Appendix B

Natural Heritage Impact Study

The *Natural Heritage Impact Study for the Redevelopment of Ontario Place* (Morrison Hershfield 2023) study area includes the entire Ontario Place Site and a 120 m Area of Influence around the site. Data relevant to the public realm Project footprint and local study area was reviewed in the context of the Category C Public Work Class Environmental Assessment (EA) and summarized within the Environmental Study Report. Additional details including field survey dates, methodology, figures and natural heritage data outside of the local study area established for this EA are included in the following technical report.

Date: May 1, 2023

CHANGE SUMMARY

Morrison Hershfield has made changes to the Natural Heritage Impact Study for the Redevelopment of Ontario Place dated November 22, 2022. Updates to the findings of this report were required to correct errors resulting from a corrupt ArcGIS file export of tree health data and to reconcile external tree data. Additional revisions were made to reflect changes in the April 2023 Arborist Report, including the separation of tree data of trees outside the Ontario Place boundary from Ontario Place and readjustment of project area boundaries.

The cumulative effect of these corrections is summarized as follows:

- 18 large (>30cm DBH) trees previously identified as Ontario Place trees are now identified as trees outside of the Ontario Place boundary;
- 70 small (<30cm DBH) trees have brought into the data set from external tree inventory data; and,
- 56 trees that were labeled as “dead” in the November submission have been corrected to “excellent”, and 25 trees that were labeled as “fair or poor” in the November submission have been corrected to “good”, out of 471 large trees (error in 17% of trees categorized).

The following is a summary of all changes to the Natural Heritage Impact Study for the Redevelopment of Ontario Place document from the original submission November 22, 2022, to current revision May 1, 2023:

1.) Section 4.3 – Revisions to text within the section, including:
    a. Incorporation of UFI tree data (trees under 30 cm DBH) to total tree numbers.
    b. Correction of tree health condition data due to an ArcGIS corrupted file export.
2.) Section 6.2.1.2 – Revisions to text and Table 8 within the section, updates included:
    a. Separation of trees outside of Ontario Place boundary from Ontario Place
    b. Incorporation of UFI tree data (trees under 30 cm DBH)
    c. Correction of tree health condition data due to an ArcGIS corrupted file export
3.) Appendix D – Corrected status of Northern Map Turtle from Not at Risk to Species of Special Concern

Regards,

Heather Kime, B.Sc.
Terrestrial Ecologist & Team Lead
Environmental Services

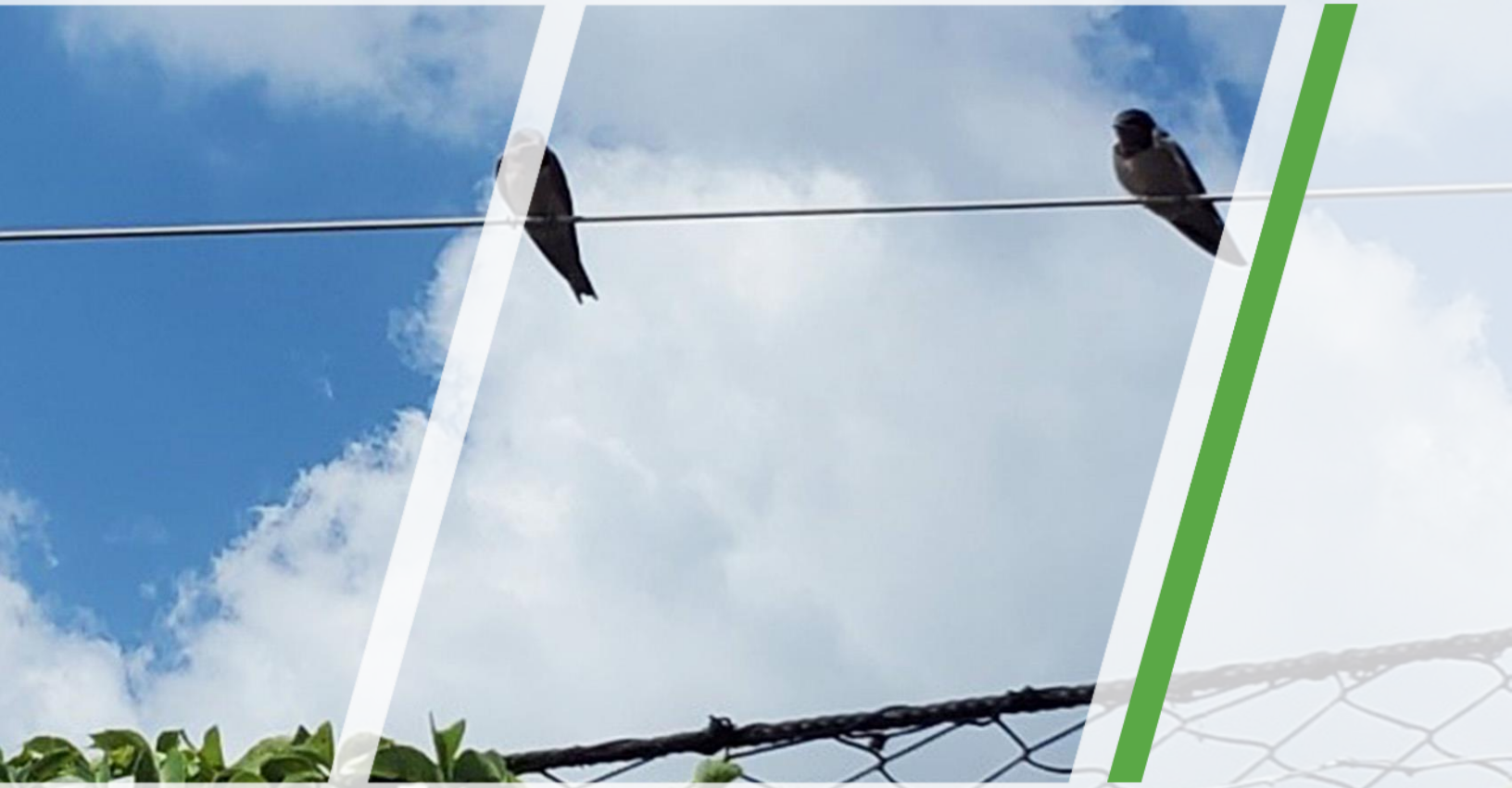
MORRISON HERSHFIELD

FINAL REPORT

Natural Heritage Impact Study for the Redevelopment of Ontario Place

Presented to:

Infrastructure Ontario



Morrison Hershfield
November 22, 2022
Revised May 1, 2023

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1. INTRODUCTION

This Natural Heritage Impact Study (NHIS) and Naturalization Plan report has been prepared by Morrison Hershfield (MH) on behalf of Infrastructure Ontario (IO), in support of the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications that will enable the renewal and redevelopment of Ontario Place ("the site").

The renewal and redevelopment of Ontario Place will transform the site into a year-round, waterfront destination for all Ontarians – establishing a future for the site that aligns with its legacy. The centrepiece of this revitalization is a comprehensive investment in publicly-accessible park and site-wide upgrades to the entire Ontario Place Public Realm (OPPR): Investments in biodiversity and habitat health – including the creation of new wildlife habitat; improvements to the resilience of the island for future generations, including necessary flood and soil mitigation; the creation of a series of new animated and fully accessible open spaces across the island and mainland; a large, flexible event space on the East Island that recalls the former Forum concert venue and expands on Trillium Park; and the introduction of a new West Island shoreline – featuring a new beach and opportunities for swimming, fishing, and water recreation.

The revitalization of Ontario Place will provide extensive new greenspace that will expand the waterfront open space network. New public realm investments will create a diversity of parks and open spaces with a wide range of programming to support use throughout the year. The revitalization will positively impact the cultural heritage value and attributes of the site. It will activate the site with new uses, introduce more than eight acres of public parkland on the West Island, and introduce new large-scale gathering areas along the waterfront and on the East Island.

Redevelopment will also involve improvements to active transportation infrastructure and ensure convenient, safe and accessible travel throughout Ontario Place, including a new water's edge promenade, which encourages direct connection to the water; a continuous 6-metre-wide multi-use trail throughout the island; enhanced connections to the Martin Goodman Trail; and improved last mile connections to the emerging mobility hub at Exhibition Station. Consolidation of mainland roads, parking areas, pick-up/drop-off, and loading facilities will address the access and servicing requirements of this new waterfront destination. Consolidation of these functions also results in increased park space and tenant development opportunities across the mainland.

Distributed across the site and integrated into the public spaces will be a series of new and enhanced attractions that will establish the site as a year-round destination for recreation, entertainment, culture, and play. Attractions include:

- **Live Nation Concert Venue**: The redevelopment of the existing Budweiser Stage to create a year-round, 20,000 seat entertainment facility able to be fully enclosed during winter. The iconic lawns and outdoor music experience will be retained and improved.
- **Therme**: A state of the art water recreation and leisure attraction featuring a waterpark, pools, wellness and sauna facilities, sports recreation, gardens and thermal baths with indoor and outdoor spaces on the West Island and mainland.
- **Science Pavilion**: Adaptively reusing and preserving the heritage pods and cinesphere structures as well as introducing a new entry pavilion space on the mainland.

- **Outdoor Adventure Playground**: A new family-friendly active play area featuring ziplines, jungle gyms, and other outdoor adventure structures.
- **Trillium Park**: The existing 3-hectare (7.5-acre) park will be retained and enhanced by the addition of new parks and gathering spaces.
- **Ontario Place Marina**: Improvements to the existing marina facilities that result in greater public access and interaction with the waterfront.

The proposed revitalization will be realized in phases, with the site-wide OPPR being delivered first alongside the Therme facility and associated parking, loading and drop-off structures. Expansions to the Live Nation Concert Venue and the Science Pavilion will follow.

The planning approvals process will be similarly phased. The proposed OPA applies to the full extent of the Ontario Place site and will provide a long-term framework for redevelopment, including for planned near-term OPPR and infrastructure improvements, as well as policy and design direction for future uses. The proposed ZBA has been scoped align with the Therme facility, parking structure and site-wide OPPR investments. Future ZBA applications may be required to secure approval for the development of additional site attractions.

The proponents of the project consider the natural heritage features to be of considerable importance to the character of the site. Any future redevelopment should ensure that these values, overall, are enhanced.

1.1 Project Location

The Ontario Place site is located at 955 Lakeshore West Boulevard within the City of Toronto, Ontario. The site was built into Lake Ontario as artificial landscaped islands, with construction beginning in 1969. Ontario Place opened on May 22, 1971, and operated as a theme park during summer months until 2011. Components of Ontario Place, including the Cinesphere, water park and amusement rides, were closed by the Government of Ontario in 2012. Echo Beach, an outdoor music venue added to the north shore of the east island in 2011, and Budweiser Stage continue to operate as concert venues during the summer season. The site has since reopened as a public park, with Trillium Park, located on the East Island, opening in 2017. The Cineshpere also reopened as an IMAX theatre in 2017.

The Area of Investigation (AOI) includes mainland areas south of Lakeshore Boulevard West and all areas on the West and East Islands (aside from Trillium Park), as well as all shorelines, and encompasses all redevelopment plans. Refer to **Figure 1** for a Key Map identifying the location and boundaries of the AOI. Trillium Park was excluded from the AOI as it is not located within the redevelopment boundaries and will remain unaffected, retaining its current natural heritage value. A 120 m distance was applied to the perimeter of the AOI to assess sensitivities within adjacent lands as part of this NHIS. The 120 m width is the Provincially recommended distance for considering potential negative impacts to adjacent lands (MNRF, 2010). **Figure 2** illustrates the AOI, the 120 m adjacent lands boundary (i.e., the Study Area) and any natural heritage features mapped by Land Information Ontario.

Figure 1: Key Map of Ontario Place AOI, within the City of Toronto

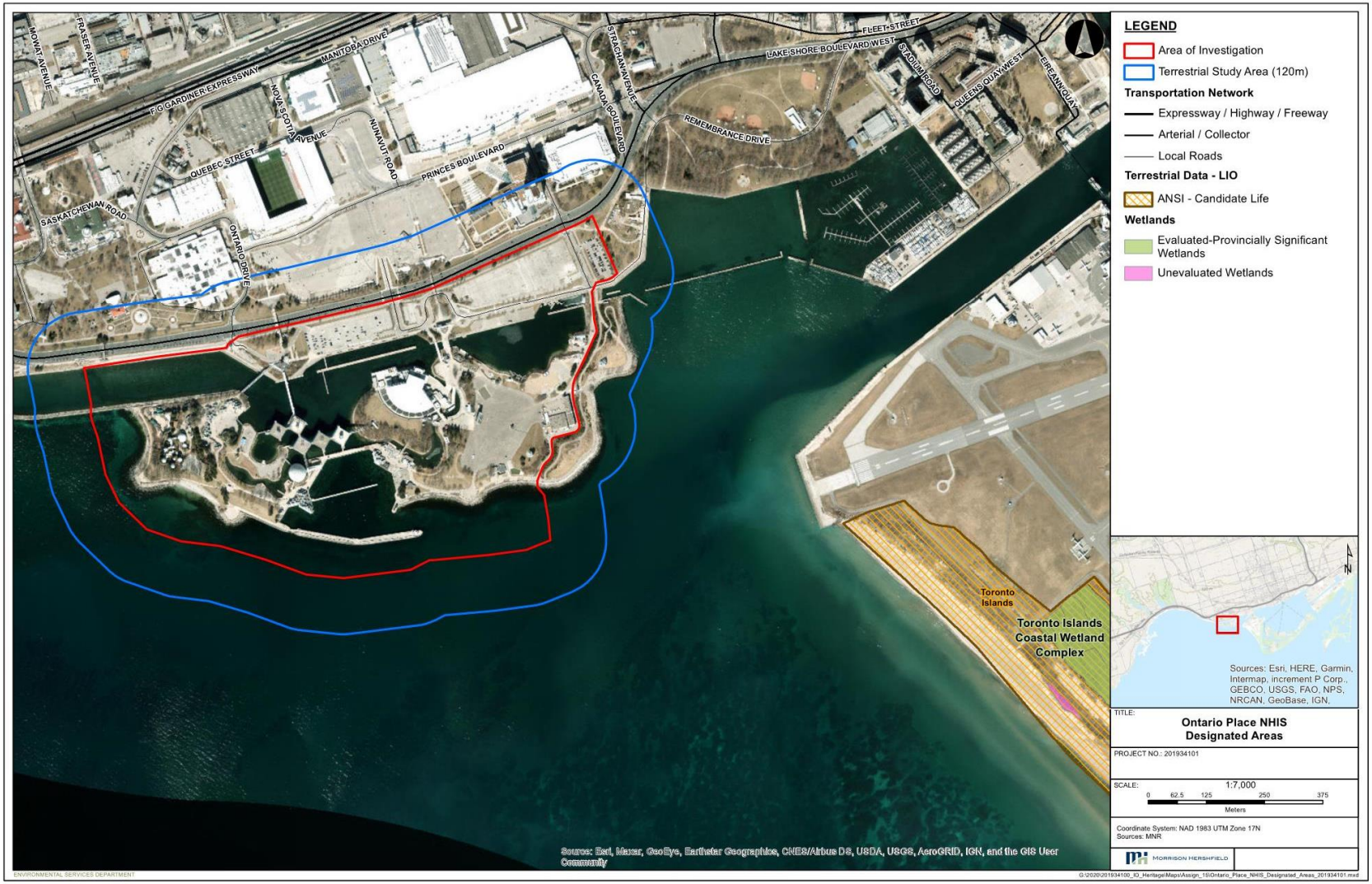

Figure 2: Designated Areas Surrounding the AOI and Study Area

1.2 About this Report

The rezoning approach for this project involves:

- OPA for all of Ontario Place, proposing new facilities for Therme, Live Nation, and OPPR improvements
- Zoning By-law Amendment for all of Ontario Place but only proposing new facility for Therme and OPPR improvements

Based on the rezoning approach, this NHIS is intended to address all facilities, but more detailed guidance for the Live Nation Concert Venue will be provided at the time of rezoning.

Consultation with permitting authorities and interested stakeholders has been initiated but is in early stages and will continue as the designs progress.

Given that the redevelopment is at a conceptual stage, particularly regarding potential opportunities for habitat enhancement or required compensation, the information presented in this NHIS regarding potential impacts, mitigation, and naturalization should be considered to be in its early stages commensurate with the project plans. Future modifications to the redevelopment plans will also involve refinement and detail for mitigation and naturalization plans in consultation with permitting authorities, agencies, and stakeholders with the goal of improving the site's natural heritage features and functions in the long term.

This NHIS is intended to be an objective, science-based study, prepared by qualified experts, which identifies key natural heritage features and functions on site, the potential development impacts on these features, and ways to minimize and mitigate negative impacts to the natural heritage system. This NHIS is accompanied by a Naturalization Plan, which identifies opportunities to strengthen the ecological functions at the site, and for the redevelopment to result in more naturalized conditions.

2. POLICY CONTEXT

The following provides a summary of policies – local, provincial, and federal – relevant to this study. This NHIS is intended to address the requirements set out in the policies as they pertain to the site's natural heritage features and functions.

2.1 Municipal

2.1.1 City of Toronto Official Plan

The natural environment is addressed in Chapter 3 Section 3.4 of the City of Toronto Official Plan (Office Consolidation March 2022). The City's significant natural heritage features and functions are shown as the natural heritage system on Map 9 (**Appendix A**). Most of the Ontario Place site is identified on Map 9 as part of the natural heritage system, including all portions south of the mainland shoreline. As stated in the Official Plan, Map 9 is not a statutory map and development proposed on or near lands shown as part of the natural heritage system is to be evaluated and may require an impact study. Per the City of Toronto Redevelopment Planning Applications Checklist dated September 2021, a Natural Heritage Impact Study (NHIS) was identified as an item to be submitted in support of the proposed redevelopment.

This NHIS has been developed in accordance with established guidelines, as part of the OPA and ZBA applications. Per these guidelines and the Official Plan, the natural heritage system is made up of areas where natural features and functions should be protected, restored, and enhanced as part of city-building decisions. Policy 3.4.11 states that development is generally not permitted in the natural heritage system illustrated on Map 9. Policy 3.4.13 states that all proposed development in or near the natural heritage system will be evaluated to assess the development's impacts on the natural heritage system and identify measures to mitigate negative impact on and/or improve the natural heritage system.

Section 3.4 of Chapter 3 of the City of Toronto Official Plan addresses consideration for lakefilling projects within Lake Ontario. Within this NHIS, lakefilling is discussed along with the Therme development and an assessment of the potential fish and fish habitat related impacts has been conducted to the level of detail available following review of preliminary design. In addition to the analysis within this report, further assessment is being undertaken to support the development's required permitting processes. This NHIS and the impacts of lakefilling discussed herein forms part of a suite of reports that address the impacts of lakefill. The full suite of reports included in this application further document and address the impacts of lakefill to a degree that is comparable with that which would be found within an Environmental Assessment.

2.1.2 City of Toronto Natural Heritage Guidelines

Other guiding principles of the Official Plan used to develop this NHIS include those related to the urban forest, light pollution, and the City's Bird Friendly Development Guidelines and required bird-friendly design in all new development subject to site plan approval.

2.2 Provincial

2.2.1 Toronto and Region Conservation Authority

The Toronto and Region Conservation Authority (TRCA) regulates development within the regulation limit through Ontario Regulation 166/06 (2013) under the Conservation Authorities Act (1990). The Regulation enables TRCA to prohibit or regulate development in areas of land associated with natural hazards, wetlands, and watercourses, collectively known as TRCA's regulated area.

Crown corporations and provincial agencies are exempt from TRCA's regulatory approval process, and permits are not required for these projects. The TRCA has developed a Voluntary Project Review (VPR), whereby interested parties may voluntarily request TRCA to review and comment on proposed detailed design activities, to confirm that TRCA policies and procedures are being adequately addressed. Under the VPR, after TRCA concerns have been satisfied, the TRCA will issue a Voluntary Project Review Letter confirming as much.

2.2.2 Provincial Policy Statement

Section 2.1 of the Provincial Policy Statement (2020) addresses natural heritage as it relates to Ontario's long-term prosperity, environmental health, and social well-being. The Natural Heritage Reference Manual (MNRF, 2010) provides guidance for implementing the natural heritage policies of the Provincial Policy Statement.

2.2.3 Endangered Species Act

The provincial Endangered Species Act (ESA) (2007) prohibits willful harm or harassment of extirpated, threatened, or endangered species that are listed in regulations under the Act. The ESA also prohibits willful damage to, or destruction of their habitats.

The Committee on the Status of Species at Risk in Ontario (COSSARO) maintains a list of species that should be assessed and classified or reclassified. Based on criteria for classification, geographic limitation, and best available scientific information, COSSARO is responsible for assessing, reviewing, and classifying species in Ontario. COSSARO submits reports regarding the classification of species and providing advice to the Minister of Environment, Conservation and Parks in accordance with the Act. The Species at Risk in Ontario (SARO) list regulation (O. Reg 230/08) under the ESA may be amended based on reporting from COSSARO and, once amended, the species is protected based on its classification. Thus, species' classification and protection are subject to change and up-to-date listings should be considered throughout the life of the project.

2.2.4 Fish and Wildlife Conservation Act

Under the Fish and Wildlife Conservation Act (FWCA) 1997, a person shall not destroy, take, or possess fish or the nest or eggs of a bird that belongs to a species that is wild by nature; this Act generally applies only to birds not covered under the MBCA. The FWCA also regulates the conditions under which numerous species of fish, mammals, reptiles, amphibians, and birds can

be caught or hunted, which is defined under the Act to include pursuing, chasing, capturing, harassing, injuring, or killing.

2.2.5 Environmental Protection Act

In 2011, a prominent development company was prosecuted under Ontario's Environmental Protection Act (EPA) as a result of bird window collisions at a development site in the City of Toronto. In 2013, the Ontario Court of Justice found that the company was responsible for hundreds of bird deaths resulting from collisions at the site beyond a reasonable doubt. The company was eventually acquitted as they were able to demonstrate that they had clearly exercised due diligence by undertaking measures to install visual markers on the most lethal parts of the buildings to address the problem. However, this is an example of how owners or managers of buildings with designs resulting in death or injury to birds could be charged with an offence under the EPA if they fail to take all reasonable measures to prevent bird collisions. In this instance, the court's ruling was that the reflected light discharged from the building was a "contaminant" under the EPA; buildings with windows that reflect light as a contaminant are in violation of s.14 of the EPA. In addition, it is also a contravention under s. 32 of the Species at Risk Act (SARA), if death or injury to a species at risk occurs and is contrary to s. 5(1) of the Migratory Birds Convention Act (MBCA) where a migratory bird species is killed; see **Sections 2.3.2** and **2.3.3** below.

2.3 Federal

2.3.1 Species at Risk Act

The federal SARA (2002) provides for the legal protection of wildlife species to prevent wildlife species from becoming extinct and to secure the necessary actions for their recovery. Species listed under SARA as endangered, threatened or extirpated are protected from killing, harming, harassing, capturing, possessing, collecting, buying, selling, and trading. Species listings are decided and overseen by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). General prohibitions apply everywhere in Canada for aquatic species, and on federal lands and First Nations lands or territories for non-aquatic species, or in instances where the provincial ESA fails to adequately protect species listed under SARA (ECCC, 2007 and SARA, 2022). Similar to the ESA, species statuses under SARA are subject to re-evaluation by COSEWIC, and therefore species protections are subject to change. Furthermore, new species can be listed and added to the protections of SARA at any time.

2.3.2 Migratory Birds Convention Act

Most species of birds in Canada are protected under the MBCA and are collectively referred to as migratory birds. In general, birds not falling under federal jurisdiction within Canada include grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, cormorants, pelicans, crows, jays, kingfishers, and some species of blackbirds, though most of these receive protection under the FWCA (see above). For migratory birds that are protected under the MBCA, their nests and nest shelters are protected against destruction throughout Canada. Environment and Climate Change Canada (ECCC) is responsible for the development and implementation of policies and

regulations to ensure the protection of migratory birds, their eggs and their nests. Under the MBCA, no person shall harass, disturb, destroy, or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, except under the authority of a permit.

Modernized Migratory Birds Regulations came into force on July 30, 2022. The new Migratory Birds Regulations, (GC, 2022), for example, provide protection to migratory bird nests when they are considered to have a higher conservation value for migratory birds. Previously, the Migratory Birds Regulations protected the nests of all migratory birds, at all times, for as long as they existed, which meant that many nests have been protected when they no longer benefit migratory birds.

