



HARRIS PARK EROSION CONTROL STRUCTURE REPLACEMENT SCOPED ENVIRONMENTAL IMPACT STUDY

Prepared for:
CITY OF LONDON

Prepared by:
MATRIX SOLUTIONS INC., A MONTROSE ENVIRONMENTAL COMPANY

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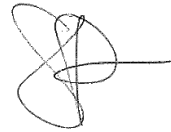
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SCOPED ENVIRONMENTAL IMPACT STUDY

Prepared for City of London, February 2024

Prepared By:

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1 INTRODUCTION

The City of London retained Matrix Solutions Inc. (hereby referred to as Matrix) to complete a scoped Environmental Impact Assessment (EIS) for the proposed Harris Park erosion control structure replacement which is located on the east bank of the North Branch of the Thame River at Harris Park in London. The existing erosion control structures are comprised of earth dykes, gabion baskets, armour stone, and rip-rap slope protection and are in a state of disrepair and require replacement.

As per the London Plan (City of London, 2016), an Environmental Impact Study (EIS) is required for projects with footprints within and adjacent to the City's natural heritage systems. The proposed Harris Park erosion control structure replacement lies within 30 meters (m) of a wooded area and within 120 m of Significant Valleylands; therefore, an EIS has been prepared following the City of London's Environmental Management Guidelines (City of London, 2021).

1.1 Subject Lands and Study Area

The replacement works will focus on the removal of the erosion control structure gabion baskets which extend from approximately 180 m south of Blackfriars Bridge to approximately 50 m north of Kensington Bridge (Dundas Street) for a total of approximately 480 m of shoreline protection. Additional repair works will be completed north of the erosion control structure where rip rap provides shoreline protection. Future replacement of the gabion baskets at the Kensington Bridge and Queen Street Bridge will also be undertaken as part of Phase 2 of the replacement works. To encompass these additional and future works, the subject lands have been expanded to cover the area from Blackfriars Bridge to the King Street Bridge located on the South Branch of the Thames River. The study area encompasses the subject lands and 120 m of adjacent lands.

The study area consists of a mixture of green space, neighbourhoods, wooded areas, residential area, significant valleylands, as well as Blackfriar's Park, Harris Park, Labatt Park, Mitchell A. Baran Park, and Ivey Park.

Map 1 of the London Plan (City of London, 2016) identifies the following within the study area:

- Green Space
- Neighbourhoods

Map 5 of the London Plan (City of London, 2016) identifies the following within the study area:

- Significant Valleylands
- Woodlands
- Waterbody: North Thames River and South Thames River

- Upper Thames River Conservation Authority (UTRCA) Boundary

Map 6 of the London Official Plan (City of London, 2016), identifies the following within the study area:

- UTRCA Regulation Limit
- Highly Vulnerable Aquifers
- Potential Special Policy Areas

A detailed map of the study area and identified features is provided in Figure 1.

1.2 Agency Consultation

Matrix submitted a request for information regarding the study area was submitted to Upper Thames River Conservation Authority (UTRCA) on January 30, 2023, followed by the Ministry of Environment Conservation and Parks (MECP) and the Ministry of Northern Development, Mines, Natural Resources and Forestry on October 26, 2023. The following information was requested:

- Presence of natural areas (Environmentally Significant Areas, Provincially Significant Wetlands, ANSI, Provincial Parks, Conservation Reserves and Wildlife Management Areas);
- Species at Risk (SAR) occurrences and potential to occur;
- Significant Wildlife Habitat (SWH) or wildlife use within the area;
- Fish records;
- Thermal regime;
- Timing windows; and
- Wetland mapping and/or evaluation

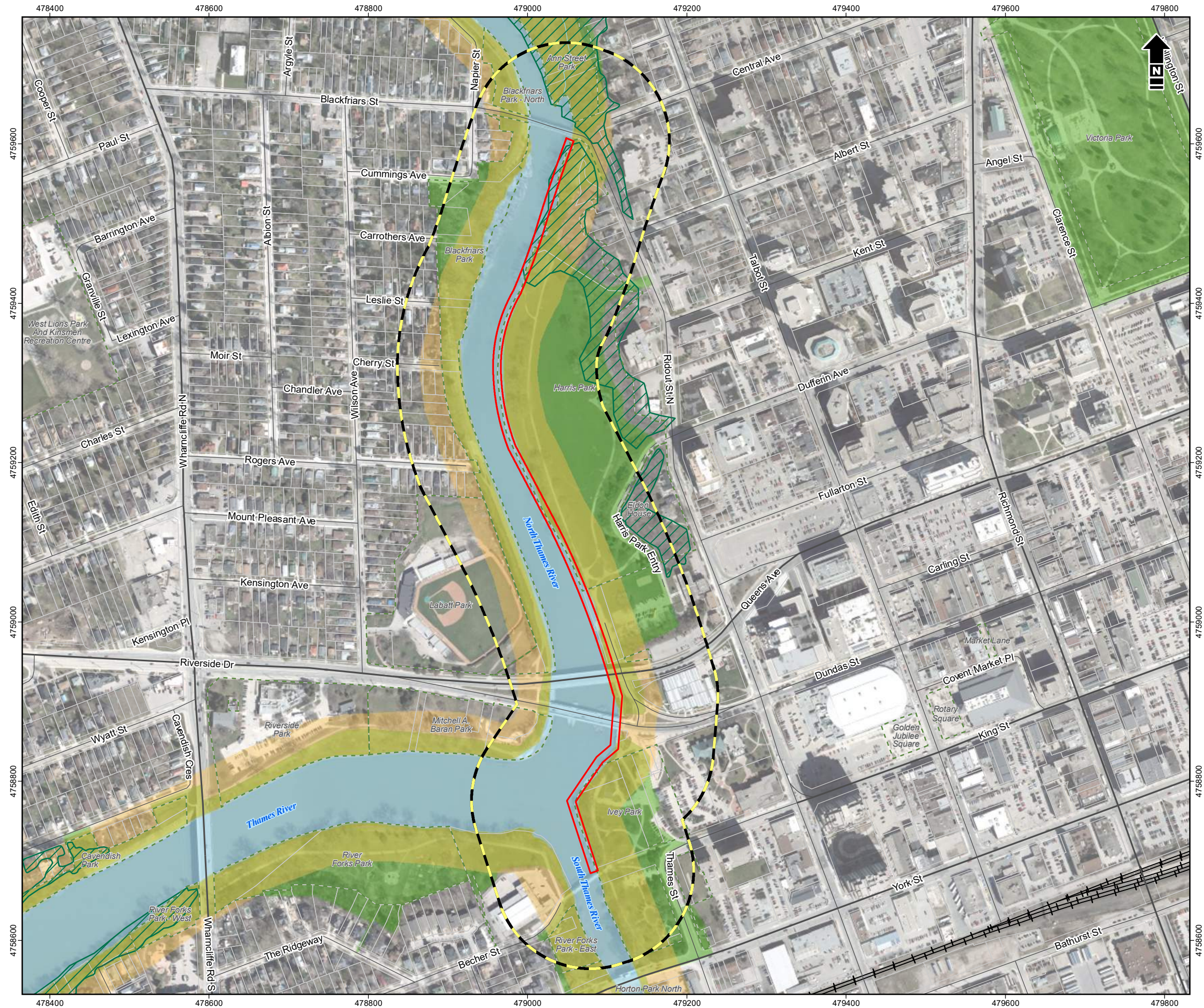
A response received on August 25, 2023 from the UTRCA indicated records of Spiny Softshell south of the Queen's Avenue Bridge, as well as Northern Map Turtle and Snapping Turtle within Harris Park. In addition, Eastern Garter, Eastern Milksnake and Midland Painted Turtle were identified as potentially occurring within the study area.

No reply has been received from MECP or NDMNRF to date.

An NHIC request was submitted on June 26, 2023, in regard to two restricted species records found during an NHIC search. A response was received on June 26, 2023, from an NHIC Information Officer. The two restricted species records were identified as Eastern hog-nosed snake.

A copy of all agency correspondence is presented in Appendix A.

I:\CityofLondon\GIS\5699\FigureAndTable\ECL\2023\Report\Figure-1-Study_Area.mxd - Tab01_L - 07-Nov-23, 02:20 PM - Inveright - TID005



- Study Area
- Subject Lands
- Park
- Significant Valleyland (London Plan)
- Green Space
- Wooded Area (Land Information Ontario)
- Parcel
- Waterbody
- Watercourse
- Highway
- Road
- Private Road
- Railway

Reference: Contains information licensed under the Open Government Licence - City of London. Contains information licensed under the Open Government Licence - Ontario. Imagery Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community

1:5,000 metres
50 0 50 100
NAD 1983 UTM Zone 17N



City of London
Harris Park

Study Area

Date: November 2023	Project: 35499	Submitter: E. Ottens	Reviewer: J. Piette
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Disclaimer: The information contained herein may be compiled from numerous third party materials that are subject to periodic change without prior notification. While every effort has been made by Matrix Solutions Inc. to ensure the accuracy of the information presented at the time of publication, Matrix Solutions Inc. assumes no liability for any errors, omissions, or inaccuracies in the third party material.

1.3 Policy Framework

Table 1 outlines the legislation, policies, and regulations relevant to natural heritage features and functions as they relate to the Harris Park erosion control structure replacement.

TABLE 1 Legislative Context

Legislation	Policies/ Regulations	Guidelines	Applicability to the Project
Federal Legislation			
Species at Risk Act (SARA)		N/A	SARA incorporates a number of prohibitions to protect SAR, providing recovery strategies for extirpated, endangered, or threatened species, as well as managing species of special concern (Government of Canada 2016). On private or provincially owned lands, only aquatic species listed as endangered, threatened, or extirpated and migratory birds listed on Schedule 1 are protected under SARA, unless ordered by the Governor in Council, or for those species that have critical habitat identified. Schedule 1 migratory birds where critical habitat has been identified require consideration under SARA. Should a species also be listed under SARA and the ESA, where the ESA provides equal or greater protection, the ESA takes precedence. Applicability to Project: Both fish and mussel species at risk have been identified within the Thames River.
Fisheries Act (1985)	Fish Protection Policy Statement (2013)	N/A	The <i>Fisheries Act</i> outlines the framework for the management and regulation of fisheries and the conservation and protection of fish and fish habitat within the fishing zones of Canada, all waters in the territorial sea of Canada, and all internal waters of Canada. The most recent revision (2019) restores protections to both fish and fish habitat by prohibiting the HADD of fish habitat and prohibiting the death of fish. Environmental recommendations and mitigation measures are to include the provision of timing windows, to avoid the death of fish or the HADD of fish habitat. Any proposed works that may result in either require a Request for Review submitted to the DFO. Applicability to Project: Any activities that may impact the Thames River or other watercourses within the study area may require a Request for Review from the DFO.
Migratory Bird Convention Act (MBCA) (1994)	Migratory Birds Regulation (2022) Migratory Bird Sanctuary Regulations (2022)	N/A	The MBCA affords protection to birds listed under Article 1 of the MBCA. General prohibitions protect migratory birds, their nests, and their eggs, and prohibits the deposition of harmful substances in waters and other areas frequented by them. The MBR clarifies the nest protection timelines for 18 species that are listed on Schedule 1. These timelines include a waiting period until the nest can be deemed abandoned and subsequently removed. The waiting period for these 18 species remains in effect even if the nest is unoccupied. Nest protection for all other species which are not listed in Article 1 remains the same, with nest removal occurring once the young have fledged. Applicability to Project: All vegetation removal shall occur outside of the migratory bird nesting window of April 1 to August 31 of any year to avoid disturbing active nests.
Provincial Legislation			
Planning Act (1990)	Provincial Policy Statement, 2020 (MMAH 2020)	Natural Heritage Reference Manual (NHRM) (2010)	The PPS provides policy direction on provincial matters of interest related to land use planning and development. It sets the policy framework for regulating development and use of land and is issued under the authority of Section 3 of the Planning Act.

Legislation	Policies/ Regulations	Guidelines	Applicability to the Project
		Significant Wildlife Habitat Technical Guide (MNR 2000) Significant Wildlife Habitat (SWH) Technical Guide (2000) Ecoregion Criterion Schedule 7E (2015).	Section 2.1 of the PPS outlines policies that provide legislative protection for the natural environment. These policies include the exclusion of development and site alteration within PSWs, habitat of endangered or threatened species, fish habitat, as well as within SWH, significant woodlands, significant valleylands, ANSIs or adjacent lands “...unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions” (MMAH 2020). The NHRM was developed to provide technical guidance for implementing the natural heritage policies of the PPS. The NHRM and SWHTG outline protection of natural heritage features within Ontario including significant wetlands, woodlands, and wildlife habitat. Applicability to Project: A number of natural heritage features are found within the study area that may contain SWH which includes potential for species of conservation concern and special concern.
Conservation Authorities Act (1990)	Ontario Regulation 157/06: Upper Thames River Conservation Authority: Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses (2022)	N/A	The Conservation Authorities Act empowers conservation authorities to regulate activities in natural and hazardous areas (such as streams, floodplains, wetlands, areas in and near rivers, slopes, and lake shoreline) through the Development, Interference with Wetlands, and Alterations to Shorelines and Watercourse Regulation. Applicability to Project: A portion of the study area is located within the jurisdiction of the UTRCA (regulated under O. Reg. 157/06). Any works within the regulatory limit may require a permit.
Fish and Wildlife Act (1997, amended 2021)	O. Reg.'s: 670/98 668/98 666/98 667/98 665/98 664/98 663/98 O. Reg. 669/98: Wildlife Schedules (1998)	N/A	The <i>Fish and Wildlife Act</i> affords protection for some species of birds, amphibians, reptiles, and mammals in Ontario. Some bird species which are not afforded protection under the MBCA are afforded protection under the <i>Fish and Wildlife Act</i>. Applicability to Project: There may be suitable habitat along the Thames River or Watson Street Oxbow, and within the study area for some of these species, such as raptors or fur bearing mammals. Environmental management considerations should include timing windows for vegetation clearing and for construction.
Endangered Species Act (2007, amended 2020)	O. Reg. 230/08 O. Reg. 242/08 O. Reg. 829/21 O. Reg. 830/21 O. Reg. 832/21	N/A	The ESA provides conservation and protection of species in Ontario. Species listed as endangered or threatened under the ESA are afforded legal protection from harm and harassment. The ESA also prohibits damage or destruction of habitat of endangered or threatened species. Habitat protection for a species can be general or subject to the specific provisions of a habitat regulation as set out in O. Reg. 832/21. Applicability to Project: The ESA applies to all SAR species within provincial lands protected under the ESA. Any impacts to these species or their habitats protected under the ESA would require a permit. The study area may contain habitat for SAR species.

Legislation	Policies/ Regulations	Guidelines	Applicability to the Project
Municipal Legislation			
The London Plan (OP) (2016)	Policy 1396 Policy 1397 Policy 1400 Policy 1401 Policy 1402 Policy 1445 Policy 1455 Policy 1456 Policy 1489 Policy 1501	N/A	The London Plan was adopted by City Council on June 23, 2016 and approved by the Minister on December 28, 2016. The goals, objectives and policies of The London Plan are meant to provide direction on decisions for physical development within the City, while having regard for relevant social, economic, and natural heritage aspects. All decisions made within the City must be consistent with the policies of The London Plan.
N/A	London Invasive Plant Management Strategy (LIPMS) (2017a)	N/A	The <i>Invasive Plant Management Strategy</i> was designed to address the need in identifying and prioritizing invasive plants posing a direct threat to the City of London's Natural Heritage System. This strategy is in line with policy 1417 "encourage rehabilitation and enhancement measures that protect the ecological function and integrity of the Natural Heritage System," of the London Plan.
N/A	City of London Environmental Management Guidelines (EMG) (2020)	N/A	The <i>London Environmental Management Guidelines</i> were implemented by the City of London in 2007. This document provides a systematic approach to the practice of environmental management and is to be used in evaluating natural heritage features or establishing buffers in the City of London
N/A	City of London Tree Protection By-Law 1515-228 (2017b)	N/A	The <i>City of London Tree Protection By-Law 1515-228</i> was designed to regulate the injuring and destruction of trees and to encourage preservation and planting of trees throughout the City of London.
N/A	City of London 2019 Parks and Recreation Master Plan (City of London 2019)	Ontario Trail Strategy (2017)	Section 6 of the Master Plan: Connecting People and Nature: Support efforts to expand active transportation networks, including trails and pathways within and connecting to, parks and natural park areas. Continued improvement and expansion of the recreational pathway and active transportation networks are key goals for the City. All trail and pathway development projects require site-specific analysis, including application of applicable policies and guidelines.
Notes: ANSI - Area of Natural and Scientific Interest DFO - Fisheries and Oceans Canada ESA - <i>Endangered Species Act</i> GRCA - Grand River Conservation Authority HADD - harmful alteration, destruction, and displacement MBCA - Migratory Birds Convention Act MBR - Migratory Birds Regulation NHRM - Natural Heritage Reference Manual O. Reg. - Ontario Regulation PPS - Provincial Policy Statement			

2 BACKGROUND REVIEW

TABLE 2 Background Sources

Source	Information Reviewed
Land Information Ontario (LIO), MNRF, 2022	Natural Heritage Features data layers
Natural Heritage Information Centre (NHIC), MNRF, 2019	Data records for the study area
Fisheries and Oceans Canada (DFO), 2022	Aquatic Species at Risk Map
Ontario Breeding Bird Atlas (OBBA), Birds Studies Canada, 2006	Species records for the study area
Ontario Butterfly Atlas, Toronto Entomologists' Association, 2022	Species records for the study area
Ontario Moth Atlas, Toronto Entomologists' Association, 2022	Species records for the study area
Ontario Reptile and Amphibian Atlas, Ontario Nature, 2019	Species records for the study area
Important Bird Areas, 2022	Data records for the study area
eBird, Cornell Lab of Ornithology, 2022	Species records for the study area
Ontario Mammals, iNaturalist, 2022	Species records for the study area
iNaturalist, 2022	Species records for the study area
List of the Vascular Plants of Ontario's Carolinian Zone (Ecoregion 7E), Oldham, 2017	Local status vegetation records for Middlesex County
Agency Correspondence	UTRCA information request
Thames River Existing Canoe Access Natural Heritage Due Diligence Report, Matrix Solutions Inc., 2022.	Information applicable to Blackfriars Park (site 3)
One River Master Plan Environmental Assessment (EA), Matrix Solutions Inc and Jacobs, 2019)	Data applicable to the Harris Park study area.
West London Dyke Environmental Impact Study (EIS), Stantec, 2016	Data applicable to the Harris Park study area.
Forks of the Thames Environmental Impact Study (EIS), Matrix Solutions Inc., 2019.	Data applicable to the Harris Park study area.
The London Plan, City of London, 2016	Applicable policies
City of London Environmental Management Guidelines, City of London, 2021	Applicable guidelines
Google Earth, Google, 2022	Aerial imagery of the study area
City of London Open Data, 2019	Tree inventory data applicable to the study area

2.1 Previous Studies

2.1.1 West London Dyke EIS

Stantec Consulting Ltd. (Stantec) was retained by the UTRCA to undertake an EIS in support of the rehabilitation and construction of the West London Dyke, in London, Ontario. The natural environment study area was located downtown London, north of Oxford Street following the Thames River, south to Wharnccliffe Road South and extending slightly north into the residential neighbourhood along Cavendish Crescent and Walnut Street. A section of the study area for the West London Dyke EIS falls within the Harris Park study area and applicable data was used to supplement natural heritage information presented herein. The following field investigations conducted by Stantec in 2015 and 2016 are applicable to the study area:

- Winter wildlife survey;
- Winter raptor survey;
- Amphibian call count surveys;
- Breeding bird surveys;
- Turtle basking surveys;
- Bat habitat assessment;
- Incidental wildlife observations;
- Wildlife habitat assessments;
- Spring, summer, and fall botanical surveys; and
- Spring and summer Ecological Land Classification (ELC).

