	Multiflora Rose	SE5	-	-	-	3
<i>Rubus idaeus</i>	Red Raspberry	S5	-	-	2	3
<i>Salix alba</i>	White Willow	SE4	-	-	-	-3
<i>Salix amygdaloides</i>	Peach-leaved Willow	S5	-	-	6	-3
<i>Salix discolor</i>	Pussy Willow	S5	-	-	3	-3
<i>Salix euxina</i>	Crack Willow	SE	-	-	-	0
<i>Salix interior</i>	Sandbar Willow	S5	-	-	1	-3
<i>Salix lucida</i>	Shining Willow	S5	-	-	5	-3
<i>Salix nigra</i>	Black Willow	S4	-	-	6	-5
<i>Salix x pendulina</i>	(<i>Salix babylonica</i> X <i>Salix euxina</i>)	SNA	-	-	-	-
<i>Silene vulgaris</i>	Bladder Campion	SE5	-	-	-	5
<i>Solidago altissima</i>	Tall Goldenrod	S5	-	-	1	3
<i>Solidago canadensis</i>	Canada Goldenrod	S5	-	-	1	3
<i>Solidago flexicaulis</i>	Zigzag Goldenrod	S5	-	-	6	3
<i>Solidago sp.</i>	Goldenrod Species	-	-	-	-	-
<i>Sorbus americana</i>	American Mountain-ash	S5	-	-	8	0
<i>Sorbus aucuparia</i>	European Mountain-ash	SE4	-	-	-	5
<i>Symphytum officinale</i>	Common Comfrey	SE5	-	-	-	5
<i>Syringa vulgaris</i>	Common Lilac	SE5	-	-	-	5
<i>Taraxacum officinale</i>	Common Dandelion	SE5	-	-	-	3
<i>Tilia americana</i>	Basswood	S5	-	-	4	3
<i>Tilia cordata</i>	Little-leaved Linden	SE1	-	-	-	5
<i>Toxicodendron radicans</i> var. <i>rydbergii</i>	Western Poison Ivy	S5	-	-	2	0
<i>Trifolium repens</i>	White Clover	SE5	-	-	-	3



Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Tussilago farfara</i>	Coltsfoot	SE5	-	-	-	3
<i>Ulmus americana</i>	White Elm	S5	-	-	3	-3
<i>Ulmus pumila</i>	Siberian Elm	SE3	-	-	-	3
<i>Ulmus sp.</i>	Elm Species	-	-	-	-	-
<i>Urtica dioica</i>	Stinging Nettle	SE2	-	-	-	0
<i>Verbascum thapsus</i>	Common Mullein	SE5	-	-	-	5
<i>Viburnum lentago</i>	Nannyberry	S5	-	-	4	0
<i>Viburnum opulus</i>	Cranberry Viburnum	S5	-	-	5	-3
<i>Vicia cracca</i>	Tufted Vetch	SE5	-	-	-	5
<i>Vincetoxicum rossicum</i>	European Swallowwort	SE5	-	-	-	5
<i>Vitis riparia</i>	Riverbank Grape	S5	-	-	0	0



ANGIOSPERMS (Monocots)

Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	Coefficient of Conservatism	Coefficient of Wetness
<i>Agrostis gigantea</i>	Redtop	SE5	-	-	-	-3
<i>Asparagus officinalis</i>	Garden Asparagus	SE5	-	-	-	3
<i>Bromus inermis</i>	Smooth Brome	SE5	-	-	-	5
<i>Dactylis glomerata</i>	Orchard Grass	SE5	-	-	-	3
<i>Erythronium americanum</i>	Yellow Trout-lily	S5	-	-	5	5
<i>Maianthemum stellatum</i>	Star-flowered False Solomon's Seal	S5	-	-	6	0
<i>Phalaris arundinacea</i>	Reed Canarygrass	S5	-	-	0	-3
<i>Phleum pratense</i>	Common Timothy	SE5	-	-		3
<i>Phragmites australis</i>	Common Reed	SU	-	-	0	-3
<i>Poa pratensis</i>	Kentucky Bluegrass	S5	-	-	0	3
<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage	S5	-	-	7	-5
<i>Typha angustifolia</i>	Narrow-leaved Cattail	SE5	-	-	-	-5



Notes:

¹Scientific Name: The scientific name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

¹Common Name: The common English name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

²S-Rank: Subnational Rank is the conservation status of a species within a particular province, territory or state. In this scenario, it is the provincial level ranking system as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

³SARO Status: Species at Risk in Ontario (Provincial Status as defined by the Endangered Species Act, 2007 as amended).

⁴COSEWIC Status: Status as defined by the Committee on the Status of Endangered Wildlife in Canada.

Endangered Species Act and Species at Risk Act Acronyms

END: Endangered

THR: Threatened

SC: Special Concern

EXT: Extirpated

NAR: Not at Risk

Subnational Rankings (S RANK)

SNR: Unranked

SU: Unrankable – Currently unrankable due to lack of information

SNA: Not applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

?: Indicates uncertainty in the assigned rank

S1: Critically Imperiled – Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled – Imperiled in the province, very few populations (often 20 or fewer),



S3: Vulnerable – Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure – Uncommon but not rare

S5: Secure – Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SE: if an element is known to occur as an exotic in Ontario, the status value assigned is SE. A ? qualifier added to that value indicates uncertainty about whether it is exotic or native. Numeric ranks of 1 through 5 added to the exotic status indicates the element's abundance in Ontario, with 1 indicating the least abundant and 5 the most.



Appendix D

Wildlife Species Lists



Appendix D.1: Avifauna Records and Observations

Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Accipitridae	<i>Accipiter cooperii</i>	Cooper's Hawk	S4	NAR	NAR	-	G5	eBird, OBBA
Accipitridae	<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5	NAR	NAR	-	G5	OBBA
Accipitridae	<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR	-	G5	eBird, OBBA, Stantec
Accipitridae	<i>Buteo platypterus</i>	Broad-winged Hawk	S5B	-	-	-	G5	OBBA
Accipitridae	<i>Circus hudsonius</i>	Northern Harrier	S5B, S4N	NAR	NAR	-	G5	OBBA
Accipitridae	<i>Haliaeetus leucocephalus</i>	Bald Eagle	S4	SC	NAR	-	G5	OBBA
Alaudidae	<i>Eremophila alpestris</i>	Horned Lark	S4	-	-	-	G5	OBBA
Alcedinidae	<i>Megaceryle alcyon</i>	Belted Kingfisher	S5B, S4N	-	-	-	G5	eBird, OBBA, Stantec
Anatidae	<i>Aix sponsa</i>	Wood Duck	S5B, S3N	-	-	-	G5	OBBA
Anatidae	<i>Anas americana</i>	American Wigeon	S4B, S4N, S5M	-	-	-	G5	OBBA
Anatidae	<i>Anas clypeata</i>	Northern Shoveler	S4B, S4N, S5M	-	-	-	G5	OBBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Anatidae	<i>Anas crecca</i>	Green-winged Teal	S4B, S4N, S5M	-	-	-	G5	OBBA
Anatidae	<i>Anas discors</i>	Blue-winged Teal	S3B, S4M	-	-	-	G5	OBBA
Anatidae	<i>Anas platyrhynchos</i>	Mallard	S5	-	-	-	G5	OBBA, Stantec
Anatidae	<i>Anas rubripes</i>	American Black Duck	S4	-	-	-	G5	OBBA
Anatidae	<i>Anas strepera</i>	Gadwall	S4B, S4N, S5M	-	-	-	G5	OBBA
Anatidae	<i>Branta canadensis</i>	Canada Goose	S5	-	-	-	G5	eBird, OBBA
Anatidae	<i>Cygnus buccinator</i>	Trumpeter Swan	S4	NAR	NAR		G4	OBBA
Anatidae	<i>Cygnus olor</i>	Mute Swan	SE	-	-	-	G5	OBBA
Anatidae	<i>Lophodytes cucullatus</i>	Hooded Merganser	S5	-	-	-	G5	OBBA
Anatidae	<i>Mergus serrator</i>	Red-breasted Merganser	S5	-	-	-	G5	OBBA
Apodidae	<i>Chaetura pelagica</i>	Chimney Swift	S3B	THR	THR	THR	G4G5	OBBA, NHIC
Ardeidae	<i>Ardea herodias</i>	Great Blue Heron	S4	-	-	-	G5	OBBA, Stantec
Ardeidae	<i>Botaurus lentiginosus</i>	American Bittern	S5B	-	-	-	G5	OBBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Ardeidae	<i>Butorides virescens</i>	Green Heron	S4B	-	-	-	G5	OBBA
Ardeidae	<i>Ixobrychus exilis</i>	Least Bittern	S4B	THR	THR	THR	G4G5	OBBA, NHIC
Ardeidae	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	S3B, S2N, S4M	-	-	-	G5	NHIC
Bombycillidae	<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5	-	-	-	G5	eBird, OBBA, Stantec
Caprimulgidae	<i>Chordeiles minor</i>	Common Nighthawk	S4B	SC	SC	THR	G5	OBBA
Cardinalidae	<i>Cardinalis cardinalis</i>	Northern Cardinal	S5	-	-	-	G5	eBird, OBBA, Stantec
Cardinalidae	<i>Passerina cyanea</i>	Indigo Bunting	S5B	-	-	-	G5	OBBA, Stantec
Cardinalidae	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S5B	-	-	-	G5	OBBA
Cardinalidae	<i>Piranga ludoviciana</i>	Western Tanager	SNA	-	-	-	G5	eBird
Cathartidae	<i>Cathartes aura</i>	Turkey Vulture	S5B, S3N	-	-	-	G5	OBBA
Certhiidae	<i>Certhia americana</i>	Brown Creeper	S5	-	-	-	G5	eBird, OBBA
Charadriidae	<i>Charadrius melodus</i>	Piping Plover	S1B	END	END	-	G3	OBBA, NHIC



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Charadriidae	<i>Charadrius vociferus</i>	Killdeer	S4B	-	-	-	G5	eBird, OBBA, Stantec
Columbidae	<i>Columba livia</i>	Rock Pigeon	SE	-	-	-	G5	eBird, OBBA, Stantec
Columbidae	<i>Zenaida macroura</i>	Mourning Dove	S5	-	-	-	G5	eBird, OBBA, Stantec
Corvidae	<i>Corvus brachyrhynchos</i>	American Crow	S5	-	-	-	G5	eBird, OBBA, Stantec
Corvidae	<i>Corvus corax</i>	Common Raven	S5	-	-	-	G5	OBBA
Corvidae	<i>Corvus ossifragus</i>	Fish Crow	S1B, S3N	-	-	-	G5	OBBA
Corvidae	<i>Cyanocitta cristata</i>	Blue Jay	S5	-	-	-	G5	eBird, OBBA, Stantec
Cuculidae	<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	S4B	-	-	-	G5	OBBA
Cuculidae	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S4S5B	-	-	-	G5	OBBA
Falconidae	<i>Falco columbarius</i>	Merlin	S5	NAR	NAR	-	G5	OBBA
Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon	S4	SC	NAR		G4	OBBA, NHIC
Falconidae	<i>Falco sparverius</i>	American Kestrel	S4	-	-	-	G5	OBBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Fringillidae	<i>Haemorhous mexicanus</i>	House Finch	SE	-	-	-	G5	eBird, OBBA, Stantec
Fringillidae	<i>Haemorhous purpureus</i>	Purple Finch	S5	-	-	-	G5	eBird, OBBA
Fringillidae	<i>Loxia leucoptera</i>	White-winged Crossbill	S5	-	-	-	G5	OBBA
Fringillidae	<i>Spinus pinus</i>	Pine Siskin	S5	-	-	-	G5	OBBA
Fringillidae	<i>Spinus tristis</i>	American Goldfinch	S5	-	-	-	G5	eBird, OBBA, Stantec
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	S4B	SC	SC	THR	G5	OBBA, NHIC, Stantec
Hirundinidae	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S4S5B	-	-	-	G5	OBBA
Hirundinidae	<i>Progne subis</i>	Purple Martin	S3B	-	-	-	G5	OBBA
Hirundinidae	<i>Riparia riparia</i>	Bank Swallow	S4B	THR	THR	THR	G5	OBBA
Hirundinidae	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B	-	-	-	G5	OBBA, Stantec
Hirundinidae	<i>Tachycineta bicolor</i>	Tree Swallow	S4S5B	-	-	-	G5	OBBA, Stantec
Icteridae	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S5	-	-	-	G5	eBird, OBBA, Stantec



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Icteridae	<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	THR	THR	G5	OBBA, NHIC, Stantec
Icteridae	<i>Icterus galbula</i>	Baltimore Oriole	S4B	-	-	-	G5	eBird, OBBA, Stantec
Icteridae	<i>Icterus spurius</i>	Orchard Oriole	S4B	-	-	-	G5	OBBA
Icteridae	<i>Molothrus ater</i>	Brown-headed Cowbird	S5	-	-		G5	OBBA, Stantec
Icteridae	<i>Quiscalus quiscula</i>	Common Grackle	S5	-	-	-	G5	eBird, OBBA, Stantec
Icteridae	<i>Sturnella magna</i>	Eastern Meadowlark	S4B, S3N	THR	THR	THR	G5	OBBA, NHIC, Stantec
Icteriidae	<i>Icteria virens</i>	Yellow-breasted Chat	S1B	END	END	-	G5	NHIC
Laniidae	<i>Lanius ludovicianus</i>	Loggerhead Shrike	S1B	END	END	-	G4	NHIC
Laridae	<i>Chlidonias niger</i>	Black Tern	S3B, S4M	SC	NAR	-	G4G5	OBBA, NHIC
Laridae	<i>Larus delawarensis</i>	Ring-billed Gull	S5	-	-	-	G5	eBird, OBBA, Stantec
Laridae	<i>Sterna hirundo</i>	Common Tern	S4B	NAR	NAR	-	G5	OBBA
Mimidae	<i>Dumetella carolinensis</i>	Gray Catbird	S5B, S3N	-	-	-	G5	eBird, OBBA, Stantec