2.3.3 Fisheries Act

The Lake Ontario shoreline along the Ontario Place property is subject to the federal *Fisheries Act* provisions which provides protection for all fish and fish habitat against harmful alteration, disruption, or destruction (HADD) of fish habitat (Section 35 (1)) and prohibits activities that cause death of fish (Section 34.4 (1)). The Department of Fisheries and Oceans Canada administers the *Fisheries Act* and defines fish habitat as water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes including spawning grounds and nursery, rearing, food supply and migration areas. For the Lake Ontario and its shoreline in the Ontario Place Study Area, fish habitat is generally perceived to be located below the highwater mark which for Lake Ontario is recognized as 75.3 metres above sea level (masl).

All projects in or near water must consider impacts to fish and fish habitat to ensure compliance with the federal *Fisheries Act* and in cases where a project's negative impacts to fish and fish habitat cannot be avoided, a Request for Review must be submitted to DFO for their determination of compliance with the Act. The Request for Review process determines whether death of fish and/or the harmful alteration, disruption, or destruction of fish habitat will likely result from a project and if either instance is unavoidable, the project may require a *Fisheries Act* Authorization as issued from the Minister of Fisheries and Oceans per Paragraph 34.4(2)(b) or 35(2)(b) of the *Fisheries Act* Regulations. The Authorization under the *Fisheries Act* may also require a plan to offset residual negative impacts.

3. METHODS

Development of this NHIS involved a review of background documents specific to Ontario Place, review of natural heritage information available for the site and surrounding area, as well as up-to-date field investigations during the 2022 field season.

3.1 Consultation

MH has been collaborating with the Live Nation, Therme and OPPR teams throughout development of this NHIS. As part of the Live Nation team, Dillon Consulting was retained to provide ecological consulting services to support the proposed plans for the Live Nation site. Dillon provided MH with a summary of their findings related to Ecological Land Classification, plant species, and wildlife observations. In general, Dillon's findings were consistent with the results of MH's field investigations. The OPPR team includes LANDinc, Martha Schwartz Partners (MSP), and SLR Consulting. No formal reports specific to existing natural heritage have been developed by the OPPR team; however, ongoing collaboration between MH and the OPPR team has informed development of the OPPR plans and this NHIS. Similarly, MH as has been collaborating with the Therme team, which includes STUDIOtla and W.F. Baird & Associates Coastal Engineers Ltd. (Baird). Collaboration with the Therme team has been focused on plans for the West Island shoreline and planting typologies.

Consultation with the City of Toronto, Toronto Region Conservation Authority (TRCA) and Aquatic Habitat Toronto has also been initiated by IO, the OPPR team and the Therme team. MH presented a summary of findings from the 2020-2022 field investigations to TRCA on September 30, during which TRCA provided some initial recommendations for consideration as the redevelopment plans develop.

Consultation with Indigenous Communities has been and will continue to be completed throughout the project. As per direction from the Ministry of Infrastructure (MOI) (formerly the Ministry of Tourism, Culture and Sport), a request was made to consult with the following:

- Alderville First Nation
- Curve Lake First Nation
- Haudenosaunee Confederacy Chiefs Council
- Hiawatha First Nation
- Kawartha Nishnawbe First Nation
- Mississaugas of Scugog Island First Nation
- Mississaugas of the Credit First Nation
- Six Nations of the Grand River

Indigenous Communities were contacted directly via notification letters from MTCS, which provided these groups the opportunities to provide comments and feedback. Notification letters provided multiple ways in which First Nations groups could participate, such as attending a presentation summarizing natural heritage surveys to date, attending a site visit to discuss the

upcoming work, receiving a report review to provide their written feedback, or participating in and monitoring on-site field work during field surveys.

MH initiated follow-up efforts (via letters, phone calls, emails, etc.) to identify Indigenous Communities that expressed interest in participating in the Ontario Place Redevelopment Project. To date, we have received feedback from the following First Nations groups:

- Kawartha Nishnawbe First Nation
- Mississaugas of the Credit First Nation
- Mississaugas of Scugog Island First Nation
- Six Nations of the Grand River

Kawartha Nishnawbe First Nation and Mississaugas of Scugog Island First Nation elected to only participate in the report reviews. Mississaugas of the Credit First Nation and Six Nations of the Grand River requested MH notify them of on-going natural heritage surveys to potentially monitor field activities. Mississaugas of the Credit First Nation and Six Nations of the Grand River participated in an MH presentation on completed Natural Heritage surveys to date, were we received their suggestions and concerns for incorporation into the NHIS Report. Consultation with First Nations communities, including comments received and responses, will be documented in a separate Consultation Report.

3.2 Background Documents

In 2012, Savanta (now GEI Consultants Ltd.) was retained by IO to undertake a comprehensive environmental review of the Ontario Place grounds. The *Ontario Place Comprehensive Natural Heritage Review* (herein referred to as the 2014 Savanta Report) was prepared to summarize the results of field investigations conducted in 2012 and 2013. The 2014 Savanta Report was included as part of MH's background review and is referred to throughout this NHIS, as needed.

In 2020, MH was retained by IO to complete a natural heritage features assessment to facilitate the demolition or renovation of 52 structures on the Ontario Place property. The AOI for this work included the majority of buildings and structures on the property, plus 10 metres around specified buildings and structures. The objectives of the 2020 field investigations were to assess potential impacts to natural heritage features and functions as a result of proposed redevelopment work and to identify the need for additional targeted Species at Risk (SAR) surveys. Based on the results of MH's initial 2020 field investigations and assessments, MH undertook additional field investigations in 2020 aimed at determining presence/absence of SAR. As a result of the field investigations in 2020, MH produced the following two (2) reports for IO, which were reviewed before commencing field surveys in 2021: *Species at Risk Surveys: Evaluation of Ontario Place to facilitate future Redevelopment* and *Natural Heritage Feature Assessment to facilitate future Redevelopment*.

MH was also retained by IO to complete aquatic and fish habitat assessments in 2020 and 2021. Aquatic field surveys completed in 2020 consisted of high-level visual surveys of in-water structures and bridges. Surveys completed in 2021 built on this information and included both shore-based fish habitat assessments and boat-based fish habitat assessments, with a total of

22 shoreline aquatic habitat sites surveyed and 18 boat based fish habitat sites surveyed. The objective of this survey was to complete a fish habitat assessment to employ a risk-based approach to determine the likelihood and severity of potential impacts to fish and fish habitat that may result from undertakings or activities associated with the redevelopment of Ontario Place. This survey provides a description of the existing aquatic conditions present within Lake Ontario and its connected waters at the Ontario Place property. Results of the surveys are documented in *Aquatic and Fish Survey Final Report.*

This NHIS has been developed in coordination with an Arborist Report (under separate cover).

3.3 Pre-Survey Background Review

Prior to undertaking field investigations, a review of the site was completed to obtain background information available on SAR and environmental sensitivities recorded within and surrounding the AOI. Data was reviewed and synthesized from the following sources:

- Natural Heritage Information Centre (NHIC)
- Ontario Breeding Bird Atlas (OBBA)
- Ontario Butterfly Atlas (OBA)
- Ontario Reptile and Amphibian Atlas (ORAA)
- The Cornell Lab of Ornithology: eBird
- Species at Risk in Ontario (SARO) lists and occurrence information
- Land Information Ontario (LIO)
- Natural History of Canadian Mammals (Naughton, 2012): species range maps
- International Union for Conservation of Nature (IUCN): species range maps
- City of Toronto Official Plan (2022) and Interactive Toronto Map Portal v2
- Aerial photography

3.4 Field Investigations

The following provides a description of the methods for the 2022 field investigations. Detailed information on field investigations undertaken prior to 2022 or by other consultants is documented in previous reports noted in **Section 3.1**.

Numerous field surveys were completed by MH biologists in spring and summer 2022, during the appropriate conditions for each type of survey. **Table 1** provides a summary of all survey types and dates, as well as time of day and weather during each survey. Refer to **Sections 3.4.1** to **3.4.11** for detailed information on all surveys completed in 2022. A photographic record of the field investigations can be found in **Appendix B**.

Table 1: Summary of Survey Dates and Conditions

Survey Type(s)	Date (m/d/y)	Survey Times - Start and End	Weather Conditions
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/4/2022	10:35-15:00	4°C, mainly sunny with 30-40% cloud, wind 1-2
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/5/2022	09:33-15:00	4°C-7°C, overcast with 100% cloud to sunny with 25% cloud, light rain to no rain, wind 2-3
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/11/2022	09:00-14:00	4°C, overcast with 100% cloud, wind 2-3
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/12/2022	09:30-13:30	8°C, full sun, wind 1-2
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/18/2022	08:00-13:30	4°C, sunny with 25% cloud to overcast with 100% cloud, wind 2-3 increasing to 5-7
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/20/2022	14:05-18:00	8°C-9°C, sunny with 30% cloud, wind 1-2
Amphibian Breeding Survey	4/20/2022	20:37-21:48	7°C, wind 1-2
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/22/2022	13:30-16:00	9°C, sunny with 10% cloud, wind 2-3
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/26/2022	08:30/12:18	9°C-10°C, sunny with 50% cloud to overcast with 100% cloud, wind 1-2
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/27/2022	08:30/11:28	1°C-4°C, overcast with 90% cloud, wind 1-2 increasing to 3-4
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	4/28/2022	08:17/11:25	0°C-7°C, full sun, wind 1-2
Landbird Stopover Surveys/Reptile Hibernaculum	5/3/2022	07:45/11:00	8°C-12°C, overcast with 100% cloud, wind 0-2

Survey Type(s)	Date (m/d/y)	Survey Times - Start and End	Weather Conditions
and Turtle Wintering Area Surveys			
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	5/5/2022	07:49/11:18	8°C-12°C, sunny with 10% cloud, wind 1-2
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	5/10/2022	07:59/11:27	12°C, sunny with 30% cloud, wind 1-2
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	5/12/2022	07:43/10:54	16°C-23°C, sunny with 10% cloud, wind 0-1
Amphibian Breeding Survey	5/16/2022	21:07-22:15	16°C, wind 0-1
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	5/18/2022	07:53/11:14	9°C, sunny with 40% cloud, wind 1-2
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	5/19/2022	08:00/10:55	10°C, overcast with 100% cloud, light rain, wind 0
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	5/24/2022	07:43/10:17	10°C, sunny with 35% cloud, wind 1-2
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	5/25/2022	07:45/09:55	13°C-15°C, sunny with 35% cloud to overcast with 100% cloud
Active Acoustic Monitoring Surveys for Bats	6/1/2022	20:22/21:52	21°C, mainly clear with 50% cloud, wind 0-2
Active Acoustic Monitoring Surveys for Bats	6/7/2022	20:26/21:56	17°C, mainly clear with 50% cloud, wind 1-2
Active Acoustic Monitoring Surveys for Bats	6/8/2022	20:27/21:57	18°C, overcast with 100% cloud, wind 1-2
Active Acoustic Monitoring Surveys for Bats	6/13/2022	20:30/22:00	20°C, mostly cloudy with 75% cloud, wind 0-1
Breeding Bird Surveys/Turtle Nesting Area Surveys	6/14/2022	07:35/10:20	18°C-19°C, sunny with 50% cloud, wind 0
Amphibian Breeding Survey	6/15/2022	22:24-23:09	21°C, wind 0-1

Survey Type(s)	Date (m/d/y)	Survey Times - Start and End	Weather Conditions
Active Acoustic Monitoring Surveys for Bats	6/15/2022	20:30/22:00	21°C, mainly clear with 50% cloud, wind 0-1
Nest Searches (Buildings, Bridges, and Structures)	6/20/2022	09:00/16:00	20°C, mainly sunny with partial cloud, wind 0-1
Active Acoustic Monitoring Surveys for Bats	6/21/2022	20:32/22:02	27°C, mostly cloudy with 75% cloud, wind 1-2
Nest Searches (Buildings, Bridges, and Structures)	6/23/2022	09:30/15:30	27°C, sun with <30% cloud, wind 0-1
Breeding Bird Surveys/Turtle Nesting Area Surveys/Nest Searches (Buildings, Bridges, and Structures)	7/5/2022	07:30/10:11	19°C-21°C, overcast with 100% cloud, intermittent drizzle, wind 0-2
Vegetation Surveys/Turtle Nesting Area Surveys/Nest Searches (Buildings, Bridges, and Structures)	7/12/2022	09:00/14:30	25°C, sunny with 50% cloud, wind 1-2
Breeding Bird Surveys/Turtle Nesting Area Surveys	7/12/2022	07:30/08:37	21°C, full sun to overcast with 100% cloud, clear to heavy rain, wind 1
Vegetation Surveys/Turtle Nesting Area Surveys	7/21/2022	09:00/14:30	24°C, sunny with 60% cloud, wind 1-3 (gusts)
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys/Vegetation Surveys	8/12/2022	09:00-13:00	19°C, full sun, wind 2-3 (gusts)
Waterfowl and Shorebird Stopover/Reptile Hibernaculum and Turtle Wintering Area Surveys	8/24/2022	10:04-15:00	22°C, full sun, wind 1-2
Waterfowl and Shorebird Stopover/Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	8/31/2022	07:00-14:30	22°C, sunny with 20% cloud, wind 3-5 (gusts)
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	9/7/2022	09:25/11:40	19°C, overcast with 100% cloud, wind 1
Landbird Stopover Surveys/Reptile Hibernaculum and Turtle Wintering Area Surveys	9/8/2022	09:08/11:00	19°C sunny with 50% cloud, wind 1

* Note that wind conditions refer to the Beaufort Wind Scale, where 0 is no wind, 4 is a moderate breeze, and 7 is high wind.

3.4.1 Species at Risk Bat Surveys

Species at Risk bat habitat in treed areas is identified using the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis, & Tri-colored Bat* (MNRF, 2017) (hereafter referred to as The Protocol). Based on *Phase I: Bat Habitat Suitability Assessment* of The Protocol, any coniferous, deciduous, or mixed wooded ecosite that includes trees at least 10 cm in diameter at breast height (dbh) has the potential to be suitable maternity roost habitat. Treed cultural areas may also have potential to be suitable maternity roost habitat. Cultural treed areas are to be assessed on a case-by-case basis to determine if there is potentially suitable habitat for SAR bats. While Ontario Place is primarily a cultural site, it contains a high number of greater than 10 cm dbh trees relative to its area. Therefore, it was determined that there was potential for SAR bats to roost in trees at Ontario Place

As per *Phase II: Identification of Suitable Maternity Roost Trees* of The Protocol, roost tree surveys were completed during the 2022 field season. All trees within the AOI were surveyed to determine if they contained cavities, cracks, crevices, or were otherwise suitable for roosting bats.

Following roost tree surveys, a quality assessment, based on *Phase III: Acoustic Surveys* of The Protocol, was conducted to determine placement of acoustic monitors. Cavity trees were ranked on the following criteria:

- Trees with dbh of 25 cm or greater.
- Cavities/cracks/crevices present 10 m or higher.
- Trees in early stages of decay (Decay classes 1 – 3).
- Trees located within 10 m of another cavity tree.

Trees that met all of these criteria were ranked as the highest quality (Very Good). Trees meeting only three (3) of these criteria were ranked as second best (Good). Trees meeting only two (2) criteria were ranked as “Moderate” quality trees. Trees meeting only one criterion were ranked as “Poor”, and trees meeting no criteria were ranked as “Very Poor”.

Using the roost tree quality data, all Very Good and Good trees identified were targeted for acoustic monitoring, as well as the vast majority of Moderate trees identified; refer to **Figure 3** for the locations and quality rank of all potential roost trees identified, as well as the locations of the acoustic monitoring survey areas. It should be noted that, in 2020, MH completed acoustic monitoring surveys targeting all buildings and structures on site that were assessed by MH as being potentially suitable for bat roosting. Where feasible, these same buildings/structures were incorporated into MH’s 2022 acoustic monitoring survey limits, to re-assess whether or not SAR bats were present in the vicinity of these buildings.

Given that the AOI is largely accessible to the public, that the AOI is highly utilized by the public, that it is difficult to deter theft of monitoring equipment in such environments, and that the public/by-passers often produce ultrasonic sounds that can confuse acoustic software and lead to noise files being misidentified as bats and many noise files being obtained, it was determined that active acoustic monitoring using handheld detectors would be the most suitable and accurate method for identifying bats at the majority of the site (at acoustic monitoring survey areas #1 to

#10). For active acoustic surveys, Echo Meter Touch 2 handheld acoustic monitors for Android and iPhone were used to monitor potential bat maternity roost trees and surrounding areas. Monitoring began one half hour before sunset and continued to one hour after sunset, as per the *Technical Field Guide for IO Service Providers and Successful Respondents of the Natural Heritage Services* (TFG) (IO, 2020). Sound was recorded for the duration of that time. Each station was visited twice over the course of the monitoring period in June; refer to **Table 1** for all dates when surveys were completed, as well as the survey conditions.

On the Live Nation grounds, where the area is secure making public accessibility less of an issue, but where co-ordinating site access during the target survey season of June (i.e., during concert season) and where steep slopes in treed areas make access to trees hazardous are larger issues, passive acoustic monitoring was determined to be the most suitable method for assessing bat presence/absence. Therefore, two (2) passive acoustic monitors (SM4s) were deployed on the Live Nation grounds from June 8 to June 20, 2022, in locations intended to encompass as many potential bat roost trees as possible, given the aforementioned steep slopes and tree accessibility issues; refer to **Figure 3** for the locations and limits of the two (2) passive acoustic monitoring areas (#11 and #12). In accordance with The Protocol, both monitors were full spectrum acoustic detectors, placed for a minimum of 10 nights, and had an assumed detection radius limit of 30 m from the microphones.

For the active acoustic monitoring using the Echo Meters, the Echo Meter Touch 2 device along with the Echo Meter Touch Bat Detector, Recorder & Analyzer application is capable of recording bat echolocation call sequences as well as auto identifying the species of bat detected in each call sequence. Following the active acoustic surveys, all recordings obtained that were auto-identified as bats were manually vetted to confirm which recordings obtained were, in fact, bats and which were noise, unless a bat was visually observed and confirmed as present by the surveyor. This is due to the fact that many sounds produced by by-passers, traffic, etc., are misidentified by the application as bats, when no bats are present. These noise recordings were ruled out as bats.

For the passive acoustic monitoring using the SM4s, all recordings retrieved from the monitoring locations were analyzed using the Kaleidoscope Pro software, which uses a Maximum Likelihood Estimator (MLE) approach to automatically identify bat vocalizations and provides the statistical likelihood of each identification. Where the likelihood was greater than 95% (p-value of 0.05 or less) and a species was detected with regularity, it was assumed to be a confident identification of species by the software. Where a species was detected with low statistical confidence, or was only detected infrequently, the call sequences were reviewed manually (visually), to confirm whether the auto-identification was accurate in those instances. The results of the bat cavity tree surveys and acoustic monitoring for SAR bats are discussed in detail in **Section 4.4.3**.

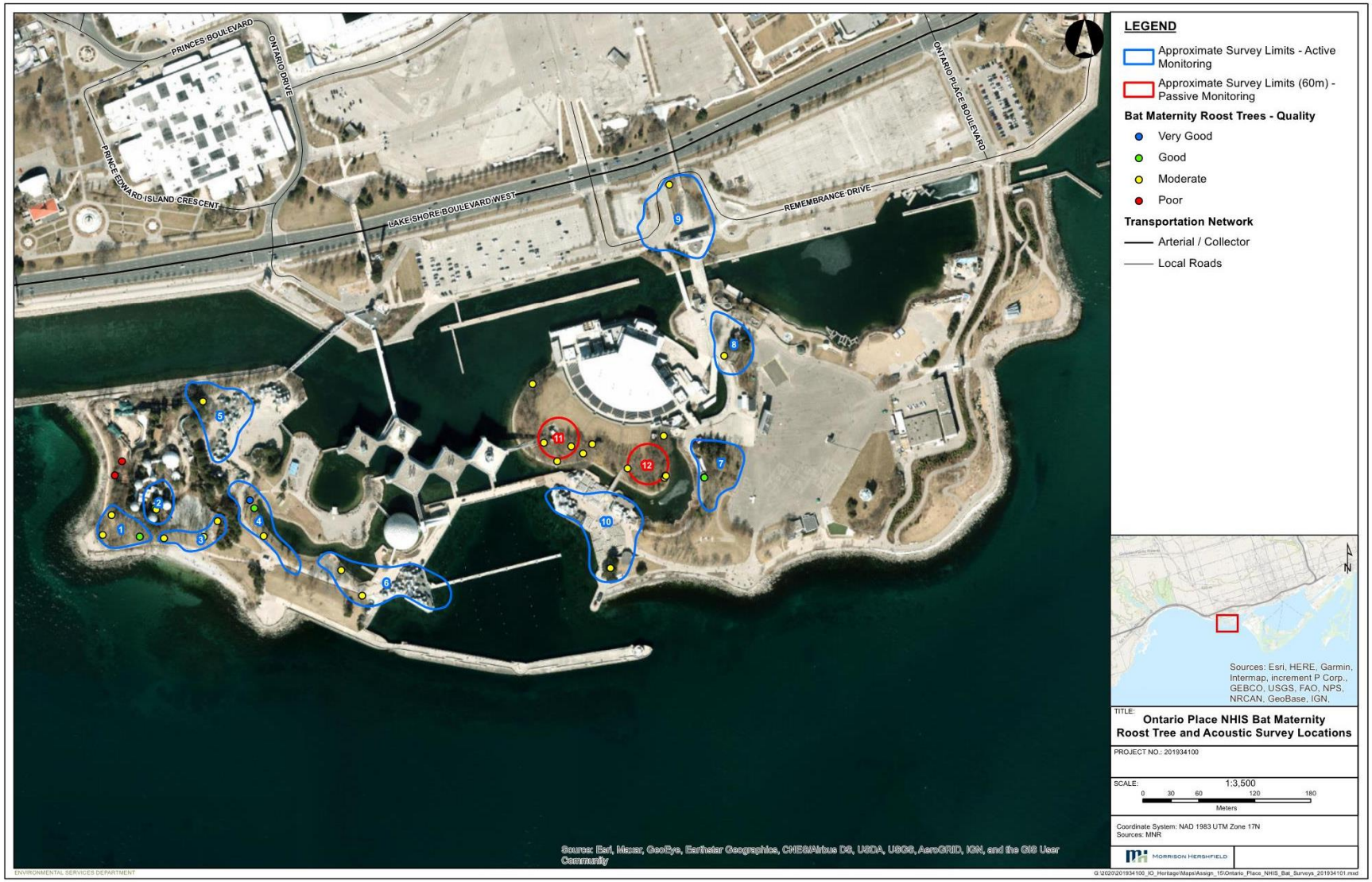

Figure 3: Bat Roost Tree and Bat Acoustic Monitoring Locations at Ontario Place

3.4.2 Landbird Migratory Stopover Surveys

Landbird Migratory Stopover Areas were assessed using the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015). Typically, woodlots greater than five (5) hectares in size and within five (5) kilometers of Lake Erie or Lake Ontario have potential to provide significant stopover habitat for Landbirds (i.e., migratory songbirds and migrant raptors). In areas where woodlots are rare, smaller areas may be considered for potential significant Landbird Migratory Stopover Areas. Despite the high cultural influences at Ontario Place, it was determined that the site had the potential to be a significant Landbird Migratory Stopover Area, as it is relatively treed and is located within Lake Ontario.

Landbird Migratory Stopover Area surveys were completed using the *Bird and Bird Habitat: Guidelines for Wind Power Projects* (MNRF, 2011) protocol for stopover counts for songbirds. Fifteen transects, of varying lengths, were selected to sample all the potential stopover habitat at Ontario Place. Each transect was surveyed 14 times over the course of the spring and fall migration seasons; refer to **Table 1** for survey dates and conditions and to **Figure 4** for the transect locations. During the surveys, all landbird species and the abundance (i.e., number of individuals) of each species was recorded for each transect, using both visual and auditory observations of birds. Equipment used for these surveys included mainly minimum 10 x magnification binoculars.

3.4.3 Waterfowl and Shorebird Stopover and Staging Surveys

Waterfowl Stopover and Staging Areas (Aquatic) and Shorebird Migratory Stopover Areas were assessed based on the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015). These areas typically include the open water and shoreline areas of lakes, ponds, bays, beaches, and rivers, where waterfowl and shorebirds stop in large aggregations to rest and feed. As Ontario Place is located within Lake Ontario and contains numerous bays, beaches, and shorelines, it was determined that there was potential for both Waterfowl Stopover and Staging Areas (Aquatic) and Shorebird Migratory Stopover Areas to occur.