2.1.2 Forks of the Thames Environment Impact Study

Matrix was retained by Jacobs Canada Inc. (Jacobs) and the City of London to complete an EIS to support the Municipal Class Schedule B Environmental Assessment (EA) for the Fork of the Thames in London, Ontario. The Schedule B EA was conducted as part of Stage 2 of the One River Master Plan (EA). Most of the Forks project site area falls within the southern portion of the Harris Park study area. Data collected as part of this report was used to supplement natural heritage information presented herein. The following field investigations in 2017 and 2018 conducted by Matrix are applicable:

- Botanical inventory;
- Breeding bird surveys;
- ELC;
- Tree Inventory;
- Fish and fish habitat assessments; and
- Incidental observations.

2.1.3 Thames River Existing Canoe Access Natural Heritage Due Diligence Report

Matrix was retained by the City of London to complete a terrestrial ecological constraints and mitigation report to satisfy due diligence requirements for the continued use and formalization of six existing canoe access locations (the sites) along the Thames River, in London, Ontario. Blackfriars Park (Site 3) located near 2 Cummings Avenue, falls within the Harris Park study area and data from that site was used to supplement natural heritage information presented herein. The following field investigations in 2022 conducted by Matrix are applicable to the study area.

- Botanical inventory;
- ELC;
- SAR/SCC habitat screening;
- SWH screening; and
- Incidental observations.

2.1.4 One River Master Plan EA

Matrix and Jacobs were retained by the City of London to conduct an EA for the One River Master Plan to determine the feasibility of implementing various projects being considered within the One River study area of the Thames River from the Boler Road bridge to the Forks of the Thames and Harris Park. A portion of the One River Master Plan EA study area falls within the Harris Park study area and applicable data was used to supplement natural heritage information presented herein. Data collected from the Forks of the Thames EIS was an appendix attached to the One River Master Plan EA.

3 NATURAL ENVIRONMENT EXISTING CONDITIONS

Natural heritage existing conditions for the study area were characterized using a combination of background information, outlined in Section 2, and reconnaissance level field investigations completed by Matrix in summer of 2023. Matrix safety followed all appropriate health and safety procedures during field investigations, due to multiple muggings reported during the summer and fall of 2023. Incidental wildlife observations were collected during all site visits and incorporated into the report. Dates and locations of specific surveys are shown in Table 3.

TABLE 3 Field Investigation Information

Field Investigation	Protocol	Date Completed	Personnel
High-level Aquatic Habitat Assessment	Modified OSAP 2013	June 21, 2023	E. Ottens
Ecological Land Classification	Lee et al. (1998) and Lee et al., (2008)	June 21, 2023	E. Ottens
Vascular Flora and Fauna Inventory	Systematic search by ELC polygon	June 21, 2023	E. Ottens and A. Perez
Incidental Wildlife Observations	N/A	June 21, 2023	E. Ottens and A. Perez
SAR Survey and SWHA Screenings	MNRF Protocols	June 29, 2023	E. Ottens and J. Piette
Tree Tally	Modified International Society of Arboriculture (ISA) protocol.	June 21, 2023	E. Ottens and A. Perez

3.1 Aquatic Habitat and Fisheries

The following sections describe the aquatic habitat and species within the study area based on background reports and reconnaissance field investigations.

3.1.1 Background

The records review identified a total of 52 fish species as potentially occurring within the study area, all associated with the Thames River. Of these, three species were identified as SAR and two species were identified as Species of Conservation Concern (SOCC):

- Lake Sturgeon (Great Lakes - Upper St. Lawrence River population) (*Acipenser fulvescens* pop. 3) (Endangered; END),
- Silver Shiner (*Notropis photogenis*) (Threatened; THR),
- Black Redhorse (*Moxostoma duquesnei*) (THR),
- Northern Brook Lamprey (*Ichthyomyzon fossor*) (Special Concern; SC) and
- Northern Longear Sunfish (*Lepomis peltastes*) (SC).

Additionally, a total of 12 mollusc species were identified as potentially occurring within the study area. Of these, three species were identified as SAR:

- Round Pigtoe (*Pleurobema sintoxia*) (END),
- Purple Wartyback (*Cyclonaias tuberculata*) (THR), and
- Wavy-rayed Lampmussel (*Lampsilis Fasciola*) (THR).

The DFO mapping tool also indicated critical habitat for Silver Shiner, Round Pigtoe, and Black Redhorse associated with the Thames River.

Fish and mollusc records obtained from the background review are presented in Table 4 and Table 5.

TABLE 4 Study Area Fish Record

Species Name		Conservation Rank				Source							
Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	iNat	DFO	LIO	Matrix, 2022	Stantec 2016	Matrix and Jacobs, 2019	Matrix Solutions Inc., 2019
Acipenseriformes													
<i>Acipenser fulvescens</i> pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	S2	END	THR		x							
Clupeiformes													
<i>Dorosoma cepedianum</i>	Gizzard Shad	S4					x						
Cypriniformes													
<i>Camptostoma anomalum</i>	Central Stoneroller	S4							x				x
<i>Cyprinus carpio</i>	Common Carp	SNA							x				
<i>Nocomis micropogon</i>	River Chub	S4							x				
<i>Notropis atherinoides</i>	Emerald Shiner	S5							x				x
<i>Notropis photogenis</i>	Silver Shiner	S2S3	THR	THR	THR	x	x	x					x
<i>Notropis rubellus</i>	Rosyface Shiner	S4							x				x
<i>Notropis volucellus</i>	Mimic Shiner	S5							x				
<i>Pimephales notatus</i>	Bluntnose Minnow	S5							x				x
<i>Rhinichthys cataractae</i>	Longnose Dace	S5							x				
<i>Semotilus atromaculatus</i>	Creek Chub	S5							x				
<i>Cyprinella spiloptera</i>	Spotfin Shiner	S4					x		x				x
<i>Luxilus chrysocephalus</i>	Striped Shiner	S4							x				
<i>Luxilus cornutus</i>	Common Shiner	S5							x				x
<i>Catostomus commersonii</i>	White Sucker	S5							x				
<i>Hypentelium nigricans</i>	Northern Hog Sucker	S4							x				x
<i>Moxostoma duquesnei</i>	Black Redhorse	S2	THR	THR	THR			x					
<i>Moxostoma erythrurum</i>	Golden Redhorse	S4					x		x				
<i>Moxostoma macrolepidotum</i>	Shorthead Redhorse	S5											x
<i>Moxostoma valenciennesi</i>	Greater Redhorse	S3							x				x
Osmeriformes													

Species Name		Conservation Rank				Source							
Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	iNat	DFO	LIO	Matrix, 2022	Stantec 2016	Matrix and Jacobs, 2019	Matrix Solutions Inc., 2019
<i>Lepomis peltastes</i>	Northern Longear Sunfish							x					
Perciformes													
<i>Ambloplites rupestris</i>	Rock Bass	S5							x				x
<i>Micropterus dolomieu</i>	Smallmouth Bass	S5							x				x
<i>Pomoxis nigromaculatus</i>	Black Crappie	S4							x				x
<i>Etheostoma blennioides</i>	Greenside Darter	S4							x				x
<i>Etheostoma caeruleum</i>	Rainbow Darter	S4					x		x				
<i>Etheostoma flabellare</i>	Fantail Darter	S4							x				
<i>Etheostoma microperca</i>	Least Darter	S4											x
<i>Etheostoma nigrum</i>	Johnny Darter	S5							x				
<i>Percina caprodes</i>	Logperch	S5							x				
<i>Percina maculata</i>	Blackside Darter	S4							x				x
Petromyzontiformes													
<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey	S3	SC	SC	SC	x							
Siluriformes													
<i>Noturus flavus</i>	Stonecat	S4							x				
TOTAL:						3	5	3	26	0	0	0	16

TABLE 5 Study Area Mollusc Records

Species		Conservation Rank				Source						
Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC	iNat	DFO	Matrix, 2022	Stantec 2016	Matrix and Jacobs, 2019	Matrix Solutions Inc., 2019
Unionidae												
<i>Alasmodonta marginata</i>	Elktoe	S3				x						x
<i>Cyclonaias tuberculata</i>	Purple Wartyback	S2	THR			x						
<i>Lampsilis fasciola</i>	Wavy-rayed Lampmussel	S2	THR	SC	SC			x				
<i>Pleurobema sintoxia</i>	Round Pigtoe	S1	END	END	END	x		x				
<i>Strophitus undulatus</i>	Creeper	S5										x
Pectinidae												
<i>Actinonaias ligamentina</i>	Mucket	S4										x
<i>Lasmigona complanata</i>	White Heelsplitter	S4										x
<i>Lasmigona costata</i>	Fluted-shell	S5										x
<i>Leptodea fragilis</i>	Fragile Papershell	S4										x
TOTAL:						3	1	2	0	0	0	6

3.1.2 Methods

3.1.2.1 Fisheries Community Assessment

Fisheries community assessments were completed by Matrix as part of the Forks of the Thames EIS (Matrix Solutions Inc., 2019) on June 7th, September 6th, and September 7th in 2017 at two locations within the Forks of the Thames River. The Forks of the Thames River refers to where the Thames River and the North Thames River meet, which is located in the southern extent of the study area for the purposes of the Harris Park EIS. Active sampling methods were used, including seine nets to actively capture fish in shallow riffle and flats areas, as well as umbrella nets to actively capture fish using specific areas of cover. Once fish were captured, they were identified, photographed, and enumerated and then released unharmed back into the river. For fish that required further identification, a small number of voucher specimens were retained in preservative for further analysis. Relic mussel shells were also collected from the fish community sampling areas, since the Thames River hosts the second most diverse freshwater mussel population in Canada.

3.1.2.2 Fish Habitat Assessment

A modified Ontario Stream Assessment Protocol (OSAP) assessment was conducted by Matrix in the Thames River (Matrix Solutions Inc., 2019) in June and September 2017. The following information was collected:

- General watercourse characteristics;
- Channel characteristics;
- Substrate and bank materials; and
- Other important habitat features (fish barriers, nursery spawning, etc...).

Additionally, to supplement data collected for previous reports, Matrix completed a high-level aquatic habitat assessment on June 21, 2023, based on a modified OSAP protocol. Observations were made from the east side of the Thames River from the banks and available look-out points, no in-water work was completed. Tasks completed during the aquatic habitat assessment included:

- Description of adjacent natural features and land uses (i.e., wetland, agriculture, etc.)
- Channel description, substrate composition, channel morphology and bank stability
- Substrate composition (i.e., clay, silt, sand, gravel, cobble, rock, boulder, muck and detritus)
- In-stream substrate and vegetation cover;
- Evidence of erosion; and
- Presence of fish.

3.1.3 Results and Discussion

3.1.3.1 Fisheries Community Assessment

In total, 1109 fish were collected during the fish sampling events at the Forks of the Thames River in 2017 (south of the Harris Park study area). Sixteen species in total were identified, with the majority consisting of Emerald Shiner, Rosyface Shiner, and Common Shiner. One SAR was identified during the surveys, Silver Shiner, which is listed under the ESA as Threatened (THR). The prevalence of minnows was likely due to the use of the seining method, which tends to sample schooling fish that prefer areas of open water, as opposed to those that are cover oriented. In total, six mollusc species were identified within the study area, none being SAR.

3.1.3.2 Fish Habitat Assessment

Within the main branch of the Forks (located within the southern extend of the Harris Park EIS study area), wetted widths ranged from 69 m to 88 m, with an average width of 78.5 m. Ripples, pools, and runs were observed. A large scour hole was found at the confluence of the South Branch of the Thames River, and the main channel was approximately 6 m deep. A sandbar is located downstream of the confluence as well. Substrate consisted of gravel, cobble, coarse sand, and gravel. Woody debris on the banks and overhanging vegetation were observed in localized areas of the main branch. Nearshore areas contained areas of refuge for fish. Bank erosion was not often observed within this area due to gabion baskets and a retaining wall. The South Branch of the Thames River had a wetted width of approximately 31 m. . The substrate consisted of silt with sporadic angular cobble. Overhanging vegetation was observed along the edges of the South Branch providing a source of food; however, no woody debris or undercut banks for

habitat were observed. There are habitat features within the Forks of the Thames River that could fulfill refuge, spawning, rearing, food supply.. The Thames River is a vital migration corridor for a variety of species; therefore, it can be designated as high habitat potential for both warm and cool water fish species.

The 980 m of the Thames River within the subject lands consisted of riffles, pools, and runs and a few sandbars. The adjacent land to the east consisted of parklands and a Fresh-Moist Lowland Deciduous Forest. No in-stream vegetation within the subject lands of the Thames River was observed. No fish, other than minnows, were observed during the field investigation; however, the water was slightly turbid. Substrate observed within and along the edges of the river consisted of silt, sand, gravel, and larger rocks. Woody debris along the banks and overhanging vegetation (shrubs and trees) were observed in localized areas along the main branch of the Thames River. Vegetation observed along the banks included species such as common buckthorn (*Rhamnus cathartica*), spotted Joe pye-weed (*Eutrochium maculatum*), willow species (*Salix sp.*), Eastern cottonwood (*Populus deltoides*), American sycamore (*Platanus occidentalis*), riverbank grape (*Vitis riparia*), horsetail species (*Eleocharis sp.*), and Manitoba maple (*Acer negundo*). Both intact and failing gabion baskets and retaining walls were observed at localized areas along the Thames River within the subject lands, and in other areas there was evidence of erosion.

3.2 Vegetation Communities and Plants

The following sections present a description of the vegetation communities and plants observed within the study area from Matrix field investigations and background information provided from past reports.

3.2.1 Background

In total, 452 vegetation records were obtained during the background review as occurring or potentially occurring within the study area. Of these, four species were identified as SAR and two species were identified as SCC.

- Butternut (*Juglans cinerea*) (END),
- American chestnut (*Castanea dentata*) (END),
- cucumber tree (*Magnolia acuminata*) (END),
- Kentucky coffee-tree (*Gymnocladus dioica*) (END),
- broad beech fern (*Phegopteris hexagonoptera*) (SC), and
- green dragon (*Arisaema dracontium*) (SC).

Eight species were identified as S1-S3 and included:

- broad beech fern (*Phegopteris hexagonoptera*),
- eastern stiff-leaved goldenrod (*Solidago rigida*),
- trumpet creeper (*Campsis radicans*),

- honey locust (*Gleditsia triacanthos*),
- American chestnut (*Castanea dentata*),
- big shellbark hickory (*Carya laciniosa*),
- cucumber tree (*Magnolia acuminata*), and
- hairy-fruited sedge (*Carex trichocarpa*).

3.2.2 Methods

Ecological Land Classification and a three-season botanical inventory (spring, summer, and fall) was completed by Stantec on May 21, July 17, and September 16th, 2015, following the 2008 ELC. Additional, ELC and a 2-season inventory was completed by Matrix in 2018 for the Forks of the Thames. To supplement this information, Matrix conducted a reconnaissance level site visit to confirm ELC and complete a vegetation inventory for the study area in 2023.

The following sections describe the methods used in more detail to assess the characteristics of the vegetation communities within the study area:

Ecological Land Classification (ELC) and Plants: Vegetation communities were characterized and mapped using the ELC system for southern Ontario (Lee et. al., 1998, 2008). Data recorded for each vegetation community included species composition, dominant and uncommon species or features. The vegetation inventory was compiled and refined by incidental observations recorded throughout all site visits. Matrix ecologists used a handheld GPS to delineate the edge of the woodland boundary. Given the seasonality of the surveys, the plant species list is limited to woody species and those with disguisable parts still visible. In addition, a series of Floristic Quality Indicators were calculated for the subject lands:

Coefficient of Conservatism (CC): The CC values range from 0 (low) to 10 (high) and are based on species tolerance to disturbance and fidelity to specific habitat conditions.

0 – 3: Species found in a wide variety of communities, including disturbed sites;

4 – 6: Species associated with a specific community but can tolerate moderate levels of disturbance;

7 – 8: Species associated with a specific community and are tolerant to minor levels of disturbances; and

9 – 10: Species with a high degree of fidelity to a narrow range of ecological conditions.