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Mimidae	<i>Mimus polyglottos</i>	Northern Mockingbird	S4	-	-	-	G5	OBBA, Stantec
Mimidae	<i>Toxostoma rufum</i>	Brown Thrasher	S4B	-	-	-	G5	OBBA
Odontophoridae	<i>Colinus virginianus</i>	Northern Bobwhite	S1?B	END	END	END	G4G5	NHIC
Pandionidae	<i>Pandion haliaetus</i>	Osprey	S5B	-	-	-	G5	OBBA, Stantec
Paridae	<i>Poecile atricapillus</i>	Black-capped Chickadee	S5	-	-	-	G5	eBird, OBBA, Stantec
Parulidae	<i>Geothlypis philadelphia</i>	Mourning Warbler	S5B	-	-	-	G5	OBBA
Parulidae	<i>Geothlypis trichas</i>	Common Yellowthroat	S5B, S3N	-	-	-	G5	OBBA, Stantec
Parulidae	<i>Leiothlypis ruficapilla</i>	Nashville Warbler	S5B	-	-	-	G5	OBBA
Parulidae	<i>Mniotilta varia</i>	Black-and-white Warbler	S5B	-	-	-	G5	OBBA
Parulidae	<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B	-	-	-	G5	OBBA
Parulidae	<i>Seiurus aurocapilla</i>	Ovenbird	S5B	-	-	-	G5	OBBA
Parulidae	<i>Setophaga coronata</i>	Yellow-rumped Warbler	S5B, S4N	-	-	-	G5	eBird, OBBA
Parulidae	<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	S5B	-	-	-	G5	OBBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Parulidae	<i>Setophaga petechia</i>	Yellow Warbler	S5B	-	-	-	G5	eBird, OBBA, Stantec
Parulidae	<i>Setophaga pinus</i>	Pine Warbler	S5B, S3N	-	-	-	G5	OBBA
Parulidae	<i>Setophaga ruticilla</i>	American Redstart	S5B	-	-	-	G5	OBBA
Parulidae	<i>Setophaga virens</i>	Black-throated Green Warbler	S5B	-	-	-	G5	OBBA
Passerellidae	<i>Junco hyemalis</i>	Dark-eyed Junco	S5	-	-	-	G5	eBird
Passerellidae	<i>Melospiza georgiana</i>	Swamp Sparrow	S5B, S4N	-	-	-	G5	OBBA, Stantec
Passerellidae	<i>Melospiza melodia</i>	Song Sparrow	S5	-	-	-	G5	eBird, OBBA, Stantec
Passerellidae	<i>Passerculus sandwichensis</i>	Savannah Sparrow	S5B, S3N	-	-	-	G5	OBBA, Stantec
Passerellidae	<i>Passerella iliaca</i>	Fox Sparrow	S5B, S3N	-	-	-	G5	eBird
Passerellidae	<i>Pooecetes gramineus</i>	Vesper Sparrow	S4B	-	-	-	G5	OBBA
Passerellidae	<i>Spizella arborea</i>	American Tree Sparrow	S5	-	-	-	G5	eBird
Passerellidae	<i>Spizella pallida</i>	Clay-colored Sparrow	S4B	-	-	-	G5	OBBA
Passerellidae	<i>Spizella passerina</i>	Chipping Sparrow	S5B, S3N	-	-	-	G5	OBBA, Stantec



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Passerellidae	<i>Spizella pusilla</i>	Field Sparrow	S4B, S3N	-	-	-	G5	OBBA
Passerellidae	<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5	-	-	-	G5	eBird
Passerellidae	<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	S5B, S3N	-	-	-	G5	eBird
Passeridae	<i>Passer domesticus</i>	House Sparrow	SE	-	-	-	G5	eBird, OBBA
Phalacrocoracidae	<i>Phalacrocorax auritus</i>	Double-crested Cormorant	S5B, S4N	NAR	NAR	-	G5	OBBA
Phasianidae	<i>Meleagris gallopavo</i>	Wild Turkey	S5	-	-	-	G5	OBBA, Stantec
Picidae	<i>Colaptes auratus</i>	Northern Flicker	S5	-	-	-	G5	eBird, OBBA, Stantec
Picidae	<i>Dryobates pubescens</i>	Downy Woodpecker	S5	-	-	-	G5	eBird, OBBA, Stantec
Picidae	<i>Dryobates villosus</i>	Hairy Woodpecker	S5	-	-	-	G5	eBird, OBBA
Picidae	<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5	-	-	-	G5	OBBA
Picidae	<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	S5	-	-	-	G5	OBBA, Stantec
Picidae	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S3	SC	END	THR	G5	NHIC



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Picidae	<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	S5B, S3N	-	-	-	G5	eBird, OBBA
Podicipedidae	<i>Podilymbus podiceps</i>	Pied-billed Grebe	S4B, S2N	-	-	-	G5	OBBA
Polioptilidae	<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher	S4B	-	-	-	G5	OBBA
Rallidae	<i>Fulica americana</i>	American Coot	S3B, S4N	NAR	NAR	-	G5	OBBA
Rallidae	<i>Gallinula galeata</i>	Common Gallinule	S3B	-	-	-	G5	OBBA
Rallidae	<i>Porzana carolina</i>	Sora	S5B	-	-	-	G5	OBBA
Rallidae	<i>Rallus elegans</i>	King Rail	S1B	END	END	END	G4	NHIC
Rallidae	<i>Rallus limicola</i>	Virginia Rail	S4S5B	-	-	-	G5	OBBA
Regulidae	<i>Regulus calendula</i>	Ruby-crowned Kinglet	S5B, S3N	-	-	-	G5	eBird
Regulidae	<i>Regulus satrapa</i>	Golden-crowned Kinglet	S5	-	-	-	G5	OBBA
Scolopacidae	<i>Actitis macularius</i>	Spotted Sandpiper	S5B	-	-	-	G5	OBBA, Stantec
Scolopacidae	<i>Scolopax minor</i>	American Woodcock	S4B	-	-	-	G5	OBBA
Sittidae	<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5	-	-	-	G5	eBird, OBBA, Stantec
Sittidae	<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5	-	-	-	G5	eBird, OBBA
Strigidae	<i>Bubo virginianus</i>	Great Horned Owl	S4	-	-	-	G5	OBBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Strigidae	<i>Megascops asio</i>	Eastern Screech-Owl	S4	NAR	NAR	-	G5	OBBA
Strigidae	<i>Strix varia</i>	Barred Owl	S5	-	-	-	G5	eBird, OBBA
Sturnidae	<i>Sturnus vulgaris</i>	European Starling	SE	-	-	-	G5	eBird, OBBA, Stantec
Trochilidae	<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B	-	-	-	G5	OBBA
Troglodytidae	<i>Cistothorus palustris</i>	Marsh Wren	S4B, S3N	-	-	-	G5	OBBA
Troglodytidae	<i>Thryothorus ludovicianus</i>	Carolina Wren	S4	-	-	-	G5	OBBA
Troglodytidae	<i>Troglodytes aedon</i>	House Wren	S5B	-	-	-	G5	OBBA, Stantec
Troglodytidae	<i>Troglodytes hiemalis</i>	Winter Wren	S5B, S4N	-	-	-	G5	OBBA
Turdidae	<i>Catharus fuscescens</i>	Veery	S5B	-	-	-	G5	OBBA
Turdidae	<i>Catharus guttatus</i>	Hermit Thrush	S5B, S4N	-	-	-	G5	eBird
Turdidae	<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	THR	THR	G4	OBBA, NHIC
Turdidae	<i>Sialia sialis</i>	Eastern Bluebird	S5B, S4N	NAR	NAR	-	G5	OBBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Turdidae	<i>Turdus migratorius</i>	American Robin	S5	-	-	-	G5	eBird, OBBA, Stantec
Tyrannidae	<i>Contopus virens</i>	Eastern Wood-pewee	S4B	SC	SC	SC	G5	OBBA, Stantec
Tyrannidae	<i>Empidonax alnorum</i>	Alder Flycatcher	S5B	-	-	-	G5	OBBA, Stantec
Tyrannidae	<i>Empidonax minimus</i>	Least Flycatcher	S5B	-	-	-	G5	OBBA
Tyrannidae	<i>Empidonax traillii</i>	Willow Flycatcher	S4B	-	-	-	G5	OBBA, Stantec
Tyrannidae	<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S5B	-	-	-	G5	eBird, OBBA, Stantec
Tyrannidae	<i>Sayornis phoebe</i>	Eastern Phoebe	S5B	-	-	-	G5	OBBA, Stantec
Tyrannidae	<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B	-	-	-	G5	OBBA, Stantec
Vireonidae	<i>Vireo gilvus</i>	Warbling Vireo	S5B	-	-	-	G5	OBBA, Stantec
Vireonidae	<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B	-	-	-	G5	OBBA, Stantec

Notes:

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²**S-Rank:** Subnational Rank (S-Rank) is the conservation status of a species or plant community within a particular province, territory or state. In this scenario, it is the provincial level ranking system as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

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References:

eBird: eBird species observation database. Available Online: <https://eBird.org/map>

NHIC: Natural Heritage Information Centre database review (Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario).

OBBA: Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii + 318pp

Stantec: Observed in the Study Area by Stantec in 2021

Endangered Species Act and Species at Risk Act Acronyms

END: Endangered

THR: Threatened

SC: Special Concern

EXT: Extirpated

NAR: Not at Risk

Subnational Rankings (S-Rank)

SNR: Unranked



SU: Unrankable – Currently unrankable due to lack of information

SNA: Not applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

?: Indicates uncertainty in the assigned rank

S1: Critically Imperiled – Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled – Imperiled in the province, very few populations (often 20 or fewer),

S3: Vulnerable – Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure – Uncommon but not rare

S5: Secure – Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SE: if an element is known to occur as an exotic in Ontario, the status value assigned is SE. A ? qualifier added to that value indicates uncertainty about whether it is exotic or native. Numeric ranks of 1 through 5 added to the exotic status indicates the element's abundance in Ontario, with 1 indicating the least abundant and 5 the most.

Global Rank (G-Rank)

G1G2: Extremely rare to very rare globally

G2: Very rare globally; usually between 5-10 occurrences in the overall range

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally; usually between 20-100 occurrences

G3G4: Rare to common globally

G4: Common globally; usually more than 100 occurrences in the overall range

G4G5: Common to very common globally

G5: Very common globally; demonstrably secure

GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.

GNR: Unranked—Global rank not yet assessed.



Appendix D.2: Herpetofauna Records and Observations

Group	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Amphibians	<i>Anaxyrus americanus</i>	American Toad	S5	-	-	-	G5	ORAA, Stantec
Amphibians	<i>Hyla versicolor</i>	Gray Treefrog	S5	-	-	-	G5	ORAA, Stantec
Amphibians	<i>Lithobates catesbeianus</i>	American Bullfrog	S4	-	-	-	G5	ORAA
Amphibians	<i>Lithobates clamitans</i>	Green Frog	S5	-	-	-	G5	ORAA, Stantec
Amphibians	<i>Lithobates palustris</i>	Pickerel Frog	S4	NAR	NAR	-	G5	ORAA
Amphibians	<i>Lithobates pipiens</i>	Northern Leopard Frog	S5	NAR	NAR	-	G5	ORAA
Amphibians	<i>Lithobates sylvaticus</i>	Wood Frog	S5	-	-	-	G5	ORAA
Amphibians	<i>Plethodon cinereus</i>	Eastern Red-backed Salamander	S5	-	-	-	G5	ORAA
Amphibians	<i>Pseudacris crucifer</i>	Spring Peeper	S5	-	-	-	G5	ORAA, Stantec
Amphibians	<i>Pseudacris maculata pop. 1</i>	Western Chorus Frog	S4	NAR	THR	THR	G5TNR	ORAA
Reptiles - snakes	<i>Lampropeltis triangulum</i>	Eastern Milksnake	S4	NAR	SC	SC	G5	ORAA, NHIC
Reptiles - snakes	<i>Storeria dekayi</i>	DeKay's Brownsnake	S5	NAR	NAR	-	G5	ORAA
Reptiles - snakes	<i>Storeria occipitomaculata</i>	Red-bellied Snake	S5	-	-	-	G5	ORAA



Group	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Reptiles - snakes	<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5	-	-	-	G5T5	ORAA
Reptiles - turtles	<i>Chelydra serpentina</i>	Snapping Turtle	S4	SC	SC	SC	G5	ORAA, NHIC
Reptiles - turtles	<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S4	-	SC	-	G5T5	ORAA, NHIC
Reptiles - turtles	<i>Emydoidea blandingii</i>	Blanding's Turtle	S3	THR	END	-	G4	ORAA, NHIC
Reptiles - turtles	<i>Graptemys geographica</i>	Northern Map Turtle	S3	SC	SC	SC	G5	ORAA
Reptiles - turtles	<i>Trachemys scripta</i>	Pond Slider	SE2	-	-	-	G5	ORAA

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G3: Rare to uncommon globally; usually between 20-100 occurrences

G3G4: Rare to common globally

G4: Common globally; usually more than 100 occurrences in the overall range

G4G5: Common to very common globally

G5: Very common globally; demonstrably secure

GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.

GNR: Unranked—Global rank not yet assessed.