Surveys to assess Waterfowl Stopover and Staging Areas (Aquatic) and Shorebird Migratory Stopover Areas were completed based on the *Bird and Bird Habitat: Guidelines for Wind Power Projects* (MNRF, 2011) stopover count methodology for open area birds. Additional information was sourced from the *Migratory Waterfowl and Shorebird Stopover Habitat Survey Protocol* (CVC, 2021) and the *Ontario Shorebird Survey Training Manual and Protocol* (ECCC, 2016). Seven (7) survey areas were established to survey all open water areas and shorelines areas at Ontario Place. During the surveys, all waterfowl and shorebird species and the abundance of each species was recorded for each area, using both visual and auditory observations. Each area was surveyed 10 times over the course of the spring and fall migration seasons; refer to **Table 1** for survey dates and conditions and to **Figure 4** for the survey areas. Equipment used for these surveys included minimum 10 x magnification binoculars as well as a 100 x magnification spotting scope and a camera with a telescopic lens, as required.

Figure 4: Avian Survey Locations at Ontario Place

3.4.4 Breeding Bird Surveys

Breeding bird surveys were completed using protocols outlined within the TFG and the *North American Ornithological Atlas Committee's Handbook for Atlasing Breeding Birds* (Smith, 1990). Ontario Place is largely within an urban setting with isolated areas of vegetation, with constantly changing impediments to movement between survey locations (e.g., temporary fencing, closures for events or temporary installations, etc.), and with a moderate to high amount of background noise at times that can severely limit the detectability of some avian species. Therefore, it was determined that transect sampling (versus fixed point counts) would be the most effective to increase species detectability and to adequately survey all available breeding habitat for birds within the AOI.

Fifteen transects were established to sample all potential breeding habitat for birds at Ontario Place aside from buildings, bridges, and structures; refer to **Section 3.4.5** for details on bridge/building surveys. Auditory and visual observations of birds were used to record all species along each transect, as well as any observations that indicated breeding behaviours for each species, such as individuals carrying nesting materials, exhibiting territorial behaviours, entering a nest site, or feeding young. Behaviours indicative of breeding were later used to assess the likelihood of each species breeding at the site (e.g., feeding young is confirmation of breeding). Each transect was surveyed (2) times during peak breeding season; refer to **Table 1** for the survey dates and conditions and to **Figure 4** for the transect locations. Data obtained during the breeding bird surveys was also used to assess the potential for several different Significant Wildlife Habitat types to occur at the site, including Colonially Nesting Bird Breeding Habitat (Trees/Shrubs), Colonially Nesting Bird Breeding Habitat (Bank and Cliff), and Marsh Bird Breeding Habitat. Equipment used for these surveys included mainly minimum 10 x magnification binoculars.

3.4.5 Nest Searches of Buildings, Bridges, and other Structures

As the AOI contains numerous buildings, bridges, and other structures that provide suitable surfaces for breeding birds to nest on, surveys to identify all nest locations on built structures within the AOI were completed. These surveys consisted of visual inspections of all buildings, bridges, and structures, on site to search for evidence of existing and/or previous bird nesting, in accordance with the TFG (IO, 2020). These surveys also included an assessment of all buildings to determine whether suitable features for SAR bird nesting are present. It should be noted that nest searches are not completed in vegetated areas for the purposes of suitability assessment, as, in general, most vegetation provides suitable habitat to support nesting birds in any given season. Furthermore, nests are typically discrete in these complex habitats, and there is as much of a chance of disturbing a nest than detecting a nest. Therefore, breeding bird surveys (**Section 3.4.4**) are instead used to assess breeding bird activity in these areas.

Nest search surveys were completed using 10 x magnification binoculars wherever possible, to minimize the possibility of disturbance to nesting birds. In instances where views of portions of buildings, or underneath of buildings or bridges were obscured or could not be adequately viewed from the shoreline, non-motorized boats were used to access and view these areas. All buildings, bridges, and other stationary structures included within this assessment are provided along with

the results of the surveys in **Section 4.4.1**. Dates of these surveys and the conditions during the surveys are shown in **Table 1**.

3.4.6 Amphibian Breeding Surveys

Amphibian Breeding Habitat (Wetlands) was assessed in accordance with the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015). Amphibian Breeding Habitat (Wetlands) typically include wetland ecosites that are isolated from woodlands. As Ontario Place is located within Lake Ontario and contains numerous bays, channels, and areas of slow-moving open water, it was determined that there was potential for Amphibian Breeding Habitat (Wetlands) at the site.

Amphibian call surveys were completed as per protocols contained within the *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians* (BSC, 2009). A total of seven (7) Amphibian Calling Stations were selected to provide full coverage of all potential amphibian breeding habitat present, while providing adequate spacing between survey stations to minimize potential for detecting the same individuals at multiple survey stations. Each survey at each Calling Station consisted of a three (3) minute long count of amphibians (auditory and visual observations included) within an approximately 100 m detection radius for 180° in front of the surveyor. Surveyors were paired and conducted surveys simultaneously, in opposite directions at each station, to cover a full 360° area within a 100 m radius. Surveys began 30 minutes after sunset and continued until all stations had been surveyed (ending before midnight). Refer to **Table 1** for the survey dates and conditions and to **Figure 5** for the Amphibian Calling Station locations.

Data recorded during the surveys included the species detected calling, as well as an estimate of the abundance of amphibians calling, using calling codes. Calling Code 1 indicates individuals can be counted reliably and that calls are not simultaneous, Calling Code 2 indicates individual calls are distinguishable but that there is some simultaneous calling occurring, and Calling Code 3 refers to a full chorus where calls are continuous and overlapping, and where a reasonable count or estimate of abundance cannot be completed. Where loud noises such as passing airplanes, traffic, or calling birds substantially interfered with hearing ability, survey time was extended appropriately to accommodate for the temporary interference, as some species of amphibians have quiet calls that may not be detected unless conditions are quiet.

Per the *Marsh Monitoring Program Participant's Handbook for Surveying Amphibians*, survey dates were completed at least 15 days apart and captured increasing daily temperatures to increase the probability of detecting all of the different amphibian species that may breed within the study area; night-time air temperatures were greater than 5°C for the first survey, greater than 10°C for the second survey, and greater than 17°C for the third survey.

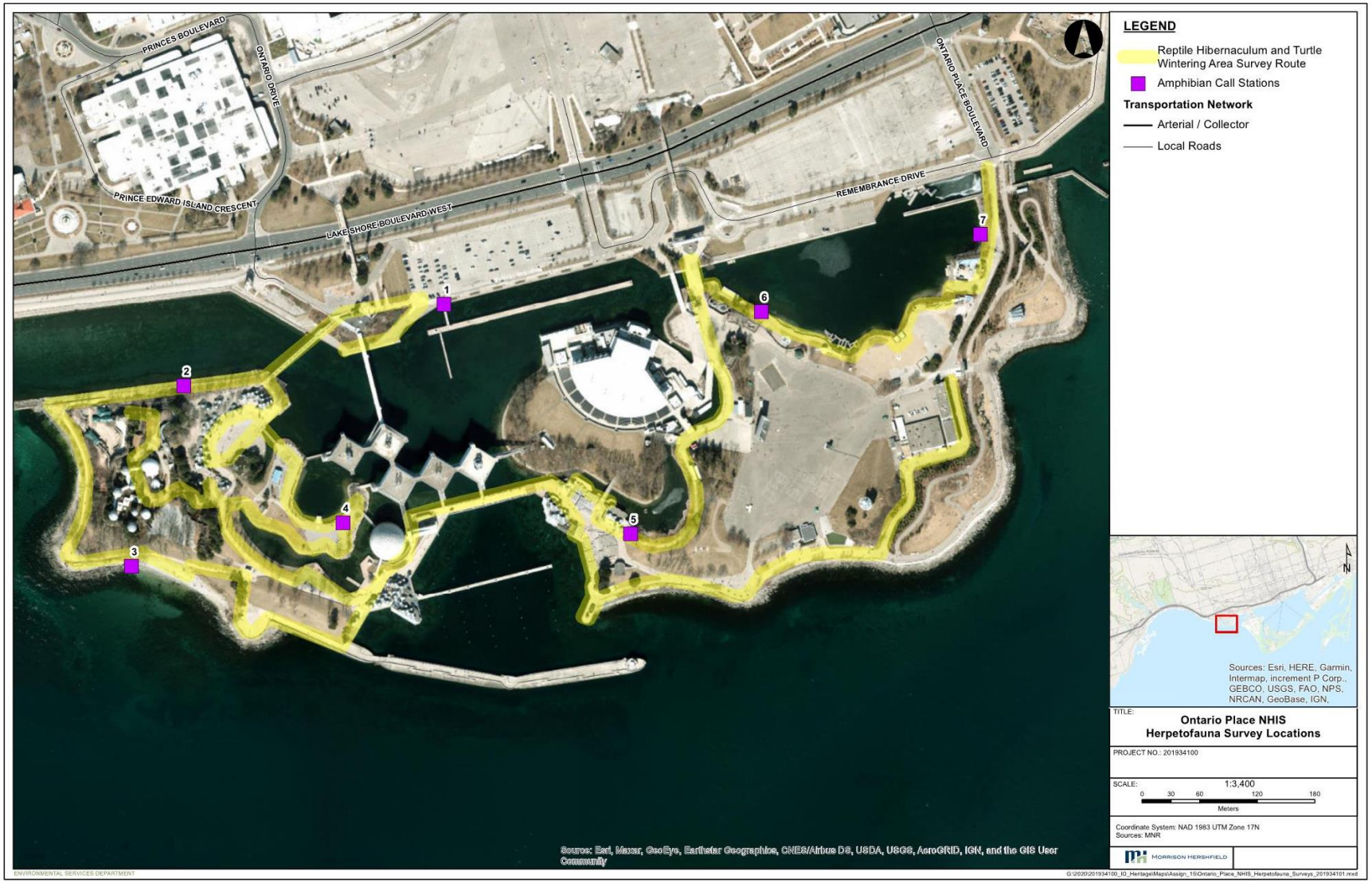

Figure 5: Herpetofauna Survey Locations at Ontario Place

3.4.7 Reptile Hibernaculum and Turtle Wintering Area Surveys

Reptile Hibernaculum and Turtle Wintering Area assessment and surveys were completed using the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015). For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. Therefore, features at Ontario Place that were likely to extend beyond the frost line were targeted for Reptile (Snake) Hibernaculum Studies, such as rock piles in rock protection areas, areas surrounding hills, and areas around building foundations and bridge abutments. For most turtles, wintering areas are in the same general area as their core habitat, in permanent water bodies and large wetlands; water must be deep enough not to freeze and have soft substrates. Therefore, shoreline areas, particularly protected bays, at Ontario Place were targeted for Turtle Wintering Area surveys. These surveys consisted of walking a single transect covering all potential hibernaculum and wintering area sites at least once per survey, and they were often completed concurrently with Waterfowl and Shorebird Stopover surveys in early spring and fall; refer to **Table 1** for the survey dates and conditions and to **Figure 5** for the locations included in the surveys.

3.4.8 Turtle Nesting Area Surveys

Turtle Nesting Areas were assessed in accordance with the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015). The most suitable Turtle Nesting Areas are located close to water, away from roads, and are sites less prone to loss of eggs to predators such as Striped Skunks (*Mephitis mephitis*) and Racoons (*Procyon lotor*). For an area to function as a Turtle Nesting Area, it must provide sand, gravel, or loose substrates that turtles are able to dig in and that are located in open, sunny areas (for egg incubation). Areas with loose substrates and sun exposure in undisturbed locations are rare at Ontario Place. However, several potentially suitable Turtle Nesting Areas were present on site, in the vicinity of Amphibian Call Station #'s 3 and 5 (**Figure 5**), therefore these areas were surveyed through June and July to assess the likelihood that turtle nesting activity occurs at Ontario Place.

3.4.9 Mammalian Surveys

Targeted surveys for mammals (aside from bats) were not completed given the limited available habitat for mammals at Ontario Place, and the species of mammals anticipated to be present. However, all observations of mammals, or evidence of presence – such as scat, carcasses, spoor, or browse, were recorded during any site visits in which they were encountered. Given the high number of site visits spanning several seasons, and completed at all times of day, there is high confidence that all large mammals that regularly use the site were recorded, though smaller mammals such as mice and moles likely would have gone undetected.

3.4.10 Invertebrate Surveys

Targeted surveys for terrestrial life stages of insects were not completed given the limited available habitat for most insects at Ontario Place, and the species of insects anticipated to be present. However, all observations of insects were recorded during any site visits in which they

were encountered. Given the high number of site visits spanning several seasons, and completed at all times of day, it is anticipated that the predominant insects that use the site were recorded.

Surveys to assess aquatic life stages of invertebrates (i.e., benthic invertebrate surveys) are planned for fall 2022.

3.4.11 Vegetation Surveys and Ecological Land Classification (ELC)

A botanical inventory and Ecological Land Classification (ELC) was previously completed for the project within the 2014 Savanta Report and was completed using the 1998 classification system (Lee et. al., 1998). Given the elapsed time since this previous assessment, in 2022 MH completed updates to the vegetation inventories and ELC within the AOI to reflect any changes to communities resulting from land use changes or succession over time. The results of the 2014 surveys have been updated based on 2022 field work and using the 2008 ELC codes (Lee, 2008).

Where possible, the same areas assessed by Savanta were assessed again by MH in 2022, and these areas were labelled and named alphabetically to be consistent with the 2014 Savanta Report for ease of interpretation of data. However, a number of areas by MH differed from those assessed by Savanta, for several reasons. Areas A, B, and L assessed by Savanta within Trillium Park were not included within MH's AOI, and are therefore not discussed within this report. Areas C, D, E, F, I, J, and M encompassed slightly different (typically larger) areas when assessed by MH in 2022, as the extent of vegetation in these areas was found to have changed compared with 2014 conditions. Also, MH added several new areas to ELC and vegetation surveys in 2022, namely Areas O and P, as they were determined to contain sufficient vegetation to warrant consideration.

The results of the Vegetation and ELC surveys can be found in **Section 4.1** below. Refer to **Appendix C** for a complete list of plant species documented by MH within the AOI.

4. NATURAL HERITAGE FEATURES AND FUNCTIONS

4.1 Designated Natural Areas

According to LIO, the City of Toronto Official Plan (2022), and the Interactive Toronto Map Portal, there are no Environmentally Significant Areas, Provincially Significant Wetlands (PSW), Areas of Natural or Scientific Interest (ANSI), or Ravine and Natural Features areas within the study area or AOI. However, almost the entire AOI, aside from open water areas and parking lots south of Lakeshore Boulevard West, is identified as part of the City's natural heritage system. As noted within **Section 2.1.1**, although Map 9 is not a statutory map, development proposed on or near lands shown as part of the natural heritage system may require an impact study, which has been detailed herein. The nearest PSW and ANSI, the Toronto Islands Coastal Wetland Complex and Toronto Islands Candidate Life Science ANSI, are located more than 500 m southeast of the AOI, at Billy Bishop Toronto City Airport; refer to **Figure** 2 for the locations of these designated areas surrounding Ontario Place. A small unevaluated wetland is also present southeast of the AOI at Billy Bishop Toronto City Airport.

4.2 Physiography and Soils

Ontario Place is an atypical site in that it is a human-made, entirely constructed landmass. Ontario Place was constructed in the 1970's via lake in-filling using construction debris such as broken concrete and brick, and various excavated soils from other construction sites. The shorelines of the site are protected by a combination of stone or rip rap revetments, stacked stone and rubble, and steel sheet pile or timber pile walls.

4.3 Vegetation and Ecological Land Classification (ELC)

Having been built into Lake Ontario as artificial landscaped islands, Ontario Place and its vegetated areas are of cultural (i.e., anthropogenic) origin and very few vegetated areas on site are naturalizing. The property continues to be landscaped (e.g., flower beds) and maintained (e.g., mowed) and most plant species that have established at the site on their own are common native or non-native species. As such, most of the vegetated areas present do not meet criteria for ecological communities established under the ELC system. Only three (3) communities were identified that approximate vegetation communities: Mixed Woodland (WOM), Dry-Fresh Black Locust Deciduous Forest (FODM4-11), and Open Aquatic (OAO) areas; refer to **Figure 6** for the locations of these communities.

Based on the April 2023 Arborist Report for the site, approximately 2,253 trees exist on site. Of these, approximately 471 are 30 cm in diameter or greater, while the remaining 1,782 are less than 30 cm in diameter. The health condition of trees – ranked as excellent, good, fair, poor, or dead – ≥30 cm diameter on site was predominately good trees (44%) and excellent trees (36%), with some fair (8%), poor (8%), and dead (3%) trees. Of these trees ≥30 cm diameter, the proportion of native and non-native trees on site is 49% native species and 45% non-native species, with 6% undetermined (e.g., dead or otherwise unidentifiable).

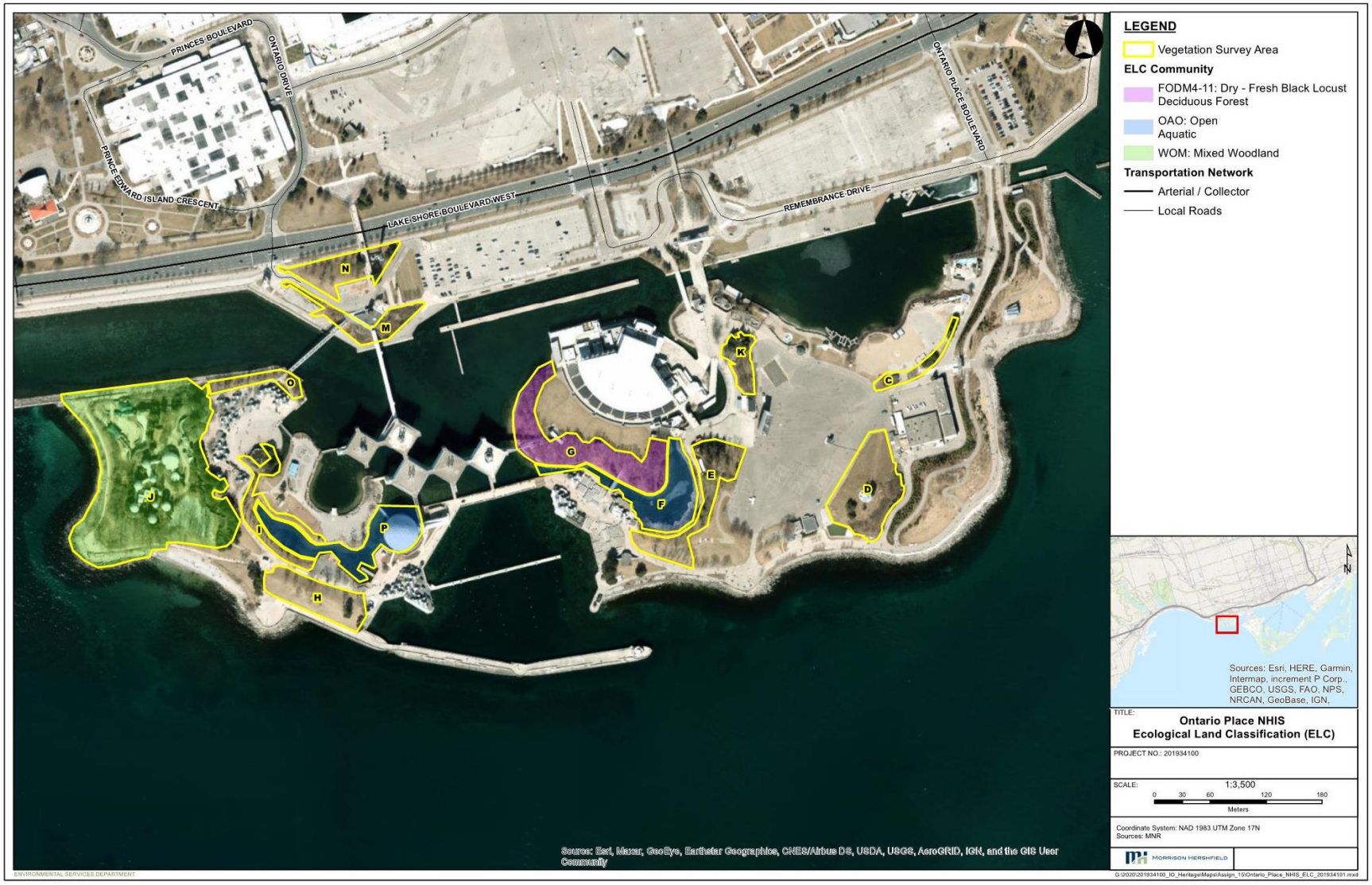

Figure 6: ELC Communities and Vegetation Survey Areas at Ontario Place

Regulated Invasive Plant Species

Invasive plant species recorded on site that are regulated and restricted in Ontario under Invasive Species Act Regulations (O. Reg. 354/16) included Pale Swallowwort (*Cynanchum rossicum*), Common Reed (*Phragmites australis* ssp. *australis*) and Japanese Knotweed (*Reynoutria japonica*). **Figure 7** illustrates the location of these species.

Significance of Vegetation Communities

Neither TRCA nor the province provide ranks for vegetation communities using the 2008 ELC classification system; however, none of the vegetation communities at Ontario Place are provincially or locally rare. Vegetation community classification and ranking by TRCA lists Open Aquatic (OAO) as a community not of concern at this time (L5). The Mixed Woodland (WOM) and Dry-Fresh Black Locust Deciduous Forest (FODM4-11) at Ontario Place are dominated by non-native species and would best fall under TRCA's L+ rank, representing a community of predominately introduced species.

Sensitivity and Significance of Vegetation

During the 2022 field investigations, which included vegetation surveys, ELC, and tree inventories, 202 vascular plants were recorded. Of these, 163 were identified to species. The proportion of native to non-native species was approximately 50% to 50%, with 81 native species and 82 non-native species recorded.

Most (82%) of the native species found on site are considered Secure (S5) in Ontario, while another 14% are considered Apparently Secure (S4). Three (3) species found on site are considered provincially rare (S1-S3) and one (1), Canadian Redbud (*Cercis canadensis*), is ranked SX, meaning it is presumed extirpated. The three provincially rare species include Kentucky Coffee-tree (S3), Honey Locust (*Gleditsia triacanthos*) (S2?), and Ohio Buckeye (*Aesculus glabra*) (S1). Kentucky Coffee-tree, Honey Locust and Ohio Buckeye specimens at Ontario Place are presumed to have been planted and are ranked L+ by TRCA. Canadian Redbud is also presumed to be planted and is not ranked by the TRCA.

Kentucky Coffee-tree (*Gymnocladus dioicus*) is also listed as provincially and federally threatened. Under the ESA, threatened species receive species and habitat protection; however, this protection does not apply to non-native (ornamental) specimens (MNRF, 2022). In Ontario, native stands of Kentucky Coffee-trees are rare and only occur in the southernmost portion of the province including Middlesex, Essex, Kent, and Lambton Counties (Environment Canada, 2014). TRCA classifies this species as non-native to the Toronto region (L+). Outside of its current, native range, this species is widely used as an ornamental tree, especially along roads. While many of these trees are grown from non-native stock that originated outside of the province, some may have been propagated from native stock. As such, the origins of most Kentucky Coffee-trees observed outside of their typical home range is either unknown or very difficult to determine (Environment Canada, 2014). Given the anthropogenic history of the site, it is presumed that all Kentucky Coffee-trees at the site have been planted as ornamental specimens and are not protected under the ESA.

Figure 7: Invasive Species Areas at Ontario Place

Fifteen (15) of the plants observed within the AOI are considered Species of Regional Conservation Concern (L1-L3) by the TRCA. Red Pine (*Pinus resinosa*) is ranked L1 and the other 14 species are ranked L3, and include:

- Sweetflag (*Acorus americanus*)
- Speckled Alder (*Alnus incana* ssp. *rugosa*)
- Waxy-fruited Thorn (*Crataegus pruinose*)
- Common Juniper (Juniperus communis)
- Tamarack (*Larix laricina*)
- Fly Honeysuckle (*Lonicera canadensis*)
- Swamp Candles (*Lysimachia terrestris*)
- Fragrant White Water-lily (*Nymphaea odorata*)
- Ninebark (*Physocarpus opulifolius*)
- White Spruce (*Picea glauca*)
- White Oak (*Quercus alba*)
- Canada Yew (*Taxus canadensis*)
- Slippery Elm (*Ulmus rubra*)
- Maple-leaved Viburnum (*Viburnum acerifolium*)

An additional fifteen (15) plant species observed within the AOI are considered Species of Conservation Concern in Urban Areas (L4) by the TRCA, including:

- Red Maple (*Acer rubrum*)
- Silver Maple (*Acer saccharinum*)
- Freeman's Maple (*Acer* X *freemanii*)
- Smooth Juneberry (*Amelanchier laevis*)
- White Birch (*Betula papyrifera*)
- Common Coontail (*Ceratophyllum demersum*)
- Beaked Hazelnut (*Corylus cornuta*)
- Canada Waterweed (*Elodea canadensis*)
- American Beech (*Fagus grandifolia*)
- Eastern White Pine (*Pinus strobus*),
- Largetooth Aspen (*Populus grandidentata*)
- Bur Oak (*Quercus macrocarpus*)
- Red Oak (*Quercus rubra*)
- Black-eyed Susan (*Rudbeckia hirta*)
- Common Three-square Bulrush (*Schoenoplectus pungens*)

None of the plant species found at Ontario Place require protection under current legislation. Most native species are not naturally occurring, and many are ornamental landscape varieties. Refer to **Appendix C** for a complete list of plant species recorded during the vegetation surveys, including the L-Ranks and S-Ranks of each species. A description of each vegetated area assessed by MH is included below. Areas A, B and L, assessed by Savanta in 2014, are located in Trillium Park and are not applicable to this NHIS.