Floristic Quality Index: The floristic quality (FQI) of a feature is represented by the mean value of CC. For example, a cultural meadow would likely have a low mean CC as this type of habitat would likely be dominated by opportunistic species that occur in a wide range habitat and are tolerant to disturbance. An intact forest would likely have a higher CC value, reflecting the specific habitat requirements for many of the species observed and general absence of disturbance. A community with an FQI of 1 - 19 will be considered of low vegetative quality; communities with an FQI of 20 - 35 will be considered to have high vegetative quality and communities with an FQI above 35 will be considered of “Natural Area” quality. It

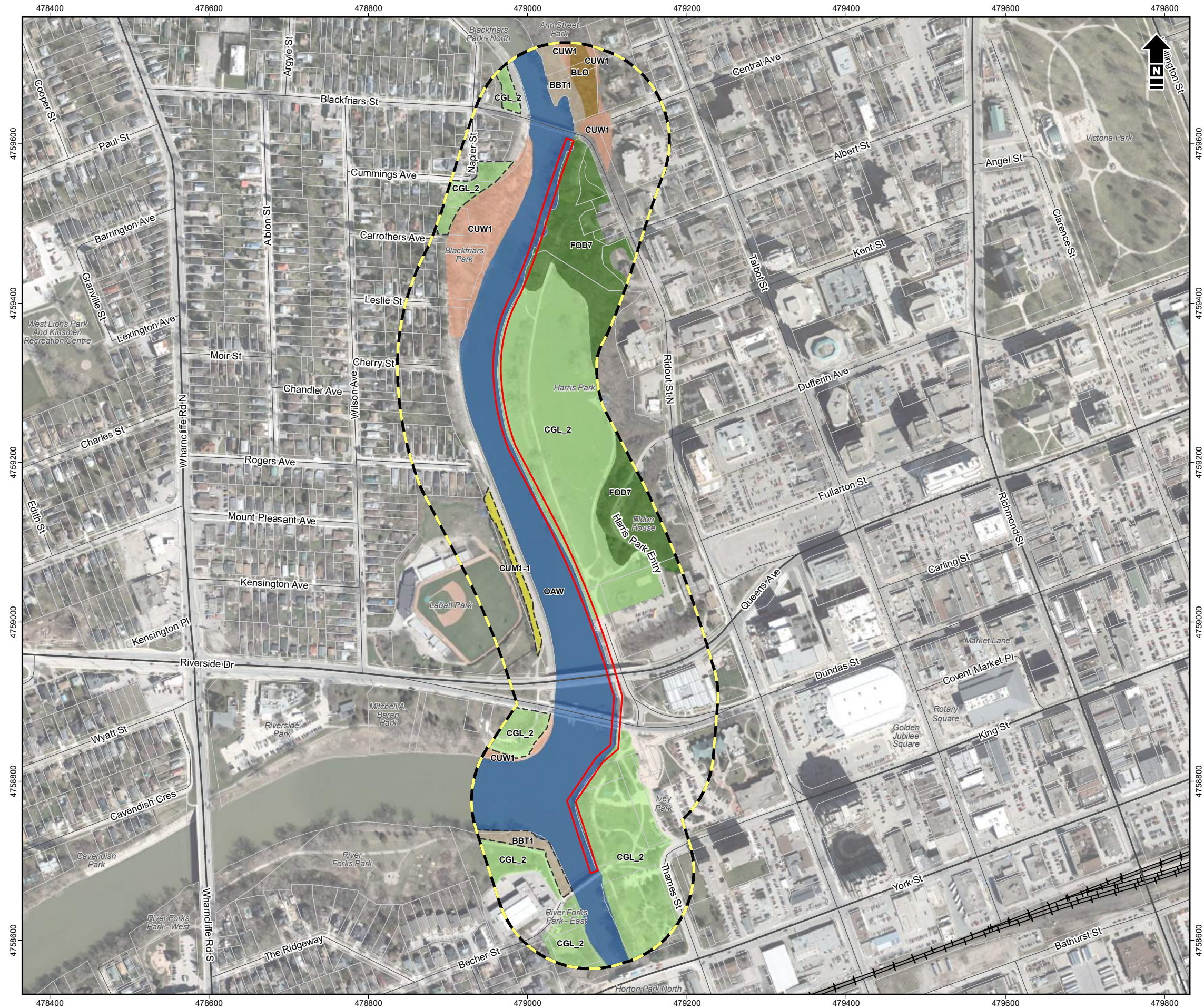
should be noted this calculation is not reflective of species abundances and is only representative of the species present.

3.2.3 Results and Discussion

Vegetation communities within the study area were previously delineated in 2016 by Stantec as part of the West London Dyke EIS and were confirmed in the field by Matrix in 2023. A large portion of the study area was dominated by parkland (Harris, Labatt, and Ivey Park) with scattered planted trees observed throughout. Harris Park, located on the east side of the Thames River, consists of manicured grassy areas, a multi-use path, and modern amphitheatre. Labatt Memorial Park, located on the west side of the Thames River includes a baseball stadium and Ivey Park, east side of the Thames River and north of King Street Bridge, includes green space with scattered trees, splashpads, and playgrounds.

Naturally occurring vegetation communities are limited to narrow strips of vegetation along the Thames River and in smaller areas located in the north and northeast sections of the study area. A total of seven ELC communities were delineated within the study area and are described below. ELC community codes presented in brackets are those communities identified by Stantec. A representative photo log can be found in Appendix B and a list of all vegetation species observed by community is presented in Appendix C. ELC delineations can be found in Figure 2.

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-  Study Area
 Subject Lands
 Parcel
 Highway
 Road
 Private Road
 Railway
- Ecological Land Classification**
 BBT1: Mineral Treed Beach/Bar (SHTM1-1)
 BLO: Open Bluff (BLO)
 CGL_2: Parkland (CGL_2)
 CUM1-1: Dry-Moist Old Field Meadow (MEMM4)
 CUW1: Mineral Cultural Woodland (WODM5)
 FOD7: Fresh-Moist Lowland Deciduous Forest
 OAW: Open Water (OAO)
 Aerial Interpretation

Reference: Contains information licensed under the Open Government Licence - City of London. Contains information licensed under the Open Government Licence - Ontario. Imagery Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community

1:5,000
50 0 50 100 metres
NAD 1983 UTM Zone 17N



Matrix Solutions Inc.
A Montrose Environmental Company

City of London
Harris Park

Ecological Land Classification

Date: November 2023	Project: 35499	Submitter: E. Ottens	Reviewer: J. Piette
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Figure 2

CUM1-1: Dry-Moist Old Field Meadow Type (MEMM4): This community was identified through aerial photo interpretation and was found in Labatt Park at the south end of the study area. According to previous Stantec field investigations, species in the herbaceous layer included smooth brome (*Bromus inermis*), orchard grass (*Dactylis glomerata*), woodland chervil (*Anthriscus sylvestris*), giant goldenrod (*Solidago gigantea*), tall goldenrod (*Solidago altissima*), herb-robert (*Geranium robertianum*), common milkweed (*Asclepias syriaca*), bladder campion, and field bindweed (*Convolvulus arvensis*). Canopy species observed included white mulberry, black walnut (*Juglans nigra*), Manitoba maple, and cherry species (*Prunus sp.*).

CUW1: Mineral Cultural Woodland Ecosite (WODM5): This community was found scattered in four locations throughout the study area. One community was observed in the south end of the study area near Mitchell A. Baran Park with the other three communities found near Blackfriar's bridge in the northern portion of the study area. Species observed within all four communities consisted more or less of the same species; however, species dominance varied throughout each community. Species included Manitoba maple, Norway maple, Eastern cottonwood, common hackberry, white mulberry, Freeman's maple (*Acer X freemanii*), black locust, green ash, and black walnut. Shrub and herbaceous species observed for all four CUW1 ecosites included common buckthorn, Virginia creeper, garlic mustard, goldenrod, riverbank grape, common ragweed (*Ambrosia artemisiifolia*), and green ash (*Fraxinus pennsylvanica*) regeneration. CUM1-1 and gravel inclusions were observed in the west section of the CUW1 community located just north of Blackfriar's Bridge within the northern extent of the study area which differed compared to the other three sites. An encampment was observed within one of the CUW communities, near the water's edge.

BLO: Open Bluff (BLO): This community was located north of Blackfriar's bridge in the northern portion of the study area and was identified as a seepage area. Dominant herbaceous species included skunk cabbage (*Symplocarpus foetidus*), true forget-me-not (*Myosotis scorpioides*), and field horsetail (*Equisetum arvense*). Other species observed included purple-stemmed angelica (*Angelica atropurpurea*), goldenrod species, and bittersweet nightshade (*Solanum dulcamara*). Scattered trees and shrubs species observed included common buckthorn and riverbank grape, bur oak, Manitoba maple, and black maple.

BBT1: Mineral Treed Beach/Bar Ecosite (SHTM1-1): This community was observed both in the north and south section of the study area, along the banks of the Thames River. The first community was found north of Blackfriar's bridge along the east banks of the Thames River. Aerial photo interpretation and information provided from previous Stantec investigations were used to identify the second community north of King Street Bridge along the west banks of the Thames River. Large cottonwoods in the canopy layer of both communities were abundant. Other tree and shrub species observed were Freeman's maple, slippery elm (*Ulmus rubra*), American sycamore, Norway maple, Eastern redbud, and common buckthorn. The understorey and ground layers were disturbed and consisted of Bishop's goutweed (*Aegopodium podagraria*), garlic mustard, Canada anemone (*Anemone canadensis*), common blue violet (*Viola sororia*), giant goldenrod, and white snakeroot (*Agertina altissima*).

FOD7: Fresh-Moist Lowland Deciduous Forest Ecosite: This community was observed in two locations along the eastern edge of the study area, one close to Blackfriar's Bridge and the other near the Harris Park entry. Species observed within the canopy included black locust (*Robinia pseudoacacia*), common hackberry (*Celtis occidentalis*), Manitoba maple (*Acer negundo*), Northern catalpa (*Catalpa speciosa*), white mulberry (*Morus alba*), Eastern cottonwood, bur oak (*Quercus macrocarpa*), American sycamore, Kentucky yellowwood (*Cladrastis kentukea*), American sweetgum (*Liquidambar styraciflua*) and black maple (*Acer nigrum*). Nine young Kentucky coffee-trees were identified along the edge of the more northern FOD7 ecosite which are listed as Threatened in Ontario. Shrub species observed included common buckthorn, riverbank grape, dogwood species (*Cornus sp.*) and Virginia creeper; however, the second FOD7 community more south near the Harris Park entry contained more Eastern redbud (*Cercis canadensis*) compared to the FOD7 community near Blackfriar's Bridge. Herbaceous species observed included garlic mustard (*Alliaria petiolata*), goldenrod species (*Solidago sp.*), Bishop's goutweed, sweet gum, mock strawberry (*Potentilla indica*), and violet species (*Viola sp.*). Woody debris was observed in both FOD7 ecosites. ABBT1 inclusion was observed within the FOD7 community near Blackfriar's bridge along the east side of the Thames River. Tree cover within this community ranged from greater than 25% to less than 60% and consisted of Eastern cottonwood, Norway maple (*Acer platanoides*), willow species (*Salix sp.*), common hackberry, white mulberry, and Manitoba maple. Shrub species included common buckthorn, riverbank grape, and ninebark (*Physocarpus opulifolius*). Species in the herbaceous layer included Bishop's goutweed, garlic mustard, Canada anemone, giant goldenrod (*Solidago gigantea*), violet species, bladder campion (*Silene latifolia*), Virginia creeper (*Parthenocissus quinquefolia*), dame's rocket (*Hesperis matronalis*), and spotted Joe-pye-weed (*Eutrochium maculatum*).

CGL_2: Parkland (CGL_2): Five Parks are located within the study area with Harris Park dominating the study area (Harris Park, Labatt Park, Ivey Park, Mitchell A Baran Park and River Fork Park). Scattered planted trees were observed within these parks and include American sycamore, willow species, white mulberry, American basswood (*Tilia americana*), Eastern cottonwood, white oak (*Quercus alba*), American hackberry, Norway spruce (*Picea abies*), and American elm (*Ulmus americana*). Scattered shrub species were observed, which included common buckthorn, riverbank grape, and staghorn sumac (*Rhus typhina*). Shrub inclusions containing the same species listed above were sporadically observed between the west side of the retaining wall and Thames River. Common herbaceous species observed along the multi-use pathway and throughout manicured green areas included goldenrod species, bird's foot trefoil (*Lotus corniculatus*), (common tansy (*Tanacetum vulgare*), aster species (*Symphyotrichum sp.*), common St. John's-wort (*Hypericum perforatum*), and spotted Joe-pye-weed. Inclusions of herbaceous species containing the same species as listed above, plus additional unidentified weedy species, were sporadically observed between the west side of the retaining wall and the Thames River. Look-out points, benches, and railings were observed within this community. Tree pruning and vegetation works were being completed during the field investigation. A series of park pathways were found in the parkland communities.

A total of 65 plant species were observed within the delineated vegetation communities, including 33 native species and 32 non-native species. The Floristic Quality Index (FQI) for the study area was 24.72, with a mean CC value of 4.30. An FQI value of 24.72 indicates a high vegetative quality or diversity within the study area, additionally, the CC value of 4.30 indicates that the species within the study area can tolerate moderate levels of disturbance and are commonly found in a wide variety of communities, including disturbed sites. The high FQI value can be attributed to the variety of smaller naturally occurring vegetation communities located along the edges of the park; however, this number is not associated with the park itself as the park is considered manicured and does not contain naturally occurring communities.

Nine Kentucky coffee-trees were identified within the FOD7 ecosite along the edge east of Harris Park, which is listed as THR under the ESA and received protection; however, these species are not in the vicinity of any of the proposed works. Additionally, Stantec identified hairy-fruited sedge, an S1-S3 and regionally rare species as well as a hybrid butternut species; neither of which were observed by Matrix during site investigations. No other SAR, S1-S3 species, or rare vegetation communities were identified during Matrix field investigations.

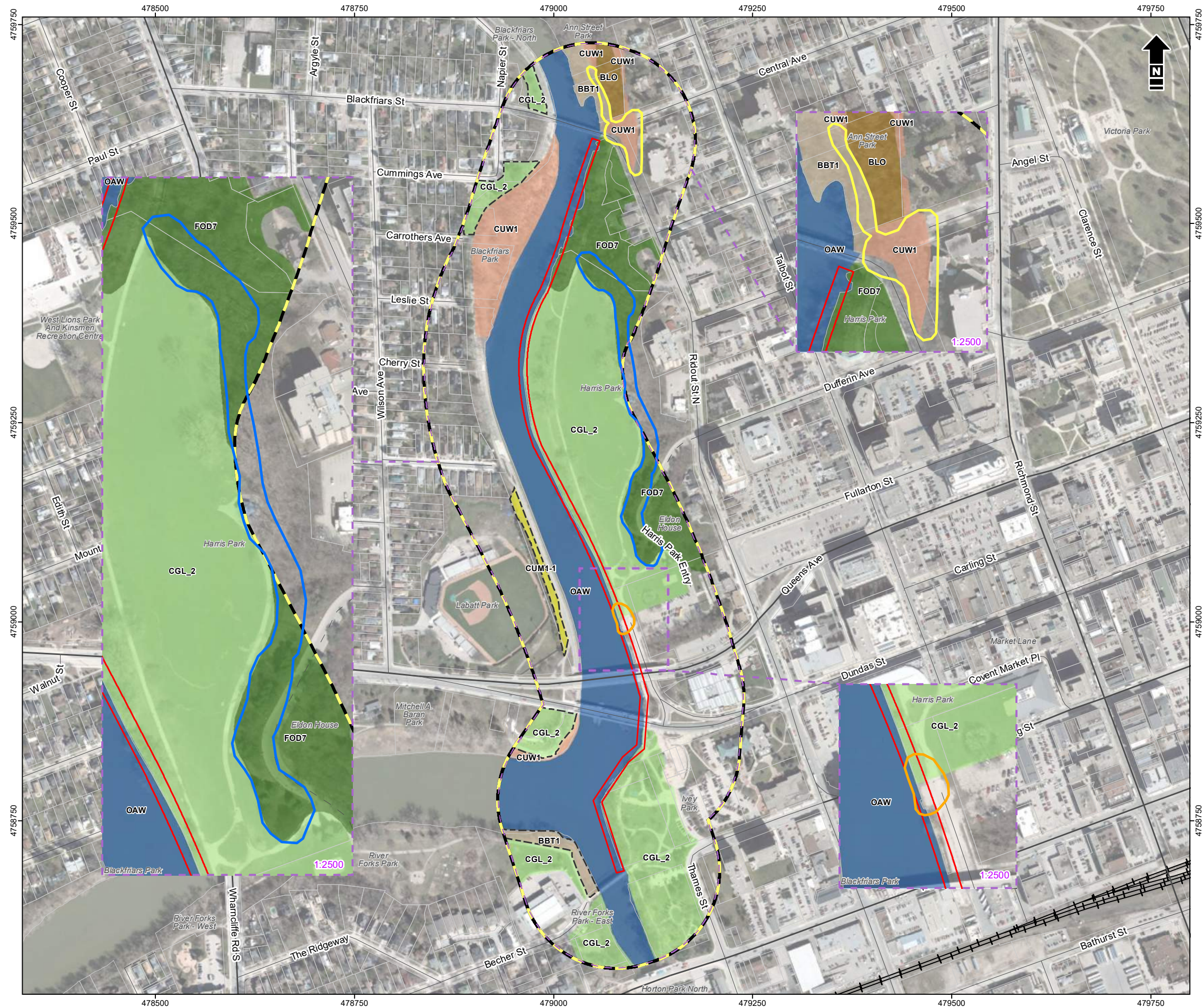
3.2.4 Invasive Species

Several invasive species were observed throughout the study area, many of which are recognized as highly invasive species as well as identified as priority species within the London Invasive Plant Management Strategy (City of London, 2022). The area is negatively influenced by the adjacent urbanization and trail network along the Forks of the Thames causing edge effects and community fragmentation. As documented by Matrix, many of the observed ELC communities were identified to be moderately to severely influenced by non-native invasive species. The most observed invasive species included:

- garlic mustard (*Alliaria petiolata*) - was observed in more intermittent areas; however, was recorded within the CUW1 community north of Blackfriar's Bridge and along the eastern edge of the BBT1 community also north of Blackfriar's Bridge.
- Japanese knotweed (*Reynoutria japonica*)- was observed in the CGL_2 community, just north of Queen's Avenue Bridge and east of the pedestrian walkway.
- common buckthorn (*Rhamnus cathartica*) - was a common species found within the shrub layer of a majority of ELC communities; however, large and more dense common buckthorn patches were observed along the edge and within the FOD7 community, found in the eastern portion of the study area.

Approximate locations of priority invasive species observed in the field can be found on Figure 3. Specific locations for invasive species are outlined below in Table 6. The location of these species should be carried forward to the detailed design drawings.