Appendix D.3: Mammals Records and Observations

Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Canidae	<i>Canis latrans</i>	Coyote	S5	-	-	-	G5	iNaturalist, Stantec
Canidae	<i>Canis lupus lycaon</i>	Eastern Wolf	S4	THR	THR	SC	G5TNR	iNaturalist
Castoridae	<i>Castor canadensis</i>	Beaver	S5	-	-	-	G5	iNaturalist
Cervidae	<i>Odocoileus virginianus</i>	White-tailed Deer	S5	-	-	-	G5	iNaturalist, Stantec
Cricetidae	<i>Microtus pennsylvanicus</i>	Meadow Vole	S5	-	-	-	G5	iNaturalist
Cricetidae	<i>Ondatra zibethicus</i>	Muskrat	S5	-	-	-	G5	iNaturalist
Cricetidae	<i>Peromyscus maniculatus</i>	Deer Mouse	S5	-	-	-	G5	iNaturalist
Didelphidae	<i>Didelphis virginiana</i>	Virginia Opossum	S4	-	-	-	G5	iNaturalist
Dipodidae	<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5	-	-	-	G5	iNaturalist
Erethizontidae	<i>Erethizon dorsatum</i>	Porcupine	S5	-	-	-	G5	iNaturalist
Leporidae	<i>Lepus americanus</i>	Snowshoe Hare	S5	-	-	-	G5	iNaturalist
Leporidae	<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5	-	-	-	G5	iNaturalist, Stantec



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Mephitidae	<i>Mephitis mephitis</i>	Striped Skunk	S5	-	-	-	G5	iNaturalist
Muridae	<i>Rattus norvegicus</i>	Norway Rat	SE	-	-	-	G5	iNaturalist
Muridae	<i>Rattus rattus</i>	Black Rat	SE	-	-	-	G5	iNaturalist
Mustelidae	<i>Lontra canadensis</i>	North American River Otter	S5	-	-	-	G5	iNaturalist
Mustelidae	<i>Mustela frenata</i>	Long-tailed Weasel	S4	-	-	-	G5	iNaturalist
Mustelidae	<i>Neovison vison</i>	American Mink	S4	-	-	-	G5	iNaturalist
Mustelidae	<i>Pekania pennanti</i>	Fisher	S5	-	-	-	G5	iNaturalist
Mustelidae	<i>Mustela richardsonii</i>	American Stoat	-	-	-	-	-	iNaturalist
Procyonidae	<i>Procyon lotor</i>	Northern Raccoon	S5	-	-	-	G5	iNaturalist
Sciuridae	<i>Marmota monax</i>	Woodchuck	S5	-	-	-	G5	iNaturalist
Sciuridae	<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5	-	-	-	G5	iNaturalist, Stantec
Sciuridae	<i>Sciurus niger</i>	Fox Squirrel	SE	-	NAR	-	G5	iNaturalist
Sciuridae	<i>Tamias striatus</i>	Eastern Chipmunk	S5	-	-	-	G5	iNaturalist, Stantec
Sciuridae	<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5	-	-	-	G5	iNaturalist



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Soricidae	<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5	-	-	-	G5	iNaturalist
Soricidae	<i>Sorex cinereus</i>	Masked Shrew	S5	-	-	-	G5	iNaturalist
Talpidae	<i>Condylura cristata</i>	Star-nosed Mole	S5	-	-	-	G5	iNaturalist
Talpidae	<i>Parascalops breweri</i>	Hairy-tailed Mole	S4	-	-	-	G5	iNaturalist
Ursidae	<i>Ursus americanus</i>	American Black Bear	S5	NAR	NAR	-	G5	iNaturalist
Vespertilionidae	<i>Eptesicus fuscus</i>	Big Brown Bat	S4	-	-	-	G5	iNaturalist, Stantec
Vespertilionidae	<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S4	-	-	-	G3G4	iNaturalist, Stantec
Vespertilionidae	<i>Lasiurus borealis</i>	Eastern Red Bat	S4	-	-	-	G3G4	iNaturalist, Stantec
Vespertilionidae	<i>Lasiurus cinereus</i>	Hoary Bat	S4	-	-	-	G3G4	iNaturalist, Stantec
Vespertilionidae	<i>Myotis lucifugus</i>	Little Brown Myotis	S3	END	END	END	G3	iNaturalist, Stantec



Notes:

¹**Scientific Name:** The scientific name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

¹**Common Name:** The common English name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

²**S-Rank:** Subnational Rank (S-Rank) is the conservation status of a species or plant community within a particular province, territory or state. In this scenario, it is the provincial level ranking system as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

³**SARO Status:** Species at Risk in Ontario (Provincial Status as defined by the Endangered Species Act, 2007 as amended).

⁴**COSEWIC Status:** Status as defined by the Committee on the Status of Endangered Wildlife in Canada.

⁵**SARA Status:** Federal status as defined by the Species at Risk Act.

⁶**G-Rank:** Global Rank (G-Rank) is the conservation status of a species or plant community across its entire range. These values were derived from the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

References:

iNaturalist: Ontario Mammals Project. Atlas Area Search: Durham Region. Retrieved April 2021 from <https://www.inaturalist.org/guides/1327>.

NHIC: Natural Heritage Information Centre database review (Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario).

Stantec: Observed in the Study Area by Stantec in 2021

Endangered Species Act and Species at Risk Act Acronyms:

END: Endangered

THR: Threatened

SC: Special Concern

EXT: Extirpated

NAR: Not at Risk



Subnational Rankings (S-Rank):

SNR: Unranked

SU: Unrankable – Currently unrankable due to lack of information

SNA: Not applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

?: Indicates uncertainty in the assigned rank

S1: Critically Imperiled – Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled – Imperiled in the province, very few populations (often 20 or fewer),

S3: Vulnerable – Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure – Uncommon but not rare

S5: Secure – Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SE: if an element is known to occur as an exotic in Ontario, the status value assigned is SE. A ? qualifier added to that value indicates uncertainty about whether it is exotic or native. Numeric ranks of 1 through 5 added to the exotic status indicates the element's abundance in Ontario, with 1 indicating the least abundant and 5 the most.

Global Rankings (G-Rank)

G1: Extremely rare globally – usually fewer than 5 occurrences in the overall range

G1G2: Extremely rare to very rare globally

G2: Very rare globally – usually between 5-10 occurrences in the overall range

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally – usually between 20-100 occurrences

G3G4: Rare to common globally

G4: Common globally – usually more than 100 occurrences in the overall range

G4G5: Common to very common globally



G5: Very common globally – demonstrably secure

GU: Status uncertain, often because of low search effort or cryptic nature of the species – more data needed

GNR: Unranked – Global rank not yet assessed.

T: Denotes that the rank applies to a subspecies or variety

Q: Denotes that the taxonomic status of the species, subspecies, or variety is questionable



Appendix D.4: Insect Records and Observations

Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Apidae	<i>Bombus affinis</i>	Rusty-patched Bumble Bee	S1	END	END	END	G2	OBA
Apidae	<i>Bombus bohemicus</i>	Gypsy Cuckoo Bumble Bee	S4	END	END	-	-	OBA
Apidae	<i>Bombus terricola</i>	Yellow-banded Bumble Bee	S3S5	SC	SC	SC	G3G4	OBA
Hesperiidae	<i>Anatrytone logan</i>	Delaware Skipper	S4	-	-	-	G5	OBA
Hesperiidae	<i>Ancyloxypha numitor</i>	Least Skipper	S5	-	-	-	G5	OBA
Hesperiidae	<i>Carterocephalus palaemon</i>	Arctic Skipper	S5	-	-	-	G5	OBA
Hesperiidae	<i>Epargyreus clarus</i>	Silver-spotted Skipper	S4	-	-	-	G5	OBA
Hesperiidae	<i>Erynnis baptisiae</i>	Wild Indigo Duskywing	S4	-	-	-	G5	OBA
Hesperiidae	<i>Erynnis icelus</i>	Dreamy Duskywing	S5	-	-	-	G5	OBA
Hesperiidae	<i>Erynnis juvenalis</i>	Juvenal's Duskywing	S5	-	-	-	G5	OBA
Hesperiidae	<i>Erynnis lucilius</i>	Columbine Duskywing	S4	-	-	-	G3	OBA
Hesperiidae	<i>Erynnis martialis</i>	Mottled Duskywing	S2	END	END	-	G3	OBA
Hesperiidae	<i>Euphyes dion</i>	Dion Skipper	S4	-	-	-	G5	OBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Hesperiidae	<i>Euphyes vestris</i>	Dun Skipper	S5	-	-	-	G5	OBA
Hesperiidae	<i>Hesperia leonardus</i>	Leonard's Skipper	S4	-	-	-	G4	OBA
Hesperiidae	<i>Hylephila phyleus</i>	Fiery Skipper	SNA	-	-	-	G5	OBA
Hesperiidae	<i>Poanes hobomok</i>	Hobomok Skipper	S5	-	-	-	G5	OBA
Hesperiidae	<i>Polites mystic</i>	Long Dash Skipper	S5	-	-	-	G5	OBA
Hesperiidae	<i>Polites origenes</i>	Crossline Skipper	S4	-	-	-	G5?	OBA
Hesperiidae	<i>Polites peckius</i>	Peck's Skipper	S5	-	-	-	G5	OBA
Hesperiidae	<i>Polites themistocles</i>	Tawny-edged Skipper	S5	-	-	-	G5	OBA
Hesperiidae	<i>Pompeius verna</i>	Little Glassywing	S4	-	-	-	G5	OBA
Hesperiidae	<i>Thorybes bathyllus</i>	Southern Cloudywing	S3	-	-	-	G5	OBA
Hesperiidae	<i>Thorybes pylades</i>	Northern Cloudywing	S5	-	-	-	G5	OBA
Hesperiidae	<i>Thymelicus lineola</i>	European Skipper	SE	-	-	-	G5	OBA
Hesperiidae	<i>Wallengrenia egeremet</i>	Northern Broken-Dash	S5	-	-	-	G5	OBA
Lycaenidae	<i>Callophrys niphon</i>	Eastern Pine Elfin	S5	-	-	-	G5	OBA
Lycaenidae	<i>Celastrina lucia</i>	Northern Spring Azure	S5	-	-	-	G5	OBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Lycaenidae	<i>Celastrina neglecta</i>	Summer Azure	S5	-	-	-	G5	OBA
Lycaenidae	<i>Cupido comyntas</i>	Eastern Tailed Blue	S5	-	-	-	G5	OBA
Lycaenidae	<i>Feniseca tarquinius</i>	Harvester	S4	-	-	-	G5	OBA
Lycaenidae	<i>Glaucopsyche lygdamus</i>	Silvery Blue	S5	-	-	-	G5	OBA
Lycaenidae	<i>Lycaena hyllus</i>	Bronze Copper	S5	-	-	-	G5	OBA
Lycaenidae	<i>Lycaena phlaeas</i>	American Copper	S5	-	-	-	G5	OBA
Lycaenidae	<i>Parrhasius m-album</i>	White-M Hairstreak	SNA	-	-	-	G5	OBA
Lycaenidae	<i>Satyrium acadica</i>	Acadian Hairstreak	S4	-	-	-	G5	OBA
Lycaenidae	<i>Satyrium calanus</i>	Banded Hairstreak	S4	-	-	-	G5	OBA
Lycaenidae	<i>Satyrium caryaevorus</i>	Hickory Hairstreak	S4	-	-	-	G4	OBA
Lycaenidae	<i>Satyrium edwardsii</i>	Edwards' Hairstreak	S4	-	-	-	G4	OBA
Lycaenidae	<i>Satyrium liparops</i>	Striped Hairstreak	S5	-	-	-	G5	OBA
Lycaenidae	<i>Satyrium titus</i>	Coral Hairstreak	S5	-	-	-	G5	OBA
Nymphalidae	<i>Aglais milberti</i>	Milbert's Tortoiseshell	S5	-	-	-	G5	OBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Nymphalidae	<i>Boloria bellona</i>	Meadow Fritillary	S5	-	-	-	G5	OBA
Nymphalidae	<i>Cercyonis pegala</i>	Common Wood-Nymph	S5	-	-	-	G5	OBA
Nymphalidae	<i>Chlosyne harrisii</i>	Harris's Checkerspot	S4	-	-	-	G5	OBA
Nymphalidae	<i>Coenonympha tullia</i>	Common Ringlet	S5	-	-	-	G5	OBA
Nymphalidae	<i>Danaus plexippus</i>	Monarch	S2N,S4B	SC	END	SC	G4	OBA, Stantec
Nymphalidae	<i>Junonia coenia</i>	Common Buckeye	SNA	-	-	-	G5	OBA
Nymphalidae	<i>Lethe anthedon</i>	Northern Pearly-Eye	S5	-	-	-	G5	OBA
Nymphalidae	<i>Lethe appalachia</i>	Appalachian Brown	S4	-	-	-	G4	OBA
Nymphalidae	<i>Lethe eurydice</i>	Eyed Brown	S5	-	-	-	G5	OBA
Nymphalidae	<i>Libytheana carinenta</i>	American Snout	SNA	-	-	-	G5	OBA
Nymphalidae	<i>Limenitis archippus</i>	Viceroy	S5	-	-	-	G5	OBA
Nymphalidae	<i>Limenitis arthemis arthemis</i>	White Admiral	S5	-	-	-	G5T5	OBA
Nymphalidae	<i>Limenitis arthemis astyanax</i>	Red-spotted Purple	S5	-	-	-	G5T5	OBA
Nymphalidae	<i>Megisto cymela</i>	Little Wood-Satyr	S5	-	-	-	G5	OBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Nymphalidae	<i>Nymphalis antiopa</i>	Mourning Cloak	S5	-	-	-	G5	OBA
Nymphalidae	<i>Nymphalis l-album</i>	Compton Tortoiseshell	S5	-	-	-	G5	OBA
Nymphalidae	<i>Phyciodes batesii</i>	Tawny Crescent	S4	-	-	-	G5	OBA
Nymphalidae	<i>Phyciodes cocyta</i>	Northern Crescent	S5	-	-	-	G5	OBA
Nymphalidae	<i>Phyciodes tharos</i>	Pearl Crescent	S4	-	-	-	G5	OBA
Nymphalidae	<i>Polygonia comma</i>	Eastern Comma	S5	-	-	-	G5	OBA
Nymphalidae	<i>Polygonia interrogationis</i>	Question Mark	S5	-	-	-	G5	OBA
Nymphalidae	<i>Polygonia progne</i>	Gray Comma	S5	-	-	-	G5	OBA
Nymphalidae	<i>Speyeria aphrodite</i>	Aphrodite Fritillary	S5	-	-	-	G5	OBA
Nymphalidae	<i>Speyeria cybele</i>	Great Spangled Fritillary	S5	-	-	-	G5	OBA
Nymphalidae	<i>Speyeria idalia</i>	Regal Fritillary	SNA	-	-	-	G3?	OBA
Nymphalidae	<i>Vanessa atalanta</i>	Red Admiral	S5B	-	-	-	G5	OBA
Nymphalidae	<i>Vanessa cardui</i>	Painted Lady	S5B	-	-	-	G5	OBA
Nymphalidae	<i>Vanessa virginiensis</i>	American Lady	S5	-	-	-	G5	OBA
Papilionidae	<i>Battus philenor</i>	Pipevine Swallowtail	SNA	-	-	-	G5	OBA
Papilionidae	<i>Papilio canadensis</i>	Canadian Tiger Swallowtail	S5	-	-	-	G5	OBA



Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Papilionidae	<i>Papilio cresphontes</i>	Giant Swallowtail	S4	-	-	-	G5	OBA
Papilionidae	<i>Papilio glaucus</i>	Eastern Tiger Swallowtail	S5	-	-	-	G5	OBA, Stantec
Papilionidae	<i>Papilio polyxenes</i>	Black Swallowtail	S5	-	-	-	G5	OBA
Papilionidae	<i>Papilio troilus</i>	Spicebush Swallowtail	S4	-	-	-	G5	OBA
Pieridae	<i>Colias eurytheme</i>	Orange Sulphur	S5	-	-	-	G5	OBA
Pieridae	<i>Colias philodice</i>	Clouded Sulphur	S5	-	-	-	G5	OBA
Pieridae	<i>Pieris oleracea</i>	Mustard White	S4	-	-	-	G5	OBA
Pieridae	<i>Pieris rapae</i>	Cabbage White	SE	-	-	-	G5	OBA, Stantec

Notes:

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¹**Common Name:** The common English name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

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⁶G-Rank: Global Rank (G-Rank) is the conservation status of a species or plant community across its entire range. These values were derived from the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

References:

OBA: Ontario Butterfly Atlas database review as published by the Toronto Entomologists' Association. Retrieved April 2021 from <https://www.ontarioinsects.org/atlas/>

Stantec: Observed in the Study Area by Stantec in 2021

Endangered Species Act and Species at Risk Act Acronyms

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THR: Threatened

SC: Special Concern

EXT: Extirpated

NAR: Not at Risk

Subnational Rankings (S-Rank)

SNR: Unranked

SU: Unrankable – Currently unrankable due to lack of information

SNA: Not applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

?: Indicates uncertainty in the assigned rank

S1: Critically Imperiled – Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled – Imperiled in the province, very few populations (often 20 or fewer),

S3: Vulnerable – Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure – Uncommon but not rare

S5: Secure – Common, widespread, and abundant in the province

SX: Presumed extirpated



SH: Possibly Extirpated (Historical)

SE: if an element is known to occur as an exotic in Ontario, the status value assigned is SE. A ? qualifier added to that value indicates uncertainty about whether it is exotic or native. Numeric ranks of 1 through 5 added to the exotic status indicates the element's abundance in Ontario, with 1 indicating the least abundant and 5 the most.