Area C

Area C consists of several small groupings of planted trees in a row, mainly including Amur Maple (*Acer ginnala*) and Austrian Pine (*Pinus nigra*).

Area D

Area D is a vegetated hill comprised of common, cultural species, such as Manitoba Maple (*Acer negundo*), Tree-of-heaven (*Ailanthus altissima*), Great Burdock (*Arctium lappa*), Canada Thistle (*Cirsium arvense*), Trailing Crown-vetch (*Coronilla varia*), Wild Carrot (*Daucus carota*), Viper's Bugloss (*Echium vulgare*), and Black Locust (*Robinia pseudo-acacia*). A regulated, restricted invasive species, Common Reed is present at the south end; refer to **Figure 7** for the locations where this species was detected.

Area E

Area E is mainly maintained, manicured, and sloped, and adjacent to a walking path. It is least maintained and most heavily treed on the north end. Species primarily include Silver Maple (*Acer saccharinum*), Tree-of-heaven, Red Ash (*Fraxinus pennsylvanica*), Red Oak (*Quercus rubra*) and White Willow (*Salix alba*).

Area F

Area F was classified as an Open Aquatic (OAO) community by MH under ELC. This community contained some submerged and emergent aquatic vegetation, though aquatic vegetation was patchy or concentrated in certain areas - e.g., a few small patches of Sweetflag (*Acorus americanus*) on the shoreline and Curly Pondweed (*Potamogeton crispus*), Canada Waterweed (*Elodea canadensis*), and Common Coontail (*Ceratophyllum demersum*) limited mainly to the deeper portions of the channel. Vegetation surveys focused on species that were observable and identifiable from the shorelines, which included species such as Serviceberry (*Amelanchier* sp.), Red-osier Dogwood (*Cornus stolonifera*), Beaked Hazelnut (*Corylus cornuta*), Spotted Touch-me-not (*Impatiens capensis*), European Water-horehound (*Lycopus europaeus*), and Reed Canary Grass (*Phalaris arundinacea*).

Area G

Area G was classified as a Dry-Fresh Black Locust Deciduous Forest (FODM4-11) community by MH under 2008 ELC. This area is a steeply sloped and treed hill, with a dense, shrub dominated, thicket-like understory, and with very little tree regeneration occurring. Area G was dominated by Black Locust, but also included species common in anthropogenically influenced forests, such as Manitoba Maple, Sugar Maple (*Acer saccharum* ssp*. saccharum*), Garlic Mustard (*Alliaria*

petiolata), European Bellflower (*Campanula rapunculoides*), Bindweed (*Convolvulus* sp.), Red Ash, White Mulberry (*Morus alba*), Virginia Creeper (*Parthenocissus quinquefolia*), and Small-leaved Linden (*Tilia cordata*).

Area H

Area H area is mainly maintained, manicured, and sloped, and adjacent to a walking path. Vegetation species are mainly common and culturally influenced, such as Amur Maple, Common Milkweed (*Asclepias syriaca*), Wild Carrot, Bird's-foot Trefoil (*Lotus corniculatus*), Crabapple (*Malus* sp.), Ribgrass (*Plantago lanceolata*), Red Ash, Silver Maple, and Austrian Pine.

Area I

Area I largely consists of a tree row along a walking path with some shoreline vegetation, and is most densely vegetated at the north end where there are planted, landscaped, trees and shrubs. Vegetation species include Amur Maple, Ox-eye Daisy (*Leucanthemum vulgare*), Bull Thistle (*Cirsium vulgare*), Canada Thistle, Grey Dogwood (*Cornus racemosa*), Red-osier Dogwood, Red Ash, Spotted Touch-me-not, Common Juniper (*Juniperus communis*), Purple Loosestrife (*Lythrum salicaria*), Honeysuckles (*Lonicera spp*.), Common Evening-primrose (*Oenothera biennis*), Reed Canary Grass, Austrian Pine, Staghorn Sumac (*Rhus typhina*), Common Three-square (*Scirpus pungens*), Hooded Skullcap (*Scutellaria galericulata*), Canada Goldenrod (*Solidago canadensis* var. *canadensis*), Purple-stem Aster (*Symphyotrichum puniceum*), Eastern White Cedar (*Thuja occidentalis*), Common Mullein (*Verbascum thapsus*), Cow Vetch (*Vicia cracca*), and White Willow.

Area J

Area J encompasses most of the West Island, and this area was classified as a Mixed Woodland (WOM) community by MH under 2008 ELC. Although the majority of soils and substrates in this area are largely impermeable and/or paved and the area is largely developed, containing several built structures and buildings, which would typically exclude it from ELC as an ecological community, it was determined that in general this area had sufficient tree coverage (>35% and < 60%) and mature enough trees to warrant its acknowledgment as a woodland community. It was further categorized as a Mixed Woodland (WOM) as it has both deciduous and coniferous tree species in proportions greater than 25%. However, it is recognized that this area is severely anthropogenically influenced and mainly non-naturalized, with the possible exception of the shoreline areas, and thus its function as an ecological community is impaired when compared with a naturally occurring woodland.

Area J includes an assortment of woodland, shoreline and cultural (both intentionally planted and accidental/escaped) species, such as Amur Maple, Manitoba Maple, Norway Maple (*Acer platanoides*), Silver Maple, Sugar Maple, Garlic Mustard, Tree-of-heaven, Common Milkweed, White Birch (*Betula papyrifera*), Wych Elm (*Ulmus glabra*), Spotted Knapweed (*Centaurea maculosa*), Canada Thistle, Virgin's Bower (*Clematis virginiana*), Bindweed, Dogwood species (*Cornus sp*.), Staghorn Sumac, White Mulberry, Norway Spruce (*Picea abies*), Austrian Pine, Red Pine (*Pinus resinosa*), Balsam Poplar (*Populus balsamifera* ssp*. balsamifera*), Largetooth Aspen (*Populus grandidentata*), Eastern Cottonwood (*Populus deltoides* ssp. *deltoides*), White Willow,

Crack Willow (*Salix fragilis*), Canada Goldenrod, Common Lilac (*Syringa vulgaris*), European Mountain-ash (*Sorbus aucuparia*), Eastern White Cedar, Canada Yew (*Taxus canadensis*), Siberian Elm (*Ulmus pumila*), Nannyberry (*Viburnum lentago*), and Riverbank Grape (*Vitis riparia*). A regulated, restricted invasive species, Pale Swallowwort is present near the middle of Area J; refer to **Figure** 2 for the location where this species was detected.

Area K

Area K is a small grouping of trees and shrubs in between and adjacent to several buildings. It contains species such as Red Maple (*Acer rubrum*), Austrian Pine, Blue Spruce (*Picea pungens*), Red Oak, Fragrant Sumac (*Rhus aromatica*), Staghorn Sumac, and Choke Cherry (*Prunus virginiana*).

Area M

Area M is a sloped area that appears to have been previously planted as an ornamental shrub garden, though it has not been well maintained. Species in this area included Ninebark (*Physocarpus opulifolius*), Manitoba Maple, Tree-of-heaven, Japanese Barberry (*Berberis thunbergia*), Northern Catalpa (*Catalpa speciosa*), Canada Thistle, Dogwoods, Red Ash, Honeysuckle, Balsam Poplar, Wall Cotoneaster (*Cotoneaster horizontalis*), Siberian Elm, Slippery Elm (*Ulmus rubra*), Wych Elm, and others. Two (2) regulated, restricted invasive species, Japanese Knotweed and Common Reed, are present in the south and west portions of Area M; refer to **Figure** 2 for the location where this species was detected.

Area N

Area N consisted of well spaced, intentionally planted trees, such as Red Maple, White Birch, Austrian Pine, Red Oak, and Elm species (*Ulmus* sp.).

Area O

Area O is a row of large, planted trees along the lakeshore, which are all Siberian Elms. Other common, weed-like species were present such as Chicory (*Cichorium intybus*) and Common Dandelion (*Taraxacum officinale*).

Area P

Area P was classified as an Open Aquatic (OAO) community by MH under 2008 ELC. This community contained some submerged and floating-leaved aquatic vegetation, though aquatic vegetation was patchy or concentrated in certain areas - e.g., an isolated small patch of Fragrant White Water-lily (*Nymphaea odorata*) and Curly Pondweed and Canada Waterweed within the deeper portions of the bay.

4.4 Wildlife and Wildlife Habitat

4.4.1 Avifauna

Numerous targeted surveys were completed to document habitat for both migrating (transient) and breeding (semi-permanent) birds within the AOI. As described in detail in **Section 3.4**,

Landbird Migratory Stopover Area, Waterfowl Stopover and Staging Area (Aquatic), Shorebird Migratory Stopover Area, and Breeding Bird surveys were all undertaken. In addition, nest searches on buildings, bridges, and other structures were also completed, and incidental observations of any bird species not detected during targeted surveys were also recorded.

Over the course of the avian surveys within the AOI, 113 bird species were observed. Of these, three (3) are considered rare in Ontario (S1-S3) at the times of year in which they were observed, including Great Egret (*Ardea alba*), King Eider (*Somateria spectabilis*), and Pied-billed Grebe (*Podilymbus Podiceps*). Under the TRCA ranking system, 30 species recorded are considered Species of Regional Conservation Concern (L2-L3), and another 33 are considered Species of Conservation Concern in Urban Areas; refer to **Appendix D** for the L-Ranks and S-Ranks of all wildlife species observed. In addition, six (6) of the avian species observed are SAR, including Barn Swallow (*Hirundo rustica*), Chimney Swift (*Chaetura pelagica*), Eastern Wood-pewee (*Contopus virens*), Horned Grebe (*Podiceps auritus*), Grasshopper Sparrow (*Ammodramus savannarum*), and Peregrine Falcon (*Falco peregrinus anatum/tundrius*). Of the avian SAR confirmed on site, only one (1) was considered a semi-permanent species and was confirmed breeding in the AOI: Barn Swallow. The other five (5) avian SAR were either observed only during migration (Horned Grebe and Grasshopper Sparrow) or were observed only infrequently and were not confirmed as breeding (Chimney Swift, Eastern Wood-pewee, and Peregrine Falcon); refer to **Section 4.4.6** for detailed discussion of SAR and SAR habitat identified within the AOI and to **Appendix E** for the mapped locations of SAR observations.

In general, only a small proportion of avian species recorded within the AOI were confirmed as breeding (~15%) or were assessed as probably or possibly breeding (~11%). The majority of bird species observed were utilizing the AOI for feeding and foraging during the summer, or for stopover and staging during migration in spring and fall; refer to **Section 4.4.5** for detailed discussion of Significant Wildlife Habitat identified within the AOI.

Eight (8) of the bird species confirmed to be breeding within the AOI were confirmed to be nesting on buildings, bridges, and structures (including birdhouses), including Common Grackle (*Quiscalus quiscula*), European Starling (*Sturnus vulgaris*), House Sparrow (*Passer domesticus*), House Finch (*Haemorhous mexicanus*), Barn Swallow, Cliff Swallow (*Petrochelidon pyrrhonota*), Tree Swallow (*Tachycineta bicolor*), and American Robin (*Turdus migratorius*). Of these, House Finch, Barn Swallow, Cliff Swallow, and American Robin are protected under the MBCA, and Barn Swallow is also protected under the ESA. **Table 2** provides a summary of all nests identified on buildings, bridges, and other structures in the AOI, and **Appendix E** contains figures showing the mapped locations of these nests. As shown in **Table 2**, atypically high numbers of Cliff Swallow nests (>1000 nests on some individual buildings) and Barn Swallow nests (total of 173 nests identified) were observed within the AOI. Although these nesting sites are not considered significant under Significant Wildlife Habitat guidelines, as they are located on human-made structures, they must be acknowledged as likely being significant to these species given the scale of nesting activity observed and given the lack of suitable nesting structures in proximity to suitable foraging and feeding habitat for swallows in the Toronto area.

Table 2: Summary of Survey Areas and Bird Nests Identified on Buildings/Bridges/Structures

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
OPC A1 - East Causeway Gatehouse	B92537	East Island	OPPR	▪ No bird nesting	15
OPC A2 - Maintenance Building	B92579	East Island	OPPR	▪ No bird nesting	16, 17
OPC A3 - Administration Building	B92578	East Island	OPPR	▪ One (1) **non-MBCA** protected House Sparrow nest in door frame/overhang on east side of building	16
OPC B1 – Bridge 1	B1	East Island/Mainland	OPPR	▪ Thirty-one (31) **MBCA** and **ESA** protected Barn Swallow nests on/under bridge on girders/supports	11
Bridge 1A	B1A	East Island/Mainland	Live Nation	▪ One (1) **MBCA** and **ESA** protected Barn Swallow nest on/under bridge on girders/supports ▪ One (1) **MBCA** protected American Robin nest on/under bridge on girders/supports ▪ One (1) **non-MBCA** protected House Sparrow nest on/under bridge on girders/supports	11
Bridge 2	B2	East Island	Live Nation	▪ One (1) **MBCA** protected Eastern Phoebe nest on/under bridge on girders/supports	12
Bridge 2A	B2A	East Island	Live Nation	▪ Two (2) **MBCA** and **ESA** protected Barn Swallow nests on/under bridge on girders/supports	8, 12
Bridge 3	B3	East Island	Live Nation	▪ No bird nesting	8

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
OPC B4 - Bridge 4	B4	East Island	OPPR and Live Nation	▪ One (1) **MBCA** protected Eastern Phoebe nest on/under bridge on girders/supports	9
OPC B5 - Bridge 5	B92575	East Island/West Island	OPPR	▪ Six (6) **MBCA** and **ESA** protected Barn Swallow nests on/under bridge on girders/supports	5, 9
OPC B6 - Bridge 6	B6	Mainland/West Island	Therme	▪ Six (6) **MBCA** and **ESA** protected Barn Swallow nests on/under bridge on girders/supports	2, 4
OPC B7 - Bridge 7	B7	Mainland	OPPR	▪ No bird nesting	4
OPC B8 - Bridge 8	B8	Mainland	OPPR	▪ No bird nesting	11
OPC B9 - Bridge 9	B92573	East Island/West Island	Live Nation and Therme	▪ Nesting area for colony of **MBCA** protected Cliff Swallows; ~500-1000 nests within grooves in underside of bridge	5, 8, 9
OPC B10 - Bridge 10	B92572	Mainland/West Island	OPPR and Therme	▪ Nesting area for colony of **MBCA** protected Cliff Swallows; ~400-500 nests within grooves in underside of bridge ▪ One (1) **MBCA** protected House Finch nest in grooves in underside of bridge ▪ One (1) **non-MBCA** protected House Sparrow nest in grooves in underside of bridge	4, 5
OPC B12 - Bridge 12 (+ Associated Docks)	B12	Mainland	OPPR and Live Nation	▪ No bird nesting	4, 8, 11
OPC B13 - Bridge 13	B13	West Island	Therme	▪ No bird nesting	2

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
Budweiser Stage Footprint (and associated outbuildings)	LN	East Island	Live Nation	▪ Twenty-five (25) **MBCA** and **ESA** protected Barn Swallow nests: five (5) on/under deck (at northwest corner behind stage) on girders/supports, one (1) on/under patio over water (southeast of seating area between Bridges B2A and B3) on girders/supports, one (1) on/under patio (east of stage) on girders/supports, seventeen (17) on/under patio (southeast of stage at south end of Bridge B2) on girders/supports, one (1) on/under unnamed concrete bridge (directly northwest of Bridge B2) ▪ One (1) **MBCA** protected American Robin nest on/under ledge of upper patio (at northeast corner of main building behind stage) ▪ One (1) **MBCA** protected American Robin nest on/under deck (at northwest corner behind stage) on girders/supports ▪ One (1) **non-MBCA** protected Common Grackle nest on/under deck (at northwest corner behind stage) on girders/supports	8, 12
OPC C1 - Cinesphere	B92569	West Island	Adjacent to OPPR and Therme	▪ Three (3) **MBCA** and **ESA** protected Barn Swallow nests on girders/exterior frames of structure, adjacent to support bridges (see SB5 and SB6)	5, 6
OPC - CE1 - Entrance Retail	B92568	East Island	OPPR	▪ No bird nesting	11, 12

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
OPC - CE2 - Entrance Guest Services	B92567	East Island	OPPR and Live Nation	▪ No bird nesting	11, 12
OPC - CE3 - Entrance Office	B92534	Mainland	OPPR	▪ No bird nesting	11
OPC - CE4 - Structure	B92533	Mainland	OPPR	▪ Two (2) **non-MBCA** protected House Sparrow and European Starling nests on/under awning	11
OPC - E1- East Island South Building	B92566	East Island	OPPR	▪ No bird nesting	13
OPC - E2- East Island South Washroom	B92565	East Island	OPPR	▪ No bird nesting	13
OPC - E4 - Entrance Plaza Hut	B92564	East Island	OPPR	▪ One (1) **MBCA** protected American Robin nest on north side of building on girder/support under roof	12
OPC - E5 - Round Hut	B92563	East Island	OPPR	▪ Five (5) **MBCA** and **ESA** protected Barn Swallow nests: two (2) on/under roof over bar (on west and south sides), three (3) on/under peak of roof	12
OPC - E6 - River Walk Washrooms	B92562	East Island	OPPR	▪ No bird nesting	12
OPC - E7 - Entrance Plaza Open Air Bar	B92561	East Island	OPPR	▪ No bird nesting	12
OPC - E8 - Echo Beach Bar	B92560	East Island	OPPR	▪ No bird nesting	16
OPC - MVE1 - East	B92557	East Island	OPPR	▪ Five (5) **MBCA** and **ESA** protected	9

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
Marina Village Building				Barn Swallow nests on building: three (3) on/under deck at southwest corner (where building extends out over water) on girders/supports, two (2) on/under awning on north side of building	
OPC - MVE2 - Marina North Washrooms	B92556	East Island	OPPR	▪ No bird nesting	9
OPC - MVE3 - Marina North East Building	B92555	East Island	OPPR	▪ Ten (10) **MBCA** and **ESA** protected Barn Swallow nests on building: two (2) on/under deck at northeast corner (where building extends out over water) on girders/supports, three (3) directly on window surfaces on north and east sides of building, five (5) on/under roof/deck over doorway at northwest corner of building	9
OPC - MVE4 - Marina East Washrooms	B92554	East Island	OPPR	▪ No bird nesting	9
OPC - MVE5- Marina East Tuck Shop	B92553	East Island	OPPR	▪ No bird nesting	10
OPC - MVE6- Marina East Lighthouse	B92552	East Island	OPPR	▪ No bird nesting	10
OPC - MVW1 - Marina West Washrooms	B92551	West Island	Therme and OPPR	▪ One (1) **MBCA** and **ESA** protected Barn Swallow nest on/under awning on northwest side of building	6
OPC - MVW2 -	B92550	West Island	Therme and	▪ Thirty-four (34) **MBCA** and **ESA**	6

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
West Marina Village Building			OPPR	protected Barn Swallow nests on building: twenty-seven (27) on/under deck on east and south sides (where building extends out over water) on girders/supports, two (2) on/under doorway on east side (furthest north), one (1) on/under doorway on east side (further south), two (2) in/on framing in roof on east side (where roof is exposed/ripped), and two (2) on/under awning located directly northeast of building (at Marina entrance)	
OPC - P1 -5 - Pavilion Pods	B92549 - 1-5	East Island/West Island	Adjacent to OPPR, Therme, and Live Nation	▪ Nesting area for colony of **MBCA** protected Cliff Swallows; ~1000-1500 nests within grooves in underside of buildings ▪ One (1) **MBCA** protected American Robin nest on/under awnings on southeast overhang over doorway on east side of B92449-5, exiting to B9 (B92573)	4, 5, 8, 9
OPC - W1 - Commons North East Building	B92581	West Island	Therme	▪ No bird nesting	2
OPC - W2 - Commons North Building	B92548	West Island	Therme	▪ No bird nesting	2
OPC - W3 - Commons Food Building	B92547	West Island	Therme	▪ One (1) **MBCA** and **ESA** protected Barn Swallow nest on/under awning on southeast side of building ▪ Three (3) **MBCA** protected American	2

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
				Robin nests on/under awnings on southeast side of building	
OPC - W4 - Commons West Building	B92546	West Island	Therme	▪ One (1) **MBCA** and **ESA** protected Barn Swallow nest on/under awning on east side of building	2
OPC - W5 - Waterfall Stage	B92545	West Island	Therme	▪ No bird nesting	2
OPC - W6 - Electrical Sub Station	B92544	West Island	Therme	▪ No bird nesting	2
OPC - W7 - Commons North Washroom	B92543	West Island	Therme	▪ No bird nesting	2
OPC - W8 - Dry Storage Building	B92542	West Island	Therme	▪ No bird nesting	2
OPC - W9 - Commons South Washrooms	B92541	West Island	Therme	▪ No bird nesting	2
OPC - W10 - Ride Maintenance Building	B92540	West Island	Therme	▪ No bird nesting	2
OPC - W11 - Silos Assembly Space	B92539	West Island	Therme	▪ No bird nesting	2, 3
OPC - W12 (1-9) - Interconnected Silos Complex	B92538 - 1-9	West Island	Therme	▪ Two (2) **MBCA** protected American Robin nests on the bridge between B92538-7 and B92538-8 ▪ One (1) **non-MBCA** protected House Sparrow nest under the bridge between B92538-7 and B92538-6	2, 3

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
OPC - WE1 - West Entrance Building	B92580	West Island	Therme	▪ One (1) **MBCA** protected American Robin nest on north side of the building, on top of metal pipe/metal detail over doorway	4
Wilderness Adventure Ride	Wilderness Adventure Ride	West Island	Therme	▪ No bird nesting	2
Driving Shed	W13	West Island	Therme	▪ No bird nesting	2
Temple Bell	TB	West Island	Therme	▪ No bird nesting	3
Dock 1	D1	West Island	Therme	▪ One (1) **MBCA** and **ESA** protected Barn Swallow nest on/under dock on girders/supports	5
Dock 2	D2	West Island	Therme	▪ No bird nesting	6
Dock 3	D3	West Island	OPPR	▪ Five (5) **MBCA** and **ESA** protected Barn Swallow nests on/under Marina dock on girders/supports	6
Breakwater	BW	West Island	OPPR and Therme	▪ Eighteen (18) **MBCA** and **ESA** protected Barn Swallow nests on breakwater: two (2) on/under lookout tower at east end, six (6) in nook on north side (accessible only by water) near middle, ten (10) in nook on north side (accessible only by water) at west end	6, 10
SB1 – Secondary Dock Element 1	SB1	West Island	Therme	▪ Two (2) **MBCA** and **ESA** protected Barn Swallow nests on/under bridge on girders/supports	5
SB2 – Secondary Dock Element 2	SB2	West Island	Therme	▪ No bird nesting	5
SB3 – Secondary	SB3	West Island	OPPR	▪ Two (2) **MBCA** and **ESA** protected	5

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix E Page # (s)
Bridge Element				Barn Swallow nests on/under bridge on girders/supports	
SB4 – Secondary Bridge Element 4	SB4	West Island	OPPR	▪ Three (3) **MBCA** and **ESA** protected Barn Swallow nests on/under bridge on girders/supports	5
SB5 – Secondary Ramp Element 5	SB5	West Island	Therme	▪ No bird nesting on bridge, though one (1) **MBCA** and **ESA** protected Barn Swallow nest located directly under bridge on Cinesphere (see B92569)	5
SB6 – Secondary Ramp Element 6	SB6	West Island	OPPR	▪ No bird nesting on bridge, though two (2) **MBCA** and **ESA** protected Barn Swallow nests located directly under and beside bridge on Cinesphere (see B92569)	5, 6
SB7 – Secondary Tower Ramp Element 7	SB7	West Island	OPPR	▪ Eleven (11) **MBCA** and **ESA** protected Barn Swallow nests on/under bottom level of ramp, under entrance to elevator, within grooves of in underside of structure ▪ One (1) **MBCA** protected House Finch nest on/under ramp within grooves in underside of structure	5

Nests of birds confirmed as breeding at Ontario Place that were not observed on buildings, bridges, or other structures, are mainly discretely located in vegetation within the AOI, such as in densely vegetated shorelines, in trees, shrubs, gardens, clumps of tall grasses, etc. One (1) species confirmed breeding on site, Killdeer, is an exception as they nest in fully exposed areas amongst gravel or small rocks. Therefore, specific locations of nests not occurring on buildings, bridges, or structures are not known, though it is presumed that all of the vegetation within Ontario Place act as nesting areas for breeding birds.