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- Subject Lands
- Parcel
- Highway
- Road
- Private Road
- Railway
- Ecological Land Classification**
 - BBT1: Mineral Treed Beach/Bar (SHTM1-1)
 - BLO: Open Bluff (BLO)
 - CGL_2: Parkland (CGL_2)
 - CUM1-1: Dry-Moist Old Field Meadow (MEMM4)
 - CUW1: Mineral Cultural Woodland (WODM5)
 - FOD7: Fresh-Moist Lowland Deciduous Forest
 - OAW: Open Water (OAO)
 - Aerial Interpretation
- Invasive Species**
 - Common Buckthorn
 - Garlic Mustard
 - Japanese Knotweed

Reference: Contains information licensed under the Open Government Licence - City of London. Contains information licensed under the Open Government Licence - Ontario. Imagery Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community.
Contains information obtained from The London Plan (Official Plan) 2016 Maps.
Contains information from the City of London Open Data Portal.

1:5,000 metres
50 0 50 100
NAD 1983 UTM Zone 17N



City of London
Harris Park

Invasive Species

Date: November 2023	Project: 35499	Submitter: E. Ottens	Reviewer: J. Piette
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Figure 3

TABLE 6 Invasive Species

Invasive Species Common Name	Invasive Species Latin Name	ELC Location
Common buckthorn	<i>Rhamnus cathartica</i>	CUM1, CUW1, BLO, BBT1, CGL_2, FOD7
Garlic mustard	<i>Alliaria petiolata</i>	CUW1, BBT1
Japanese knotweed	<i>Fallopia japonica</i>	CGL_2

3.3 Tree Tally

A tree tally was conducted by Matrix on June 21, 2023, to verify existing tree information collected by Ron Koudys Landscape Architects (RKLA) and review the City of London Open Tree Data. The tree tally was conducted 5 m - 10 m from the east side of the Thames River. The DBH (diameter at breast height), genus, and species (if possible) were recorded. Information pertaining to the tree tally can be found below in **Table 7** and preliminary tree data from RKLA is presented in **Table 8**. Details regarding tree removals are provided in a separate tree preservation report prepared by RKLA. It should also be noted, all efforts will be made onsite to preserve as many trees as possible.

TABLE 7 Tree Tally Information

DBH	<10 cm	10-24 cm	25-50 cm	>50 cm	Total	Percent (%)
Freeman's Maple		1	1		2	0.97
Northern Catalpa	1	1			2	0.97
Manitoba Maple	29	30	15	3	77	37.6
Common Hackberry	22	1		4	27	13.2
Eastern Cottonwood	1		1	9	11	5.37
White Mulberry	12		1		13	6.34
Willow sp.		2		8	10	4.88
Sugar Maple	1				1	0.49
Black Locust	2	3	2		7	3.41
Norway Maple	9	1		1	11	5.37
White Poplar				1	1	0.49
Green Ash	1	3	1		5	2.44
Red Oak	1		1		2	0.97
Elm species	6				6	2.93
Maple sp.	2	3			5	2.44
Burr Oak		1	2		3	1.46
London Planetree	2	1	3	1	7	3.41
Little Leaf Linden			1		1	0.49
Dead		4	6	2	12	5.85
Ash sp.	1				1	0.49
Unknown sp.		1			1	0.49
Total	90	52	34	29	205	100%

TABLE 8 Tree Tally Information

ID #	BOTANICAL NAME	COMMON NAME	DBH (cm)	CANOPY RADIUS (m)	CROWN CONDITION	STRUCTURAL FORM	STRUCTURAL INTEGRITY	COMMENTS	REMOVAL RATIONALE	PRESERVE OR REMOVE
1	<i>Quercus alba</i>	White Oak	34	4	5	Good	Good	marked with white spray paint	conflict with shoreline protection & restoration	remove
2	<i>Salix</i> spp.	Willow	96	5	4	Poor	Poor	major cavity at base, dead leader, multiple dead branches	conflict with shoreline protection & restoration	remove
3	<i>Acer rubrum</i>	Red Maple	27	2.5	5	Good	Good	recent pruning	none	preserve
4	<i>Platanus x acerifolia</i>	London Plane Tree	49	3.5	5	Fair	Fair	multiple trunk wounds, dead branches	fair tree condition, conflict with shoreline protection & restoration requirements	remove
5	<i>Platanus x acerifolia</i>	London Plane Tree	48	3.5	5	Fair	Good		fair tree condition, conflict with shoreline protection & restoration requirements	remove
6	<i>Tilia cordata</i>	Little Leaf Linden	50	3	5	Fair	Fair	marked with white spray paint, multiple dead branches	fair tree condition, conflict with shoreline protection & restoration	remove
7	<i>Celtis occidentalis</i>	Hackberry	19	2	5	Fair	Good		none	preserve
8	<i>Populus deltoides</i>	Cottonwood	123	12	4	Good	Good	slight lean, minor trunk wounds	conflict with shoreline protection & restoration	remove
9	<i>Populus deltoides</i>	Cottonwood	48	7	4	Fair	Good	suppressed between trees 8 & 10	conflict with shoreline protection & restoration	remove
10	<i>Populus deltoides</i>	Cottonwood	124	12	4	Fair	Good		conflict with shoreline protection & restoration	remove
11	<i>Acer saccharinum</i>	Silver Maple	39	4	5	Fair	Good		conflict with proposed pathway	remove
12	<i>Salix</i> spp.	Willow	122	6	4	Good	Good	squat form, low branched	conflict with shoreline protection & restoration	remove
13	<i>Acer platanoides</i>	Norway Maple	55	4	5	Fair	Good		conflict with proposed pathway	remove

ID #	BOTANICAL NAME	COMMON NAME	DBH (cm)	CANOPY RADIUS (m)	CROWN CONDITION	STRUCTURAL FORM	STRUCTURAL INTEGRITY	COMMENTS	REMOVAL RATIONALE	PRESERVE OR REMOVE
14	<i>Populus deltoides</i>	Cottonwood	160	15	5	Good	Good		conflict with shoreline protection & restoration	remove
15	<i>Populus deltoides</i>	Cottonwood	76	12	5	Good	Good		conflict with shoreline protection & restoration	remove
16	<i>Acer platanoides</i>	Norway Maple	68	4	5	Good	Good		remove as directed by City	remove
17	<i>Populus deltoides</i>	Cottonwood	156	14	5	Fair	Good	marked with white spray paint	fair tree condition, potential conflict with proposed path	remove
18	<i>Platanus x acerifolia</i>	London Plane Tree	94	10	5	Good	Good		none	preserve
19	<i>Acer negundo</i>	Manitoba Maple	92	9	5	Good	Good		conflict with proposed pathway	remove
20	<i>Celtis occidentalis</i>	Hackberry	35	3	5	Good	Good		none	preserve
21	<i>Acer saccharum</i>	Sugar Maple	34	3	5	Good	Good		none	preserve
22	<i>Acer saccharum</i>	Sugar Maple	10,9,3,3	2	5	Poor	Fair	multi-stem 4, lean south, mature epicormic growth	poor tree condition	remove
23	<i>Quercus rubra</i>	Red Oak	10	2	5	Good	Good		none	preserve
24	<i>Quercus macrocarpa</i>	Bur Oak	29	3	5	Good	Good		none	preserve
25	<i>Populus deltoides</i>	Cottonwood	270,200	15	4	Poor	Fair	multi-stem 2, one stem cut off, one stem significant lean south	poor tree condition	remove
26	<i>Acer rubrum</i>	Red Maple	5	1	5	Good	Good		none	preserve
27	<i>Salix spp.</i>	Willow	~45	6	5	Poor	Poor	hole in the centre at base of trunk, shrubby	poor tree condition, conflict with proposed pathway	remove
28	<i>Morus alba</i>	Mulberry	35,25	4	4	Fair	Fair	primary union at dbh, lean south	fair tree condition, conflict with proposed pathway	remove
29	<i>Acer rubrum</i>	Red Maple	19	2.5	5	Fair	Good	major epicormic growth	conflict with shoreline protection & restoration	remove

ID #	BOTANICAL NAME	COMMON NAME	DBH (cm)	CANOPY RADIUS (m)	CROWN CONDITION	STRUCTURAL FORM	STRUCTURAL INTEGRITY	COMMENTS	REMOVAL RATIONALE	PRESERVE OR REMOVE
30	<i>Acer rubrum</i>	Red Maple	18	2.5	5	Fair	Good	major epicormic growth	conflict with shoreline protection & restoration	remove
31	<i>Acer rubrum</i>	Red Maple	13	2.5	5	Good	Good		conflict with shoreline protection & restoration	remove
32	<i>Acer rubrum</i>	Red Maple	10	2.5	5	Good	Good		conflict with shoreline protection & restoration	remove
33	<i>Acer rubrum</i>	Red Maple	10	2.5	5	Good	Good	chlorotic	conflict with shoreline protection & restoration	remove
34	<i>Acer platanoides</i>	Norway Maple	73	6	5	Good	Good		none	preserve
35	<i>Cladrastis kentukea</i>	Yellowwood	12	2	4	Fair	Good	epicormic growth at base, minor dieback	none	preserve
36	<i>Acer saccharum</i>	Sugar Maple	36	3	5	Good	Good		none	preserve
37	<i>Ginkgo biloba</i>	Ginkgo	30	3	5	Good	Good	full form	none	preserve
38	<i>Gymnocladus dioicus</i>	Kentucky Coffee-tree	23	3	5	Good	Good	full form	none	preserve
39	<i>Quercus macrocarpa</i>	Bur Oak	20	2.5	5	Good	Good	epicormic growth at base	conflict with shoreline protection & restoration	remove
40	<i>Acer rubrum</i>	Red Maple	8	1.5	5	Good	Good	chlorotic	none	preserve
41	<i>Quercus macrocarpa</i>	Bur Oak	22	2.5	5	Good	Good		none	preserve
42	<i>Acer x freemanii</i>	Autumn Blaze Maple	43	2	5	Good	Good		none	preserve
43	<i>Quercus macrocarpa</i>	Bur Oak	26	2.5	5	Good	Good		minor impact to critical root zone	preserve
44	<i>Morus alba</i>	Mulberry	32,29	4	4	Fair	Good	multi-stem 2, lean east over pathway	none	preserve
45	<i>Populus deltoides</i>	Cottonwood	95	17	4	Fair	Fair		conflict with shoreline protection & restoration	remove
46	<i>Populus deltoides</i>	Cottonwood	88	16	4	Fair	Fair		conflict with shoreline protection & restoration	remove
47	<i>Celtis occidentalis</i>	Hackberry	34	3.5	5	Good	Good		none	preserve

ID #	BOTANICAL NAME	COMMON NAME	DBH (cm)	CANOPY RADIUS (m)	CROWN CONDITION	STRUCTURAL FORM	STRUCTURAL INTEGRITY	COMMENTS	REMOVAL RATIONALE	PRESERVE OR REMOVE
48	<i>Acer saccharum</i>	Sugar Maple	27	3	5	Good	Good		none	preserve
49	<i>Amelanchier alnifolia</i>	Serviceberry	16	2	5	Good	Good		none	preserve
50	<i>Liriodendron tulipifera</i>	Tulip Tree	7	1.5	4	Fair	Good		none	preserve
51	<i>Cladrastis kentukea</i>	Yellowwood	32,29	3.5	4	Fair	Good	multi-stem 2, lean east over pathway, cavity at primary union	none	preserve
52	<i>Cercis canadensis</i>	Redbud	~12	2	5	Fair	Fair	low primary union, minor cavities at unions, slight lean south	conflict with shoreline protection & restoration	remove

3.4 Wildlife

No formal wildlife surveys were conducted by Matrix in 2023; however, previous wildlife surveys were conducted in 2015, 2017, 2018, and 2022 and are summarized below. Background information from several available online wildlife atlases, databases, and citizen-science platforms were also used to supplement previous studies and identify potential species and the likelihood of encountering sensitive species within the study area. All potential species were included in the Species at Risk and Significant Wildlife Habitat Screening tables. The following summarizes the results of the background information. All wildlife lists can be found in **Appendix E**.

3.4.1 Birds

In total, 398 bird records were identified during the background review as potentially occurring within the study area. Of these, five are listed as SAR and seven are listed as SC:

- Bank Swallow (*Riparia riparia*) (THR),
- Bobolink (*Dolichonyx oryzivorus*) (THR),
- Chimney Swift (*Chaetura pelagica*) (THR),
- Eastern Meadowlark (*Sturnella magna*) (THR),
- Lesser Yellowlegs (*Tringa flavipes*) (THR),
- Bald Eagle (*Haliaeetus leucocephalus*) (SC),
- Barn Swallow (*Hirundo rustica*) (SC),
- Common Nighthawk (*Chordeiles minor*) (SC),
- Eastern Wood-pewee (*Contopus virens*) (SC),
- Olive-sided Flycatcher (*Contopus cooperi*) (SC),
- Peregrine Falcon (*Falco peregrinus*) (SC),
- Canada Warbler (*Cardellina canadensis*) (SC) and
- Wood Thrush (*Hylocichla mustelina*) (SC).

In addition to the background information above, breeding bird surveys were completed on June 5, June 18, and July 3, 2015, and on June 1 and June 12, 2018, associated results can be found below:

- A winter wildlife surveys was completed concurrently with a winter raptor walking survey on March 6, 2015, and a total of two raptor species were observed flying over the Thames River. A Bald Eagle (SC) was observed flying over the Thames River at a height of approximately 100 m. A Red-tailed Hawk (*Buteo jamaicensis*) was also observed flying over the Thames River. No foraging or perching habitat was observed.

- Chimney Swift (THR), Barn Swallow (SC), and Bald Eagle (SC) were observed flying over the Thames River near the Forks area; however, nesting, perching, or foraging was not observed during three rounds of breeding bird surveys in 2015.
- During breeding bird surveys conducted in 2018, a Barn Swallow (SC) colony was observed under Kensington Bridge. Chimney Swifts (THR) were observed flying over the southern banks of the Thames River; however, no nesting was observed.

3.4.2 Amphibians and Reptiles

In total, 67 amphibian and reptile records were identified during the background review as potentially occurring within the study area. Of these, three species are listed as SAR and three species are listed as SC.

- Queensnake (*Regina septemvittata*) (END),
- Spiny Softshell (*Apalone spinifera*) (END),
- Eastern Foxsnake (Carolinian population) (*Pantherophis vulpinus*) (END),
- Eastern Ribbonsnake (Great Lakes population) (*Thamnophis sauritus*) (SC),
- Northern Map Turtle (*Graptemys geographica*) (SC) and
- Snapping Turtle (*Chelydra serpentina*) (SC).

In addition to the background information above, formal amphibian and reptile-related surveys conducted in the field in 2015 and associated results can be found below:

- Amphibian call count surveys were conducted using the Marsh Monitoring Program (MMP) (Bird Studies Canada, 2003) and Environment Canada's Amphibian Road Count program (2008) by in 2015. A total of three breeding survey windows were included in the study design; however, the second and third surveys were not conducted due to the absence of surface water pooling. No amphibian calls were heard during surveys.
- Turtle basking surveys were completed from April to September in 2015 along the Thames River. Visual encounter surveys consisted of surveyors observing potential basking locations for approximately 15-20 minutes with binoculars and spotted scopes. Any potential turtles hiding in nearby vegetation was also surveyed. A total of three turtle species were observed basking in the Thames River: Eastern Spiny Softshell (END), Northern Map Turtle (SC), and Red-eared Slider. None of these observations occurred within our (Harris Park) study area, as the observations were all associated with survey stations located west of Wharncliffe Road South. No suitable basking habitat or turtles were observed by Matrix in our study area.

3.4.3 Insects

In total, 154 insect records were identified during the background review as potentially occurring within the study area. Of these, three species are listed as SAR and three species are listed as SC.

- False-foxglove Sun Moth (*Pyrrhia aurantiago*) (END),
- Rusty-patched Bumble Bee (*Bombus affinis*) (END),
- Nine-spotted Lady Beetle (*Coccinella novemnotata*) (END),
- Reversed Haploa Moth (*Haploa reversa*) (THR),
- American Bumble Bee (*Bombus pensylvanicus*) (SC),
- Monarch (*Danaus plexippus*) (SC), and Y
- Yellow-banded Bumble Bee (*Bombus terricola*) (SC).

No formal insect surveys were conducted; however, none of these species were observed during site investigations.

3.4.4 Mammals

In total, 62 mammal records were identified during the background review as potentially occurring within the study area. Of these, five species were listed as SAR and one species was listed as SC.

- American Badger (*Taxidea taxus*) (END),
- Eastern Small-footed Myotis (*Myotis leibii*) (END),
- Little Brown Myotis (*Myotis lucifugus*) (END),
- Northern Myotis (*Myotis septentrionalis*) (END),
- Tricoloured Bat (*Perimyotis subflavus*) (END), and
- Woodland Vole (*Microtus pinetorum*) (SC).

Formal mammal-related surveys conducted in the field in 2015 and associated results can be found below:

- A bat habitat assessment was completed in April 2015. Very few suitable bat cavity trees were observed; therefore, acoustic monitoring was not conducted. No hibernacula were observed during investigations. The Thames River could provide foraging habitat for bats.
- Three mammals were recorded during winter wildlife surveys in 2015: Grey Squirrel, Eastern Cottontail, and Mink.

Identification of suitable bat maternity roosting habitat during the tree tally was completed by Matrix in 2023 following Step 1 of the Maternity Roost Surveys (Forests/Woodlands) protocol provided by MECP through email correspondence on June 8, 2021 (pers. Correspondence). According to the protocol, maternity roost habitat may be found within the following ELC communities: Deciduous Forest (FOD), Mixedwood Forest (FOM), Coniferous Forest (FOC), Deciduous Swamp (SWD), Mixedwood Swamp (SWM),

and Coniferous Swamp (SWC). Cultural Woodlands (CUW) are also thought to provide suitable habitat for bat maternity roosting habitat. The location of trees exhibiting appropriate attributes, such as appropriate DBH, cavities, loose bark, cracks, or knot holes of trees within 5 m east of the Thames River were recorded, the extent of the search ranging from Queen's Bridge to approximately 50 m south of Blackfriars bridge. The only area not searched was approximately 50 meters of the BBT1 ecosite south of Blackfriars bridge which could not be investigated due to very steep bank slopes and other safety concerns; however, no tree removals will be undertaken in this area and impacts to this area are not anticipated.