Global Rankings (G-Rank)

G1: Extremely rare globally – usually fewer than 5 occurrences in the overall range

G1G2: Extremely rare to very rare globally

G2: Very rare globally – usually between 5-10 occurrences in the overall range

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally – usually between 20-100 occurrences

G3G4: Rare to common globally

G4: Common globally – usually more than 100 occurrences in the overall range

G4G5: Common to very common globally

G5: Very common globally – demonstrably secure

GU: Status uncertain, often because of low search effort or cryptic nature of the species – more data needed

GNR: Unranked – Global rank not yet assessed.

T: Denotes that the rank applies to a subspecies or variety

Q: Denotes that the taxonomic status of the species, subspecies, or variety is questionable



Appendix D.5: Fish Records and Observations

Thermal Regime	Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Coldwater	Salmonidae	<i>Oncorhynchus mykiss</i>	Rainbow Trout	SNA	-	-	-	G5	CLOCA
Coldwater	Salmonidae	<i>Oncorhynchus tshawytscha</i>	Chinook Salmon	SNA	-	-	-	G5	CLOCA
Coldwater	Salmonidae	<i>Salmo trutta</i>	Brown Trout	SNA	-	-	-	G5	CLOCA
Coolwater	Anguillidae	<i>Anguilla rostrata</i>	American Eel	S1S2	END	THR	-	G4	NHIC
Coolwater	Catostomidae	<i>Catostomus commersonii</i>	White Sucker	S5	-	-	-	G5	CLOCA
Coolwater	Cottidae	<i>Cottus bairdii</i>	Mottled Sculpin	S5	-	-	-	G5	CLOCA
Coolwater	Cyprinidae	<i>Rhinichthys cataractae</i>	Longnose Dace	S5	-	-	-	G5	CLOCA
Coolwater	Cyprinidae	<i>Rhinichthys obtusus</i>	Western Blacknose Dace	SNA	-	-	-	G5	CLOCA
Coolwater	Cyprinidae	<i>Semotilus atromaculatus</i>	Creek Chub	S5	-	-	-	G5	CLOCA
Coolwater	Gasterosteidae	<i>Culaea inconstans</i>	Brook Stickleback	S5	-	-	-	G5	CLOCA
Coolwater	Gasterosteidae	<i>Gasterosteus aculeatus</i>	Threespine Stickleback	S4S5	-	-	-	G5	CLOCA
Coolwater	Gobiidae	<i>Neogobius melanostomus</i>	Round Goby	SNA	-	-	-	G5	CLOCA



Thermal Regime	Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Coolwater	Percidae	<i>Etheostoma caeruleum</i>	Rainbow Darter	S4	-	-	-	G5	CLOCA
Coolwater	Percidae	<i>Etheostoma nigrum</i>	Johnny Darter	S5	-	-	-	G5	CLOCA
Coolwater	Percidae	<i>Perca flavescens</i>	Yellow Perch	S5	-	-	-	G5	CLOCA
Coolwater	Petromyzontidae	<i>Petromyzon marinus</i>	Sea Lamprey	SNA	-	-	-	G5	CLOCA NHIC
Warmwater	Centrarchidae	<i>Ambloplites rupestris</i>	Rock Bass	S5	-	-	-	G5	CLOCA
Warmwater	Centrarchidae	<i>Lepomis cyanellus</i>	Green Sunfish	S4	NAR	NAR	-	G5	CLOCA
Warmwater	Centrarchidae	<i>Lepomis gibbosus</i>	Pumpkinseed	S5	-	-	-	G5	CLOCA
Warmwater	Centrarchidae	<i>Micropterus dolomieu</i>	Smallmouth Bass	S5	-	-	-	G5	CLOCA
Warmwater	Centrarchidae	<i>Micropterus salmoides</i>	Largemouth Bass	S5	-	-	-	G5	CLOCA
Warmwater	Cyprinidae	<i>Carassius auratus</i>	Goldfish	SNA	-	-	-	G5	CLOCA
Warmwater	Cyprinidae	<i>Cyprinus carpio</i>	Common Carp	SNA	-	-	-	G5	CLOCA
Warmwater	Cyprinidae	<i>Luxilus cornutus</i>	Common Shiner	S5	-	-	-	G5	CLOCA
Warmwater	Cyprinidae	<i>Pimephales notatus</i>	Bluntnose Minnow	S5	NAR	NAR	-	G5	CLOCA



Thermal Regime	Family	Scientific Name ¹	Common Name ¹	S-Rank ²	SARO Status ³	COSEWIC Status ⁴	SARA Status ⁵	G-Rank ⁶	Source
Warmwater	Cyprinidae	<i>Pimephales promelas</i>	Fathead Minnow	S5	-	-	-	G5	CLOCA
Warmwater	Ictaluridae	<i>Ameiurus nebulosus</i>	Brown Bullhead	S5	-	-	-	G5	CLOCA

Notes:

¹**Scientific Name:** The scientific name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

¹**Common Name:** The common English name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

²**S-Rank:** Subnational Rank (S-Rank) is the conservation status of a species or plant community within a particular province, territory or state. In this scenario, it is the provincial level ranking system as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

³**SARO Status:** Species at Risk in Ontario (Provincial Status as defined by the Endangered Species Act, 2007 as amended).

⁴**COSEWIC Status:** Status as defined by the Committee on the Status of Endangered Wildlife in Canada.

⁵**SARA Status:** Federal status as defined by the Species at Risk Act.

⁶**G-Rank:** Global Rank (G-Rank) is the conservation status of a species or plant community across its entire range. These values were derived from the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

References:

CLOCA: Central Lake Ontario Conservation Authority 2021 long term aquatic monitoring data.

Received from CLOCA on August 19 2021 (direct data request; see records of correspondence in **Appendix B** for details).

NHIC: Natural Heritage Information Centre database review (Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario).



Endangered Species Act and Species at Risk Act Acronyms

END: Endangered

THR: Threatened

SC: Special Concern

EXT: Extirpated

NAR: Not at Risk

Subnational Rankings (S RANK)

SNR: Unranked

SU: Unrankable – Currently unrankable due to lack of information

SNA: Not applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

?: Indicates uncertainty in the assigned rank

S1: Critically Imperiled – Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled – Imperiled in the province, very few populations (often 20 or fewer),

S3: Vulnerable – Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure – Uncommon but not rare

S5: Secure – Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SE: if an element is known to occur as an exotic in Ontario, the status value assigned is SE. A ? qualifier added to that value indicates uncertainty about whether it is exotic or native. Numeric ranks of 1 through 5 added to the exotic status indicates the element's abundance in Ontario, with 1 indicating the least abundant and 5 the most.



Global Rank (GRank)

G1G2: Extremely rare to very rare globally

G2: Very rare globally; usually between 5-10 occurrences in the overall range

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally; usually between 20-100 occurrences

G3G4: Rare to common globally

G4: Common globally; usually more than 100 occurrences in the overall range

G4G5: Common to very common globally

G5: Very common globally; demonstrably secure

GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.

GNR: Unranked—Global rank not yet assessed.



Appendix E

Species at Risk and Species of Conservation Concern Habitat Screening Assessments