As shown in **Table 2** above many of the buildings, bridges, and other structures within the AOI were confirmed to have nest sites associated with them, as hundreds of bird nests were documented during the nest searches.

It should be noted that buildings and structures that were not identified as providing nesting habitat for migratory birds in 2022, or parts of buildings/structures that have not been directly identified as nesting areas may also become nesting habitat in the future, especially if nesting opportunities become limited elsewhere within the AOI due to other exclusion and/or construction activities.

None of the buildings or structures within the AOI were found to have features that were potentially suitable for Chimney Swift nesting or roosting (i.e., chimneys), though Chimney Swifts were occasionally observed flying and foraging within the AOI (see **Appendix E**). Two (2) buildings within the AOI were identified as being potentially suitable for Common Nighthawk (*Chordeiles minor*) nesting, as they had gravel rooves that mimic this species' natural nesting areas. However, these two (2) buildings were easily viewable and were small enough in size that they were visually inspected frequently during the summer breeding season, and no Common Nighthawks were observed at any time. Furthermore, no Nighthawks were heard anywhere within the AOI during nighttime surveys completed in summer to detect amphibians or bats (refer to **Sections 4.4.2** and **4.4.3**).

4.4.2 Herpetofauna

Numerous targeted surveys were completed to document habitat for herpetofauna within the AOI. As described in detail in **Section 3.4**, Amphibian Breeding, Reptile Hibernaculum and Turtle Wintering Area, and Turtle Nesting Area surveys were all undertaken. In addition, any incidental observations of herpetofauna species not detected during targeted surveys were also recorded.

Over the course of the surveys for herpetofauna within the AOI, four (4) reptile and amphibian species were observed, including American Toad (*Anaxyrus americanus*), Midland Painted Turtle (*Chrysemys picta marginata*), Northern Map Turtle (*Graptemys geographica*), and Red-eared Slider (*Trachemys scripta elegans*). Of these, Painted and Map Turtles are considered Species of Regional Conservation Concern (L2-L3) by the TRCA, and American Toad is considered a Species of Conservation Concern in Urban Areas. Red-eared Slider is a non-native, introduced species; refer to **Appendix D** for the L-Ranks and S-Ranks of all wildlife species observed, as well as descriptions of the observation locations. In addition to being a Species of Regional Conservation Concern, Northern Map Turtle is also a SAR under the ESA; refer to **Section 4.4.6** for detailed discussion of SAR and SAR habitat identified within the AOI and to **Appendix E** for the mapped locations of SAR.

Aside from American Toad, which was identified calling during Amphibian Breeding surveys and was therefore likely to be breeding, no herpetofauna breeding or nesting activity was observed within the AOI. Based on the times of year that turtles were observed, it is expected that turtles utilize Vegetation Survey Area F within the AOI for both basking and feeding habitat in summer, as well as for wintering areas during brumation; refer to **Section 4.4.5** for detailed discussion of Significant Wildlife Habitat identified within the AOI.

4.4.3 Mammals

No SAR mammals were recorded in the AOI at any time during the surveys undertaken by MH in 2022; refer to **Section 4.4.6** for detailed discussion of SAR and SAR habitat identified within the AOI.

Not including bats, seven (7) mammals were directly observed on site over the course of the field surveys, including American Mink (*Mustela vison*), Beaver (*Castor canadensis*), Eastern Cottontail (*Sylvilagus floridanus*), Eastern Grey Squirrel (*Sciurus carolinensis*), Raccoon, Red Squirrel (*Tamiasciurus hudsonicus*), Striped Skunk, and an unidentifiable species of vole (*Microtus* sp.). Evidence of Red Fox (*Vulpes vulpes*) was also observed. All of these species aside from Raccoon and Striped Skunk are ranked as Species of Conservation Concern in Urban Areas (L4) by the TRCA.

The results of the targeted surveys completed to identify potential bat habitat on site concluded that a total of 33 potential maternity roost trees for SAR bats were present on site. Of these 30 potential roost trees, 1 was ranked as Very Good quality, 7 were ranked as Good, 23 were Moderate, 2 were Poor, and 0 were Very Poor.

Multiple call sequences identified by the software(s) and manually confirmed as being bats were obtained at several monitoring locations. Eastern Red Bat (*Lasiurus borealis*), Hoary Bats (*Lasiurus cinereus*), Big-brown Bats (*Eptesicus fuscus*) and/or Silver-haired Bats (*Lasionycteris noctivagans*) were all recorded within the AOI. Since Big-brown Bats and Silver-haired Bats both create similar call sequence patterns and use similar frequency ranges, it is difficult to differentiate between these species with high levels of certainty using the auto identification software, or manually. Therefore, based on the recordings obtained it can only be concluded with certainty that Hoary Bats and Eastern Red Bats were present on site along with at least one (1) other species of bat (Big-brown or Silver-haired Bats), or possibly two (2) other species (Big-brown and Silver-haired Bats). Within acoustic monitoring area #'s 11 and 12, Silver-haired and/or Big-brown, Hoary, and Eastern Red Bats were detected during the monitoring period. Within acoustic monitoring area #'s 3 5, and 7 Hoary Bat was detected, with Silver-haired and/or Big-brown Bat also being detected at #3. The bat species detected were generally not directly observed during acoustic surveys. However, based on the extent and frequency of the observations it can be concluded that these species are likely to be utilizing maternity roost trees within the AOI as rearing and roosting habitat as well as using the AOI for feeding and foraging. None of the bat species detected during the acoustic surveys are SAR. However, Big-brown Bat is ranked as a Species of Conservation Concern in Urban Areas (L4) by the TRCA, and all bats detected receive protection of individuals under the FWCA.

4.4.4 Invertebrates

During the field surveys four (4) species of invertebrates were observed, including Bald-faced Wasp (*Dolichovespula maculata*), Cabbage White (*Pieris rapae*), European Honey Bee (*Apis mellifera*), and Monarch (*Danaus plexippus*). Cicadas (Family Cicadidae), as well as Crickets Grasshoppers and Katydids (Order Orthoptera) were also observed. All these insects are relatively common regionally and provincially, aside from Monarch, which is a SAR under the ESA. Monarchs were observed at several locations within the AOI over the course of the field surveys; refer to **Section 4.4.6** for a detailed discussion of SAR and SAR habitat identified within the AOI and to **Appendix E** for the mapped locations of SAR.

4.4.5 Significant Wildlife Habitat

The field surveys conducted by MH in 2022 were planned in order to identify all potential Significant Wildlife Habitat (SWH) occurring at Ontario Place as described within *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015). There are four (4) broad categories of SWH: seasonal concentration areas of animals, rare vegetation communities or specialized habitat for wildlife, habitat for species of conservation concern (not including endangered or threatened species), and animal movement corridors. Within each of these categories are more specific types of wildlife habitat. In total, four (4) distinct Significant Wildlife Habitat types were identified within the AOI, and all others were absent, or did not meet the threshold to be considered significant. **Appendix F** provides details on all criteria used to determine Significant Wildlife Habitat and provides a complete list of all Significant Wildlife Habitat types that were either confirmed or eliminated as being present.

Seasonal Concentration Areas of Animals

Bat Maternity Colonies are woodlands or forest stands, typically containing more than 10 large diameter (>25cm dbh) maternity roost trees per hectare, where more than 10 Big Brown Bats or more than five (5) adult, female, Silver-haired Bats have been confirmed. Abundance estimates cannot be made through acoustic monitoring and individuals cannot be counted; however, as these species were detected during the acoustic monitoring surveys in the vicinity of numerous maternity roost trees, Vegetation Survey Areas J and G are considered Candidate Bat Maternity Colonies.

Turtle Wintering Areas are locations where five (5) or more over-wintering Midland Painted Turtles, or one (1) or more Northern Map Turtles or Snapping Turtles (*Chelydra serpentina*) are detected over-wintering within a wetland. As at least one (1) Northern Map Turtle was observed in Vegetation Survey Area F in early spring after ice-out, and in early fall approaching ice-on, this area is considered a Confirmed Turtle Wintering Area.

Landbird Migratory Stopover Areas are those that are used by more than 200 migratory songbirds and/or migrant raptors per day, with more than 35 species detected in total and with at least 10 species recorded on at least five (5) different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. As more than 200 migratory songbirds and/or migrant raptors were detected on at least one (1) day, more than 35 species

were detected in total, and at least 10 species were recorded on at least five (5) different survey dates, the entire AOI is considered a Confirmed Landbird Migratory Stopover Area.

Rare Vegetation Communities or Specialized Habitat for Wildlife

Based on the criteria for Ecoregion 7E, there are no Rare Vegetation Communities or Specialized Habitat for Wildlife at Ontario Place.

Habitats of Species of Conservation Concern

Special Concern and Rare Wildlife Species include those that are listed as Special Concern under the ESA or are provincially rare (S1-S3, SH). Several Special Concern (SC) and provincially rare (PR) wildlife species were detected over the course of the field surveys, including Great Egret (PR), King Eider (PR), and Pied-billed Grebe (PR), Eastern Wood-pewee (SC), Horned Grebe (SC), Monarch (SC), Peregrine Falcon (SC), Grasshopper Sparrow (SC), and Northern Map Turtle (SC). Therefore, the AOI provides confirmed habitat for Special Concern and Rare Wildlife Species. Refer to **Appendix E** for the mapped locations of SAR, including Special Concern Species. Great Egret and Pied-billed Grebe were both observed within Waterfowl Stopover Survey Area #1, and King Eider was observed within Waterfowl Stopover Survey Area #6.

In addition to wildlife, several provincially rare plants were also recorded in the AOI, including Kentucky Coffee-tree (S3), Honey Locust (S2?), and Ohio Buckeye (S1). However, all individuals of these species at Ontario Place are presumed to have been planted.

Animal Movement Corridors

Based on the criteria for Ecoregion 7E, there are no Animal Movement Corridors at Ontario Place.

4.4.6 Wildlife Species at Risk

Prior to undertaking field investigations, a review of all available background information on the site pertaining to SAR was completed. Although additional SAR have been recorded previously within 1-10 km of the study area according to the NHIC, OBBA, ORAA, and OBA, these species were either not detected during targeted surveys in completed 2022 (or in previous surveys completed by MH in 2020 and 2021) or their habitat is absent from Ontario Place. The only exception is Snapping Turtle (Special Concern under ESA), which may have potential habitat within the AOI in the same locations as Map Turtles but may not have been detectable during the extensive surveys completed by MH given the discrete, often submerged lifestyle, and highly camouflaged nature of this species; invasive surveys requiring permits for handling and trapping are required in some habitats to detect Snapping Turtles with certainty. A summary of SAR species recorded within 1-10 km of the study area, as determined during the background review, can be found in **Appendix G**. This summary provides an evaluation of habitat requirements for each species, as well as a discussion of suitable habitat within the AOI, if applicable.

Based on the field program undertaken by MH in 2022, the following terrestrial SAR were confirmed on site, refer to **Appendix E** for the mapped locations of these observations:

- Barn Swallows (Threatened under ESA and SARA) were identified nesting on numerous structures, buildings, and bridges, and in large numbers (refer to **Table 2**).
- Chimney Swifts (Threatened under ESA and SARA) were observed foraging within the AOI.
- Northern Map Turtle (Special Concern under ESA and SARA) was confirmed overwintering and basking within Vegetation Survey Area F, an Open Aquatic (OAO) community.
- Monarch Butterflies (Special Concern under ESA and SARA) were observed nectaring within several vegetated areas.
- Eastern Wood-pewee (Special Concern under ESA and SARA) was observed on the West Island within Vegetation Survey Area J, a Mixed Woodland (WOM) community, during the breeding season, but was not confirmed as breeding.
- Horned Grebe (Special Concern under ESA and SARA) was observed in open water areas during migration.
- Grasshopper Sparrow (Special Concern under ESA) was observed temporarily, feeding and foraging during migration.
- Peregrine Falcon (Special Concern under ESA) was observed flying through/over the site.
- Snapping Turtle (Special Concern under ESA) was not observed, though this species is difficult to detect and may possibly be present in the same locations as Northern Map Turtles.

As the above noted SAR have been identified on site, specific mitigation and avoidance measures for these species are required. As noted previously in **Sections 2.2.3** and **2.3.2**, the species listed under the ESA and SARA, as well as species statuses and protections are subject to change. For example, currently Barn Swallow and Peregrine Falcon are under consideration for status changes by COSSEWIC federally, under SARA (Barn Swallow from Threatened to Special Concern and Peregrine Falcon from Special Concern to Not at Risk). Therefore, these species may also be re-evaluated by COSSARO and re-listed under the ESA in the future as well.

4.5 Fish and Fish Habitat

Based on background data review as well as 2020 and 2021 field investigations, fish habitat at the site is largely characterized by the effects of anthropogenic alteration. Existing habitat has been altered extensively throughout the site over decades of changes to the surrounding lake and land use since Ontario Place was originally constructed and opened in 1971. The shoreline and open water habitat areas described below can be found mapped in **Figure 8**.

The fish habitat present along the shoreline of the Ontario Place study area is resultant of historical lake infill and stabilization efforts but has since been compromised by erosion and other fluvial influences. For example, the *Existing Shoreline Conditions Report (Shoreplan, 2022)* outlines shoreline stability and instability across Ontario Place and indicates that several shoreline areas are damaged or eroded with undermining or collapse present and/or deteriorated beyond their functional lifespan with no design life or functional life remaining. Further, the existing shoreline protection around the perimeter of West Island lakefill is beyond its original 50-year

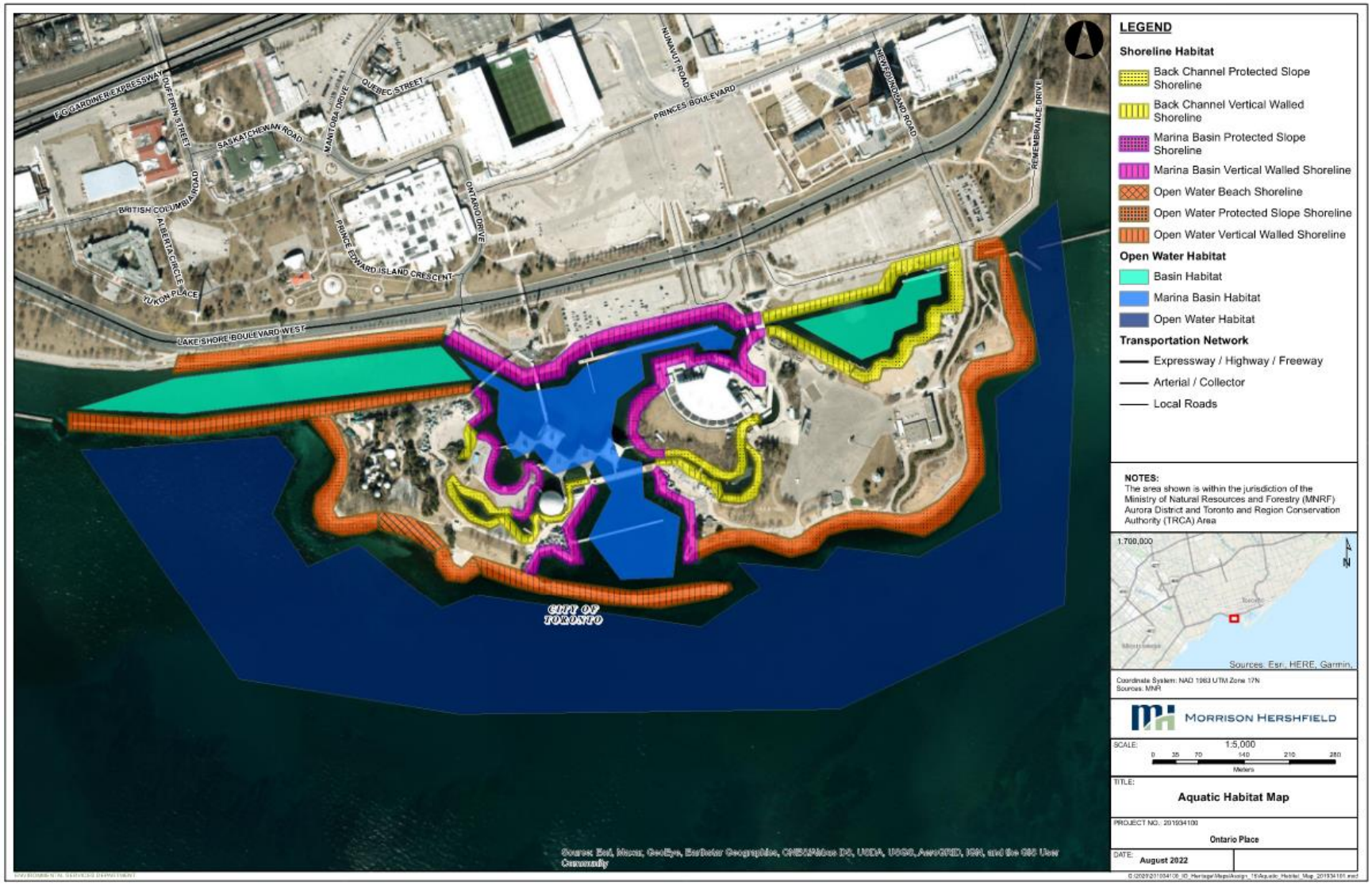

Figure 8: Shore and Open Water Habitat Characterization Map

design life; it is deteriorated and in need of replacement/rehabilitation (Baird, 2022; **Appendix H**). Over the past 200 years, the pressures of colonization, port expansion, industry, transportation, and recreation changed the Toronto waterfront almost beyond recognition. With these changes came serious environmental degradation, to the extent that in 1987, the Toronto waterfront was included on the International Joint Commission's list of 42 Areas of Concern for the Great Lakes (WRT, 2001).

Despite the altered conditions, the aquatic habitat found on site within the Ontario Place Study Area supports resident and migratory fish species within Lake Ontario during a range of their life cycles. During field investigations conducted in 2020 and 2021, the nearshore and offshore adjacent habitat was observed to vary only marginally in form and function and is generally summarized to provide cover, nutrient input, foraging opportunities as well as nursery areas and may have the potential to support spawning for warmwater species such as Pumpkinseed (*Lepomis gibbosus*) and Northern Pike (*Esox lucius*).

The fish species that have been recorded within the Ontario Place AOI through multiple background sources are found below in **Table 3**. The NHIC database was reviewed and only one species was documented in the Area of Interest, the American Eel.

Table 3: Ontario Place Fish Species Pre-Survey Data Search Results

Fish Species	TRCA Waterfront Electrofishing 2002-2017	LIO (Lake Ontario)	Fish ON-Line
Alewife	X	X	
American Eel	X		
Atlantic Salmon		X	
Black Crappie		X	X
Blacknose Dace		X	
Bluegill	X	X	X
Bluntnose Minnow	X	X	
Bowfin	X	X	X
Brook Stickleback	X	X	
Brook Trout		X	X
Brown Bullhead	X	X	X
Brown Trout	X	X	X
Central Mudminnow		X	
Central Stoneroller		X	
Channel Catfish		X	X
Chinook Salmon		X	

Fish Species	TRCA Waterfront Electrofishing 2002-2017	LIO (Lake Ontario)	Fish ON-Line
Coho Salmon		X	X
Common Carp	X	X	X
Creek Chub		X	
Common Shiner	X	X	
Emerald Shiner	X	X	
Fathead Minnow		X	
Freshwater Drum	X	X	X
Gizzard Shad	X	X	
Golden Shiner	X	X	
Goldfish	X	X	
Green Sunfish	X		
Johnny Darter		X	
Lake Chub		X	
Lake Trout		X	X
Lake Whitefish		X	X
Largemouth Bass	X	X	X
Logperch		X	
Longnose Dace		X	
Longnose Gar		X	
Longnose Sucker		X	
Mottled Sculpin		X	
Muskellunge		X	X
Northern Pike	X	X	X
Pumpkinseed	X	X	X
Rainbow Smelt		X	X
Rainbow Trout	X	X	X
River Chub		X	
Rock Bass	X	X	X
Round Goby	X	X	
Round Whitefish		X	X

Fish Species	TRCA Waterfront Electrofishing 2002-2017	LIO (Lake Ontario)	Fish ON-Line
Sea Lamprey		X	
Shorthead Redhorse		X	
Slimy Sculpin		X	
Smallmouth Bass	X	X	X
Spotfin Shiner		X	
Spottail Shiner		X	
Tessellated Darter		X	
Threespine Stickleback	X	X	
Trout-Perch		X	
Walleye	X	X	X
White Bass		X	X
White Perch		X	X
White Sucker	X	X	X
Yellow Perch	X	X	X

Shoreline Habitat

Nearshore habitat and water quality parameters are likely to be compromised under existing conditions through a number of anthropogenic influences including combined storm sewer inlets, which during overflow events, introduce abundant phosphorus into the basin habitats which further accelerates algal growth which was observed to be dominant in the interior basin and embayments. Aquatic vegetation, where present may act as a buffer to moderate the impact of the algal blooms' effect on water quality parameters.

Aquatic habitat in and around Ontario Place is characterized by the following features shown in **Figure 8**:

Open Water Beach Shoreline

This habitat community is defined by the gravel beach habitat that is adjacent to the open waters of Lake Ontario. The water depth is shallow along the beach shoreline and increases with distance from the shore.

Open Water Vertical Walled Shoreline

This habitat community is defined by banks that are composed of vertical wall of either concrete, steel pilings, or wood pilings. These banks do not provide habitat for fish through refuge spaces, collection of nutrients, or spawning locations. This shoreline habitat is adjacent to the open waters

of Lake Ontario. The water depth is approximately 6-8 m at the shoreline and increases with distance from the shore.

Open Water Protected Sloped Shoreline

This habitat community is defined by banks that are comprised of boulder, rip-rap, or armour stone. These banks provide moderate habitat for fish through refuge spaces, nutrient collection, or potential spawning locations. This shoreline habitat is adjacent to the open waters of Lake Ontario and is suitable to function as refuge habitat for the American Eel. The water depth is approximately 2 to 4 m at the shoreline, increasing with distance from the shore.

Marina Basin Vertical Walled Shoreline

This habitat community is defined by banks that are composed of vertical wall of either concrete, steel pilings, or wood pilings. These banks do not provide habitat for fish through refuge spaces, collection of nutrients, or spawning locations. This shoreline habitat is adjacent to or within the marina basin, where recreational use and docking of boats occurs seasonally. Water depths are generally deeper than sloped shoreline habitat communities, yet the average water depths are shallower than the open water lake habitat.

Marina Basin Protected Sloped Shoreline

This habitat community is defined by banks that are comprised of boulder, rip-rap, or armour stone. These banks provide moderate habitat for fish through refuge spaces, nutrient collection, or potential spawning locations. This shoreline habitat is adjacent to the marina basin, where recreational use and docking of boats occurs seasonally, and the average water depths are shallower than the open water lake habitat.

Back Channel Vertical Walled Shoreline

This habitat community is defined by banks that are composed of vertical wall of either concrete, steel pilings, or wood pilings. These banks do not provide habitat for fish through refuge spaces, collection of nutrients, or spawning locations. This shoreline habitat is adjacent to back channel habitat within Ontario Place, which is defined by shallow slow moving water generally confined to narrower banks and more protected from wind and wave action. Soft substrates such as muck, silt, sand, and detritus.

Back Channel Protected Sloped Shoreline

This habitat community is defined by banks that are composed of boulder, rip-rap, or armour stone. These banks provide moderate habitat for fish through refuge spaces, nutrient collection, or potential spawning locations. This shoreline habitat is adjacent to back channel habitat within Ontario Place, which is defined by shallow slow moving water and soft substrates such as muck, silt, sand, and detritus.