- One candidate bat snag was observed in the CGL_2 community (Harris Park) within the subject lands. The bat tree is an Eastern cottonwood with a DBH of 174 cm and a decay class of 2, with loose and peeling bark. Although parkland is not considered an ELC community suitable for potential bat habitat, any tree exhibiting bat habitat characteristics could be considered bat habitat. This tree, given its isolation from other suitable trees is considered of low habitat value and is likely not a primary cavity tree as bats tend to prefer locations where suitable trees are more densely clustered together.

4 ASSESSMENT OF NATURAL HERITAGE FEATURES AND FUNCTIONS

Significant natural heritage features include those listed in the Provincial Policy Statement, 2020 (PPS; MMAH 2020), the Natural Heritage Reference Manual (NHRM; MNR 2010), the Significant Wildlife Habitat Technical Guide (SWHTG; MNR 2000), the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (the Ecoregion 7E Schedules; MNRF 2015), and The London Plan (City of London 2016). The findings of the background review and site investigation were cross referenced with the criteria provided in these documents to identify the presence of, or potential presence of, significant natural heritage features and functions.

4.1 Aquatic Habitat and Fisheries

The following aquatic features were identified within the subject lands:

- **Significant Valleylands/Significant Corridor:** Significant Valleylands fall within the east side of the subject lands associated with the Thames River.
- **Watercourse:** the Thames River is considered a permanent warm watercourse.
- **Fish Habitat:** The DFO Aquatic SAR mapping tool indicated critical habitat for Silver Shiner, Round Pigtoe, and Black Redhorse associated with the Thames River. SAR found or potentially found within the Thames River also include Silver Shiner, Round Pigtoe, Black Redhorse, Northern Longear Sunfish, and Wavy-rayed Lampmussel.

4.2 Terrestrial Habitats and Features

The following identified terrestrial features were identified within the subject lands:

- **Woodlands:** Small woodland feature within the park is identified as a “woodland” on Map 5.
- **Significant Woodland:** The CUW1 (WODM5) within the study area is identified as a Significant Woodland based on the City of London Guideline Documents for the Evaluation of Ecologically Significant Woodlands (City of London, 2006); however, this community does not fall within the subject lands.

4.3 Species at Risk Screening

4.3.1 Methods

Matrix conducted a background records review to create a list of potential SAR species within the subject lands and surrounding landscape to supplement existing information known for the area. This list was developed using publicly available resources and community-based ecological monitoring databases. Once the list was compiled, a screening exercise was completed to determine the presence of suitable habitat for each SAR identified as potentially occurring within the subject lands, based on known preferred habitat characteristics for each species. The following species were included within the SAR Screening:

- Species listed as either Threatened (THR) or Endangered (END) under the Endangered Species Act (ESA) administered by the MECP. Individuals of these species, as well as their habitat, are protected in Ontario.
- Species of Conservation Concern (SOCC) include those listed as Special Concern (SC) under ESA, or species listed as threatened or endangered under the federal Species at Risk Act (SARA), not protected under the ESA, and species with Provincial S-rank assigned by the NHIC as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable). SOCC receive protection under the Natural Heritage Reference Manual, and their habitat is considered significant wildlife habitat (SWH).
- Species listed under SARA are only protected on federal land, as part of projects that are otherwise being permitted by a federal agency and includes aquatic SAR. SARA also requires consideration for any migratory bird listed on Schedule 1 where critical habitat has been identified; however, should the species also be listed under ESA and provides equal or greater protection, the ESA take precedence.

4.3.2 Results and Discussion

Aquatic Species

Species potentially found within the Thames River listed under **Section 3.1.1** of this report. These The SAR species were confirmed as present or potentially occurring within the Thames River by NHIC and DFO Aquatic SAR mapping. A DFO Request for Review will be submitted to understand permitting implications.

Terrestrial Species

A total of 23 SAR species and 17 SOCC species were identified as potentially occurring within the study area during the background review. This number was refined based on habitat characteristics present within the subject lands as observed through field investigations. Two SAR and two SOCC were confirmed species. Four SAR and two SOCC were candidate species.

A summary of the SAR screening can be found below, and the full SAR screening can be found in **Appendix F**.

Confirmed SAR

- Kentucky coffee Tree (*Gymnocladus dioicus*) – This species is not present within our areas of impact; however, was confirmed in the FOD7 ecosite along the edge east of Harris Park.
- Spiny Softshell – This species is not present within our areas of impact; however, have been confirmed near the Forks of the Thames.

Candidate SAR

- SAR Bats (Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*). – Potential cavity trees are located within the FOD and CUW communities within the study area. No corresponding ELC communities are present within the limits of disturbance.

Confirmed SOCC

- Barn Swallow (*Hirundo rustica*) – Species confirmed under Kensington Bridge. The bridge will not be impacted by proposed work.
- Northern Map Turtle (*Graptemys geographica*) – Species confirmed within the Thames River; however, no basking or nesting habitat was identified within our areas of impact. Consultation with the UTRCA indicated there are records within Harris Park for this species.

Candidate SOCC

- Snapping Turtle (*Chelydra serpentina*) - Consultation with the UTRCA indicated there are records within Harris Park for this species.
- Monarch (*Danaus plexippus*) – suitable habitat is found along the edges of vegetation communities and the river corridor.

Details regarding species with candidate habitat are in Appendix D.

4.4 Significant Wildlife Habitat Assessment

4.4.1 Background

SWH is identified under Section 2.3 of the PPS, as areas where plants, animals, and other organisms live and find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle and areas which are important to migratory or non-migratory species. Wildlife habitat is considered significant where it is ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system.

Defining wildlife habitat significance for Ecoregion 7E, in which the subject property is located, is described in the Significant Wildlife Habitat Criteria Scheduled for Ecoregion 7E (MNRF, 2015). SWH is protected under the PPS (MMAH 2020).

Wildlife habitat is divided into four broad categories as described in the SWHTG (MNR, 2000), as follows:

- seasonal concentration areas
- rare vegetation communities or specialized habitats for wildlife
- habitats of species of conservation concern, excluding the habitats of endangered and threatened species
- animal movement corridors

4.4.2 Methods

Using available background information and field survey results, the study area was evaluated for suitable geographic criteria and habitat characteristics of each candidate Significant Wildlife Habitat, as outlined in the MNRF SWHTG.

A summary of the SWH screening results is provided in the following sections and the detailed analysis is provided in **Appendix G**.

4.4.3 Results and Discussion

The SWH screening for the subject lands found that the criteria for candidate SWH were met for two categories:

Turtle Wintering Areas: The Thames River has been identified as SWH for turtle overwintering. Northern map turtles were identified in the Thames River during Stantec field investigations. No in-water work is proposed within the Thames River.

Special Concern and Rare Wildlife Species:

- Candidate SC Species: Snapping Turtle and Monarch.
- Confirmed SC Species: Barn Swallow and Northern Map Turtle.

5 PROPOSED DESIGN

The existing gabion basket erosion control structure will be replaced with a sloped vegetated stone revetment. The revetment will have a slope of 3:1 and allow widening of the channel at the bankfull width. The stone will be a mix of cobble and stone ranging in size from Granular B material to 200 mm diameter round stone. Topsoil will be mixed with the stone and a 150 mm thick layer of topsoil will be placed over the stone to support plant growth. The revetment and adjacent park area will be vegetated with a riparian/meadow species seed mix supported with plugs. A biodegradable erosion control blanket will be placed over the seeded area to protect from erosion during vegetation establishment. The revetment will be constructed in 300 mm lifts with topsoil placed between each lift and worked into the voids to provide additional growing media for the deep rooted species. A top layer of 150 mm of topsoil will be placed on the rock revetment for seed growth. All areas in the park will have 300 mm of topsoil.

Several park improvements are also proposed for Harris Park.

- Improved fishing platform – The existing fishing platform will be widened slightly to make it more accessible and enhanced with improved seating and information boards.
- Improved river access point – The river access point will be a poured in place concrete ramp at maximum 8% grade to meet AODA accessibility requirements. The angle of approach to the river is decreased to allow the flatter grade without impacting the existing Harris Park Gate roadway and the TVP alignment.
- Proposed lookout platform – A new lookout is proposed at the centre point between the fishing platform and the river access point. The lookout will be set back from the current top of bank to prevent encroachment on flow conveyance. The bank will be regraded at 5:1 through this section to allow further widening of the channel.
- Proposed pathways – New asphalt pathways through the restoration area have been included in the design to allow the public to move through meadow area in a way that protects the vegetation. The 3:1 slope revetment provides a stable slope allowing the pathways to be outside the stable slope setback.
- Benches, planters, and signage – the proposed benches will be made of flood resistant material and bolted to concrete pads to prevent them being washed away during flood events. Raised concrete planters and benches are proposed at the lookout area and will be poured in place. Additional information signage is proposed at key locations to present information on natural heritage and cultural heritage features in the park and surrounding areas.

Construction Methodology

The revetment will be constructed in approximately 30 m sections to minimize the area of exposed soils that may be inundated during flooding conditions during construction. Additionally, the revetment will be constructed outside of the normal water level to avoid in-water works. The following construction methodology is proposed:

Install ESC Measures – Place robust siltation barrier along the shoreline between the gabion baskets and the waters edge. Deposition along the toe of the gabion baskets has created a sediment bar where the robust siltation barrier can be installed. A turbidity curtain will be placed in the river adjacent to the exposed work area and relocated as each 30 m section is completed.

Step 1 – Excavate native material for the proposed revetment behind the gabion baskets. The gabion baskets will provide a barrier between the channel and the works to allow the work to be completed in the dry if the water level rises.

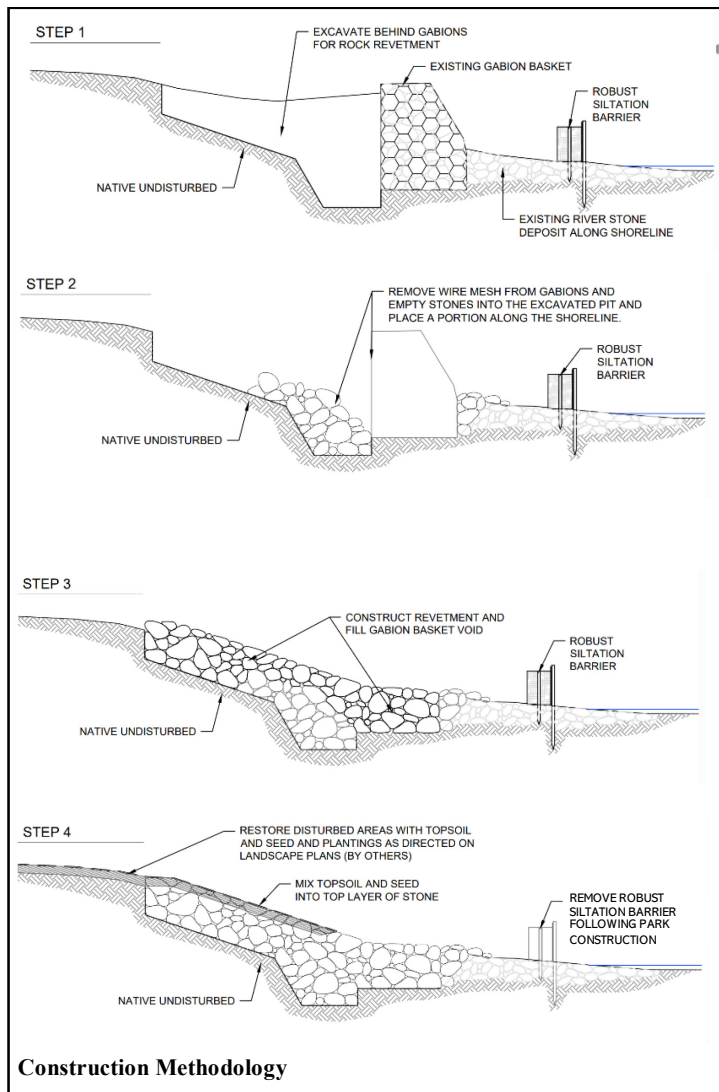
Step 2 – Snip and remove the existing gabion baskets and place stone excavated pit.

Step 3 – Construct the revetment and fill the gabion basket void with rock mix. Mix gabion stone with rock. The revetment will be constructed in 300 mm lifts with 150 mm of topsoil placed between each lift and worked into the voids.

Step 4 – Restore the area by placing 150 mm of topsoil over the revetment and hydroseeded with a wet meadow seed mix. The park area will be restored with 300 mm topsoil and a dry meadow seed mix. Plugs will be placed in the park area to provide quicker revegetation. Remove siltation barrier after completion of park works.

The works are located within the 2-year flood limit and as such will be susceptible to flooding. The revetment will be constructed in 30 m sections starting in the upstream end to reduce the area of exposed soils at any one time. During high flow events, any exposed areas should be stabilized with clear stone to prevent erosion. These steps are outlined in Figure 4.

FIGURE 4 Construction Methodology



6 IMPACTS OF PROPOSED DESIGN

The following section identifies, describes, and discusses the existing and potential impacts to the natural environment that may occur due to the Harris Park erosion control structure replacement.

- **Existing Impacts** are the existing stressors or other factors contributing to the site's current state.
- **Short Term (indirect) impacts** are generally those associated with the construction stage of the project and are typically temporary and preventable through the application of proper construction practices & mitigation and site inspection.
- **Long Term (direct) impacts** are those related to actual development plan and post-construction activities; however, these can also be mitigated or minimized through careful planning, construction design and the implementation of environmental best management practices.

Based on Matrix site investigations, the following impacts are relevant to the Harris Park erosion control structure replacement and should be considered for future management of natural heritage features and functions within the subject lands.

6.1 Impacts to Aquatic Habitat and Fisheries

6.1.1 Existing Impacts

- **Degraded Aquatic Habitat within Thames River:** Poor water quality may result from surface runoff from adjacent land uses and both point and non-point pollution sources. This may negatively affect aquatic vegetation and macrophytes, leading to decreased quality of aquatic habitat.
- **Erosion:** Varying degrees of erosion are present along much of the banks of the Thames River.
- **Backwatering:** backwatering conditions observed in the Thames River near the Forks area.
- **Debris Jams:** Areas of woody debris have accumulated within the Thames River.

6.1.1 Short-Term Impacts

- **Water Quality:** Short-term water quality impacts include runoff from the construction area that may allow sediment to enter the Thames River and increase turbidity of the water.
- **Sediment and Erosion:** Clearing and grading activities will expose soils potentially resulting in sediment run-off discharging into the Thames River.
- **Impacts to aquatic species:** Short-term, temporary impacts may occur to fish species during the installation of erosion control measures.

6.1.1 Long-Term Impacts

- **Alteration to Fish Habitat:** Erosion control work has the potential to cause serious harm to fish and fish habitat if habitat is removed or altered.
- **Improve Water Quality:** The implementation of the erosion control measures has the potential to enhance water quality by removing the deteriorated wire baskets, and through the replacement of turf with native riparian grasses.
- **Improve Aquatic Habitat:** Aquatic habitat will be improved within the reach through the removal of the gabion baskets and planting of native riparian herbaceous species.

6.2 Impacts to Terrestrial Habitats and Features

6.2.1 Existing Impacts

- **Fragmentation of Natural Vegetation and Habitat:** The area has been heavily influenced by human clearing for parkland and trail purposed.

- **Dust Deposition:** Vegetation and ground cover within vegetation communities likely experience reduced productivity of vegetation along their edges due to the adjacent residential areas, parkland, and roads.
- **Edge Effects on Vegetation Communities:** The edges of the vegetation communities within the subject lands are exposed to increased effects of light, wind, and road salts.
- **Human Activities:** The Thames Valley Parkway, a multi-use trail is located within the subject lands creating minor impacts to edge vegetation, including potential for litter.
- **Invasive Species:** Many invasive species such as Japanese knotweed, garlic mustard, and common buckthorn were observed.
- **Canada Geese:** large numbers of geese were observed in the parks, especially Harris Park. Bird feces and aggressive bird behaviour can pose potential health and safety hazards to the public.

6.2.1 Short-Term Impacts

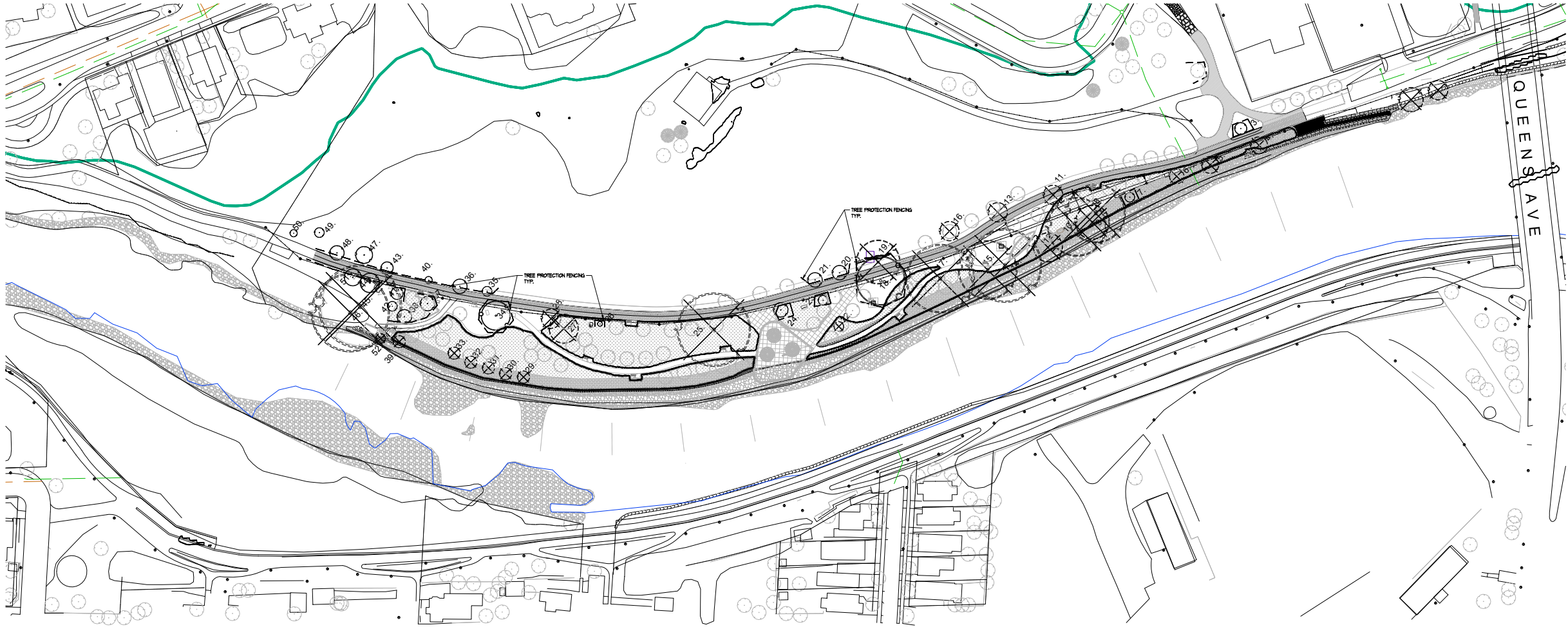
- **Rooting Zones:** Impacts to the root zone of trees due to grading and construction activities.
- **Soil Compaction and Contamination:** Soil compaction and soil contamination potential as a result of heavy machinery operation, and spills or leaks.
- **Sediment and Dust:** Increased levels of sediment and erosion potential due to land clearing may impact adjacent vegetation communities and increase dust deposition.