Appendix E.1: Species at Risk Habitat Screening Assessment

Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Birds	Bank Swallow	<i>Riparia riparia</i>	THR	THR	THR	S4B	OBBA	The Bank Swallow breeds on a variety of sites with vertical banks, including riverbanks, bluffs, aggregate pits and stock piles of sand and soil. Sand-silt substrates are preferred. Nesting sites are often near open habitats used for aerial foraging. Large wetlands are used as communal roosts during post-breeding, migration, and wintering periods (COSEWIC 2013).	Low - There were no eroding banks suitable for Bank Swallow observed in the Study Area. This species was not observed during field investigations.
Birds	Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	THR	S4B	OBBA, NHIC, Stantec	Bobolink nest primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures. Preferred ground cover species include grasses such as Timothy and Kentucky bluegrass and forbs such as clover and dandelion (COSEWIC 2010a). Bobolink is an area-sensitive species, with reported lower reproductive success in small habitat fragments (COSEWIC 2010a).	High - Cultural meadow and hayfields in the Study Area have the potential to support Bobolink. Bobolink was confirmed in the Study Area during field investigations.
Birds	Chimney Swift	<i>Chaetura pelagica</i>	THR	THR	THR	S4B, S4N	OBBA, NHIC	Chimney Swift uses chimneys for roosting and breeding, and less commonly, nest in large hollow trees (Cadman et al. 2007). Nesting sites typically have a constant ambient temperature (COSEWIC 2007). It is an aerial insectivore, and often forages near water (COSEWIC 2007).	Low - There were no suitable chimney structures observed in the Study Area and there is a low potential for Chimney Swift to nest in the trees in the Study Area. This species was not observed during field investigations.
Birds	Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR	THR	S4B	OBBA, NHIC, Stantec	Meadowlarks are ground nesting birds (Harrison, 1975), which are often associated with human-modified habitats where they sing from prominent perches such as roadside wires, trees, and fenceposts. As a grassland species the Eastern Meadowlark typically occurs in meadows, hayfields and pastures. However, it will utilize a wider range of habitat than most grassland species, including mown lawn (e.g. golf course, parks), wooded city ravines, young conifer plantations and orchards (Peck and James 1983). The Eastern Meadowlark is generally tolerant of habitat with early succession of trees or shrubs.	High - Cultural meadow and hayfields in the Study Area have the potential to support Eastern Meadowlark. Eastern Meadowlark was confirmed in the Study Area during field investigations.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Birds	King Rail	<i>Rallus elegans</i>	END	END	END	S1B	NHIC	The King Rail is the most threatened of North American rails (Poole et al., 2005) and is listed as federally and provincially endangered. In Ontario, King Rail is associated with emergent freshwater coastal marshes, most often dominated by cattails, sedges and common reed (Ducks Unlimited Canada, undated), but uses shrub/marsh habitat and brackish marshes with rushes and grasses in other parts of its range (Poole et al., 2005). It is thought to prefer large marshes more than 70 ha in size (Ducks Unlimited Canada, undated). Limiting factors are habitat loss, and habitat deterioration through pollution and artificial control of water levels (COSEWIC, 2000a).	Low - Wetlands in the Study Area are generally small and do not have adequate open water present for King Rail. This species was not observed during field investigations.
Birds	Least Bittern	<i>Ixobrychus exilis</i>	THR	THR	THR	S4B	OBBA, NHIC	The Least Bittern is a relatively small bird that nests in freshwater marshes where dense aquatic vegetation occurs with woody vegetation and open water. They are found most commonly in marshes greater than 5 ha in size (Gibbs <i>et al.</i> , 1992). The Canadian population of Least Bitterns is estimated at less than 1000 pairs. The majority of Least Bitterns that breed in Canada are found in Ontario. The species is designated threatened due to its very small and declining population that depends on high quality marsh habitats that are being lost and degraded across the species' range (NHIC, 2007). The Least Bittern is protected under the Canadian Species at Risk Act (SARA), the Canada/United States Migratory Birds Convention and the Migratory Bird Treaty between the United States and Mexico.	Low - Wetlands in the Study Area are generally small and do not have adequate open water present for Least Bittern. This species was not observed during field investigations.
Birds	Loggerhead Shrike	<i>Lanius ludovicianus</i>	END	END	END	S2B	NHIC	This species prefers early successional shrubland, including unimproved pastured areas. It utilizes open country with short vegetation, including pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas and open woodlands (Reuven, 1996). Also known as a “passerine raptor”, the Loggerhead Shrike impales its prey on thorns, sharp branches or barbed wire since it lacks talons of a true raptor. Factors potentially contributing to this species' decline include habitat loss, pesticides, road associated mortality, adverse weather and interspecific competition. Concentrations of the species are located on core areas of limestone plain adjacent to Canadian Shield. In Ontario, populations are concentrated on and around the Napanee and Carden Plains (Cadman et al, 2007).	Low - Although successional shrubland and open habitat is abundant in the Study Area, populations of Loggerhead Shrike are not known to be concentrated in the area. This species was not observed during field investigations.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Birds	Northern Bobwhite	<i>Colinus virginianus</i>	END	END	END	S1	NHIC	The Northern Bobwhite is a very rare and declining grassland species. The best habitat in southern Ontario includes the grasslands and savannahs of Walpole Island, however, there is potential habitat along riparian zones along the Thames River and Kettle Creek (Cadman <i>et al.</i> , 2007). Fragmentation and loss of suitable grassland habitat through intensified agricultural practices are the major factors limiting populations of this species (COSEWIC, 2003a).	Low - Northern Bobwhite is extremely rare in the province and unlikely to occur in the highly disturbed/urbanized Study Area. This species was not observed during field investigations.
Birds	Piping Plover	<i>Charadrius melodus</i>	END	END	END	S1B	OBBA, NHIC	Piping plover nesting in southern Ontario is restricted to the shores of the Great Lakes and Lake of the Woods in northwestern Ontario. Nesting sites include open sand, gravel, or shell-covered substrate above the tideline. (Cadman et al, 2007).	Low - The Study Area does not include suitable shoreline habitat. This species was not observed during field investigations.
Birds	Yellow-breasted Chat	<i>Icteria virens</i>	END	END	END	S2B	NHIC	Yellow-breasted Chat is not widespread in Ontario, but most records from the province are from the Carolinian region (Eagles, 1987). Likely never common here, the Yellow-breasted Chat prefers successional habitats where clearings have become overgrown with scrub and thickets (Cadman and Page, 1994), early second-growth forest and shrub in abandoned agricultural fields, fencerows, forest edges and openings, and near streams (Eckerle and Thompson, 2001). In Ontario, it is usually found in shrubby tangles and deciduous thickets (Eagles, 1987).	Low - Although successional habitat is abundant in the Study Area, Yellow-breasted Chat is extremely rare in the province and unlikely to occur in the disturbed or urbanized Study Area. This species was not observed during field investigations.
Reptile	Blanding's Turtle	<i>Emydoidea blandingi</i>	THR	THR	THR	S3	NHIC, ORAA	Blanding's Turtles frequent lakes, ponds, and marshes, and prefer shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch, 2002). They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults usually occupy open or partially vegetated sites, whereas juveniles occupy areas with thick aquatic vegetation including sphagnum, water lilies and algae. Nesting occurs in dry conifer or mixed hardwood forests, up to 410 m from any body of water, in loose substrates including sand, organic soil, gravel and cobblestone, nesting may also occur along gravel roadways (COSEWIC, 2005).	Medium - Oshawa Creek and Harmony Creek provide permanent standing water in the Project Study Area that has the potential to support Blanding's Turtle. Ponds in the Study Area are mostly comprised of stormwater management ponds, which also have potential to support Blanding's Turtle.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Mammals	Little Brown Myotis	<i>Myotis lucifugus</i>	END	END	END	S4	iNaturalist, Stantec	This species up until recently was considered the most common bat species in Ontario, and most frequently found bat species in North America. The recent change in status is due to significant declines in recent years attributed to a condition referred to as White-nose Syndrome (WNS). A widespread species, the Little Brown Bat is commonly found in warm sites such as buildings, attics, roof crevices, under bridges or in cavities of canopy trees in the forest (COSEWIC, 2013).	High - Forest and swamp communities and buildings in the Study Area have the potential to provide suitable bat maternity habitat for SAR bats. Little Brown Myotis was recorded in the Study Area during bat acoustic surveys.
Mammals	Eastern Small-footed Myotis	<i>Myotis leibii</i>	END	Not listed	END	S2S3	MNDMNRF	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius; Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Medium - Forest and swamp communities and buildings in the Study Area have the potential to provide suitable bat maternity habitat for SAR bats. Eastern Small-footed Myotis was not recorded in the Study Area during bat acoustic surveys; however, there were 4 unidentified Myotis species calls recorded which have the potential to be Eastern Small-footed Myotis.
Mammals	Northern Myotis	<i>Myotis septentrionalis</i>	END	END	END	S3?	MNDMNRF	The Northern Myotis (formerly Northern Long-eared Bat; <i>Myotis septentrionalis</i>) is a resident bat of upland forests of eastern North America, typically foraging for aerial insects in the forest understory. Maternity roosts are typically located under the bark of large trees and are rarely found in human-made structures. Hibernating colonies typically reside in cave crevices (COSEWIC, 2013). The precipitous population decline of this species in recent years is attributed to a condition referred to as White-nose Syndrome (WNS).	Medium - Forest and swamp communities and buildings in the Study Area have the potential to provide suitable bat maternity habitat for SAR bats. Northern Myotis was not recorded in the Study Area during bat acoustic surveys; however, there were 4 unidentified Myotis species calls recorded which have the potential to be Northern Myotis.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Mammals	Tri-colored Bat	<i>Perimyotis subflavus</i>	END	END-END	END	S3?	MNDMNRF	The Tri-colored Bat roosts in colonies in tree cavities (COSEWIC 2013b) in a wide variety of deciduous and coniferous forest stands. It is strongly associated with forest watercourses and streamside vegetation (COSEWIC 2013b).	High - Forest and swamp communities in the Study Area have the potential to provide suitable bat maternity habitat for SAR bats. Tri-colored Bat was not recorded in the Study Area during bat acoustic surveys; however, there were 31 unidentified species calls recorded as either Eastern Red bat or Tri-colored Bat that could not be confirmed.
Insects	Gypsy Cuckoo Bumble Bee	<i>Bombus bohemicus</i>	END	END	END	S4	NHIC	The Gypsy Cuckoo Bumble Bee occurs in diverse habitats, including open meadows, mixed farmlands, urban areas, boreal forest and montane meadows. This species parasitizes host nests of other bumblebees species in the spring. Since Gypsy Cuckoo Bumble Bees do not produce workers, mated females kill or subdue the host queen and lay eggs for the host colony workers tend. Hosts include the endangered Rusty-patched Bumble Bee and the Yellow-banded Bumble Bee which is a special concern species (COSEWIC 2014).	Low - This species has the potential to occur throughout the Study Area, although species occurrences are quite rare.
Insects	Mottled Duskywing	<i>Erynnis martialis</i>	END	END-NS	END	S2	NHIC	Mottled Duskywing is associated with the larval food plants, which in Ontario are Prairie Root and New Jersey Tea. These plant species generally grow in dry, sandy soils within oak or pine woodlands, along roadsides, hydro corridors, riverbanks, oak savannas, shady hillside, tallgrass prairies and alvars (Linton, 2015).	Low - Prairie Root and New Jersey Tea were not observed during field investigations. Mottled Duskywing is therefore unlikely to occur in the Study Area.
Insects	Rusty-patched Bumble Bee	<i>Bombus affinis</i>	END	END	END	S1	NHIC	The Rusty-patched bumblebee occurs in diverse habitats, including mixed farmland, sand dunes, marshes, urban areas and woodlands. It has been observed feeding on a variety of plant species. Nest locations are found underground, usually in abandoned rodent burrows. The rusty-patched bumblebee's northernmost range includes southern Ontario and Southwestern Quebec in Canada (COSEWIC, 2010b).	Low - This species has the potential to occur throughout the Study Area, although species occurrences are quite rare.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Plants	American ginseng	<i>Panax quinquefolius</i>	END	?	END	S2	NHIC	Although there are likely more than 100 extant populations of American Ginseng in Ontario, many are quite small. These populations are threatened by human exploitation; declining populations are due to habitat loss and harvesting for its root, which is highly prized for its supposed medicinal properties. This species is found within rich, moist deciduous woods, particularly on calcareous rocky shaded slopes (NHIC, 2010). Colonies often found in the warm, well drained microhabitat at the bottom of gentle south to south-west facing slopes (COSEWIC, 2000b).	Low - Rich, moist deciduous woodlands were absent from the Study Area. American Ginseng was not observed in the Study Area during field observations.
Plants	Butternut	<i>Juglans cinerea</i>	END	END	END	S3?	NHIC	Butternut is commonly found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows ideal habitat includes rich, moist, and well-drained soils often found along streams, but may also be found on well-drained gravel sites, particularly those made of limestone (COSEWIC, 2003b). Butternut is intolerant of shade and occurs singly or in small groups with a variety of associates (Farrar, 1995).	High - Butternut was visually confirmed in the Study Area during field observations. Refer to Sections 4.5.2.2, 4.5.4, and 4.7 within report for results. [NTD: Genetic testing to confirm the purity of the Butternut is currently underway.]
Fish	American Eel	<i>Anguilla rostrata</i>	END	NS	END	S1?	NHIC	The American Eel uses a broad variety of habitats. In freshwater habitats, viable habitat can be found in both slow and fast-flowing waters including all waters extending from the high-water mark down to at least 10 m depth within the American Eel range (COSWIC, 2012).	Low - American Eel has been captured in Lake Ontario and also a section of Oshawa Creek north (upstream) of the Study Area (NHIC 2021). As such it reasonable to assume that American Eel may occur in the reaches of Oshawa Creek in the Study Area. Within the Study Area, there are no records of American Eel in the NHIC database (NHIC 2021).



Notes:

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⁶SARA Status: Federal status as defined by the Species at Risk Act

References:

NHIC: Natural Heritage Information Centre database review (Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario).

MNDMNRF: MNDMNRF Species at Risk in Ontario List. Species range information retrieved November 2021 from <https://www.ontario.ca/page/species-risk-ontario>

OBBA: Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii + 318pp

ORAA: Ontario Nature. 2019. Ontario Reptile and Amphibian Atlas [web application]. Toronto, Ontario. Available online: <https://ontarionature.org/oraa/maps/>

Stantec: Observed by Stantec during 2021 field investigations.

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Subnational Rankings (S RANK)

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- S4:** Apparently Secure – Uncommon but not rare
- S5:** Secure – Common, widespread, and abundant in the province
- SX:** Presumed extirpated
- SH:** Possibly Extirpated (Historical)
- SE:** if an element is known to occur as an exotic in Ontario, the status value assigned is SE. A ? qualifier added to that value indicates uncertainty about whether it is exotic or native. Numeric ranks of 1 through 5 added to the exotic status indicates the element’s abundance in Ontario, with 1 indicating the least abundant and 5 the most.



Appendix E.2: Species of Conservation Concern Habitat Screening Assessment

Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Birds	Bald Eagle	<i>Haliaeetus leucocephalus</i>	SC	NAR	NAR	S4	OBBA	The Bald Eagle almost always nests near water, usually on large lakes. Large stick nests are placed in trees located within mature woodlots. They usually prefer 250 ha of mature forest for breeding, however, along Lake Erie, where the lake provides a valuable food source, the eagles will nest in smaller woodlots or even single trees (Sandilands, 2005). This species has experienced a relatively recent and substantial increase in population as well as an expansion in range following a decline during the mid-20 th century (Cadman et. al. 2007).	Low - There were no large stick nests observed in the Study Area during field investigations. Nesting locations are likely closer to the Lake Ontario shoreline.
Birds	Barn Swallow	<i>Hirundo rustica</i>	SC	SC	THR	S4B	OBBA, NHIC, Stantec	The Barn Swallow commonly nests on walls or ledges of barns, bridges, culverts or other man-made structures (Cadman et al. 2007). Where suitable nesting structures occur, Barn Swallow often form small colonies, sometimes mixed with other swallow species. The Barn Swallow feeds on aerial insects while foraging over a variety of open habitats such as pastures, lawns, meadows and fields (COSEWIC 2011). It will also frequently forage in woodland clearings, over wetland habitats or open water where insect prey are abundant (Cadman et al. 2007).	High - Barn Swallow was confirmed in the Study Area during field investigations.
Birds	Black Tern	<i>Chlidonias niger</i>	SC	NAR	NAR	S3B, S4M	NHIC OBBA	The Black Tern is a small tern that nests semi-colonially in freshwater marshes with emergent vegetation. This species prefers marshes or marsh complexes of more than 20 ha in size for breeding (Dunn and Agro 1995). Preferably the marsh habitat consists of roughly 50:50 open water and emergent vegetation (Cadman et. al. 2007).	Low - Wetlands in the Study Area are generally small and do not have adequate open water present for Black Tern.
Birds	Common Nighthawk	<i>Chordeiles minor</i>	SC	SC	THR	S4B	OBBA	The Common Nighthawk is an aerial insectivore and forages at dawn and dusk. Common Nighthawks nest on the ground in open habitats preferably with rocky or graveled substrate. Nighthawks will even nest on gravel roofs in the city. The regeneration or succession of forest clearings and the destruction of grassland habitats appear to play a major role in this species' decline along with the non-selective spraying for mosquitoes (Cadman et al., 2007). Other potential limiting factors include an increase in predators such as domestic cats, striped skunks, raccoons, American crows and common ravens, as well as road-associated mortality (COSEWIC, 2007a).	Medium - Common Nighthawk has the potential to occur throughout open habitat in the Study Area. This species was not observed during field investigations.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Birds	Eastern Wood-Pewee	<i>Contopus virens</i>	SC	SC	SC	S4B	OBBA, Stantec	The Eastern Wood-Pewee is a forest bird of deciduous and mixed woods. Nest-site selection favors open space near the nest, typically provided by clearings, roadways, water, and forest edges. Nests are cryptic as they are covered with lichens, typically appearing like a knot on top of a branch and little is known about nesting behavior (Cadman et al, 2007).	High - Potential habitat for Eastern Wood-Pewee occurs throughout the forests and woodlands in the Study Area. This species was observed during field investigations.
Birds	Peregrine Falcon	<i>Falco peregrinus</i>	SC	NAR	SC	S4	NHIC, OBBA	Traditionally, in Ontario, the peregrine falcon has been a rare breeder, preferring suitable rock cliffs, particularly those adjacent to water. More recently the species has been released in various urban centers in Ontario where it successfully nests on tall buildings. Relatively recent increases in abundance and distribution are owing to now established populations in natural areas and urban environments, both of which are separate and distinct populations. These increases reflect the large-scale recovery efforts across the species range (Cadman et al, 2007). Despite significant recovery from population declines due to exposure to organochlorine pesticides, particularly DDT, limiting factors still include pesticide use in the species' wintering range as well as human disturbance at nest sites and increased legal and illegal harvest for falconry (COSEWIC, 2007b).	Low - Rock cliffs and tall buildings were absent from the Study Area. This species was not observed during field investigations.
Birds	Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	SC	END	THR	S3	NHIC	The Red-headed Woodpecker occupies a wide range of habitats, but most are characterized by open areas for feeding; snags for roosting, and a secure food supply. This species requires multiple snags for nesting, roosting, and foraging. Some of the habitats used are open deciduous and riparian woodlands, orchards, parks, agricultural lands, savanna-like grasslands, beaver ponds with snags, forest edges, burned forests, and flooded bottomland forests. Habitats are similar in both breeding and wintering range, but winter distribution most determined by presence of food. Have been known to move north in winter if mast is heavy (N.A.S., 2012; Smith et al, 2000).	Low - Potential habitat for Red-headed Woodpecker occurs throughout the Study Area; however, this species was not observed during field investigations.
Birds	Wood Thrush	<i>Hylocichla mustelina</i>	SC	THR	THR	S4B	NHIC, OBBA	Wood Thrush prefer deciduous and mixed forests in southern Ontario, ranging from small and isolated to large and contiguous woodlots. The presence of tall trees and a thick understory are preferred (Cadman <i>et al.</i> , 2007).	Low - Potential habitat for Wood Thrush occurs throughout the forests and woodlands in the Study Area. This species was not observed during field investigations.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Reptiles	Milksnake	<i>Lampropeltis triangulum</i>	NAR	SC	SC	S4	NHIC, Ontario Nature 2019	Generally, occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	Medium - This species has the potential to occur throughout open habitat in the Study Area.
Reptiles	Midland Painted Turtle	<i>Chrysemys picta marginata</i>	NAR	SC		S4	NHIC, Ontario Nature 2019	Painted turtles inhabit waterbodies, such as ponds, marshes, lakes and slow-moving creeks, that have a soft bottom and provide abundant basking sites and aquatic vegetation. These turtles often bask on shorelines or on logs and rocks that protrude from the water. The midland painted turtle hibernates on the bottom of waterbodies.	Medium - Oshawa Creek and Harmony Creek provide permanent standing water in the Project Study Area that has the potential to support Midland Painted Turtle. Ponds in the Study Area are mostly comprised of stormwater management ponds, which also have potential to support Midland Painted Turtle.
Reptiles	Northern Map Turtle	<i>Graptemys geographica</i>	SC	SC	SC	S3	ORAA	Map turtles are highly aquatic and inhabit slow moving, large rivers and lakes with soft bottoms and abundant aquatic vegetation. Basking sites include rocks and deadheads adjacent to deep water (COSEWIC 2002) Nesting occurs in soft sand or soil and at a distance from the water, hibernation is communal and occurs at the bottoms of lakes (MacCulloch, 2002). Females leave the water in June to nest (MacCulloch, 2002).	Medium - Oshawa Creek and Harmony Creek provide permanent standing water in the Project Study Area that has the potential to support Northern Map Turtle. Ponds in the Study Area are mostly comprised of stormwater management ponds, which are unlikely to support Northern Map Turtle.
Reptiles	Snapping Turtle	<i>Chelydra serpentina</i>	SC	SC	SC	S4	NHIC ORAA	Snapping Turtles inhabit ponds, sloughs, streams, rivers, and shallow bays that are characterized by slow moving water, aquatic vegetation, and soft bottoms. Females show strong nest site fidelity and nest in sand or gravel banks at waterway edges in late May or early June (COSEWIC, 2008).	Medium - Oshawa Creek and Harmony Creek provide permanent standing water in the Project Study Area that has the potential to support Snapping Turtle. Ponds in the Study Area are mostly comprised of stormwater management ponds, which also have potential to support Snapping Turtle.