Open Water Habitat

Open water habitats were also assessed during field investigations. Variance in habitat conditions were observed to be present in these areas which occur away from shoreline habitat and based

on characteristics such as water depth, open water area, and recreational use, the open water habitat areas within and surrounding the Ontario Place property have been categorized into three (3) habitat communities, including:

Basin Habitat

Basin habitat is defined as open water areas within the Ontario Place property that are not subject to the significant wind and wave action present in open Lake Ontario due to protection provided by break walls or by Ontario Place itself. The estimation of average depth within basin habitat it 4 m.

Marina Basin Habitat

Marina Basin habitat is defined as open water areas within the Ontario Place property that like Basin Habitat, are not subject to the significant wind and wave action of Lake Ontario due to protection provided by break walls or by Ontario Place itself. Additionally, this habitat has a higher level of boat traffic, mooring and boat refueling activities expected due to the presence of the Marina. Deeper depths, with an average of 6 m, sufficient for navigation are also anticipated throughout this habitat component.

Open Water Habitat

Open Water Habitat is habitat surrounding Ontario Place that is a part of the larger Lake Ontario habitat system and is not protected by any landforms from significant wind and wave action which occurs naturally. Bottom substrates within this habitat are dominated by sand. Water depth increases with the distance from shore.

Open Water Habitat

Open water transects surveys were planned at eighteen (18) locations surrounding The Ontario Place property. Habitat conditions, temperature and water depth data surveys for seventeen (17) of these transects were conducted with use of underwater drone videography; conditions during data collection at Transect 10 did not allow for safe operation of the underwater drone due to undertow. Data captured can be found below in **Table 4**.

Table 4: Open Water Transect Survey Data Results

Transect	Water Temperature at Start (°C)	Depth at Start (m)	Water Temperature at Middle (°C)	Depth at Middle (m)	Water Temperature at End (°C)	Depth at End (m)
LO1	13	4	11	4.5	11	4.6
LO2	12	4.5	11	5.1	11	5.3
LO3	11	5.9	11	6.5	10	6.6
LO4	11	6.2	11	6.3	11	8
LO5	12	5	11	7	10	7.1

LO6	12	6.3	12	6.4	12	6.8
LO7	12	7.8	11	8.3	10	8.8
LO8	11	8	11	8.6	10	8.6
LO9	11	8.2	11	8.1	11	8.3
LO10	N/A	N/A	N/A	N/A	N/A	N/A
LO11	12	2.2	11	5.8	11	6.6
LO12	11	4.6	10	7	10	6.8
LO13	11	4.4	11	4.8	11	4.6
LO14	11	2.1	12	1.5	11	1.4
LO15	12	3.6	12	3.9	12	4.1
LO16	12	3.8	12	3.8	12	4.3
LO17	13	3.4	13	3.8	13	1.6
LO18	13	3..7	13	3.9	13	3.3

Vegetation

Aquatic vegetation provides essential fish habitat opportunities as it creates and supports important life cycles for a variety of species of fish. Aquatic vegetation provides refuge and is utilized by many species as nursery habitat for juvenile fish, cover for smaller species of fish and invertebrates but also enables ambush points for predators and is an important feature in predator prey interaction. The aquatic vegetation also contributes to the overall concentration of dissolved oxygen within a system which can be a limiting factor for species where low dissolved oxygen concentrations are present. Aquatic vegetation was present in 10 of the 22 shoreline aquatic habitat survey locations within the shoreline habitat assessments.

The aquatic vegetation observed at these locations was submerged, and there was no evidence of emergent or floating aquatic vegetation at any of the sampling locations. The observed vegetation was identified as Curly-leafed Pondweed (*Potamogeton crispus*), Elodea (*Elodea* spp.) and *Potamogetan* spp. Curly-leafed pondweed has been identified as a non-native species and was observed in several locations throughout the property. All sites where aquatic vegetation was observed to be present were within Marina Basin or Back Channel habitats, where vegetative growth may thrive in softer, unconsolidated substrates. These finer substrates are more likely to accumulate in these areas due the protected nature of the confined habitats as they are less subject to wind and wave action as otherwise present in the open water habitat component of Lake Ontario. Algae was present and abundant at all sampling locations within the Marina and Back Channel habitats, including growth on top of the submerged aquatic vegetation observed.

Nearshore Sediment

Sediment sampling was completed at all shoreline sampling locations to visually document the physical characteristics of substrates and was completed with the use of a Ponar Grab Sampler. Physical characteristics of the substrates varied in proportion between each sampling location,

however muck, silt, sand, and large material such as boulder and rip-rap were the dominant substrates collected or noted throughout the Ontario Place Study Area. It is also worth noting that Zebra mussels (*Dreissena polymorpha*) and their shells were considered abundant throughout the Ontario Place Study Area and were often included in the sediment samples.

4.5.1 Fish Species at Risk

A review of the provincial and federal Species at Risk (SAR) databases indicated that there are three (3) protected species that have been identified within proximity to the Ontario Place Study Area; American Eel (*Anguilla rostrata*), Shortnose Cisco (*Coregonus reighardi*) and Deepwater Sculpin *(Myoxocephalus thompsonii)*.

American Eel is listed as threatened by COSEWIC, however not afforded protection by the Species at Risk Act (SARA) as it is not listed on Schedule 1. It is listed as Endangered and afforded protection under the provincial ESA. The species has recently been recorded within the Ontario Place Study Area by TRCA waterfront sampling where two occurrences of American Eel capture were recorded in 2013 and in 2016 within the Ontario Place Pavilions. Suitable American Eel Habitat within the Ontario Place Study Area is mapped in **Figure 9**.

Shortnose Cisco is listed as Endangered under SARA and the ESA and is afforded protection under each Act. The Species at Risk (SAR) aquatic SAR database mapping provided by DFO illustrates the presence of Shortnose Cisco in Lake Ontario, however due to the deep nature of the preferred habitat, it is not found within the study area. The provincial Recovery Strategy for the species indicates that the area for consideration in developing a habitat regulation for the species could include depths of 22 m to 92 m in Lake Ontario in areas where its primary prey, Opossum Shrimp (*Mysis diluviana*) and a small bottom-dwelling invertebrate, *Diporeia* sp., occur. Spawning is documented to occur predominantly at depths of 73 m in Lake Ontario (*Shortnose Cisco Ontario Recovery Strategy Series, 2018*).

Deepwater Sculpin is listed as Special Concern under SARA and is considered not at risk by SARO. The Species at Risk (SAR) aquatic SAR database mapping provided by DFO illustrates the presence of Deepwater Sculpin in Lake Ontario, however due to the deep nature of the preferred habitat, the mapping does not include the Ontario Place Study Area as it exists further from the Lake Ontario shoreline where the depths increase. This species is considered to occupy Lake Ontario at depths of 60 m to 150 m and prefer temperatures less than 7ºC (DFO, 2017). Spawning migrations and habitat requirements for spawning are largely unknown (*Deepwater Sculpin Management Plan, 2017).* Due to these habitat constraints and requirements for deep water, Deepwater Sculpin are not expected to be present within the Ontario Place Study Area.

Figure 9: Fish Species at Risk Map Based on Field Observation

4.6 Assessment of Significance and Sensitivity

4.6.1 Significant Habitat of Endangered and Threatened Species

Barn Swallow and Chimney Swift were identified on site, both of which are listed as Threatened and receive protection of habitat and individuals under the ESA (2007). However, Chimney Swifts were only observed over/above the site feeding and foraging, and no roosting, nesting, or categorized or critical habitat is present on site for this species. A large number of Barn Swallow nests were found on numerous structures, buildings, and bridges, within the AOI, therefore breeding and rearing habitat for this species is present. In Ontario, habitat for Barn Swallows is categorized as follows:

- Category 1: The Barn Swallow nest.
- Category 2: The area within 5 m of the nest.
- Category 3: The area between 5 m and 200 m of the nest.

Barn Swallow are intolerant to activities occurring within Category 1 habitat and are most tolerant to activities occurring in Category 3 habitat (though this is dependent on the level of disturbance associated with the activities). In total, 173 nests providing Category 1 habitat for Barn Swallows were identified within the AOI, thus Category 1, 2, and 3 habitat is present. As protected habitat for Barn Swallows is confirmed on site and is located within the proposed project footprint, actions for this species under the ESA are required in advance of the project proceeding (refer to **Section 6.2.3**).

Lake Ontario within the Ontario Place Study Area directly supports fish and fish habitat, including potentially sensitive habitat for the Endangered American Eel and is afforded protection under the provincial ESA. The species has been recorded within the Ontario Place Study Area by TRCA waterfront sampling where a single American Eel was recorded in 2013 and in 2016 within the Ontario Place Pavilions. The Eels use of Lake Ontario is widespread over a diverse range of habitat conditions, however sensitive spawning habitat is not found within Lake Ontario. Within the property of Ontario Place, Lake Ontario provides generic coarse rock substrate along much of the shoreline adjacent to the open water of Lake Ontario which may function as significant habitat for American Eel.

Within Lake Ontario, large coarse rock located in water depths greater than 1 m is suitable habitat for the American Eel as it provides refuge for the species as cover is provided within the interstitial spacing of the rock. The coarse rock is present in substrate and along much of the shoreline adjacent to the open water of Lake Ontario. This form of suitable habitat for the Eel was identified to be present at Ontario Place during environmental field assessments and occurs along the southern shoreline of the property; specifically, within the Therme and OPPR developments. The location of American Eel coarse rock habitat (See **Figure 9**) coincides with proposed alteration of existing shoreline conditions at each of the Therme and OPPR proposed development sites and activities may trigger the provincial Endangered Species Act.

During field assessment, large coarse rock habitat suitable for American Eel was identified to occur in greatest abundance within shoreline habitat monitoring locations EIS-1, EIS-2. EIS-3, and WIS-2. These habitat monitoring locations identified banks that are comprised of boulder, rip-rap, or armour stone adjacent to depths greater than 1 m. These banks provide moderate habitat for American Eel through provision of refuge spaces and is adjacent to the open waters of Lake Ontario and as such are suitable to function as refuge habitat for the American Eel.

Within the protected basins of the inner harbour, shallow waters with soft, unconsolidated fine substrates are present but have undergone anthropogenic alterations over decades of changes in surrounding land and water usage. While these substrates may be suitable for use as over wintering habitat for the Eel, due to the anthropogenic alterations which have occurred in this habitat, the fine substrates are not perceived as significant. The documented presence of the American Eel indicates its specific usage of the aquatic habitat within the Ontario Place Study Area during spring/summer seasons. The species and the specific habitat which it prefers are present on site and these habitat features should be protected and preserved, where possible.

4.6.2 Significant Wetlands and Significant Coastal Wetlands

There are no PSWs or significant coastal wetlands on or within 120 m of Ontario Place.

4.6.3 Significant Woodlands

There are no significant woodlands on or within 120 m of Ontario Place.

4.6.4 Significant Valleylands

There are no significant valleylands on or within 120 m of Ontario Place.

4.6.5 Significant Wildlife Habitat

As discussed in **Section 4.4.5**, the following types of Significant Wildlife Habitat were identified on site: Candidate Bat Maternity Colonies, Confirmed Turtle Wintering Areas, Confirmed Landbird Migratory Stopover Areas, and Confirmed Special Concern and Rare Wildlife Species.

4.6.6 Significant Areas of Natural and Scientific Interest

There are no ANSIs at or within 120 m of Ontario Place.

5. PROPOSED REDEVELOPMENT

As described in **Section 1**, redevelopment will be realized in phases, with the site-wide Ontario Place OPPR being delivered first alongside the Therme facility and associated parking, loading and drop-off structure. Expansions to the Live Nation Concert Venue and the Science Pavilion will follow. This section provides a summary of the proposed plans for the OPPR and Therme facility to date.

5.1 Ontario Place Public Realm

The redevelopment for OPPR draws from the design and implementation strategies of Trillium Park. Trillium Park is on the east side of Ontario Place and is a nature park – a gateway to experiencing native Ontario landscapes right on the shoreline of Toronto. The OPPR project is grounded in preserving and enhancing the natural landscape at Ontario Place by creating a forest park. The design seeks to implement a forest through the OPPR land and then pull back that forest through implementing recreation, gathering spaces, event spaces, and tourism destinations. A forest was chosen not just because of Trillium Park's success, but also because Ontario Place is located within a significant bird migration zone. This forest approach is being deployed on the majority of the East Island, in replacement of the existing IO Administration and Maintenance Buildings (B92579 and B92578), surrounding Brigantine Cove (the east bay within Waterfowl Stopover Survey Area #1), and around the area that will become the future 'Forum' and event spaces (i.e., the large, pavement area currently bordered by Vegetation Survey Areas C, D, E, and K). When creating the atmosphere and feeling of these naturalized spaces, planting plays a significant role not only for the aesthetic, but also for the representation of Ontario native species. Planting of native grasses, shrubs and multi-stem trees creates a dense and diverse habitat within the landscape that provides habitat for plants and animals at Ontario Place.

Brigantine Cove is a prime opportunity to create aquatic habitat and a naturalized shoreline edge. By integrating a variety of aquatic plants, this area could create a variety of wetland conditions which would help establish ecosystems where diverse aquatic species can thrive. Letting nature create its planting palette is one of the strategies taken from Trillium Park as well as Tommy Thompson Park; this is referred to as conservation by design because it allows nature to take its course through the land. This also allows the landscape to be resilient through times of flooding, drought, heat, and cold. The strategy for Brigantine Cove is to create a network of forested and wetland spaces to improve water quality, manage occasional flooding and to create an immersive landscape experience for visitors. To improve water quality within Brigantine Cove, rebuilding the causeway at the East Gateway into a bridge is being proposed. This new bridge is seen as an opportunity to create additional water flow into Brigantine Cove and to repair a portion of the cove that currently sees stagnant water and debris build up. This implementation would also allow for kayaks to move into Brigantine Cove from east of Trillium Park, creating a watercraft connection that could be integral to water-based tourism and recreation.

The mainland provides immense opportunities for increasing plantings within the OPPR as well as removing impervious surfaces and increasing wildlife habitat. By streamlining vehicle circulation and concentrating pick up and drop off locations the design intends to create new green space by removing existing streets and parking. A series of planted bosques, rain gardens and

planting beds are seen as enhancement strategies to improve the waterfront edge of the mainland. A denser tree canopy along Lakeshore Boulevard is seen as a method to create more shade for cyclists, but to also cool down the trail and provide additional habitat for birds, mammals, and insects. All areas that are paved have been proposed to be implemented with permeable pavers to allow water infiltration, as well as to reduce runoff from these areas.

Along the shorelines, grades of the area must be raised to prevent flooding and protect from storm surge. Between Trillium Park and the marina, there are several existing mature trees that the OPPR design team aims to retain if they remain in a healthy condition. The goal for grading is to gradually raise the site, which should allow for protection of some of the existing trees that date back to the original landscape designed by Michael Hough. The goal for the south shore area of the East Island is to create a stepped stone terrace down to the water, giving people access to the area and protecting them in inclement weather. Creating new planting areas along these lower areas near the water's edge would add texture, attraction, and habitat to the shoreline. The OPPR team is also looking at creating tidepools and water's edge planting zones here, to increase habitat and soften the edge of the island.

The OPPR team proposes replacing the existing lawn areas with grasslands, meadow, and shrub planting to boost biodiversity and create the immersive landscape that unifies the East Island with Trillium Park. The waterway in this zone is often stagnant and grows an abundance of algae; the OPPR team envisions improving this area with a thicker wetland habitat to help with water purification.

Together these strategies look to boost the biodiversity, forest canopy cover, climate resilience, and ecological habitat at Ontario Place. Looking to the future detail and progression of these design elements the OPPR team aims to implement the following:

- Consider erosion, sedimentation, and soil types into all naturalized zones
- Develop a design palette for birds, butterflies, insects, mammals, amphibians, and fish
- Identify plant species through plaques in 4 different languages for public education (a continuation of Trillium Park design intent)
- Design for resilient landscapes that can handle severe weather, climate adaptation, etc.
- Design for species through carving and building the landforms needed for their specific habitats
- Implement a management plan – a long term commitment to evaluating ecological changes at Ontario Place
    - Example: Native Sumac (*Rhus sp.*), Poplars (*Populus spp.*), and more can become invasive and dominate the plantings unless closely monitored. New species such as Chinese Elm (*Ulmus parvifolia*), White Mulberry, and Northern Catalpa have become established in other waterfront parks like Tommy Thompson Park. Some of these plants require controlled thinning or elimination.

5.2 Therme

Therme recognizes the intrinsic value of the West Island to the citizens of Ontario, and the importance of the landscape as a component of a connected system of park elements that define Ontario Place. The *Ontario Place Landscape Strategy* (Therme Canada, 2022) notes that the landscape strategy for the West Island is dedicated to preserving the cultural and natural heritage of Ontario Place. This includes the intent of the regional designers to reshape the relationship between the urban landscape and Lake Ontario. To support these ideas, the following overarching principals have been implemented by Therme:

1. To honor the land stewardship of the First Nations and the importance of a common cultural goal of public access to water and land with a meaningful engagement with the site design.
2. As a man-made environment, to respect the heritage value of the original vision for Ontario Place and the innovative landscape design of Michael Hough. The Therme vision preserves the integrity of the original modernist approach to the landscape and recognizes the contextual nature of changing technologies and evolved public uses with improvements focused on:
   - Design of localized micro-climates for comfort through plantings and structures such as shaded shelters.
   - Naturalized environments that represent the native landscape of Ontario.
   - Water as an organizing element.
   - Creation of playful landforms with strong view corridors and desire lines.
   - Integration of landscape architecture with innovative technologies that blend the natural and built environments.
   - Creation of a gateway to the West Island as a link between the City and Lake Ontario.
3. To address impacts of climate change functionally and aesthetically armoring the shoreline for long term sustainable preservation of the West Island.
4. The management of storm and wastewater through innovative wetland landscape systems that function as an ecological and landscape amenity.
5. To celebrate the multicultural mosaic of the province through an innovate and creative landscaped environment.
6. Creating continuous public access to the lakefront with an enhanced experience that connects to the existing Toronto trail network (e.g., connecting Trillium Park and the Martin Goodman Trail to the William Davis Trail).
7. To have ecological sustainability, as well create terrestrial and aquatic habitats, at the core of the landscape vision.
8. To provide diverse and unique public open space experiences with a focus on passive recreation.
9. To provide a landscape that promotes engagement with nature in all four-seasons.
10. To provide a landscape that is fully accessible to people of all ages and abilities.

The proposed redevelopment work associated with the Therme revitalization includes the following:

- Construction of a new main entrance building on the west mainland, the Therme Pavilion, as well as a new public bridge, the Gateway Bridge, to the West Island from the Therme Pavilion. The Gateway Bridge is also intended to double as a seating/observation platform during events.
- Construction of a large state of the art water recreation and leisure attraction featuring a waterpark, pools, wellness and sauna facilities, sports recreation, gardens, and thermal baths with indoor and outdoor spaces, the Therme Building, on the West Island.
- Creation of a new pier and plaza area in the northwest section of the West Island, with washrooms/change rooms and a new canoe and kayak marina area.
- Creation of a new beach along the west side of the West Island that will deliver a swimming experience not currently available (size of beach, patron capacity, shielded from wave action, gradual slope for wading toddlers/those less capable swimmers) at Ontario Place. The west side provides an opportunity for shielding the beach from wave action by both the west headland and the artificial reef (see next point regarding reef), and swimming will remain accessible on the south shore of the West Island via steps to the water for both seating and for water access (see next point regarding stepped terraces).
- Installation of new shoreline protections around the West Island including beach pebbles, armour stone, and stepped terraces, as well as construction of a submerged stone reef to improve habitat diversity and shelter the new beach area from wave action.
- Raising the shoreline elevations to mitigate flooding hazards due to high water levels.
- Inclusion of a large, multi-use pathway around the entire West Island perimeter with associated benches, lighting, etc.
- Lake in-filling to the extent required to expand the West Island footprint to accommodate the work.
- Establishment of green rooves on the main Therme Building, as well as elsewhere where feasible, such as on the Gateway Bridge, on shade shelter structures, and on washrooms.
- Installation of green spaces, including seven (7) different planting areas containing native species within Therme Public Landscape spaces to create different eco-zones, as well as additional green space associated with Therme Facility Landscape areas.

6. IMPACT ASSESSMENT AND MITIGATION

The following provides discussion of the potential impacts of the proposed Ontario Place redevelopment to the site's natural heritage features and functions. Construction impacts as well as impacts after completion of the redevelopment are discussed.

Impacts which remain after completion of construction are generally considered long term or permanent and can be both positive and negative. Positive impacts can result from the benefit of restoration efforts through proposed plantings and incorporation of habitat enhancement features. Negative impacts result from loss of existing natural heritage features and functions, or permanent footprint impacts for proposed buildings and associated infrastructure (e.g., paved pathways). Opportunities for site restoration and enhancement can mitigate the loss of existing natural heritage features and functions. Where restoration efforts are unable to address the extent of the permanent negative impacts, compensation may be required to address negative residual effects.

Construction impacts are generally considered short term and temporary and are directly related to construction activities. Many potential temporary impacts related to the construction stage of the proposed redevelopment can be avoided or minimized through the development and proper implementation of both standard and site-specific approaches to construction practices, site inspections, and mitigation measures.

This NHIS identifies potential impacts based on the redevelopment plans for the OPPR and Therme facility as of October 2022 to support the OPA and ZBA applications. Plans for the Live Nation Concern Venue have also been reviewed and a preliminary assessment of potential impacts is provided. The impact assessment provided herein is intended to inform further analysis and detailed mitigation strategies. For the purposes of this NHIS, MH has worked with design files provided by the tenants to inform the impact assessment and create figures for illustration; however, discrepancies in total areas (e.g., in square metres or hectares) between the tenants' and MH's analyses are noted. As designs are refined, MH will continue to work with the tenants to ensure consistency. Thus, for the purposes of this impact assessment, areas are approximate.

6.1 Fish and Fish Habitat

The proposed works at Ontario Place will result in both land and water-based impacts to the natural environment. There is potential for both positive and negative permanent impacts as a result of the final design. Temporary impacts have the potential to result from activities during construction. The potential impacts to fish habitat for the Therme, OPPR and Live Nation areas are categorized by proponent for the purposes of this report and characterize the location of impacts, however the extent of impacts must also be considered from a cumulative perspective given the proximity and natural interaction of habitat functions across the Ontario Place shoreline as a whole.

Therme, OPPR and Live Nation properties are located within the nearshore areas of Lake Ontario which support warm and coolwater fish species including sportfish. Each development site provides shoreline habitat on which fish species depend directly or indirectly to carry out their life processes, which may include spawning grounds, nursery, rearing, food supply or migrational

areas as defined under the *Fisheries Act*. Refer to **Figure 10** for impact and restoration documentation mapping.

6.1.1 Potential Permanent Impacts and Mitigation

The potential permanent impacts to fish and fish habitat are to be partially compensated for as outlined below in **Section 7.2.1**. The compensation features address the destruction and alteration of fish habitat by increasing the diversity of the local habitat through incorporation of the Toronto Aquatic Habitat Restoration Strategies including techniques such as Submerged Reef, Open Coast Revetment and Modified Growth of Submerged Aquatic Vegetation habitats. Proponents are working with Aquatic Habitat Toronto and Toronto Waterfront Aquatic Restoration Strategies to compensate for potential impacts to fish and fish habitat with the guiding principle that higher quality habitat will result onsite through improvements to existing conditions.

Shoreline modifications and improvements of Lake Ontario below high water mark of Lake Ontario are required to restore the integrity of the historical infilled shoreline as it has surpassed its 50 year design life as well as to rehabilitate the shoreline protection to meet present day coastal engineering design standards for erosion and flooding at 100-year storm criteria. Preliminary designs by Baird include resiliency measures for climate change and an updated 100-year flood level based on recent scientific advances and provide a further 50-year design life for shorelines while also functioning to provide enhanced public space and connectivity to the water (Baird, 2022).

These shoreline modifications and infilling of Lake Ontario have the potential to permanently impact the fish and fish habitat present along the Ontario Place shoreline. Although preliminary, a comprehensive quantification of the approximate amount habitat which may be impacted has been completed and is included in this report. Mitigation and avoidance of permanent impacts has been incorporated through consideration of alternative designs and much of the infill will follow principles of mitigation by design. Wherever possible, infill material will be specified to create spawning, refuge and foraging habitat that may otherwise be scarce or absent under existing condition. Reduction of additional new lakefill was also incorporated, where possible, while maintaining opportunities for public usage and shoreline restoration. The proposed work at Ontario Place will result in permanent land and water-based disturbances to the natural environment as outlined in the Pathway of Effects (PoE) diagrams which are found in **Appendix I**. Assessment of impacts should also consider the cumulative effects of their activities on the adjacent habitat areas as these areas may interact and provide function to other habitat types nearby.