6.2.1 Long-Term Impacts

- **Damage to Peripheral Vegetation:** During grading and construction in areas immediately adjacent to trees being protected, roots may be damaged by machinery and soils may be compacted, thereby affecting the trees' ability to grow and absorb nutrients and water.
- **Potential Disturbance or Loss of Vegetation:** Vegetation removal will be required to accommodate the Harris Park erosion control structure replacement. Estimated vegetation removals by ELC community are presented below. Disturbance areas can be seen on **Figure 5**.
- **Increased Naturalized Area:** the restoration of vegetation communities disturbed as part of the proposed works will provide enhanced plant diversity, generate riparian habitat, and increase pollinator habitat.
- **Additional Wildlife Habitat:** Additional native tree plantings will provide additional wildlife habitat.
- **Park User Benefits:** Additional native tree plantings will be aesthetically pleasing within the landscape and will be able to provide shading for park users.
- **Invasive Species:** Introduction of non-native species may occur from contaminated equipment, increased site activity and disturbance to site. However, an invasive species management plan shall be provided to remove invasive species encountered during construction.
- **Increase Native Species Cover:** Opportunity to increase native species coverage through the planting of native trees and herbaceous species.

TABLE 9 Estimated Vegetation Removals

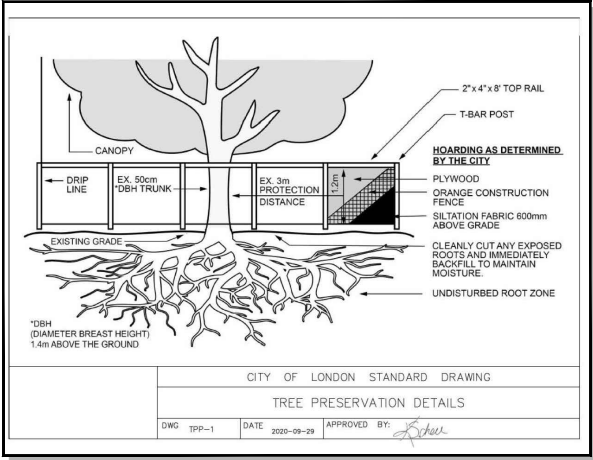
ELC Community	Total area (ha)	Removals (ha)
Parkland (CGL_2)	~4.1ha	~1.28ha
FOD7: Fresh-Moist Lowland Deciduous Forest Type	~2.7 ha	~0.0019 ha
Total	~6.8ha	~1.28 ha



TREE PRESERVATION PLAN
SCALE = 1:750

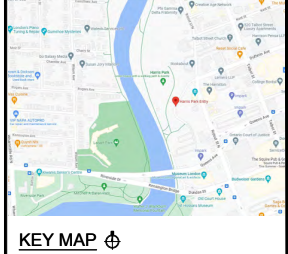
LEGEND

- PROPOSED DECIDUOUS TREE
- EXISTING DECIDUOUS TREES TO REMAIN
- EXISTING DECIDUOUS TREES TO BE REMOVED
- TREE PROTECTION BARRIER



TREES TO BE REMOVED (29)									
ID #	BOTANICAL NAME	COMMON NAME	LOCATION	SIZE DBH (cm) CANOPY (m) SPREAD (m)	HEALTH & CONDITION	COMMENTS	RECOMMENDATIONS	IMPACT MITIGATION	
1	Quercus alba	White Oak	50' E of Road St. Victoria Ave	24	4	Good	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
2	Larix laricina	Willow	50' E of Road St. Victoria Ave	16	5	Poor	major cavity at base, dead leaves, multiple dead branches	conflict with shoreline protection & restoration requirements	remove
4	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	49	15	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
5	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	48	15	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
6	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	50	5	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
8	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	91	10	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
9	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	42	7	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
10	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	104	10	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
11	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
12	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	102	6	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
13	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
14	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
15	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
16	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
17	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
18	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
19	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
20	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
21	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
22	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
23	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
24	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
25	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
26	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
27	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
28	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
29	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove

TREES TO BE PRESERVED (23)									
ID #	BOTANICAL NAME	COMMON NAME	LOCATION	SIZE DBH (cm) CANOPY (m) SPREAD (m)	HEALTH & CONDITION	COMMENTS	RECOMMENDATIONS	IMPACT MITIGATION	
1	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
2	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
3	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
4	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
5	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
6	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
7	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
8	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
9	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
10	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
11	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
12	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
13	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
14	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
15	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
16	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
17	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
18	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
19	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
20	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
21	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
22	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove
23	Alnus incana	London Plane Tree	50' E of Road St. Victoria Ave	110	4	Fair	marked with white spray paint	conflict with shoreline protection & restoration requirements	remove



RON KLOUDYS LANDSCAPE ARCHITECTS

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Ronald H. Kloudys, O.A.L.A. C.S.L.A. DATE

FEB/2024	ISSUED FOR REVIEW	1.
JAN/2024	ISSUED FOR 90% SUBMISSION	6.
JAN/2024	ISSUED FOR REVIEW	5.
DEC/2023	ISSUED FOR REVIEW	4.
NOV/2023	ISSUED FOR REVIEW	3.
JUL/2023	ISSUED FOR REVIEW	2.
JUL/2023	ISSUED FOR REVIEW	1.

DATE DESCRIPTION No.

FLUTING INFORMATION:
PLOTTED DATE: FEB/2024
PLOTTED SCALE: 1/4"

PROJECT TITLE:
HARRIS PARK
LONDON, ONTARIO

DRAWING TITLE:
TREE PRESERVATION PLAN

DRAFT

DATE: JUNE 2023 SCALE: AS NOTED DRAWING No. T-1
DRAWN: RSLA Inc. CHECKED BY: RSLA Inc.
PROJECT No. 22-254LI

6.1 Impacts to Species at Risk and Significant Wildlife Habitat

6.1.1 Existing Impacts

- **Noise Pollution:** Moderate noise levels from adjacent residential areas, roads, parklands, and trails were noted throughout the study area. This noise may cause a reduction in the species abundance or richness of birds and other wildlife residing within the study area. Some species have likely become accustomed to the noises generated by human activities.
- **Human Activities:** The area surrounding the subject lands is heavily used by walkers, residential owners, and dogwalkers, which can impact wildlife species, specifically during the breeding season. This can increase mortality of resident species and influence success rate of breeding.
- **Maintenance Activities:** Mowing from nearby residential areas and parks can cause noise pollution, disturbance to wildlife and potential mortality of reptiles, amphibians, and small rodents. Vegetation pruning and removal was being performed within some of the park areas at the time of Matrix field investigations.

6.1.2 Short-Term Impacts

- **Non-native Species:** Introduction of non-native species from equipment, increased site activity and disturbance to site from traffic.
- **Noise/Vibration Pollution:** Short-term increases in noise, vibration, human activity, and disturbances from construction traffic may interfere with species carrying out life processes, including breeding.

6.1.3 Long-Term Impacts

- **Improved Banks:** The improvement of the banks through the erosion control structure replacement will likely benefit aquatic habitat in that future failure of the structure into the river will be avoided.
- **Enhancement of Wildlife Habitat:** Wildlife habitat along the riparian areas of the Thames River will be enhanced to promote wildlife habitat through the planting of native seed and plugs. To enhance and increase bat habitat, two rocket boxes will be installed within suitable maternity roost habitat for bat SAR in strategically placed areas adjacent to foraging habitat. For this project, the two rocket boxes will be installed on the west edge of the forested community (FOD7) within the study area. Additional native tree plantings will provide additional wildlife habitat.

7 ENVIRONMENTAL MITIGATION STRATEGY

The following three components form the basis of the strategy developed to minimize potential impacts to the natural environment within the subject lands.

- **Avoidance** – Placement of the final design layout outside of valuable natural heritage features to the extent possible.
- **Mitigation** – Implementing measures designed to minimize or eliminate impacts to natural features or functions.
- **Compensation and Enhancement** – Restoring, enhancing, or replacing features or functions which may be affected by the construction of the project.

7.1 Avoidance

The limits for the proposed Harris Park erosion control structure replacement and park improvements have been designed to protect, where feasible, the existing natural heritage features along the Thames River, riparian areas, woodlands, and Significant Valleylands. For this reason, potential impacts have been limited to those areas essential for proposed works thereby reducing and limiting the overall impacts.

7.2 Mitigation Measures

The following are the proposed mitigation measures to be implemented within the subject lands to minimize or eliminate impacts to the natural environment during construction activities. A summary table has been provided in Appendix G.

7.2.1 Fish Habitat Protection

The following mitigation measures to avoid impacts to fish and fish habitat shall be implemented. In addition to the mitigation measures below, the project shall implement any mitigation outlined by the DFO through the Request for Review process.

- **Erosion and Sediment Control:** Mitigation measures must be used for erosion and sediment control to prohibit sediment from entering the Thames River. The primary principles associated with sedimentation and erosion protection measures are to: minimize the duration of soil exposure, retain existing vegetation, where feasible, encourage re-vegetation, divert runoff away from exposed soils, keep runoff velocities low, and trap sediment as close to the source as possible.
- **Exposed Soil:** Any soils exposed during construction shall be seeded as soon as possible once grading is complete. Erosion control blanket shall be used in all restoration areas to limit the potential for erosion during elevated water levels in the Thames River.

- **Construction Timing (Fish):** In water works and construction shall adhere to MNRF and DFO in-water works timing restrictions for a warmwater system, as identified as March 15 - July 15 or as directed by MNRF, or DFO (DFO, 2013 and MNRF 2013).
- **DFO Request for Review:** All requirements outlined by the DFO shall be implemented.
- **Contaminant and Spill Response Plan:** A plan shall be developed and implemented immediately in the event of a sediment release or spill of a deleterious substance and an emergency spill kit must be kept on site. No storage of construction equipment, materials, chemicals, stockpiled resources of soil or storage of any other objects associated with site alteration is to occur within the delineated natural area, or within 30 m of any watercourse. Maintenance of machinery during construction shall also occur a minimum of 30 m away from any watercourse.
- **Riparian Vegetation Removals:** Clearing of riparian trees and/or shrubs should be minimized such that physical and biological functional attributes of the terrestrial vegetation can be maintained as they relate to aquatic ecological function. Removals should be completed through consultation with an ecologist to avoid any sensitive species.

7.2.2 Vegetation Protection

The following mitigation measures to avoid impacts to vegetation shall be implemented.

- **Controlled Construction Vehicle Access Construction:** Vehicle access shall be limited to areas outside of the drip-line of the trees being protected and limited to less sensitive areas to prevent soil compaction and/or the initiation of soil erosion events. Construction vehicle re-fueling stations shall be centralized away from vegetation communities and watercourses. Vehicle washing shall be prohibited in areas adjacent to vegetation communities and watercourses.
- **Tree Removals:** All tree removals must comply with the City of London Tree Protection By-Law 1515-228. Tree removal shall be completed by or overseen by a Certified Arborist using proper arboricultural techniques.
- **Protective Fencing:** The installation of different types of protection fencing such as sediment and erosion fencing (silt fencing), and exclusion fencing shall be considered. These fences can minimize construction impacts, such as damage to trees or sediment transport into adjacent natural heritage features. Protective fencing should be installed adjacent to vegetation communities being protected. This includes the area surrounding the Thames River and around all trees not identified for removal. Proper installation and maintenance of installed fencing is necessary to reduce the risk of potential impacts.
- **Tree Pruning:** If pruning is required, this should be conducted by a certified arborist or a qualified employee of the City Forestry Department. Pruning should be conducted according to ISA standards. The minimum amount of pruning should be conducted to avoid negative effects to the structure and integrity of the tree. Pruning may include both the branches and roots depending on the extent of the

dripline. Extra care should be taken when pruning roots so as to not impact the structure of the tree or its ability to uptake water and nutrients.

- **Exposed Soil:** Any soils exposed during construction shall be seeded as soon as possible once grading is complete. Should any soils be left exposed after November 15th, erosion control blankets or similar material shall be used to stabilize the soils.
- **Tree Care:** Tree care for newly planted trees is required for a 2-3 year period to ensure trees can establish successfully.
 - ✦ A watering schedule should be implemented.
 - ✦ Any required tree maintenance, such as pruning and disease control, should be carried out by a qualified professional.
 - ✦ Tree care activities are to be documented (for example, proof of a watering schedule being utilized) and included in the monitoring report (see Section 9 of this report).
- **Invasive Species Management and Control:** Figure 3 invasive species and the steps below, shall be carried forward to the design drawings and represents the extent of invasive species to be controlled during construction. Species observed within the study area that require management include, garlic mustard, Japanese knotweed and common buckthorn. The following BMPs shall be followed:
 - ✦ Anderson, Hayley. 2012a. Invasive Garlic Mustard (*Alliaria petiolata*) Best Management Practices in Ontario. Ontario Invasive Plant Council. Peterborough, ON.
 - ✦ Anderson, Hayley. 2012. Invasive Japanese Knotweed (*Fallopia japonica*), Best Management Practices in Ontario. Ontario Invasive Plant Council, Peterborough, ON.
 - ✦ Anderson, Hayley. 2012. Invasive Common (European) Buckthorn (*Rhamnus cathartica*), Best Management Practices in Ontario. Ontario Invasive Plant Council, Peterborough, ON.
- The following steps shall be taken to control invasive species on the site:
 - ✦ Construction shall follow the Clean Equipment Protocol (Halloran et al., 2016) during construction activities to prevent the further spread of invasive species.
 - ✦ Removal of all invasive species within the construction limits shall occur, including root systems.
 - ✦ Excavated material containing invasive species is to not be reused within the site and shall be disposed at an approved landfill.
 - ✦ Disposal of invasive species shall be administered in an appropriate manner following accepted and approved disposal guidelines from governing agencies. This includes disposal of material to a City of London approved Landfill.

- ✦ Consideration for the inclusion of strategies outlined in the London Invasive Plant Management Strategy is also recommended.

7.2.3 Wildlife, Species at Risk, and Significant Wildlife Habitat

The following mitigation measures to protect wildlife within the subject lands shall be implemented. These measures are concentrated around the avoidance of wildlife and providing adequate exclusion of wildlife from work areas.

- **Timing Restrictions for Wildlife:** Restricting construction related activities outside of sensitive periods for local or significant wildlife species can limit disturbance during life cycle stages. Construction related activities shall be limited to the daylight hours (i.e. 7am to 7pm) to reduce the amount of noise disturbance to resident wildlife. Any vegetation clearing shall occur outside of the breeding bird period (i.e. April 1 to August 31) as well as the bat roosting periods for the three SAR bat species (April 1 to September 30) to reduce impacts to breeding birds avoiding incidental take under MBCA and bats under ESA.
- **Active Nest:** Should an active nest be observed during construction, a 10 m – 15 m setback shall be delineated and designated as a no-work area. The nest shall be monitored by a qualified biologist until no eggs or fledglings are present. Work may resume once the nest is vacant under the advice of a qualified biologist.
- **On-Call Biologist:** A qualified biologist/ecologist shall be retained to be on-call should any wildlife be encountered. The biologist/ecologist shall provide appropriate recommendations in the identification, relocation, or transport of any encountered wildlife.
- **Wildlife Salvage:** Prior to construction a qualified biologist/ecologists will inspect the areas of construction and relocate any wildlife away from the construction zone.
- **Visual Encounter Surveys:** Contractor shall complete a daily inspection of work areas should be completed by construction staff to confirm no wildlife is present in the work area prior to commencing activities for the day. When wildlife is encountered the on-call biologist shall be contacted.
- **Permits:**
 - ✦ *Wildlife Scientific Collectors Authorization and Animal Care:* No wildlife is to be handled or relocated without a Wildlife Scientific Collectors Authorization from the MNRF. This permit shall be obtained by a qualified individual prior to construction.
 - ✦ *DFO Request for Review:* A request for review is required and shall be submitted prior to construction.

- ✦ *ESA Section 23.18:* Given the nature of the proposed work and as there will be minor impacts to confirmed SAR turtle habitat and candidate SAR bat, snake, and turtle habitat, this project meets the requirements for registration under Section 23.18 (1) 4 Threats to Health and Safety not Imminent - Work to protect against drought, flooding, forest fires, unstable slopes and erosion as long as the protection does not include the building of new infrastructure. A Notice of Activity and SAR Mitigation Plan shall be prepared prior to construction.
- ✦ *UTRCA Section 28:* A permit under Section 28 of O.Reg 157/06 for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses is required from the UTRCA.
- **Protective Fencing:** Protective fencing shall be installed adjacent to construction zone to prevent wildlife entry into the areas of impact and shall be periodically inspected by qualified environmental specialists.
- **Wildlife or Sensitive Species Encounters:** A Wildlife Management Plan shall be implemented to assist contractors or environmental monitor in the procedures to be followed in the event of an encounter. Procedures to be followed include:
 - ✦ Upon observation of wildlife in the work area; work in the vicinity is to stop immediately.
 - ✦ On-call biologist/ecologist shall be contacted immediately to inquire on next steps for the wildlife encountered.
 - ✦ On-call biologist/ecologist shall identify the species and provide appropriate recommendations.
 - ✦ A setback shall be established to protect the species until guidance has been received either from the qualified biologist/ecologist or the MECP.
 - ✦ Details regarding the size and implementation of the setback for SAR shall be determined in consultation with the MECP and the on-call biologist.
 - ✦ Should the species be identified within the construction footprint, a relocation strategy shall be developed in consultation with the appropriate agencies.
 - ✦ Any observation of SAR or SOCC shall be reported to the on-call biologist immediately to be reported to the MECP and NHIC within 48 hours.