Group	Common Name ¹	Scientific Name ²	SARO ³	COSEWIC ⁴	SARA ⁵	S-Rank ⁶	Source(s)	Habitat Description	Probability of Occurrence in the Study Area (Low, Medium or High)
Insects	Monarch	<i>Danaus plexippus</i>	SC	END	SC	S4B, S2N	NHIC, Ontario Butterfly Atlas	In southern Ontario the Monarch is found primarily wherever milkweed and wildflowers (including goldenrods, asters and purple loosestrife) exist (COSEWIC, 2010). The Larvae occur only where milkweed exists; adults are more generalized, feeding on a variety of wildflower nectar (OMNR, 2014). This includes abandoned farmland, along roadsides, and other open spaces where these plants grow (COSEWIC, 2010).	High - Cultural meadows in the Study Area have the potential to support Monarch. Monarch was observed foraging in the Study Area during field investigations.
Insects	Southern Cloudywing	<i>Thorybes bathyllus</i>	NAR	NAR	NAR	S3	Ontario Butterfly Atlas	The Southern Cloudywing inhabits open, dry areas, restricted to southwestern Ontario (Hall 2014).	Low - Open areas in the Study Area may provide suitable habitat for this species; however, it is more commonly observed further southwest in Ontario.
Insects	Yellow-banded Bumble Bee	<i>Bombus terricola</i>	SC	SC	SC	S5	Ontario Butterfly Atlas	The Yellow-banded Bumblebee occurs in a variety of habitats including mixed woodlands, farmlands, urban areas, montane meadows, prairie grasslands and boreal habitats (COSEWIC 2015).	Medium - This species has the potential to occur throughout the Study Area.
Fish	Silver Lamprey	<i>Ichthyomyzon unicuspis</i>	SC	NS	SC	S3	NHIC	The Silver Lamprey requires clear water during its parasitic phase to locate fish hosts, relatively clean stream substrate composed of sand and organic debris, and unrestricted migration routes for spawning. The Silver Lamprey appears to prefer streams with stable flow regimes and clean, unpolluted water (COSEWIC 2011).	Low - This record is from Bowmanville Creek which is included in the Study Area; however, the project activities will not overlap with this watercourse.

Notes:

¹Scientific Name: The scientific name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

²Common Name: The common English name of a species as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.

³SARO Status: Species at Risk in Ontario (Provincial Status as defined by the Endangered Species Act, 2007 as amended).

⁴COSEWIC Status: Status as defined by the Committee on the Status of Endangered Wildlife in Canada

⁵SARA Status: Federal status as defined by the Species at Risk Act

⁶S RANK: Subnational Rank is the conservation status of a species or plant community within a particular province, territory or state. In this scenario, it is the provincial level ranking system as published by the Natural Heritage Information Centre hosted by the Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario.



References:

NHIC: Natural Heritage Information Centre database review (Ministry of Northern Development, Mines, Natural Resources and Forestry / Land Information Ontario).

MNRF: MNRF Species at Risk in Ontario List. Species range information retrieved November 2021 from <https://www.ontario.ca/page/species-risk-ontario>

OBBA: Cadman, M. D., D.A. Sutherland, G.G. Beck, D. Lepage, A.R. Couturier. 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. (eds) Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of natural resources, and Ontario Nature, Toronto, xxii + 318pp

Ontario Butterfly Atlas: Retrieved October 2021 from <https://www.ontarioinsects.org/atlas/>

Stantec: Observed by Stantec during 2021 field investigations.

Endangered Species Act and Species at Risk Act Acronyms

END: Endangered

THR: Threatened

SC: Special Concern

EXT: Extirpated

NAR: Not at Risk

Subnational Rankings (S RANK)

SNR: Unranked

SU: Unrankable – Currently unrankable due to lack of information

SNA: Not applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species

?: Indicates uncertainty in the assigned rank

S1: Critically Imperiled – Critically imperiled in the province (often 5 or fewer occurrences)

S2: Imperiled – Imperiled in the province, very few populations (often 20 or fewer),

S3: Vulnerable – Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure – Uncommon but not rare

S5: Secure – Common, widespread, and abundant in the province

SX: Presumed extirpated

SH: Possibly Extirpated (Historical)

SE: if an element is known to occur as an exotic in Ontario, the status value assigned is SE. A ? qualifier added to that value indicates uncertainty about whether it is exotic or native. Numeric ranks of 1 through 5 added to the exotic status indicates the element’s abundance in Ontario, with 1 indicating the least abundant and 5 the most.



Appendix F

Significant Wildlife Habitat Screening Assessment



Appendix F: **Significant Wildlife Habitat Assessment for the Metrolinx Bowmanville Study Area**

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Seasonal Concentration Areas	Waterfowl Stopover and Staging Area (Terrestrial)	Fields with sheet water during spring (mid-March to May), or annual spring melt water flooding found in any of the following Community Types: Meadow (CUM1), Thicket (CUT1). Agricultural fields with waste grains are commonly used by waterfowl, and these are not considered SWH unless they have sheet water available.	ELC surveys were used to assess features within the Study Area that may support waterfowl stopover and staging areas (terrestrial).	Absent. There were large meadows and thicket communities throughout the Study Area; however, there are no records of waterfowl in the iNaturalist database and there is no eBird hotspot information for these areas. There were pockets of wetland plants observed in some of these features; however, there was no evidence of larger areas of standing water that would indicate prolonged presence of standing water in the spring.
	Waterfowl Stopover and Staging Area (Aquatic)	The following Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD). Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. The combined area of the ELC ecosites and a 100 m radius area is the SWH. Sewage treatment ponds and storm water ponds do not qualify as a SWH; however, a reservoir managed as a large wetland or pond/lake does qualify.	ELC surveys were used to assess features within the Study Area that may support waterfowl stopover and staging areas (aquatic).	Absent. Marsh communities in the Study Area are small and lack adequate standing water. Narrow swamp communities are associated with watercourses in the Study Area which are not of suitable size to support large congregations of waterfowl. Ponds in the Study Area are mostly comprised of stormwater management ponds, which do not qualify as SWH.
	Shorebird Migratory Stopover Area	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of amour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a significant wildlife habitat. The following community types: Meadow Marsh (MAM), shoreline (BB), or Sand Dune (SD).	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support migratory shorebirds.	Absent. No suitable shoreline habitat in the Study Area.
	Raptor Wintering Area	At least one of the following Forest Community Types: Deciduous Forest (FOD), Mixed Forest (FOM) or Coniferous Forest (FOC), in combination with one of the following Upland Community Types: Meadow (CUM1), Thicket (CUT1), Savannah (CUS1), Woodland (CUW1) (<60% cover) that are >20 ha and provide roosting, foraging and resting habitats for wintering raptors. Upland habitat (CUM1, CUT1, CUS1, CUW1), must represent at least 15 ha of the 20 ha minimum size.	ELC surveys and GIS analysis were used to assess features within the Study Area that may support wintering raptors.	Absent. There is a large area of meadow/thicket at the west end of the Study Area. This area is not a known wintering raptor area. There are no records of raptors in the iNaturalist database and there is no eBird hotspot information for this area. Additionally, the forest community adjacent to this feature is small (1.5ha) and comprised mainly of young to mid-aged poplars with a dense understory of common buckthorn.
	Bat Hibernacula	Hibernacula may be found in caves, mine shafts, underground foundations and karsts. May be found in these Community Types: Crevice (CCR), Cave (CCA).	ELC surveys were used to assess features within the Study Area that may support bat hibernacula.	Absent.

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Seasonal Concentration Areas cont.	Bat Maternity Colonies	<p>Maternity colonies considered significant wildlife habitat are found in forested ecosites.</p> <p>Either of the following Community Types: Deciduous Forest (FOD), Mixed Forest (FOM), Coniferous Forest (FOC), Deciduous Swamp (SWD), Mixed Forest (SWM) and Coniferous Forest (SWC) that have wildlife trees >10 cm diameter at breast height (dbh).</p> <p>Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).</p> <p>Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2.</p> <p>Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees.</p> <p>Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.</p>	ELC surveys and bat acoustic surveys were used to assess features within the Study Area that may support bat maternity colonies.	Confirmed Habitat: Forest communities in the Project Footprint/Study Area have been confirmed to support bat maternity colonies. Bats were recorded at all 25 bat monitoring stations across the Study Area.
	Turtle Wintering Areas	<p>Snapping and Midland Painted turtles utilize ELC community classes: Swamp (SW), Marsh (MA) and Open Water (OA). Shallow water (SA), Open Fen (FEO) and Open Bog (BOO).</p> <p>Northern Map turtle- open water areas such as deeper rivers or streams and lakes can also be used as over-wintering habitat.</p> <p>Water has to be deep enough not to freeze and have soft mud substrate.</p> <p>Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.</p>	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support areas of permanent standing water but not deep enough to freeze.	Candidate Habitat: Oshawa Creek and Harmony Creek provide permanent standing water in the Study Area that has the potential to support turtle wintering areas. Stormwater management ponds in the Study Area may support turtle wintering areas; however, they do not qualify as SWH.
	Snake Hibernacula	<p>Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock and other natural features. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.</p> <p>Any ecosite in southern Ontario other than very wet ones may provide habitat. The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBT1).</p>	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support snake hibernacula.	Absent.

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Seasonal Concentration Areas cont.	Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	<p>Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following Community Types: Meadow (ME), Thicket (TH), Bluff (BL), Cliff (CL).</p> <p>Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles.</p> <p>Does not include a licensed/permitted Mineral Aggregate Operation.</p>	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support colonial bird breeding habitat.	Absent.
	Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	<p>Identification of stick nests in any of the following Community Types: Mixed Swamp (SWM), Deciduous Swamp (SWD), Treed Fen (FET).</p> <p>The edge of the colony and a minimum 300 m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH.</p> <p>Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.</p>	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support colonial bird breeding habitat (Trees/Shrubs).	Absent.
	Colonial-Nesting Bird Breeding Habitat (Ground)	<p>Any rocky island or peninsula within a lake or large river.</p> <p>For Brewer's Blackbird close proximity to watercourses in open fields or pastures with scattered trees or shrubs found in any of the following Community Types: Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Meadow (CUM1), Thicket (CUT1), Savannah (CUS1).</p>	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support colonial bird breeding habitat (Ground).	Absent.
	Migratory Butterfly Stopover Areas	<p>Located within 5 km of Lake Ontario.</p> <p>A combination of ELC communities, one from each land class is required: Field (ME, TH) and Forest (FOC, FOM, FOD).</p> <p>Minimum of 10 ha in size with a combination of field and forest habitat present.</p>	ELC surveys and GIS analysis were used to assess features within the Study Area that may support migratory butterfly stopover areas.	Absent. Although the Study Area is within 5 km from Lake Ontario, there are no meadow or thicket communities of suitable size that are adjacent to forest communities.
	Landbird Migratory Stopover Areas	<p>The following community types: Forest (FOD, FOM, FOC) or Swamp (SWC, SWM, SWD).</p> <p>Woodlots must be >10 ha in size and within 5 km of Lake Ontario – woodlands within 2 km of Lake Ontario are more significant.</p>	ELC surveys and GIS analysis were used to assess features within the Study Area that may support landbird migratory stopover areas.	Absent. Although the Study Area is within 5 km from Lake Ontario, there are no woodlots of suitable size to support landbird migratory stopover areas.
	Deer Yarding Areas	<p>Delineated by the MNDMNRF as areas where deer move to in response to the onset of winter snow and cold.</p> <p>The following forested ecosites within Community Series: FOC, FOM, SWC, SWM.</p> <p>Deer yard may also occur in mixed and coniferous plantations (CUP2 and CUP3), and deciduous forest (FOD) and thicket (CUT) communities.</p>	No studies required as the MNDMNRF delineates this habitat.	Absent.