The Pathways of Effects are based on the preliminary design of the proposed work; further review of the DFO Pathways of Effects is required during Detail Design. Following preliminary review of the POEs, the following land-based activities have been identified to potentially result in permanent impacts post-construction, including: Grading, Excavation and Riparian Planting; and the following in-water activities have also been identified to potentially result in permanent impacts post-construction, including: Placement of Material or Structures in Water, Organic Debris management, Addition or Removal of Aquatic Vegetation, Wastewater Management, and Structure Removal.

Figure 10: Potential Fish Habitat Impact and Restoration Documentation

Based on the PoE diagrams, potential stressors were identified as a result of the land-based and in-water activities including, but not limited to: change in slope, alteration to native vegetation, removal of topsoil, change in habitat structure and cover, change in sediment and contaminant concentrations, change in external nutrient/energy inputs, change in land drainage patterns, lubricant and fuel leaks from equipment, bank instability, and exposed soils and re-suspension and entrainment of sediment.

The placement of material or structures in water has potential to result in permanent residual positive and negative effects on fish. Negative effects may occur due to the loss of habitat, while positive residual effects may occur through proposed habitat enhancements such as installation of reef habitat to provide diversity. The addition of aquatic vegetation will also have a permanent positive residual effect on fish and fish habitat as vegetation is expected to function to provide habitat diversity and buffer compromised water quality. The magnitude and extent of the potential negative and positive residual effects is considered to be high as current designs show destruction of 44,815 m^2 of fish habitat and the alteration including restorative fish habitat enhancements of 55,805 m^2. It is noted that of the fish habitat proposed to be permanently altered, 51,660 m^2 is intended to benefit the local fishery as described below as part of the Therme and OPPR Developments. The residual 4,145 m^2 of fish habitat that is proposed to be permanently altered is resultant of installation of the swimming pier and installation and widening of bridges on West and East Island. These alterations are dependent on final design which is pending but may further be reduced. Refer to **Figure 10** for impact documentation and restoration mapping. No fish mortalities are expected as a result of the permanent residual effects.

Therme Development

The proposed works at the Therme development include lake infill and shoreline re-alignments to improve upon the function of the existing shoreline from public usage, natural heritage function and climate change resiliency perspectives and will provide a further 50-year design life for shoreline at West Island (Baird, 2022). The works have the potential to result in the permanent destruction of approximately 36,000 m^2 of fish habitat. Further, the construction and installation of the swimming pier and a new public bridge, the Gateway Bridge (2,936 m^2) as well as the installation of the restorative fish habitat features (25,096 m^2) have the potential to result in permanent alteration including beneficial alteration to fish habitat in the amount of approximately 28,032 m^2. The proposed Therme development site will also see approximately 1,095 m^2 of new fish habitat resulting from the permanent creation of fish habitat along the eastern wetlands on West Island.

With respect to the beneficial alterations, the fish habitat features proposed are considered to permanently alter but benefit the local fishery and function to restore the failing shoreline and partially compensate for the permanent impacts resulting from the destruction of fish habitat by increasing diversity of habitat features with incorporation of Toronto Waterfront Aquatic Habitat Restoration Strategy (TWAHRS) Submerged Reef, Surcharged Open Coast Revetment, Modified Growth of Submerged Aquatic Vegetation and Cobble Beach habitat through collaboration with Aquatic Habitat Toronto. These enhancements are discussed in **Section 7.2.1**.

Detail design will enable this assessment to be refined and more accurately capture the residual impacts and benefits to fish and fish habitat resulting from this proposed development. It should be noted that where possible, an increase to the connectivity and functionality of the shoreline habitats may be permanently enhanced following incorporation of riparian and shoreline habitat linkages. These linkages will occur through permanent re-naturalization along the shoreline as instances of existing hardened shorelines which are currently inhibit value in these transitional habitat areas.

The lake infilling and placement of the new structures will be permanent and large in size, therefore the extent and duration are considered high. These impacts identified herein are localized to the Therme site and specifically the footprint of the new infill and shoreline re-alignments as well as the proposed installations of the swimming pier and Gateway Bridge at the West Island entrance. No negative lakeward effects beyond the footprint of the new infill and shoreline re-alignments are anticipated as a result.

Live Nation Development

Preliminary design indicates works which have the greatest likelihood to impact fish and fish habitat consist of creation of a Lakefront Event Pier and associated Terrace along with construction of new pedestrian and service bridges. Lake infill and/or occupation of the lake bed beyond the existing footprint associated with the Lakefront Event Pier and associated Terrace has the potential to result in the permanent destruction of 8,815 m^2 of fish habitat. New Pedestrian and Service Bridges are proposed and assuming a clear span for each bridge which excludes abutments or piers placed below the highwater mark has the potential to result in permanent alteration of up to 1,209 m^2 of fish habitat. Further fish and fish habitat assessment is required as design details for the Lakefront Event Pier and associated Terrace as well as pedestrian and service bridges are confirmed.

Ontario Place Public Realm Development

With respect to potential for permanent impacts to fish and fish habitat, preliminary design indicates that works are consisting of shoreline stabilization and restoration of areas for armored lookouts only and those that are proposed are shown to be within the footprint of the existing shoreline; as such no re-alignment of shoreline or infill of Lake Ontario is proposed. It is anticipated that mitigations can avoid potential for negative residual impacts to fish and fish habitat. Should lake infill and/or occupation of the lake bed beyond the existing foot print be designed, further review on impacts to fish and fish habitat is required.

It should be noted that the OPPR development site will see a permanent creation of approximately 755 m^2 of fish habitat resulting in positive residual effects from the permanent removal of the existing fill/berm located at the eastern extent of the development site. At this location, a new bridge crossing is proposed at the eastern entrance to East Island. The creation of habitat will not only result in permanent, positive residual effects to the local fish habitat in the immediate area, but is also likely to reestablish connectivity to the habitat within the surrounding interior embayments including Brigantine Cove which was historically eliminated through previous lake infill. As a result of this reestablished fluvial linkage, permanent, positive residual effects to the fishery are anticipated to occur within Brigantine Cove in the approximate amount of 26,564 m^2.

When compared to existing conditions, these positive residual effects are anticipated to result from the increased water circulation, a limiting factor identified within Brigantine Cove and may lead to more diverse temperature gradients and circulation within the relatively shallow Brigantine Cove and inner harbour aquatic environments. It is anticipated that both easterly and westerly winds on Lake Ontario will likely help improve habitat conditions within the inner harbour aquatic environment.

6.1.2 Potential Temporary Impacts

Potential for temporary impacts associated with construction activities exist when working in or near water, yet incorporation of mitigation measures are anticipated to address potential for temporary impacts to fish or fish habitat which may result from temporary works. These temporary works may include construction activities such as construction of temporary access roads or work spaces, temporary in-water works and other proposed construction activities within 30 m of the high water mark of Lake Ontario. Mitigation measures to avoid temporary impacts are discussed below in Construction Mitigation.

The proposed work at the Therme, OPPR and Live Nation sites will result in both land-based and in-water disturbances to the natural environment as outlined in the Pathway of Effects (PoE) diagrams which are found in **Appendix I**. The Pathways of Effects are based on the preliminary design of the proposed work and how it may be constructed; further review of the DFO Pathways of Effects is required during Detail Design. The following land-based activities are likely to occur during construction and have the potential to result in temporary impacts, including vegetation clearing, grading, excavation, riparian planting, and use of industrial equipment; and the following in-water activities have also been identified, including placement of material or structures in water, organic debris management, addition or removal of aquatic vegetation, wastewater management, and structure removal.

Based on the PoE diagrams, potential temporary stressors were identified due to the land-based and in-water activities including, but not limited to alteration to vegetation, removal of topsoil, change in habitat structure and cover, change in sediment and contaminant concentrations, change in external nutrient/energy inputs, lubricant and fuel leaks from equipment, and exposed soils and re-suspension and entrainment of sediment. These stressors are addressed through incorporation of construction mitigation measures outlined in **Section 6.1.3.**

The potential effects on fish and fish habitat from these stressors are perceived to be temporary as the effects are anticipated to occur for short duration and re-establish overtime. The magnitude and extent of the potential temporary effects is considered low as the work will include incorporation of impact mitigation measures as outlined below. No fish mortalities are expected as a result of the work and other potential effects such as increased turbidity are anticipated to be mitigated, monitored and localized to the immediate work area.

Therme Development

The proposed works at the Therme development include lake infill and shoreline re-alignments where topsoil, aquatic and riparian vegetation removal may occur as well as change in external nutrient/energy inputs, exposure of soils, re-suspension and entrainment of sediment which may

result in increased turbidities, change in habitat structure and cover and/or change in sediment and contaminant concentrations. Equipment required during the construction activities also have potential for lubricant and fuel leaks which may result in temporary impacts to fish and fish habitat.

Although the potential for temporary impacts exists due to the activities outlined above, the incorporation of the impact mitigation measures described below are anticipated to mitigate and avoid temporary impacts to the fish and fish habitat within and adjacent to the Therme Development. As designs continue to progress, further refinement of this assessment is required to more accurately capture impacts to fish and fish habitat resulting from the proposed development.

Live Nation Development

Preliminary design indicates works which have the greatest likelihood to impact fish and fish habitat consist of creation of a Lakefront Event Pier and associated Terrace along with construction of new pedestrian and service bridges. Temporary stressors to fish or fish habitat may include topsoil, aquatic and riparian vegetation removal as well as change in external nutrient/energy inputs, exposure of soils, re-suspension and entrainment of sediment which may result in increased turbidities, change in habitat structure and cover and/or change in sediment and contaminant concentrations. Equipment required during the construction activities also have potential for lubricant and fuel leaks which may result in temporary impacts to fish and fish habitat.

Although the potential for temporary impacts exists due to the activities outlined above, the incorporation of the impact mitigation measures described below are anticipated to mitigate and avoid temporary impacts to the fish and fish habitat within and adjacent to the Live Nation Development. Further fish and fish habitat assessment is required as design details for the Lakefront Event Pier and associated Terrace as well as pedestrian and service bridges are confirmed.

Ontario Place Public Realm Development

Preliminary design indicates that there is potential for temporary impacts to fish and fish habitat resulting from works consisting of shoreline stabilization and restoration of areas for armored lookouts. Along the shoreline, grades must be raised to prevent flooding and protect from storm surge. Temporary impacts which have the potential to occur as a result include topsoil and riparian vegetation removal as well as change in external nutrient/energy inputs, exposure of soils, re-suspension and entrainment of sediment which may result in increased turbidities, change in habitat structure and cover and/or change in sediment and contaminant concentrations. Equipment required during the construction activities also have potential for lubricant and fuel leaks which may result in temporary impacts to fish and fish habitat.

It is anticipated that mitigation measures outlined below can avoid temporary impacts to fish and fish habitat. Further fish and fish habitat assessment is required as design details for the shoreline stabilization areas and restoration of areas for armoured lookouts are confirmed.

6.1.3 Construction Mitigation

Appropriate fish and fish habitat mitigation measures must be implemented prior to and during construction. A fish and fish habitat impact assessment has been completed during this preliminary design and will require further refinement during a detailed fish and fish habitat assessment at Detail Design.

Generally, mitigation measures can be applied to avoid impacts to fish and fish habitat for projects where work is being completed below the high-water mark, or within 30 m of a waterbody containing fish and fish habitat. However, the infill of Lake Ontario or installing structures which occupy the lake bed may not be mitigatable from a fish and fish habitat perspective.

Due to the presence of warm and cool water fish species, specific measures for any required in-water works or work on channel banks are anticipated to be permitted between July 16 to March 14 (to be confirmed through consultation with MNRF or TRCA) on Lake Ontario at Ontario Place.

The following mitigation measures shall also be applied during the construction activities in or around water:

- Minimize duration of in-water work whenever possible
- Schedule work to avoid times of excessive wave action that may increase erosion and sedimentation.
- Retain a qualified environmental professional to ensure applicable permits for relocating fish are obtained and to capture any fish trapped within an isolated/enclosed area at the work site and safely relocate them to an appropriate location in the same waters. Fish may need to be relocated again, should flooding occur on the site.
- Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Screens should be located in areas and depths of water with low concentrations of fish throughout the year. The screen face should be oriented in the same direction as the flow and ensure openings in the guides and seals are less than the opening criteria to make “fish tight”. Screens should be located a minimum of 300 mm (12 in.) above the bottom of the watercourse to prevent entrainment of sediment and aquatic organisms associated with the bottom area.

Applicable OPSS for Fish Protection includes **OPSS MUNI 182: General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks** and the **DFO Interim code of practice: end-of-pipe fish protection screens for small water intakes in freshwater**.

Erosion and Sediment Controls

Every effort should be made to contain sediments within the work area to avoid re-suspension and potential lakeward impacts. The disturbance and release of sediments may have direct negative effects such as respiratory stress, reduced feeding efficiency and loss of nursery/rearing habitat in lakeward areas. Sediment impacts associated with proposed construction which are not properly contained may affect local fish populations as well as habitats downstream.

- Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
- Erosion and sediment control measures shall be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear.
- All in-water work which is anticipated to have potential to result in increased turbidities will be addressed with appropriate mitigation measures designed through consultation with DFO and TRCA.
- Only materials free of fines will be used in and adjacent to Lake Ontario which includes construction of any coffer dams.
- Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
- Any pumps shall be monitored at all times and back-up pumps shall be readily available on-site in the event of pump failure.
- Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.
- Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.
- Repairs to erosion and sediment control measures and structures if damage occurs.
- Removal of non-biodegradable erosion and sediment control materials once site is stabilized.

Applicable OPSS for working in and around waterbodies, dewatering, and erosion and sediment Control include: **OPSS MUNI 182: General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks, OPSS MUNI 517: Construction Specification for Dewatering,** and **OPSS MUNI 805: Construction Specification for Temporary Erosion and Sediment Control Measures.**

Bank Re-vegetation and Stabilization

Clearing of riparian vegetation should be kept to a minimum whenever possible and use of existing trails, roads or cut lines to avoid disturbance to the riparian vegetation and prevent soil compaction is recommended. Additional measures to avoid impacts to bank vegetation and stability include:

- When practicable, prune or top the vegetation instead of grubbing/uprooting.
- Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of the waterbody below the ordinary high water mark. If material is removed from the waterbody, set it aside and return it to the original location once construction activities are completed.

- Immediately stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation through re-vegetation with native species (seed) suitable for the site.
- Restore bed and banks of the waterbody to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage must be restored.
- If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, ensure that appropriately sized, clean rock is used.

Applicable OPSS for Preservation of Riparian Vegetation and Restoration of Disturbed areas include **OPSS MUNI 182: General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks** and **OPSS MUNI 803: Construction Specification for Vegetative Cover**.

Operation of Machinery

The Contractor must ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds for the duration of construction. The Contractor must also ensure that:

- Whenever possible, operate machinery on land above the high water mark in a manner that minimizes disturbance to the banks and bed of the waterbody.
- Use temporary crossing structures or other practices to cross streams or waterbodies. For fording equipment without a temporary crossing structure, use stream bank and bed protection methods (e.g., swamp mats, pads) if minor rutting is likely to occur during fording.
- Wash, refuel and service machinery and store fuel and other materials for the machinery a minimum of 30 m from any surface water features to prevent any deleterious substances from entering the water.

Applicable OPSS for Equipment Use includes **OPSS MUNI 182: General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks**.

Containment and Emergency Spill Response

For the proposed works within the Therme, OPPR and Live Nation developments, the respective proponents shall develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance as well as keep emergency spill kits on site (and in heavy machinery) in case of emergency.

The proponents shall also ensure that:

- Materials such as paint, primers, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.
- Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.

- All spills shall be reported to the Ministry of Environment (MOE) Spills Action Centre (1-800-268-6060). The Contract Administrator or Contractor will contact DFO and/or MNRF Aurora District if there is likelihood for impacts to fish, fish habitat or wildlife resources within Lake Ontario or any other watercourses as a result of the work.

6.2 Terrestrial

As stated above, the proposed works at Ontario Place will result in both land and water-based impacts to the natural environment. There is potential for both positive and negative permanent impacts as a result of the final design. Temporary negative impacts are likely to result from construction activities. The potential impacts to existing vegetation associated with the proposed Therme, OPPR, and Live Nation areas are quantified separately (by tenant), where possible; however, the potential impacts to wildlife and wildlife habitat have largely been assessed in consideration of the site as a whole, rather than in isolation, given the mobility of wildlife.

6.2.1 Potential Permanent Impacts and Mitigation

The following provides an assessment of the overall long-term impacts of the proposed project to the terrestrial natural heritage features and functions on site. The redevelopment will require the loss of existing vegetation and habitat to accommodate construction. The completed redevelopment, as proposed, will include permanent footprint impacts associated with new buildings, infrastructure, and hardscapes, and shoreline protections, as shown in **Figure 11**, as well the installation of approximately 13,452 m^2 of green rooves and 76 279 m^2 of green space (**Figure 12**), including 52 312 m^2 within Public Realm areas and 23 967 m^2 within Therme areas. It is recognized that there will be some inevitable lag time between when the existing habitat on site is removed and when the replacement vegetation on site functions as habitat for some species. Overall, the loss of existing vegetation and habitat it provides is estimated at 63,064 m^2, while the proposed green rooves and green space total an area of 89,365 m^2, for a net gain (in area) of ~26,301 m^2. The proposed green roofs and green spaces are intended to restore and improve upon the existing terrestrial features and functions on site.

6.2.1.1 Proposed Restoration and Planting Plans

Based on the current designs, it is estimated that 80 222 m^2 green space and 13,452 m^2 green rooves will be created within the AOI following completion of the project to act as habitat for various wildlife species, to varying degrees; refer to **Figure 12**. Although planting plans and restoration plans are in varying stages of development between the different stakeholders, at this time (October 2022) it is understood that proposed green spaces will consist of the following:

- Seven (7) planting areas within Therme Public Landscape areas, each comprised entirely of species that are either native to Ontario or are native cultivars, to ultimately increase the number of native species on site, including Oak Point, Ontario Trail, Sugar Bush, Maple Promenade, Wetland Innovation Zone, and The Gateway planting areas, the latter of which is also proposed to contain an Elm Restoration area; refer to **Appendix J** for the current species lists proposed within each of these areas.

Figure 11: Terrestrial Assessment of Impacted Areas

Figure 12: Proposed Post Redevelopment Green Spaces and Green Roofs

- ~531 trees to be planted within the seven (7) Therme Public Landscape areas (refer to **Table 5**) as well as other spaces, including numerous mast, seed/achene, and berry producing species for wildlife such as Oaks, Serviceberries, Nannyberry, and Elderberry (*Sambucus sp.*).
- At this time, the anticipated area of green space within the OPPR is 52,312 m^2 and includes an estimated 2,479 trees (refer to **Table 5**).
- The combined total for proposed tree plantings (531 plus 2,479) is 3010.
- Numerous shrubs, and ground covers (in addition to trees) to be planted within the OPPR green spaces. Though proposed species lists for these areas are not yet known, it is understood that the intent of these planted areas is that they are to be in keeping with existing plantings in Trillium Park, which consist largely of native species providing habitat and foraging opportunities for a variety of insects and wildlife.
- Creation of wetlands within Therme Public Landscape areas (i.e., Wetland Innovation Zone planting area) containing a variety of emergent, submergent, and floating-leaved aquatic plants, creating improved habitat for some insects, waterfowl, amphibians, aquatic reptiles, and marsh breeding birds.
- Creation of wetlands with aquatic plants within OPPR areas, in the vicinity of Brigantine Bay, creating improved habitat for some insects, waterfowl, amphibians, aquatic reptiles, and marsh breeding birds.
- Creation of green rooves within Therme Public Landscape and Therme Facility areas, providing additional planting opportunities, feeding, and foraging habitat for insects and birds, micro-climates, etc.
- Additional green spaces such as lawns, planters, and garden within Therme Facility areas and OPPR areas, which may have limited function as habitat for most wildlife, but will still contribute to habitat for some insects, to micro-climates, and to overall complexity of green spaces on site.

The proposed green rooves and green space within the Therme Public Landscape area are intended to include naturalized environments that represent the native landscape of Ontario and provide terrestrial and aquatic habitat improvements overall. Plans issued for the ZBA include planting typologies and strategies; detailed planting plans will be developed in the next stages of the project. At this time, the anticipated area of green roofs I will be 13,452 m^2, green space proposed will include 23 967 m^2 and 52312 m^2 within the Therme and Public Realm landscaped areas, respectively, and green space will include an estimated 3010 planted trees (see **Table 5**). These proposed planted trees will result in a net gain of 1536 trees, or a 58% overall increase in the number of trees on site, when compared with the current conditions and when required tree removals are considered. Refer to **Appendix J** for the current species lists for the different planting areas proposed within Therme Public Landscape locations; species list for OPPR areas are not available at the time of writing of this report.

Based on the proposed restoration and planting plans, in time, it is anticipated that the overall area of vegetation on site will increase and will be represented by a larger proportion of species native to Ontario.

Table 5: Approximate Number of Proposed Trees to be Planted at Ontario Place Post Redevelopment

Stakeholder	Proposed Location	Number of Proposed Trees to be Planted
OPPR	The Mainland	1222
	Brigantine Cove	253
	Public Waterfront	498
	The Forum	72
	Ravine Walk	434
	TOTAL	**2,479**
Therme	Oak Point	**65**
	Ontario Trail	**76**
	Sugar Bush	**49**
	Wetland Innovation Zone	**90**
	The Gateway/Elm Restoration Area	**123**
	Maple Promenade	**112**
	Other Areas	**16**
	TOTAL	**531**

In addition to the proposed restoration and planting plans described above that are still in development, there are opportunities to incorporate additional measures to restore, improve, and augment habitat for wildlife at Ontario Place as the designs progress, as part of the Naturalization Plans. Details on the ways in which various habitat types on site could further be created and enhanced are described in **Section 7**.

6.2.1.2 Vegetation and Vegetation Communities

As previously described, the majority of the property is landscaped and maintained, and of anthropogenic origin. As such, most of the vegetated areas present do not meet criteria for ecological communities established under the ELC system. **Table 6** provides a summary of impacted areas within ELC communities and **Table 7** provides a summary of impacts within vegetated areas that do not meet ELC criteria. Overall, the proposed redevelopment is anticipated to require the removal of 63,064 m^2 or ~6.3 hectares (ha) of vegetated areas within the site. Impacted areas in relation to the proposed site designs (current as of October 2022), can be seen in **Figure 11**.

Secondary, long-term impacts at the site that are likely to occur due to vegetation clearing include:

- Potential impacts to root systems of remaining trees, resulting in root stress/tree decline in retained trees.

- Changes in microclimates (increased temperatures, increased light penetration, decreased soil moisture) through loss of canopy cover, resulting in possible desiccation of soils or changes in water and soil thermal regimes.
- Loss of riparian vegetation and root masses, encouraging erosion and soil loss at the site.
- Loss of habitat for wildlife (refer to **Section 6.2.1.3**).

Table 6: Summary of Anticipated Vegetation Removal within ELC Communities

Area ID	ELC Code	ELC Community	Total Size (m^2)	Total Impacted Area (m^2)	Percent Impacted (%)	Project Component
F	OAO	Open Aquatic	4816	574	12	Live Nation
G	FODM4-11	Dry-Fresh Black Locust Deciduous Forest	7149	5100	71	Live Nation
J	WOM	Mixed Woodland	25710	25710	100	Therme
P	OAO	Open Aquatic	5153	5153	100	Therme
TOTAL				**36 537**		

Table 7: Summary of Anticipated Vegetation Removal within other Vegetated Areas

Area ID	Total Size (m^2)	Total Impacted Area (m^2)	Percent Impacted (%)	Project Component
C	1208	1208	100	Public Realm
D	5784	5784	100	Public Realm
E	4336	4336	100	Live Nation and Public Realm
H	3843	3843	100	Therme
I	2756	2756	100	Therme
K	1495	1495	100	Live Nation and Public Realm
M	2470	2470	100	Therme and Public Realm
N	3264	3264	100	Therme and Public Realm
O	1369	1369	100	Therme
TOTAL		**26 525**		

Based on the April 2023 Arborist Report, it is anticipated that 127 (~69%) of the 183 trees 30 cm in diameter or greater within the limits of the OPPR will require removal to accommodate the proposed OPPR plans, while 100% of the 226 trees 30 cm in diameter or greater within the Therme area will require removal to accommodate the Therme plans. A limited analysis of potential impacts to trees within the Live Nation area has been completed as part of the April 2023 Arborist Repot. **Table 8** provides a summary of anticipated tree removals by tree size and by

area. Of the trees with 30 cm in diameter or greater requiring removal, 89% are of Fair health or better (e.g., Good, Excellent), and 11% are of Poor health or worse (e.g., dying, dead). As shown in **Table 8**, it is also anticipated that approximately 75% (1,343 of 1,782) of trees in the AOI with diameters less than 30 cm will require removal as a result of the Therme and OPPR plans.