7.2.4 Geese Management Strategies

Large numbers of Canada Geese were observed within Harris Park. Geese can be considered a nuisance species when in large numbers. According to the “Canada and Cackling Geese: Management and Population Control in Southern Canada handbook (Canadian Wildlife Service, 2010) the following can be attributed to Geese:

- Bird feces can pose a potential health hazard and may contribute to contamination of nearby water sources with parasites and coliform bacteria;
- Bird feces foul green spaces, walkways, and trails, ;
- Aggressive geese can impact public safety;
- Can damage grass and vegetation; and
- Compress and erode soils in parks and green spaces.

The following strategies from the CWS handbook are recommended to manage geese populations. A combination of the recommended strategies should be implemented as a long-term management strategy as geese can adapt quickly; however, implementing multiple strategies has been proven effective.

- **Habitat Modification:** several lawn/habitat management techniques can be used to discourage geese.
 - ✦ Mowing Less Frequently: geese prefer young grass, as longer grass is known to be coarser and more fibrous and not palatable. Consideration should be given to allow more time between mowing within the park.
 - ✦ Modify the Type of Grass: alternative types of grass, such as fescue can be naturally repellant to geese.
 - ✦ Establish tall plantings: the planting of tall plants such as long grasses, sedges or herbaceous species, along the riparian area of the Thames River. This will reduce the line of sight and open water access areas for geese and make them less comfortable at the park.
- **Scaring Tactics** (Not Requiring a Federal Permit): Subsection 24(1) of the Migratory Birds Regulations states that "any person may, without a permit, use equipment, other than an aircraft or firearms, to scare migratory birds that are causing or are likely to cause damage to crops or other property."
 - ✦ *Flags:* Flags fluttering in the wind on tall poles have been known to be effective at discouraging geese. The flags create a sense of an overhead threat which the geese do not like. The flag should be about 0.6 m by 1 m and two or three slits about one-third the length of the flag should be cut in the end of the flag, to make three or four flaps. The flags should be mounted at least 2.5 m above the ground.
 - ✦ *Scarecrows:* effigies (human, eagle, swan, or coyote) can be perceived as a threat. Eagle decoys larger than life size and coyote decoys have shown success. Although it is said geese become accustomed to this type of scare tactic, it is recommended for the City to consider this technique with a dual purpose. Opportunities to incorporate artistic metal statues or effigies into park features could be considered.

- **No Supplemental Feeding:** feeding geese can attract large numbers year-round and encourages them to stay in one place so long as they are fed. This can also cause health issues for geese when inappropriate food is given to them (such as bread).
 - ✦ *Post signs:* signs should be posted in the park to discourage wildlife feeding and raise awareness of the issue.

7.2.5 Restoration and Compensation Measures

In accordance with The London Plan Policy 1401_ and 1402_, restoration of vegetation communities disturbed as part of construction shall be provided at a one for one land area replacement, where feasible. Proposed restoration and compensation can be seen on the detailed design drawings.

- **Restoration Material:** All material (seed, trees, plugs etc.) will be sourced from approved City of London nurseries.
 - ✦ A total of 80 trees are recommended to be planted within the park. The proposed tree species have been selected in consultation with the City of London and are presented in Table 10.

TABLE 10 Recommended Park Plantings

COMMON NAME	BOTANICAL NAME
Trees	
NORTHERN HACKBERRY	<i>Celtis occidentalis</i>
TULIP TREE	<i>Liriodendron tulipifera</i>
AMERICAN SYCAMORE	<i>Platanus occidentalis</i>
BLACK MAPLE	<i>Acer nigrum</i>
SINGLE STEM REDBUD	<i>Cercis canadensis</i>

- **Revegetation of Disturbed Areas:** Any areas disturbed for construction shall be revegetated with a native seed mix as soon as possible after disturbance. Seeding shall not occur after November 15th. All seed mixes shall be installed with accepted nurse crop. Selected nurse crop shall be based on timing of application as indicated in City of London Supplemental Standards for Parks and Open Spaces (SPO).
- **Seed Mixes:** Seed Mix 1 is recommended for revetment and Seed Mix 2 is recommended for the meadow area. These two mixtures will provide enhanced diversity as well as increased pollinator habitat.

TABLE 11 Recommended Seed Mix 1 – Riparian (Revetment) Mix

Common Name	Latin Name	Max Height	Percent (%)
Virginia wild rye	<i>Elymus virginicus</i>	0.9m	20
Fox Sedge	<i>Carex vulpinoidea</i>	0.9m	10
Bebb's Sedge	<i>Carex bebbii</i>	0.6-0.9m	20
Porcupine Sedge	<i>Carex hystericina</i>	0.6-0.9m	10
Awl-Fruited Sedge	<i>Carex stipata</i>	0.9m	5
Hop Sedge	<i>Carex lupulina</i>	0.2-1m	5
Common Boneset	<i>Eupatorium perfoliatum</i>	0.6-0.9m	5
Obedient Plant	<i>Physostegia virginiana</i>	0.6-0.9m	5
Great Blue Lobelia	<i>Lobelia siphilitica</i>	0.3-0.9m	5
Golden Alexanders	<i>Zizia aurea</i>	0.3-0.9m	5
Canada Anemone	<i>Anemone canadensis</i>	0.3-0.6m	5
Mountain Mint	<i>Pycnanthemum virginianum</i>	0.3-0.9m	5

TABLE 12 Recommended Seed Mix 2 – Meadow Mix

Common Name	Latin Name	Max Height	Percent (%)
Smooth Blue Aster	<i>Symphyotrichum laeve</i>	0.6-0.9m	10
Black-eyed Susan	<i>Rudbeckia hirta</i>	< 1m	10
Butterfly Milkweed	<i>Asclepias tuberosa</i>	<1m	20
Virginia Wild Rye	<i>Elymus virginicus</i>	0.9m	20
Wild Bergamot	<i>Monarda fistulosa</i>	0.5-0.9m	5
Little Bluestem	<i>schizachyrium scoparium</i>	0.6-0.9m	20
Heath Aster	<i>Symphyotrichum erocoides</i>	0.3-0.6m	5
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>	0.4-0.9m	5
Ohio Spiderwort	<i>Tradescantia ohiensis</i>	up to 1m	5

- **Plugs:** In addition to the recommended seed mixtures above, the use of plugs within a 5 m -10 m swath at the top of the revetment, at a density of 4 plugs per m², is recommended to help provide quicker establishment within the landscape as well as create an immediate visual barrier for geese.

TABLE 13 Recommended Riparian Plugs

Common Name	Latin Name	Max Height of Plant
Smooth Blue Aster	<i>Symphyotrichum laeve</i>	0.3 m to 0.9 m
Hoary Vervain	<i>Verbena stricta</i>	0.3 m to 0.6 m
Butterflyweed	<i>Asclepias tuberosa</i>	< 1 m

Common Name	Latin Name	Max Height of Plant
Golden Alexanders	<i>Zizia aurea</i>	up to 1 m
Bergamot	<i>Monarda didyma</i>	< 1m
Wild Columbine	<i>Aquilegia canadensis</i>	up to 1m

Additional Compensation Measures

To enhance and improve bat habitat two rocket boxes will be installed within suitable maternity roost habitat for bat SAR in strategically placed areas adjacent to foraging habitat.

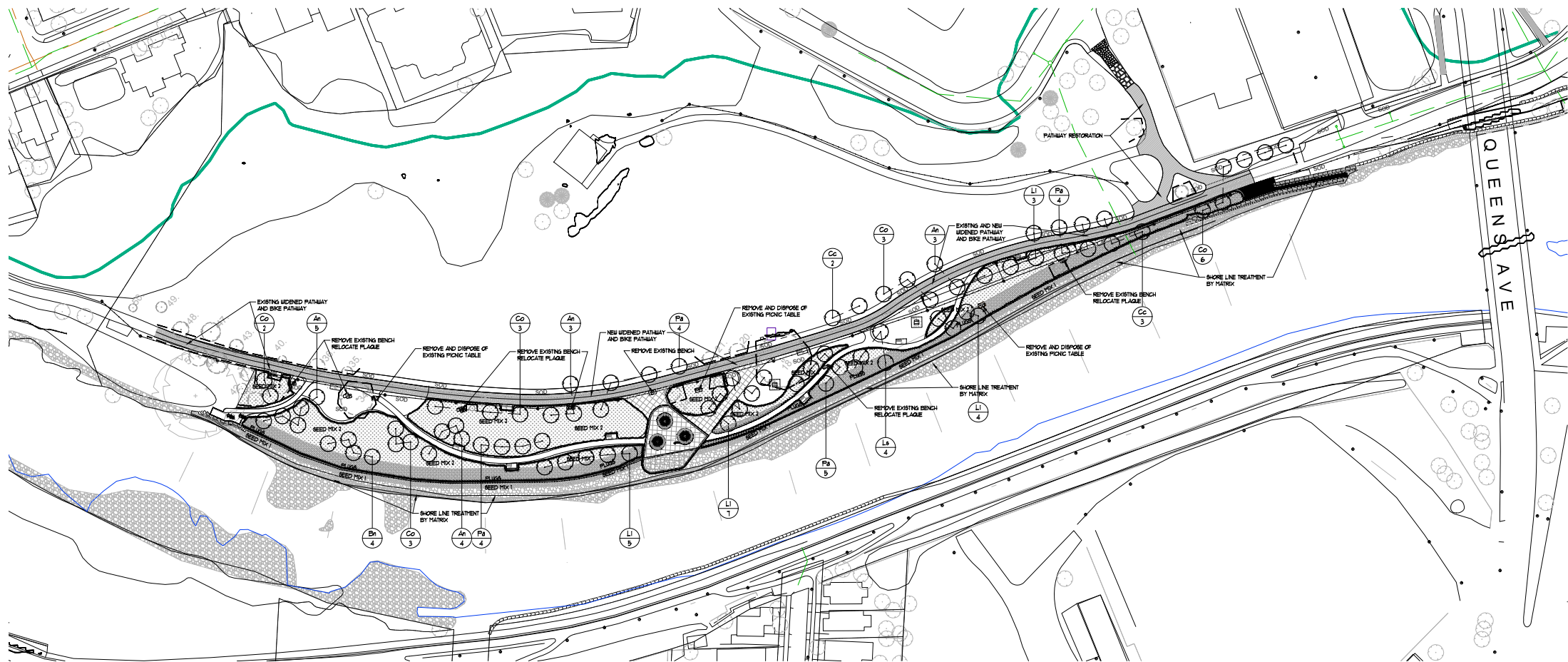
- Two rocket boxes will be installed on the west edge of the forested community (FOD7), located adjacent to the parkland.
- Rocket boxes are similar in size and installation to standard bat boxes but considered better design, permitting full freedom of movement within the structure for better thermal regulation.
- The contractor may use either the BCM Rocket Roost Model (available for purchase through Bat Conservation and Management [BCM]) or the Two-chamber Rocket Box (publicly available from Bat Conservation International [BCI]).
- Rocket boxes shall be installed prior to the bat roosting season (before March 31st, or after October 1st).
- Rocket boxes will receive at least 6 to 8 hours of sunlight and placed at least 6 m from the nearest tree branch, wires; or other potential perches for aerial predators (Bat Conservation Management; BCM 2019).

Fishing line can pose a threat to both aquatic species and general wildlife, as they can become entangled in it or die from it due to ingestion. It is recommended that the installation of fishing line recycling containers in appropriate areas be considered.

- Fishing line isn't biodegradable and can persist in the environment long-term.
- Fishing line recycling containers can be purchased through Clear Your Gear. Contact information is provided below:

- ✦ Steve Loney. steve@clearyourgear.ca, 210-1600 Kenaston Blvd, Winnipeg, Manitoba, CANADA R3P 0Y4

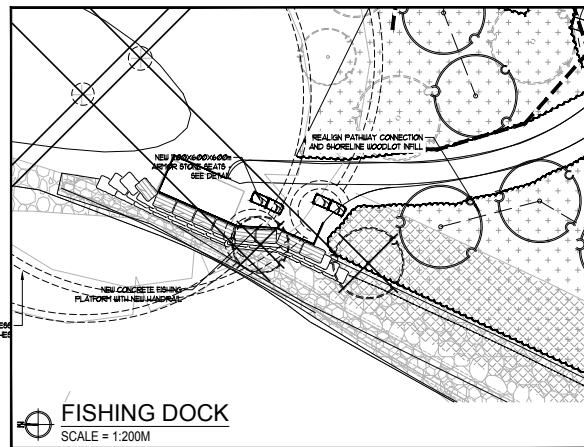
The proposed restoration is shown in Figure 6.



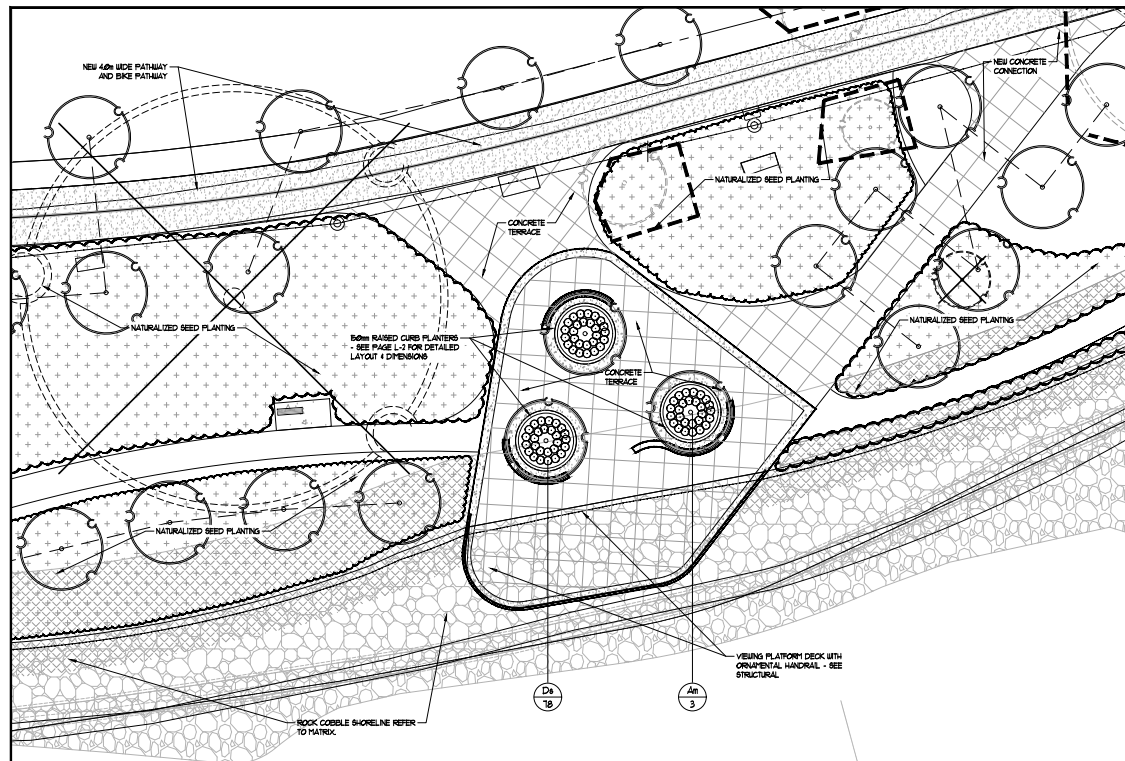
LANDSCAPE PLAN
SCALE = 1:750M

PLANT MATERIAL					
KEY	COMMON NAME	BOTANICAL NAME	QTY	SIZE	COND
An	BLACK MAPLE	Acer nigra	5	60cmal	UB
La	SWEETGUM	Liquidambar styraciflua	4	60cmal	UB
Co	BLUE BIRCH	Betula caroliniana	4	60cmal	UB
Dr	RIVER BIRCH	Betula nigra	4	60cmal	UB
Co	HACKBERRY	Celastrus occidentalis	11	60cmal	UB
Li	TULIP TREE	Liriodendron tulipifera	9	60cmal	UB
Pa	AMERICAN SYCAMORE	Platanus occidentalis	11	60cmal	UB

LEGEND	
	PROPOSED DECIDUOUS TREES
	PROPOSED CONIFEROUS TREES
	PROPOSED PLANTINGS
	PLANT KEYS - SEE PLANT MATERIALS LIST
	PROPOSED CONCRETE PAVING
	PROPOSED ASPHALT PAVING
	ROCK COBBLE - SEE MATRIX
	SEED - SEE NOTES
	SEED WITH PLUGS - SEE NOTES
	PROPOSED ARMOURSTONE - SEE DETAIL
	EXISTING DECIDUOUS TREES TO REMAIN
	EXISTING CONIFEROUS TREES TO REMAIN
	EXISTING PLANTINGS TO REMAIN
	TREE PROTECTION BARRIER
	EXISTING PICNIC TABLE ON CONCRETE SLAB TO BE REMOVED
	EXISTING COMMEMORATIVE BENCH - REMOVE BENCH AND CONCRETE PAD - RETURN BENCH TO CITY RENTAL PLACQUE UNDER THE DIRECTION OF PLANNING
	EXISTING BENCH - REMOVE BENCH AND CONCRETE PAD - RETURN BENCH TO CITY
	120x40x120mm PROPOSED CONCRETE BENCH PAD - SEE DETAIL
	40x40x120mm PROPOSED CONCRETE PICNIC TABLE PAD - SEE DETAIL

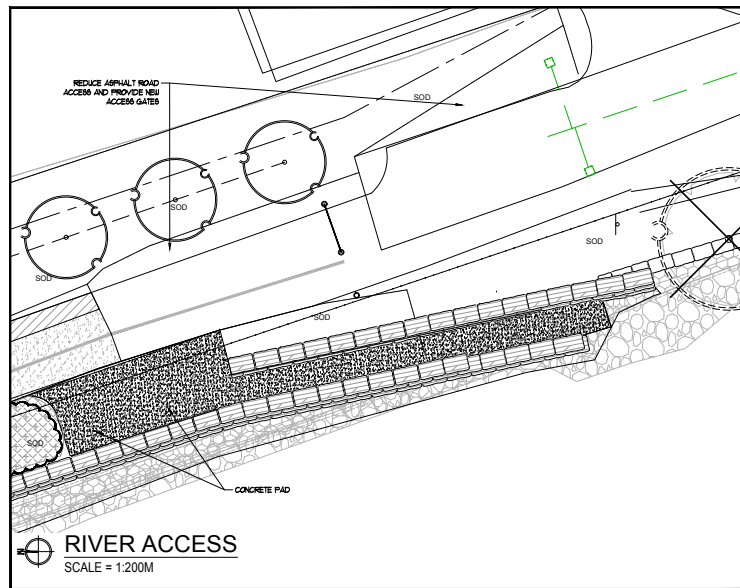


FISHING DOCK
SCALE = 1:200M

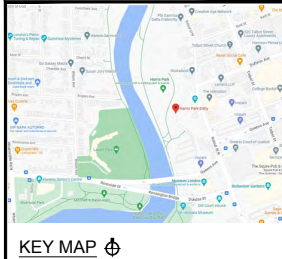


LOOKOUT
SCALE = 1:200M

PLANT MATERIAL					
KEY	COMMON NAME	BOTANICAL NAME	QTY	SIZE	COND
An	MULTI-STEM SERVICEBERRY	Aralia nudicaulis multi-stem	3	75cm	UB
Dr	PRUNE DROPPED	Prunella spicata	18	50cm	POT



RIVER ACCESS
SCALE = 1:200M



KEY MAP

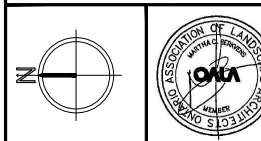


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Ronald H. Koudys, O.A.L.A. C.S.L.A. DATE

DATE	DESCRIPTION	No.
FEB/2024	ISSUED FOR REVIEW	1.
JAN/2024	ISSUED FOR 90% SUBMISSION	6.
JAN/2024	ISSUED FOR REVIEW	5.
DEC/2023	ISSUED FOR REVIEW	4.
NOV/2023	ISSUED FOR REVIEW	3.
JUL/2023	ISSUED FOR REVIEW	2.
JUL/2023	ISSUED FOR REVIEW	1.