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Seasonal Concentration Areas cont.	Deer Winter Congregation Areas	Woodlots typically >100 ha in size unless determined by the MNR as significant. (If large woodlots are rare in a planning area >50 ha). All forested ecosites within Community Series: FOC, FOM, FOD, SWC, SWM, SWD. Conifer plantations much smaller than 50 ha may also be used.	No studies required as the MNDMNRF delineates this habitat.	Absent.
Rare Vegetation Communities	Cliffs and Talus Slopes	A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. Any ELC Ecosite within Community Series: TAO, TAS, TAT, CLO, CLS, CLT. Most cliff and talus slopes occur along the Niagara Escarpment.	ELC surveys were used to assess features within the Study Area that would be considered cliffs or talus slopes.	Absent.
	Sand Barrens	Sand barrens typically are exposed sand, generally sparsely vegetated and cause by lack of moisture, periodic fires and erosion. Vegetation can vary from patchy and barren to tree covered but less than 60%. Any of the following Community Types: SBO1 (Open Sand Barren Ecosite), SBS1 (Shrub Sand Barren Ecosite), SBT1 (Treed Sand Barren Ecosite).	ELC surveys were used to assess features within the Study Area that would be considered to be sand barrens.	Absent.
	Alvars	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover. Any of the following Community Types: ALO1(Open Alvar Rock Barren Ecosite), ALS1 (Alvar Shrub Rock Barren Ecosite), ALT1 (Treed Alvar Rock Barren Ecosite), FOC1 (Dry-Fresh Pine Coniferous Forest), FOC2 (Dry-Fresh Cedar Coniferous Forest), CUM2 (Bedrock Cultural Meadow), CUS2 (Bedrock Cultural Savannah), CUT2-1 (Common Juniper Cultural Alvar Thicket), or CUW2 (Bedrock Cultural Woodland). An Alvar site >0.5 ha in size.	ELC surveys were used to assess features within the Study Area that would be considered to be alvar communities.	Absent.

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Rare Vegetation Communities cont.	Old-growth Forest	<p>Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species.</p> <p>No minimum size criteria t in any of the following Community Types: FOD (Deciduous Forest), FOM (Mixed Forest), FOC (Coniferous Forest).</p> <p>Forests greater than 120 years old and with no historical forestry management was the main criteria when surveying for old-growth forests.</p>	ELC surveys were used to assess features within the Study Area that would be considered to be old-growth forest communities.	Absent.
	Savannahs	<p>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</p> <p>Any of the following Community Types: TPS1 (Dry-Fresh Tallgrass Mixed Savannah Ecosite), TPS2 (Fresh-Moist Tallgrass Deciduous Savannah Ecosite), TPW1 (Dry-Fresh Black Oak Tallgrass Deciduous Woodland Ecosite), TPW2 (Fresh-Moist Tallgrass Deciduous Woodland Ecosite), CUS2 (Bedrock Cultural Savannah Ecosite).</p>	ELC surveys were used to assess features within the Study Area that would be considered to be savannah communities.	Absent.
	Tall-grass Prairies	<p>A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has <25% tree cover.</p> <p>Any of the following Community Types: TPO1 (Dry Tallgrass Prairie Ecosite), TPO2 (Fresh-Moist Tallgrass Prairie Ecosite).</p>	ELC surveys were used to assess features within the Study Area that would be considered to be tall-grass communities.	Absent.
	Other Rare Vegetation Communities	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG.	ELC surveys were used to assess features within the Study Area that would be considered to be other rare vegetation communities.	Absent.
Specialized Habitat for Wildlife	Waterfowl Nesting Area	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, SWD4.</p> <p>Note: includes adjacency to Provincially Significant Wetlands.</p>	<p>ELC surveys were used to assess features within the Study Area that may support nesting waterfowl.</p> <p>Habitats adjacent to wetlands without standing water were not considered candidate SWH.</p>	<p>Absent – Marsh communities in the Study Area are small and lack adequate standing water. Narrow swamp communities are associated with watercourses in the Study Area which are not of suitable size to support large congregations of waterfowl.</p> <p>Ponds in the Study Area are mostly comprised of stormwater management ponds, which do not qualify as SWH.</p>
	Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</p> <p>Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms).</p> <p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands.</p>	ELC surveys and wildlife habitat assessments were used to assess features within the Study Area that may support nesting, foraging and perching habitat for large raptors.	Absent. No large stick nests were observed during field investigations.

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Specialized Habitat for Wildlife cont.	Woodland Raptor Nesting Habitat	<p>All natural or conifer plantation woodland/forest stands combined >30 ha and with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer.</p> <p>Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands.</p> <p>May be found in all forested ELC Ecosites.</p> <p>May also be found in SWC, SWM, SWD and CUP3.</p>	ELC surveys, wildlife habitat assessments and GIS analysis were used to assess features within the Study Area that may support nesting habitat for woodland raptors.	Absent.
	Turtle Nesting Areas	<p>Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, BOO1, FEO1.</p> <p>Best nesting habitat for turtles is close to water, away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.</p> <p>For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.</p> <p>Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</p>	ELC surveys, wildlife habitat assessments and GIS analysis were used to assess features within the Study Area that may support turtle nesting areas.	Absent. There were no suitable natural areas of exposed sand or gravel observed in the Study Area.
	Seeps and Springs	<p>Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.</p> <p>Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system.</p>	ELC surveys were used to assess features within the Study Area that may support seeps/springs.	Absent. No seepage areas associated with headwater streams are present in the Study Area.
	Amphibian Breeding Habitat (Woodland)	<p>All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.</p> <p>Presence of a wetland, lake, or pond within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians.</p> <p>Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.</p>	<p>ELC surveys were used to assess features within the Study Area that may support woodland breeding amphibians.</p> <p>Amphibian call count surveys were conducted to target the wetland features in the Study Area.</p>	Absent. There were no features with an abundance of calling frogs or toads identified during amphibian surveys in the Study Area.

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Specialized Habitat for Wildlife cont.	Amphibian Breeding Habitat (Wetland)	<p>ELC Community Classes SW, MA, FE, BO, OA and SA.</p> <p>Wetland areas >120 m from woodland habitats.</p> <p>Wetlands and pools (including vernal pools) >500 m² (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats.</p> <p>Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.</p> <p>Bullfrogs require permanent water bodies with abundant emergent vegetation.</p>	ELC surveys were used to assess features within the Study Area that may support wetland breeding amphibians. Amphibian call count surveys were conducted to target the wetland features in the Study Area.	Absent. There were no features with an abundance of calling frogs or toads identified during amphibian surveys in the Study Area.
	Woodland Area-Sensitive Bird Breeding Habitat	<p>Large mature forest stands, woodlots >30ha with interior forest habitat (i.e. at least 200m from edge).</p> <p>All Ecosites associated with these ELC Community Series; FOC, FOM, FOD, SWC, SWM, SWD.</p>	ELC surveys and GIS analysis were used to determine whether woodlots that occurred within the Study Area that were >30 ha with interior habitat present (>200 m from edge).	Absent.
Species of Conservation Concern	Marsh Bird Breeding Habitat	<p>All wetland habitats with shallow water and emergent aquatic vegetation.</p> <p>May include any of the following Community Types: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: Swamp (SW), Marsh (MA) and Meadow (CUM) Community Types.</p>	ELC surveys were used to identify marshes with shallow water and emergent vegetation that may support marsh breeding birds.	<p>Absent. Marsh communities in the Study Area are small and lack adequate standing water. Narrow swamp communities are associated with watercourses in the Study Area which are not of suitable size to support large congregations of marsh breeding birds.</p> <p>Ponds in the Study Area are mostly comprised of stormwater management ponds, which do not qualify as SWH.</p> <p>Targeted callback surveys for marsh breeding birds were not completed; however, as described above, the wetlands in the Study Area are unlikely to support the required number of species to qualify as SWH.</p>
	Open Country Bird Breeding Habitat	Grassland areas > 30 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or hay or livestock pasturing in the last 5 years, in the following Community Type: Meadow (CUM).	ELC surveys and GIS analysis were used to identify grassland communities within the Study Area that may support area-sensitive breeding birds.	Absent. There are no meadows in the Study Area > 30 ha in size.
	Shrub/Early Successional Bird Breeding Habitat	Old field areas succeeding to shrub and thicket habitats >10 ha, not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years, in the following Community Types: Thickets (CUT), Savannas or Woodlands (CUW).	ELC surveys and GIS analysis were used to identify large communities that may support shrub/early successional breeding birds.	<p>Candidate Habitat. There is one thicket in the Study Area > 10 ha in size east of Bloor Street East and south of the railroad tracks. The thicket was dominated by invasive shrub species including common buckthorn, autumn olive and Tartarian honeysuckle. There were no indicator species identified during field investigations. Out of the common listed bird species in the Criteria Schedule, only Willow Flycatcher was observed.</p> <p>Although the thicket qualifies as SWH due to its size, the non-native composition of the feature reduces the quality of the habitat may impact the suitability of the habitat for certain bird species.</p>

Wildlife Habitat Category	Candidate Wildlife Habitat	Criteria	Methods	Confirmed or Candidate Habitat Present in the Study Area?
Species of Conservation Concern cont.	Terrestrial Crayfish	Meadow marshes and edges of shallow marshes (no minimum size). Vegetation communities include MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM. Terrestrial Crayfish construct burrows in marshes, mudflats, meadows. Can be found far from water.	ELC surveys and wildlife habitat assessments were used to identify shallow marsh and meadow marsh communities that may support Terrestrial Crayfish within the Study Area.	Candidate Habitat. Terrestrial crayfish burrows were not observed during field investigations from the ROW; however, there is a potential for terrestrial crayfish to occur in the Study Area outside of the ROW.
	Special Concern and Rare Wildlife Species	All special concern and provincially rare (S1-S3, SH) plant and animal species (SOCC) within potential to occur in the Study Area.	ELC surveys were used to identify suitable habitat for each potential SOCC listed in Appendix C.2.	Confirmed and Candidate Habitat. The following SOCC were confirmed in the Study Area: Barn Swallow, Monarch and Eastern Wood-Pewee. There is candidate habitat for the following SOCC in the Study Area: Yellow-banded Bumble Bee, Eastern Milksnake, Map Turtle, Midland Painted Turtle and Snapping Turtle
Animal Movement Corridors	Amphibian Movement Corridor	Corridors may be found in all ecosites associated with water. Determined based on identifying significant amphibian breeding habitat (wetland).	Identified after Amphibian Breeding Habitat is confirmed. Movement corridors should be considered when amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat.	Absent.
	Deer movement corridors	Associated with deer wintering habitat confirmed by MNDMNRF.	Identified after deer wintering habitat is confirmed by the MNDMNRF.	Absent. No deer wintering habitat was identified by the MNDMNRF; therefore, there is no candidate habitat for deer movement corridors in the Study Area.

Appendix G

Aquatic Photographic Record





Photo 1: Conditions at Aquatic Station 1 Goodman Creek south of the railway alignment. Southwest aspect. 07/16/21



Photo 2: Conditions at Aquatic Station 1 Goodman Creek south of the railway alignment. Southeast aspect. 07/16/21



Photo 3: Conditions at Aquatic Station 2 Oshawa Creek north of the railway alignment. Northeast aspect. 07/15/21



Photo 4: Aquatic habitat conditions at Aquatic Station 2 Oshawa Creek north of the railway alignment. North aspect. 07/15/21



Photo 5: Aquatic habitat conditions at Aquatic Station 2 Oshawa Creek south of the railway alignment. Southeast aspect. 07/15/21



Photo 6: Aquatic habitat conditions at Aquatic Station 2 Oshawa Creek south of the railway alignment. Southeast aspect. 07/15/21



Photo 7: Conditions at Aquatic Station 3 Harmony Creek north of the railway alignment. South aspect. 07/15/21



Photo 8: Conditions at Aquatic Station 3 Harmony Creek north of the railway alignment. North aspect. 07/15/21

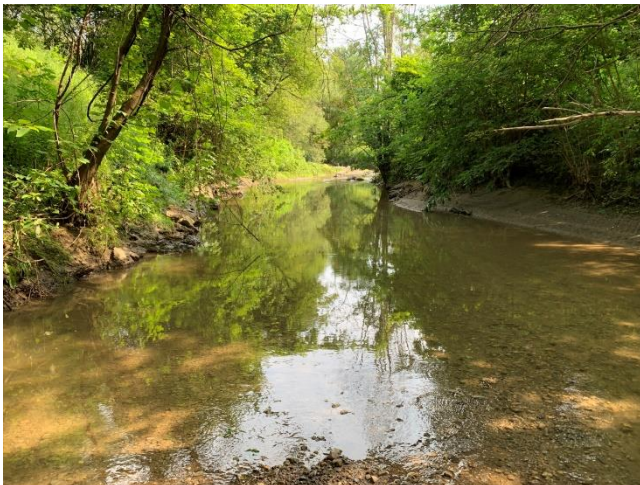


Photo 9: Conditions at Aquatic Station 3 Harmony Creek south of the railway alignment. North aspect. 07/15/21



Photo 10: Conditions at Aquatic Station 3 Harmony Creek south of the railway alignment. South aspect. 07/15/21



Photo 11: Conditions at Aquatic Station 4 Farewell Creek north of the railway alignment. North aspect. 07/14/21



Photo 12: Conditions at Aquatic Station 4 Farewell Creek north of the railway alignment. North aspect. 07/14/21



Photo 13: Conditions at Aquatic Station 5 in an unnamed tributary north of the railway alignment. 07/14/21



Photo 14: Conditions at Aquatic Station 5 in an unnamed tributary south of the railway alignment. South aspect 07/14/21



Photo 15: Conditions at Aquatic Station 6 Robinson Creek north of the railway alignment. Northwest aspect. 07/14/21



Photo 16: Conditions at Aquatic Station 6 Robinson Creek north of the railway alignment. South aspect. 07/13/21



Photo 17: Conditions at Aquatic Station 6 Robinson Creek south of the railway alignment. South aspect. 07/14/21



Photo 18: Conditions at Aquatic Station 6 Robinson Creek south of the railway alignment. Northeast aspect. 07/14/21



Photo 19: Conditions at Aquatic Station 7 north of the railway alignment in an unnamed tributary. Southwest aspect. 07/16/21



Photo 20: Conditions at Aquatic Station 7 north of the railway alignment in an unnamed tributary. South aspect. 07/16/21



Photo 21: Conditions at Aquatic Station 7 north of the railway alignment in an unnamed tributary. 07/16/21



Photo 22: Conditions at Aquatic Station 7 north of the railway alignment in an unnamed tributary. North aspect. 07/16/21



Photo 23: Conditions at Aquatic Station 7 south of the railway alignment in an unnamed tributary. North aspect. 07/16/21



Photo 24: Conditions at Aquatic Station 7 south of the railway alignment in an unnamed tributary. South aspect. 07/16/21



Photo 25: Conditions at Aquatic Station 8 north of the railway alignment in Robinson Creek. Northeast aspect. 07/13/21



Photo 26: Conditions at Aquatic Station 8 north of the railway alignment in Robinson Creek. Southeast aspect. 07/13/21



Photo 27: Conditions at Aquatic Station 8 north of the railway alignment in Robinson Creek. 07/13/21



Photo 28: Conditions at Aquatic Station 8 south of the railway alignment in Robinson Creek. South aspect. 07/13/21



Photo 29: Conditions at Aquatic Station 8 south of the railway alignment in Robinson Creek. South aspect. 07/13/21



Photo 30: Conditions at Aquatic Station 8 south of the railway alignment in Robinson Creek. North aspect. 07/13/21



Photo 31: Conditions at Aquatic Station 9 north of the railway alignment in a tributary of Tooley Creek. East aspect. 07/13/21



Photo 32: Conditions at Aquatic Station 9 north of the railway alignment in a tributary of Tooley Creek. East aspect. 07/13/21



Photo 33: Conditions at Aquatic Station 9 south of the railway alignment in a tributary of Tooley Creek. West aspect. 07/13/21



Photo 34: Conditions at Aquatic Station 9 south of the railway alignment in a tributary of Tooley Creek. West aspect. 07/13/21



Photo 35: Conditions at Aquatic Station 10 north of the railway alignment in tributary of Darlington Creek. South aspect. 07/12/21



Photo 36: Conditions at Aquatic Station 10 south of the railway alignment in tributary of Darlington Creek. South aspect. 07/12/21



Photo 37: Conditions at Aquatic Station 11 north of the railway alignment in Darlington Cr. North aspect. 07/12/21



Photo 38: Conditions at Aquatic Station 11 north of the railway alignment in Darlington Cr. 07/12/21



Photo 39: Conditions at Aquatic Station 11 south of the railway alignment in Darlington Cr. Southeast aspect. 07/12/21



Photo 40: Conditions at Aquatic Station 11 south of the railway alignment in Darlington Cr. Southeast aspect. 07/12/21



Photo 41: Conditions at Aquatic Station 11 south of the railway alignment in Darlington Cr. Southwest aspect. 07/12/21



Photo 42: Conditions at Aquatic Station 11 south of the railway alignment in Darlington Cr. Southeast aspect. 07/12/21



Photo 43: Conditions at Aquatic Station 12 north of the railway alignment in a tributary of Darlington Cr. 07/13/21



Photo 44: Conditions at Aquatic Station 12 north of the railway alignment in a tributary of Darlington Cr. 07/13/21



Photo 45: Conditions at Aquatic Station 12 south of the railway alignment in a tributary of Darlington Cr. 07/13/21



Photo 46: Conditions at Aquatic Station 12 south of the railway alignment in a tributary of Darlington Cr. 07/13/21



Photo 47: Conditions at Aquatic Station 13 north of the railway alignment in a tributary of Darlington Cr. North aspect. 07/13/21



Photo 48: Conditions at Aquatic Station 13 north of the railway alignment in a tributary of Darlington Cr. 07/13/21



Photo 49: Conditions at Aquatic Station 13 south of the railway alignment in a tributary of Darlington Cr. South aspect. 07/13/21



Photo 50: Conditions at Aquatic Station 13 south of the railway alignment in a tributary of Darlington Cr. North aspect. 07/13/21



Photo 51: Conditions at Aquatic Station 14 north of the railway alignment in a tributary of Darlington Cr. Northeast aspect. 07/12/21



Photo 52: Conditions at Aquatic Station 14 north of the railway alignment in a tributary of Darlington Cr. S aspect. 07/12/21



Photo 53: Conditions at Aquatic Station 14 south of the railway alignment in a tributary of Darlington Cr. South aspect. 07/12/21



Photo 54: Conditions at Aquatic Station 14 south of the railway alignment in a tributary of Darlington Cr. North aspect. 07/12/21

Appendix H

Air temperature and In-Situ Water Quality Measurements



Appendix H Air Temperature and In-Situ Water Quality Measurements during Aquatic Habitat Surveys in 2021

Watercourse (WCL-#)	Date/Time	Air Temperature °C	Water Temperature °C	pH	Specific Conductance µS/cm	Dissolved Oxygen mg/l
Goodman Creek (WCL-1)	2021-07-16 09:45	20	21	7.9	823	5.3
Oshawa Creek (WCL-2)	2021-07-15 13:15	23	22	8.4	805	6.8
Harmony Creek (WCL-3)	2021-07-15 09:45	23	21	8.2	1239	7.1
Farewell Creek (WCL-4)	2021-07-14 14:00	23	23	8.2	783	6.9
Unnamed Tributary (WCL-5)	2021-07-14 11:00	23	dry	dry	dry	dry
Robinson Creek (WCL-6)	2021-07-14 9:45	23	22	7.9	664	5.9
Unnamed Tributary (WCL-7)	2021-07-16 11:30	23	16	7.8	2872	3.8
Tooley Creek (WCL-8)	2021-07-13 12:30	22	19	8.2	1197	6.9
Darlington Creek (WCL-11)	2021-07-12 13:10	22	20	7.8	1113	5.9
Darlington Creek Tributary (WCL-12)	2021-07-13 10:40	22	17	7.9	946	4.6
Darlington Creek Tributary (WCL-13)	2021-07-13 10:10	22	18	8.1	1226	4.8
Darlington Creek Tributary (WCL-14)	2021-07-12 11:35	22	21	7.7	652	6.4

Appendix I

Fish Community Sampling Results



Appendix I-1: Summary of Field Survey and Weather Conditions during Fish Community Surveys in 2023

Date	Water Course (WCL) Sampled	Air Temperature (°C)	Precipitation	Precipitation (previous 24 hours)
May 17, 2023	Farewell Creek (WCL 4)	10	None	None
May 18, 2023	Tooley Creek (WCL 8) Unnamed Tributary of Tooley Creek (WCL 9); Darlington Creek (WCL 10)	13	None	None
May 24, 2023	Unnamed Tributary of Darlington Creek (WCL 12)	15	Light Rain	None
May 25, 2023	Robinson (WCL 6); Unnamed Tributary of Darlington Creek (WCL 13)	14	None	2 mm
May 26, 2023	Unnamed Tributary of Darlington Creek (WCL 14)	18	None	None
July 10, 2023	Tooley Creek (WCL 8)	26	None	None
July 11, 2023	Farewell Creek (WCL 4)	28	None	None
July 12, 2023	Unnamed Tributary of Darlington Creek (WCL 11)	23	None	None
July 14, 2023	Robinson (WCL 6)	24	None	None

Appendix I-3: Summary of Backpack Electrofishing Effort Spring and Summer 2023

Date	Water Course (WCL) Sampled	Length (m)	Start – End Time	Seconds
May 17	Farewell Creek (downstream) (WCL 4)	60	0930-1200	3368
May 17	Farewell Creek (upstream) WCL 4	60	1200-1500	1641
May 18	Tooley Creek (downstream) WCL 8	60	945-1300	878
May 18	Tooley Creek (upstream) WCL 8	60	1300-1600	878
May 18	Tooley Creek (upstream and downstream) WCL 9	40	1400-1430	210
May 18	Darlington Creek (downstream) WCL 10	40	1500-1600	88
May 24	Darlington Creek (downstream) WCL 11	15	1100-1200	672
May 24	Darlington Creek (downstream) WCL 11	10	1030-1100	360
May 24	Darlington Creek (upstream) WCL 11	70	0850-1030	1576
May 24	Unnamed Tributary of Darlington Creek (downstream) WCL 12	15	1250-1320	690
May 25	Robinson (downstream) WCL 6	30	0945-1200	1345
May 25	Robinson (upstream) WCL 6	20	1200-1300	713
May 25	Unnamed Tributary of Darlington Creek (downstream) WCL 13	15	1230-1300	361
May 25	Unnamed Tributary of Darlington Creek (upstream) WCL 13	3	1300-1330	196
May 26	Unnamed Tributary of Darlington Creek (downstream) WCL 14	10	0830-0900	328
May 26	Unnamed Tributary of Darlington Creek (upstream) WCL 14	10	0900-0930	282
July 10	Tooley Creek (downstream) WCL 8	50	1000-1230	771
July 10	Tooley Creek (upstream) WCL 8	50	1230-1430	595
July 11	Farewell Creek (downstream) WCL 4	50	0800- 0915	1422
July 11	Farewell Creek (upstream) WCL 4	50	1125-1215	1175
July 12	Unnamed Tributary of Darlington Creek (downstream) WCL 11	50	0830-0930	650
July 14	Robinson (downstream) WCL 6	50	0830-1030	1254
July 14	Robinson (upstream) WCL 6	50	1030-1130	827

Appendix I-2: In-Situ Water Chemistry and Watercourse Conditions During Fish Community Surveys in 2023

Watercourse Name	Date	Water Temperature (°C)	pH	Water Depth (min -max) cm	Water Velocity (visual approximation)	Water Clarity	Conductivity (µS/cm)	Dissolved Oxygen (mg/l)
Farewell Creek (WCL-4)	2023-05-17	9.1	7.7	10-60	Fast	clear	880	11.3
Farewell Creek (WCL-4)	2023-07-11	18.7	8.3	10-80	Baseflow	Clear	913	9.0
Robinson Creek (WCL-6)	2023-05-25	11.0	7.6	20-60	Moderate	Clear	929	12.3
Robinson Creek (WCL-6)	2023-07-14	21.1	8.1	10-40	Slow to Moderate	Slightly turbid (light brown)	631	5.8
Tooley Creek (WCL-8)	2023-05-18	8.0	7.8	5-100	Moderate	Clear	793	12.7
Tooley Creek (WCL-8)	2023-07-10	17.9	8.0	5-55	Baseflow to Slow	Clear	806	7.3
Unnamed Tributary of Tooley Creek (WCL-9)	2023-05-18	11.1	7.2	5-30	Baseflow	Clear	1118	11.6
Darlington Creek (WCL-10)	2023-05-18	13.8	7.2	5-10	Baseflow	Clear	1466	11.7
Unnamed Tributary of Darlington Creek (WCL-11)	2023-05-24	13.2	7.3	5-30	Moderate	Clear	845	8.3
Unnamed Tributary of Darlington Creek (WCL-11)	2023-07-12	18.8	7.6	0-32	Slow	Clear	886	3.7
Unnamed Tributary of Darlington Creek (WCL-12)	2023-05-24	11.3	7.6	20-130	Slow	Clear	908	8.6
Unnamed Tributary of Darlington Creek (WCL-4)	2023-05-25	10.1	7.8	10-150	Baseflow	Clear	1078	9.2
Unnamed Tributary of Darlington Creek (WCL-14)	2023-05-26	11.1	7.2	10-70	Baseflow	Clear	705	7.4

Appendix I-4: Fish Catches, Effort and Catch per Unit Effort - 2023 Survey Locations

Location	Farewell Creek (WCL 4)		Robinson Creek (WCL 6)		Tooley Creek (WCL 8)		Unnamed Tributary of Tooley Creek (WCL 9)		Unnamed Tributary of Darlington Creek (WCL 10)		Darlington Creek (WCL 11)		Unnamed Tributary of Darlington Creek (WCL 12)		Unnamed Tributary of Darlington Creek (WCL 13)		Unnamed Tributary of Darlington Creek (WCL 14)	
Date/ Species	May 17 th	July 11 th	May 25 th	July 14 th	May 18 th	July 10 th	May 18 th	N/A ¹	May 18 th	N/A ¹	May 24 th	July 12 th	May 24 th	N/A ¹	May 25 th	N/A ¹	May 26 th	N/A ¹
Blacknose Dace	80	104	90	66	16	26	0		0		11	11	0		0		0	
Bluegill Sunfish	0	0	0	0	0	0	0		0		0	0	0		7		0	
Brook Stickleback	0	0	0	0	1	20	0		0		17	304	0		2		0	
Brown Bullhead	0	0	2	0	0	0	0		0		0	0	0		0		0	
Creek Chub	18	12	102	155	7	27	0		0		1	0	0		0		30	
Cyprinidae spp.	0	0	0	0	0	16	0					0						
Fathead Minnow	2	0	1	1	48	13	0		0		0	0	0		0		0	
Goldfish	1	0	0	0	0	0	0		0		0	0	0		0		0	
Green Sunfish	1	0	0	0	0	52	0		0		2	0	0		0		0	
Johnny Darter	11	17	19	88	0	0	0		0		0	0	0		1		0	
Lepomis spp.	0	0	0	0	11	1	0		0		9	0	0		0		0	
Longnose Dace	112	49	0	0	0	0	0		0		0	0	0		0		0	
Mottled Sculpin	8	6	0	0	0	0	0		0		0	0	0		0		0	
Northern Redbelly Dace	0	0	0	0	7	8	0		0		0	0	0		0		0	
Pumpkinseed Sunfish	57	17	0	1	0	7	0		0		0	0	0		0		0	

Location	Farewell Creek (WCL 4)		Robinson Creek (WCL 6)		Tooley Creek (WCL 8)		Unnamed Tributary of Tooley Creek (WCL 9)		Unnamed Tributary of Darlington Creek (WCL 10)		Darlington Creek (WCL 11)		Unnamed Tributary of Darlington Creek (WCL 12)		Unnamed Tributary of Darlington Creek (WCL 13)		Unnamed Tributary of Darlington Creek (WCL 14)	
Date/ Species	May 17 th	July 11 th	May 25 th	July 14 th	May 18 th	July 10 th	May 18 th	N/A ¹	May 18 th	N/A ¹	May 24 th	July 12 th	May 24 th	N/A ¹	May 25 th	N/A ¹	May 26 th	N/A ¹
Rainbow Darter	64	55	0	0	0	0	0		0		0	0	0		0		0	
Rainbow Trout	32	15	0	0	0	6	0		0		0	0	0		0		0	
Round Goby	5	0	0	0	0	0	0		0		0	0	0		0		0	
White Sucker	4	1	0	0	1	108	0		0		0	4	0		0		0	
Total Number of Fish	395	276	214	311	91	283	0		0		40	319	0		10		30	
Effort (Electro-fishing seconds)	5009	2597	2058	2081	1756	1366	210		88		2608	650	690		557		610	
CPUE (# of fish per electrofishing second)	0.08	0.11	0.10	0.15	0.05	0.21	0		0		0.02	0.49	0		0.02		0.05	

Note: 1 – Locations were not sampled due to absence of water at time of survey.