PLOTTING INFORMATION
PLOTTED DATE = FEB/2024
PLOTTED SCALE = 1:1



PROJECT TITLE:
HARRIS PARK
LONDON, ONTARIO

DRAWING TITLE:
LANDSCAPE PLAN
DRAFT

DATE: JUNE 2023	SCALE: AS NOTED	DRAWING No. L-1
DRAWN: RKL Inc.	CHECKED BY: RKL	
PROJECT No. 22-254J		

8 NET EFFECTS

Net effects are those impacts that remain or are residual after mitigation measures, including avoidance, compensation, and restoration, have been applied. The net effects of potential impacts were assessed based on the expected efficiency of the recommended mitigation measures intended to avoid or reduce potential environmental effects.

- **No net effect:** Identifies no measurable impact to natural heritage features and their functions.
- **Low net effect:** Identifies the loss of common habitat types possessing limited potential value, or the loss of a portion of an identified habitat; however, not resulting in long-term impacts such as a reduction or loss in function to the habitat being protected or to the ability of local species to carry out life processes.
- **Medium net effect:** Identifies the loss of uncommon habitat that may result in long-term impacts to remaining habitat or linkages, reduction in local size of population that may have an impact on other species life cycles, longer or more frequent interruptions to animal behaviour activities and change or replacement of a system with some loss of ecological function.
- **High net effect:** Identifies the loss of rare or unusual habitat types that will result in long-term and cumulative impacts on remaining habitat and linkages, significant reduction in the local size of a population that will impact species life cycles, long term continuous interruptions of animal behaviour activities that results in the loss of productivity and or death of young while animal is away and change or replacement of a cultural system with complete loss of ecological function.

The net effects of the Proposed Works and associated mitigation measures are shown in the table below.

TABLE 14 Net Effects Table

Natural Heritage Component	Potential Impacts	Potential Effects	Mitigation Measures	Net Effects
Aquatic Habitat and Fisheries	Sediment and Erosion	• Sediment deposition within the Thames River.	• Installation of erosion and sediment control measures (ESC) around the entire construction limits. • Monitoring should occur to ensure erosion controls are installed as intended.	NO-LOW NET EFFECT Proper installation and monitoring of ESC measures minimizes the risk of sediment deposition into the Thames River.
	Spills and Leaks from Construction Equipment	• Construction equipment leaks and spills causing contamination to watercourses.	• Regular maintenance and inspection of machinery. • Refueling and maintenance to be completed in designated areas at least 30 m away from the Thames River • Clean Equipment Protocol (2016) should be followed.	NO - LOW NET NEGATIVE EFFECT Proper cleaning and maintenance of machinery can minimize leaks and spills. Establishing designated refueling areas can minimize the likelihood of spills into watercourses.
	Disturbance to the Thames River and aquatic species	• Potential release of sediment temporarily into the Thames River	• Install sediment and erosion control measures prior to onset of construction. • Proper contractor practices will include avoiding working near water during high flow events, proper maintenance of equipment, installation of erosion controls, flow diversion and temporary coffer dams, etc. • Follow mitigation outlined for construction. • Follow in-water work timing windows. • Recommend the installation of fishing line containers, where appropriate to prevent death/injury to aquatic species. • Restoration efforts will promote the creation of riparian habitat.	POSITIVE NET EFFECT Through the implementation of all proposed mitigation measures, proposed works are not anticipated to cause a negative impact to the Thames River and aquatic species. Repairs to the banks will improve stability.
	Interference with Wetlands and Watercourses	• Potential impacts to surface water and the Thames River	• Proposed work is limited to the edges of natural features. • Implementation of setbacks to provide protection to natural features. • Obtain Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Permit from UTRCA and follow permitting requirements. • Installation of sediment and erosion protection measures and continued monitoring of their	NO NET EFFECT Work is considered short-term and temporary. Appropriate mitigation will be applied. Any mitigation required through the permitting process will also be implemented.

Natural Heritage Component	Potential Impacts	Potential Effects	Mitigation Measures	Net Effects
			effectiveness throughout the duration of the construction works.	
Vegetation Communities and Plants	Sediment and Erosion	• Sediment deposition within vegetation communities caused by construction.	• Installation of erosion and sediment control measures (ESC) around the entire construction limits. • Monitoring should occur to ensure erosion controls measures is installed as intended.	NO-LOW NET EFFECT Proper installation and monitoring of ESC measures minimizes the risk of sediment deposition in adjacent natural features.
	Dust Deposition	• Dust deposition, caused by construction, on vegetation communities causing a reduction in photosynthesis.	• Use of dust suppressants should be considered as required. • Water adjacent vegetation when dust occurs.	NO NET EFFECT Dust suppressants can reduce the probability of dust accumulation in vegetation communities.
	Damage to Adjacent Natural Features	• 19 trees will require removal. • Rooting zone damage adjacent to areas of grading and excavation. • Soil compaction caused by machinery adjacent to vegetation communities potentially affecting vegetation's ability to absorb nutrients and water. • Structural damage to adjacent vegetation by operation of heavy machinery (i.e. damaged branches, trampled ground cover etc.).	• Clearly delineate the limits of work to prevent accidental intrusion. • Installation and monitoring of protection fencing to protect vegetation. • Minimize tree removal to only the areas required to accommodate construction and access to the site to the extent possible. • Proper root pruning of adjacent trees during grading and excavation following good forestry practice.	LOW NET EFFECT Roots of those trees being protected may require pruning, under the supervision of a Certified Arborist, to avoid impacts. Proper installation and monitoring of fencing can minimize impacts. Site access is to be restricted to only those areas required, limiting the potential impacts to vegetation. Restoration Plan will include vegetation replacement to offset removals. 40 trees are recommended to be planted within the park. Invasive species and hazard trees are being removed.
	Construction Equipment Impact	• Construction equipment leaks and spills causing damage to adjacent vegetation communities.	• Regular maintenance and inspection of machinery. • Refueling and maintenance to be completed in designated areas at least 30 m away from sensitive features.	NO - LOW NET NEGATIVE EFFECT Proper cleaning and maintenance of machinery can minimize leaks and spills. Establishing designated refueling

Natural Heritage Component	Potential Impacts	Potential Effects	Mitigation Measures	Net Effects
			Clean Equipment Protocol (2016) should be followed.	areas can further minimize the likelihood of spills into vegetation.
	Loss of Vegetation	Removal of 1.28 ha of park area, 0019 ha of FOD7 and 29 trees to accommodate construction.	- Areas disturbed due to construction that are not permanently lost, should be replanted with native trees and seed. - Sediment and erosion control fencing will be installed to prevent any construction machinery from entering areas being protected. - Tree removal will not alter form and function of the overall community being preserved. - Trees were removed outside of the Breeding bird and bat roosting windows. - Restoration plan will provide native trees and seed within all areas disturbed for construction.	POSITIVE NET EFFECT Vegetation removal will be compensated for by planting native seed, plugs and trees to increase native species cover in all areas disturbed for construction. Riparian seed mix and plugs are recommended to increase riparian and pollinator habitat.
	Benefits for Park Users	- Aesthetically pleasing trees - Trees will provide shading for park users. - Creation of pollinator meadow	Native tree plantings in restored areas.	POSITIVE NET IMPACT Native tree plantings will improve naturalized areas impacted by proposed works.
Species at Risk and Significant Wildlife Habitat	Loss of SAR habitat or Individual Species	Potential disturbance to 1 isolated bat cavity tree in the CGL_2.	- Restoration of any disturbed areas using native trees and herbaceous species. - Restrict vegetation removal within vegetation communities outside of the bird nesting season (April 1st to August 31st) and outside of the bat roosting period (March 15 – November 30 and April 1- September 30). - To compensate for the removal of the candidate bat tree, two rocket boxes will be installed within suitable maternity roost habitat for bat SAR in strategically placed areas adjacent to foraging habitat. Two rocket boxes will be installed on the west edge of the forested community (FOD7) within the study area.	NO NET EFFECT Vegetation removal will not affect the form or function of the larger contiguous forest located within adjacent vegetation communities.
	Significant Wildlife Habitat Disturbance	Potential disturbance to Candidate SWH habitat for Snapping Turtle and monarch habitat	- Restoration of any disturbed areas using native trees and herbaceous species. - Seed mixes shall incorporate the use of milkweed.	POSITIVE NET EFFECT The vegetation removal is not anticipated to affect the form and

Natural Heritage Component	Potential Impacts	Potential Effects	Mitigation Measures	Net Effects
			• Restriction to vegetation removal within vegetation communities outside of the bird nesting season (April 1st to August 31st) • The form and function of the SWH habitats will be maintained. • Installation of sediment fencing along the edges of natural features to prevent wildlife from entering the construction zone. • Any works within potential reptile habitat shall have a wildlife rescue performed prior to the hibernation period (early October to the end of May (timing is seasonally dependent)) and permitting and authorization obtained from MNRF.	function of the Significant Wildlife Habitat. Additional riparian habitat for wildlife species will be created through the implementation of the restoration plan.
	Impacts to General Wildlife.	• Disturbance to breeding birds and other wildlife due to noise and vibration. • Injury or incidental take of bird nests or eggs.	• Restrict construction activities to daytime hours (sunrise to sunset). • Restrict vegetation clearing to periods before and after the bird nesting period of April 1st to August 31st • Install construction fencing to delineate the limits of construction. • Meeting between contractor and project ecologist at the commencement of the project to outline the expectation and requirements of working in a natural environment. • Weir removal will occur during less sensitive period during wildlife life cycles. • Wildlife ecologist will be onsite to relocate turtles as necessary. • Recommend the installation of fishing line containers, where appropriate to prevent injury/death to wildlife. • Additional native tree plantings will provide additional wildlife habitat.	LOW NET EFFECT Adhering to timing restrictions, minimizes construction disturbances to general wildlife. Construction is not anticipated to prevent wildlife movement between natural features. Increase in pollinator habitat will be created through the implementation of the restoration measures.

9 MONITORING

Monitoring of construction, restoration and enhancement work is recommended during, and post-construction. Monitoring shall be completed by qualified ecologists/biologists and include:

- **Erosion and Sediment Control:** Weekly monitoring of sediment and erosion control measures during grading, construction and following a significant precipitation event shall occur.
- **Plantings:** Monitoring of plantings for three years following construction shall be completed to document compliance with the restoration plans (e.g., the proper species and quantities were planted), establishment of planted material, and implement adaptive management to correct deficiencies. Adaptive management may be triggered by poor survival (<80%) of planted material, insufficient vegetation cover and the presence of unacceptable invasive species. Adaptive management strategies may include additional plantings, and/or control of unwanted species.
- Monitoring shall include photographic vegetation monitoring and documentation of invasive plant species establishment (if any), as well as a general assessment of plant growth and vigor within the restoration areas.
- Invasive Species Cover shall be monitored by estimated percent cover within the study area. Where greater than 10% cover is estimated remedial action may be required. Particular attention shall be given to the invasive species of concern identified on page 16 of the London Invasive Plant Management Strategy (LIPMS) (City of London, 2017); however, any identified invasive species should be recorded.
- Invasive species control works shall be monitored to ensure BMPs have been followed and that common buckthorn, garlic mustard, and Japanese knotweed have been eliminated from specified areas.
- Monitoring shall include planted tree health assessments to evaluate trees and determine if any further action is required.
- Tree care activities are to be documented and included in the monitoring report.
- **Long Term Maintenance:** A long term maintenance plan should be developed to provide direction to City staff on the monitoring and maintenance of the meadow areas after completion of the 3-year monitoring period. The long term maintenance should focus on identification and removal of invasive species or other undesirable species that are not consistent with the revegetation objectives.
- **Reporting:** Annual monitoring reports detailing the results of monitoring and maintenance activities and recommending adaptive mitigation strategies will be compiled by a qualified professional and submitted to the City by December 31st of each year for the length of the monitoring period. Reporting shall include results of monitoring, any deficiencies or concerns and remedial action provided.

10 ENVIRONMENTAL MITIGATION STRATEGY SUMMARY

The following presents a summary of proposed mitigation and restoration measures identified in **Section 7** and **Section 9** above. A mitigation measures summary table is presented in **Appendix G**.

10.1 Fish Habitat Protection

- Erosion and Sediment Control Measures
- Exposed Soil Seeding
- Construction Timing (Fish)
- DFO Request for Review
- Fish Salvage
- Contaminant and Spill Response Plan
- Riparian Vegetation Removals

10.2 Vegetation Protection

- Controlled Construction Vehicle Access During Construction
- Tree Removals Completed by Certified Arborist
- Protective Fencing to be Installed
- Tree Pruning by Certified Arborist
- Exposed Soil
- Invasive Species Management and Control

10.3 Wildlife, Species at Risk, and Significant Wildlife Habitat

- Timing Restrictions for Wildlife Implemented
- Active Nest
- On-Call Biologist Retained
- Wildlife Salvage prior to Construction
- Visual Encounter Surveys completed by Contractor
- Permits: Wildlife Scientific Collectors Authorization and Animal Care, DFO Request for Review, Fish Collection License, ESA Section 23.18
- Protective Fencing Installed
- Wildlife or Sensitive Species Encounters

10.4 Geese Management Strategies

- Modify Lawn Grass
- Scaring Techniques Not Requiring a Federal Permit

- No Supplemental Feeding

10.5 Restoration and Compensation Measures

- Restoration Material Approval
- Revegetation of Disturbed Areas
- Use of Native Material (Trees, Seed, Plugs)
- Installation of Bat Rocket Boxes
- Proposed Fishing Line Recycling Containers
- Monitoring (Erosion and Sediment Control, Vegetation Monitoring, Invasive Species Control, Planted Tree Health Assessments, Reporting)

11 POLICY COMPLIANCE

The following presents how the Harris Park erosion control work and park improvements complies with applicable Federal, Provincial, and Municipal Legislation/Policies:

- ***Migratory Birds Convention Act, 1994*** – Vegetation will be cleared outside of the breeding bird season of April 1 to August 31 and bat roosting window of March 15- November 30 and April 1-October 1 of any construction year.
- ***Ontario Restricted Activity Timing Windows for the Protection of Fish and fish Habitat*** – In water work timing restriction of March 15 to July 15.
- ***Fisheries Act*** – DFO Request for Review will be submitted in early 2023. This report shall be updated once a response has been received.
- ***Endangered Species Act, 2007*** – Project meets the requirements to Register under Section 23.18 (1) 4 Threats to Health and Safety not Imminent - *Work to protect against drought, flooding, forest fires, unstable slopes and erosion as long as the protection does not include the building of new infrastructure.*
- ***UTRCA Ontario Regulation 157/06*** – A permit will be required from the UTRCA. No negative impacts to features are anticipated because of proposed work.
- ***City of London Official Plan Policies*** - This Scoped EIS was prepared through discussions had during the virtual scoping meeting and in accordance with the London Plan Policies. The proposed erosion control work and park improvements will not negatively impact the natural features and ecological functions on, or adjacent to the subject lands and will create an overall net benefit to the environment by resolving erosion control issues, the planting of native trees, seed and plugs as well as the enhancement to wildlife habitat. Potential negative impacts to the natural environment will be

avoided or offset through the design and through the implementation of the mitigation measures outlined within this report.

12 CONCLUSIONS

This Draft EIS report provides the required supporting documentation for the proposed works. This report provides:

- A description of the existing natural heritage conditions within the study area as delineated through a combination of field investigations and review of available background information.
- The identification of vegetation communities, plants, wildlife, and natural heritage features.
- An assessment of significance based on federal, provincial, and municipal criteria for the delineated natural heritage features.
- An assessment of potential impacts on natural heritage features and functions; and,
- Recommendations to protect natural heritage features, where feasible, including recommended mitigation measures to reduce or avoid risk of impacts on natural features, compensation for loss of vegetation, and the restoration of degraded habitats within the study area.

Based on the investigations and assessments documented in this report, the proposed erosion control structure replacement and park improvements are not anticipated to result in net negative impacts on the features and functions of onsite natural heritage features and will result in a net benefit to the system by improving aquatic habitat, planting native trees and seed mixes, increasing naturalization areas (conversion of mowed lawn to pollinator-friendly meadow), implementing invasive species control, and the improvement to wildlife habitat. It is recommended that all components of the EMP provided in this report should be carried forward and implemented.

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