Table 8: Summary of Trees Potentially Impacted and Protected by Area

Area	Total Trees ≥30cm DBH Proposed to be Impacted	Total Trees ≥30cm DBH Proposed to be Protected	Total Trees <30cm DBH Proposed to be Impacted	Total Trees <30cm DBH Proposed to be Protected	% Of Total Trees per Area Proposed to be Impacted
Public Realm	127	56	429	237	65%
Therme	226	0	634	0	100%
Live Nation	19	25	280	202	57%
Ontario Place Totals	372	81	1,343	439	77%
Trees Outside of Ontario Place Boundary	0	18	0	0	0
Totals	**372**	**99**	**1,343**	**439**	76%

6.2.1.3 Wildlife and Wildlife Habitat

Avifauna

As shown in **Table 6** and **Table 7**, the project will result in the removal of most of the existing vegetation on site, removing much of the available nesting habitat for birds until green spaces are reintroduced. In addition, many of the existing buildings and structures within the AOI, the majority of which provide nesting habitat for birds (as shown in **Table 2**) will also be subject to demolition, renovation, or redevelopment, resulting in further loss of nesting areas for avifauna in some instances. Furthermore, the required vegetation removals as well as work along shorelines in shallow waters are likely to reduce invertebrate abundances, seed and fruit availability, and other feeding and foraging opportunities for numerous species of birds. Therefore, it is anticipated that the proposed work could negatively influence migratory landbird and breeding bird populations on site for some time after the project is complete as it will take time for plantings to be established following construction. However, many migrating and/or breeding birds that are displaced from the AOI in the interim are likely to find nesting and foraging opportunities at nearby alternative locations in the interim, such as within Trillium Park or Coronation Park, in the Toronto Islands Coastal Wetland Complex Candidate ANSI at Billy Bishop Toronto City Airport, or at Leslie Street Spit and Tommy Thompson Park, which are already recognized as Important Bird Areas (IBA) by IBA Canada. Long-term impacts to Avifauna as they relate specifically to rare, SAR, and species

of conservation concern birds are assessed below under Significant Wildlife Habitat and Species at Risk.

The various project components will require land-based lighting that surpasses the existing conditions; land-based light sources, primarily during nighttime, are increasingly being identified/acknowledged as potential sources of impacts to a variety of species both terrestrial and aquatic. To ensure impacts to the terrestrial ecosystem and avifauna from additional land-based light sources are minimized to the greatest extent feasible, the following design features should be incorporated as part of the new lighting plan:

- New light fixtures should be installed with the ability to reduce light levels to decrease illumination during non-operation times. The lighting control system should be designed to identify the fixtures to be turned off and fixtures to be dimmed during the non-operation hours to meet light levels required for Occupational Health and Safety (OHS).
- New light poles should consist of forward throwing, directional fixtures to reduce light spillage outside the intended footprint, to reduce increased illumination over the aquatic environment and shorelines (as well as to ensure compliance with light pollution standards).
- New light fixtures must utilize warmer colours (yellow) to reduce potential for increases in attraction by wildlife to light sources.

Ontario Place experiences a significant influx of migrating birds during the annual spring and fall migrations. Most migrating bird species can become confused by a combination of lights and glass of buildings, leading to an increase in collisions with glass while they are flying at night. As such, to ensure impacts to the birds from additional glass and structures on site are minimized to the greatest extent feasible, the City of Toronto's Bird Friendly Development Guidelines must be incorporated into the design plans, wherever they are applicable. Compliance with City of Toronto Light Pollution bylaws must also be considered.

Herpetofauna

The site does not provide habitat for the majority of herpetofauna and most work proposed is not anticipated to directly impact these species, provided that general construction mitigation and avoidance measures are applied as recommended for these species in **Section 6.2.3.** Work with the potential to permanently disrupt or alter the thermal regimes, flows, or substrates within confirmed Turtle Wintering Areas (Vegetation Survey Area F) is not recommended. Although the project is expected to permanently impact some area within which turtles were observed (Vegetation Survey Areas P and F), only Vegetation Survey Area F was found to provide significant and/or specialized habitat for turtles, and impacts within this ELC community are relatively minor (~12% impacted). In addition, it is anticipated that these impacts will be countered by proposed plans to create and vastly enhance wetland habitat on site elsewhere, such as within Brigantine Cove as part of the Public Realm Plans or within the Wetland Innovation Zone proposed by Therme.

Mammals

The majority of mammals identified on site (e.g., Striped Skunk, Red Fox, American Mink, Raccoon, Eastern Cottontail, Eastern Grey Squirrel) are considered generalist species, and have few limitations on where they can exist. Although habitat for these species will be impacted through vegetation removals and building and structures redevelopments, it is likely that the majority of these species will persist in the area during construction in nearby undisturbed locations such as Trillium Park and Coronation Park and will reinhabit the AOI relatively quickly after the project is complete. The exception is bats identified on site, which have very specific habitat requirements for roosting and for rearing and also require abundances of insects (see Invertebrate section below); as these species depend on mature, declining trees with cavities or crevices and/or old buildings and structures in disrepair for roosting, as well as on insects for feeding, it is anticipated that the proposed work could negatively influence bat populations on site for some time after the project is complete. Further discussion regarding bats is provided below.

Invertebrates

Vegetation removals as well as work along shorelines in shallow waters are expected to reduce availability of spawning, breeding, foraging, and nectaring habitat for invertebrates, and as such are expected to reduce insect populations, until such a time that vegetated areas are reinstated and substrates remain undisturbed, following construction.

Significant Wildlife Habitat

Existing Significant Wildlife Habitat identified on site included: Candidate Bat Maternity Colonies, Confirmed Turtle Wintering Areas, Confirmed Landbird Migratory Stopover Areas, and Confirmed Special Concern and Rare Wildlife Species.

The current design plans identify removal of 100% (33 of 33) of the potential maternity roost trees for bats on site and feeding opportunities for bats are also likely to be reduced (as noted above under Mammals). While the proposed planting plans have the potential to provide habitat for bats, any new plantings will take years to develop into suitable bat maternity roost trees. Therefore, in order to ensure that roosting areas for bats remain on site in the interim, it is recommended that bat houses be installed on site by multiple stakeholders, as discussed in **Section 7**. Some existing trees on site may also provide suitable habitat for bats in the nearer term as they continue to decay.

Foraging, feeding, and roosting/perching opportunities within the AOI used as Landbird Migratory Stopover areas will be reduced following vegetation removals (as noted above under Avifauna). Although it is recognized that there will be a delay between when the existing habitat on site is removed and when the replacement vegetation on site functions as habitat for some Landbird species, the proposed post-redevelopment site conditions are expected to eventually provide similar if not superior habitat for Landbird Migratory birds in the long-term after green spaces have become established, based on the current site plans.

Turtle Wintering Areas have the potential to be impacted if they are not considered during progression and development of the designs (as noted above under Herpetofauna). Currently, only minor impacts are proposed within significant areas for turtles: Turtle Wintering Areas within

Vegetation Survey Area F. However, improvement to wetland habitat proposed for Ontario Place as a whole are expected to improve habitat conditions for turtles within the AOI in the long-term, overall.

Habitat for the majority of Special Concern and Rare Wildlife noted on site will remain available during and after construction, as many of these animals occur in open water (e.g., King Eider, Pied-billed Grebe, Horned Grebe), within shoreline habitats that are not proposed to be altered at Ontario Place (e.g., Northern Map Turtle) or that will remain available at Trillium Park or Live Nation (e.g., Great Egret), or they are only occasional (e.g., Grasshopper Sparrow) or aerial visitors (e.g., Peregrine Falcon) within the AOI for foraging and feeding. Of all Special Concern and Rare animals noted on site, only one (1) Eastern Wood-pewee may potentially be impacted by the proposed work, particularly through the loss of vegetation survey Area J where it was observed during breeding season. Eastern Wood-pewees can be found in smaller more immature treed areas and parklands such as those found at Trillium Park, however, some individuals prefer larger, more contiguous woodlots such as vegetation survey area J for breeding. In addition to animals, several provincially rare plants were also recorded in the AOI, including Kentucky Coffee-tree (S3), Honey Locust (S2?), and Ohio Buckeye (S1). However, all individuals of these species at Ontario Place are presumed to have been planted and are ranked locally by TRCA as commonly occurring species. Although these particular plant species may longer be present at Ontario Place post-redevelopment, based on the current planting plans, it is expected that numerous different plant species ranked as S1-S3 will be established on site, such as Shumard Oak (*Quercus shumardii*) (S3), and Bayberry (*Myrica pensylvanica*) (S1); refer to **Appendix J** for the current species lists for the different planting areas proposed within Therme Public Landscape locations.

Species at Risk

The project requires impacts to (removal and/or exclusion of) the majority of Barn Swallow nests on site, which are protected under the ESA. As such, registration and financial restitution will be required under the ESA for every Barn Swallow nest to be impacted, in advance of the work, as described in **Section 6.2.3**. No other terrestrial SAR receiving habitat protection under the ESA have been identified on site. Although there will be reductions in Barn Swallow nesting activity and areas during construction, many Barn Swallow nesting area identified on site are anticipated to remain available for nesting following construction, and new nesting areas on newly created structures are also expected to exist. Therefore, permanent impacts to nesting Barn Swallows at Ontario Place are unlikely overall. In instances where there will be permanent impacts to nesting areas for Barn Swallows and areas will no longer be available or suitable for nesting following construction, these long-term impacts are accounted for under the Species Conservation Charges, as a steeper financial penalty is imposed.

6.2.2 Potential Temporary Impacts

Potential temporary impacts associated with the site's terrestrial features and functions are primarily associated with the construction stage of redevelopment and include the following:

- Vegetation and Tree Loss, Soil Erosion and Compaction: Grubbing, and grading required for construction will be preceded by the removal of existing trees and vegetation for related

activities such as soil remediation, shoreline protection, improvements to accessibility of the site for equipment etc., and will result in exposure of soils. Exposed soils are susceptible to erosion and deposition into adjacent areas. Use of machinery and vehicles on site has the potential for compaction of exposed soils. During tree removals, there is potential for damage or injury to occur to non-target trees intended for retention.

- Introduction or Spread of Invasive Species: Machinery and vehicles entering and leaving the work areas, as well as use of machinery and vehicles within the work areas, has the potential to spread invasive plant species, particularly Common Reed, Japanese Knotweed, and Pale Swallowwort, which are known to occur at the site, and especially within areas of exposed soils (see previous point).
- Spills: Use of machinery and vehicles on site has the potential for leaks or spills of oil, gasoline, and other fluids.
- Disturbance to Wildlife: It is anticipated that general construction activities will generate dust, noise and vibrations that may temporarily disturb wildlife, therefore wildlife utilizing the site may be temporarily displaced during construction.
- Damage and Disturbance to Adjacent Natural Features: Work on site has the potential to impact features outside of the work limits and may include similar impacts to those associated with construction within the work limits, such as runoff, damage due to use of machinery and noise disturbance.

If not properly managed and prevented, these temporary impacts may lead to long-term impacts. It is anticipated that, with implementation of the mitigation measures outlined in **Section 6.2.3**, potential temporary impacts can be mitigated during the construction phase.

6.2.3 Construction Mitigation

Many of the potential temporary impacts are commonly encountered with construction activities and development and thus mitigation measures to minimize these temporary impacts are well-developed and effective when properly implemented.

The following mitigation and avoidance measures are recommended based on the current Therme, Live Nation, and OPPR designs (as of October 2022). The mitigation measures herein should be reviewed and updated as the designs progress, to ensure adequate environmental measures are provided for all phases and all aspects of the project.

Vegetation and Vegetation Communities

Implementation of the following mitigation measures is recommended to minimize impacts to vegetation and vegetation communities throughout the AOI prior to and/or during construction:

- All vegetation removals will be completed in accordance with **OPSS MUNI 201: Construction Specification for Clearing, Close Cut Clearing, Grubbing, and Removal of Surface and Piled Boulders**.
- Surplus material resulting from removals operations will be handled as per **OPSS MUNI 180: General Specification for the Management of Excess Materials**.

- All trees not being removed should be protected in accordance with Tree Protection Plans, included in the contract documents, and should be completed in a manner consistent with industry best practice and applicable regulations such as City of Toronto *Tree Protection Policy and Specifications for Construction near Trees*.
- Trees not designated for removal shall not be damaged and shall be protected from flooding and sediment deposits from construction operations. However, in the event of injury, damaged trees not being removed shall be pruned or treated as outlined in **OPSS MUNI 801: Construction Specification for the Protection of Trees**.
- Equipment and vehicles shall not be operated or re-fueled within the dripline of trees not designated for removal, as per in **OPSS MUNI 801: Construction Specification for the Protection of Trees**.
- Vegetation removals beyond the project limits will not be completed in order to accommodate construction sheds, site offices, toilets, stockpiling areas, storage areas, parking etc. These structures and/or areas will be maintained within the project footprint, and in identified areas shown on the contract drawings.
- The Contractor must ensure that machinery arrives on site in a clean condition, and is maintained free of excess or leaking fuel, lubricants, coolant or any other contaminants for the duration of construction, as per **OPSS MUNI 182: General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks**.

Areas within the work limits contain invasive plant species Common Reed, Pale Swallowwort (i.e., Dog-strangling Vine), and Japanese Knotweed, which are restricted species under Invasive Species Act Regulations (O. Reg. 354/16). Regulations for restricted invasive species include ensuring these species are not spread/deposited elsewhere into new locations. Therefore, the spread of invasive and noxious vegetation species to, from and within the Working Areas must be prevented.

- The Contractor shall implement best management practices to prevent the introduction/spread of invasive plants including proper soil management and equipment clearing protocols. The Contractor shall follow the guidelines outlined in the *Invasive Phragmites – Best Management Practices in Ontario*, (OIPC, 2011), *Invasive Dog-strangling Vine – Best Management Practices in Ontario*, (OIPC, 2012), and *Invasive Japanese Knotweed – Best Management Practices in Ontario*, (OIPC, 2012).
- Debris including earth clods or invasive and noxious vegetation material attached to the outside surfaces of equipment is prohibited from entering the Working Area. Equipment coming on site shall be inspected as close to the site entrance as possible for debris, and if present, debris shall be completely removed and collected for disposal, prior to the equipment proceeding to the Working Area
- Where invasive species have been identified within the limits of disturbance associated with the work, these areas will be clearly marked on the contract drawings. The Contractor shall clean all vehicles and equipment exposed to invasive plants prior to leaving the site. The Contractor shall follow all *Best Management Practices set forth in the Clean Equipment Protocol for Industry* (Halloran et. Al, 2013), prepared by the Peterborough

Stewardship Council and the Ontario Invasive Plant Council for the Canada-Ontario Invasive Species Centre and the MNRF.

- Soil from areas impacted by invasive vegetation shall not be stockpiled for reuse.
- No invasive species shall be present in fill or topsoil brought on to the site to complete the work.
- A disposal plan will be required to dispose of invasive species and soils containing invasive species. Soils containing invasive species are difficult to accommodate at some landfill facilities, as these soils are not clearly defined, and most landfills deem it a contaminated soil. Though considered a non-hazardous material, many landfill locations do not accept invasive species containing soils.
- Disturbed areas requiring cover shall be revegetated as per the landscape architecture plans. Areas requiring seeding or sodding shall be covered in accordance with **OPSS MUNI 804: Construction Specification for Seed and Cover** and **OPSS MUNI 802: Construction Specification for Topsoil**.

Soils

Mitigation measures shall be implemented in order to successfully manage soils within the work limits, including:

- Vegetation should be maintained for as long as possible prior to disturbance. Excavations and removals shall be performed in such a manner and with such equipment as to leave undisturbed and undamaged any portion of an area not designated for removal/excavation or salvage. All damaged or disturbed areas shall be corrected expeditiously, in accordance with **OPSS MUNI 510: Removals**.
- Effective mitigation techniques for erosion and sediment control shall be in place prior to the removal of vegetative cover or exposure of soils. Erosion and sediment controls shall be frequently monitored maintained, adapted, and repaired as required to remain effective at all times, including during shut down periods, as per **OPSS.MUNI 182: General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks**, and **OPSS MUNI 805: Temporary Erosion and Sediment Control Measures**.
- Excess earth resulting from construction operations should be handled as per **OPSS MUNI 180: General Specification for the Management of Excess Materials**.
- A Spill Response Plan must be prepared that outlines the measures that will be implemented, such as spill kits, and drip pans under all non-mobile machinery, and must be kept on site at all times. Details pertaining to spill prevention and response for operation of machinery and storage of deleterious substances (i.e., fuel, oil etc.) shall be included in this plan to ensure adequate mitigation measures are implemented to prevent release of such substances into the adjacent waterbody or soils. All spills shall be reported to the Ministry of Environment (MOE) Spills Action Centre (1-800-268-6060) as well as to DFO and MNRF Aurora District if there is potential for significant impacts to fish or fish habitat and/or wildlife resources

Operation of Machinery

The following mitigation measures are recommended to minimize potential for disruption to wildlife, during construction:

- Any barges required for the use of transporting construction materials or supplies (i.e., rock protection) should be operated in a manner to avoid excessive disturbance of the substrates, to limit the amount of suspended sediments.
- All equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, unnecessary idling/running, and the lubrication of moving parts.
- All work will conform with City of Toronto Noise bylaws unless an exemption is obtained.
- As per **OPSS MUNI 506: Dust Suppression**, steps shall be taken as necessary to control dust resulting from operations such that it does not affect traffic, enter surface waters, or escape beyond the working area to cause a nuisance to pedestrians or wildlife. Dust suppressants shall be applied in a manner that avoids ponding, runoff, drifting, and tracking of the material beyond the area of application. Dust suppressant application shall not proceed during periods of rain when the surface is in a saturated condition or on areas of ponded water. Dust suppressants, other than water, shall not be applied when weather forecasts indicate a high probability of rainfall in order to minimize loss of the material from the intended area of application. Areas receiving rainfall within 6 hours after application may require reapplication of the material.

Migratory and Breeding Birds

The MBCA provides legal protection to migratory birds in Canada, and prevents harm, harassment, or destruction of their young, nests, and eggs. The FWCA prohibits the killing, harassment, or capture of listed species. The following avoidance and mitigation measures are recommended to avoid impacts to MBCA and/or FWCA protected birds as a result of the Project activities:

- Individuals, nests, eggs, or young of protected birds shall not be disturbed or destroyed at any time.
- All vegetation and tree removal and/or clearing operations must be completed after August 31 and before April 1 of any year, outside of the breeding bird active nesting season.
  - In the event a tree removal must occur between April 1 and August 31, the Contractor must retain a Qualified Avian Specialist to conduct a survey to confirm that no nests are present, prior to clearing. Nest search surveys are only suitable on isolated trees or in sparsely vegetated areas; they are not to be relied on as an alternative to abiding by the timing window for breeding birds.
- All demolitions of buildings/structures with nests or potential nesting areas, redevelopment of exterior areas of buildings/structures with nests or potential nesting areas, or removal of features on buildings/structures with nests or potential nesting must be completed after August 31 and before April 1 of any year, outside of the breeding bird active nesting season. Note that buildings and structures or parts of buildings/structures that have not

been identified as providing nesting habitat for birds previously may also become nesting habitat for birds in any given year, particularly where nesting opportunities become limited elsewhere within the AOI due to other exclusion and/or construction activities. Examples of suitable, existing nesting locations are shown in the Photographic Record within **Appendix B**.

  - In the event these activities cannot be completed before April 1 or after August 31, the Contractor must install exclusion measures around the building/structure that is the object of the activities as per Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Buildings and Structures (MNRF, 2017), to prevent birds from accessing the building/structure to nest on.

- If a bird showing behaviour indicative of nesting (e.g., carrying nesting material, alarm calling, acting agitated, etc.) and/or nests or young birds are encountered in the work limits at any time, consultation with an Avian Specialist shall be completed, and works will not continue in the location of the observation until after August 31 (or until the area is determined by the Avian Specialist to no longer be in use by breeding birds). Species specific buffers (or setback distances) in which no work can occur may be established by the Avian Specialist surrounding nests or other observations, using guidance provided by ECCC.

Bats and Other Mammals

As a result of impacts to confirmed habitat (i.e., maternity roost trees) for non-SAR bats on site, the following mitigation measures to avoid impacts to these species, which are protected under the FWCA, shall be implemented:

- The project disturbance limits will be clearly marked prior to commencement of work, and all activity will be restricted to within the marked limits.
- Removals of trees that are potential bat maternity roost trees must not occur during the active bat season, from April 1 to September 30 of any year. All potential roost trees shall be clearly marked on the contract drawings.
- Night work should not occur in proximity to potential bat maternity roost trees. If night work must occur, lighting must be directed away from bat habitat areas and toward the work zone, to the greatest degree possible.

To prevent impacts to other mammals during construction, the following shall be implemented:

- A daily pre-construction search of all machinery and the work area shall be implemented to identify presence of wildlife, as animals may be found hiding or basking around equipment, rocks, debris piles etc., especially if they are displaced during construction.
- Any wildlife encountered in the work area will not be knowingly harmed and shall be allowed to move away from the work area on their own. In the event that any wildlife encountered does not move away from the area or is injured, the Contract Administrator shall be notified immediately, and a Qualified Biologist should be contacted for recommendations to prevent harassment and/or harm to applicable wildlife.

Turtles

To avoid potential impacts to herptiles as a result of the proposed project activities, including SAR Map and Snapping Turtles, the following avoidance and mitigation measures are recommended:

- Wherever work in water (e.g., in-filling, work around building or bridge footings or piers, etc.) will occur, heavy duty silt fencing and turbidity curtains shall be installed within and adjacent to all turtle habitat areas, to prevent or minimize the risk of harm to turtles by physically preventing turtles from entering the work areas at any time prior to or during construction. Where work in water must occur during the peak activity period for turtles (i.e., April 1 to October 31), heavy duty silt fence and turbidity curtains shall be installed around the work limits, prior to the peak activity period (before April 1), and shall be frequently monitored and maintained for the duration of construction.
- Though there is low potential for turtle nesting, nesting opportunities may be present in gardens, in lawns areas, along beaches and bays, and in gravel areas, or can be created during construction if there are exposed soils from excavation, or from soil stockpiling present during the nesting season. If a nesting turtle is observed at any time (i.e., digging or sitting on a nest), the MNRF shall be notified immediately, a five (5) metre buffer zone shall be flagged around the nest site, and the area shall be protected from harm during the nesting season, unless otherwise managed (i.e., relocation or offsite incubation) with MNRF's approval.
- If a turtle is sighted during construction, work will immediately stop near the turtle, and it should be allowed to move out of the work area on its own. The Contractor should immediately notify the Contract Administrator, and the Contract Administrator will be responsible for notifying the MNRF for further direction.

All Wildlife

- Before filling any holes or trenches, they shall be inspected for wildlife, and any trapped wildlife shall be removed and released nearby. Before operating heavy equipment, a scan around the equipment should be completed to ensure that turtles and other wildlife are not basking or hiding in the vicinity.
- A worker awareness program shall be provided to all on-site personnel for all wildlife likely to be encountered on site, which includes species identification, habitat characteristics, and species-specific guidance with respect to appropriate actions to be taken if these species are encountered.
- The Contractor should be advised that any brush piles or soil stockpiles should be tarped or covered to ensure they do not provide nesting, denning, or hiding opportunities for wildlife, unless the intent of such brush piles or soil stockpiles is to provide intentional temporary cover for wildlife during construction.

Species at Risk

Although the majority of SAR have been ruled out as potentially present within the project limits, as they were not detected during MH's targeted field surveys, several have been confirmed as present and have a higher likelihood of being encountered during the project, particularly Barn

Swallow, as this species has the potential to nest on/under structures such as bridges, docks, patios/decks, overhangs, awnings, and window or other ledges. If the contractor encounters a SAR within the work limits at any time that is likely to be impacted by the operations:

- The Contractor shall immediately notify the Contract Administrator and suspend operations within the area identified by the Contract Administrator.
- Work shall remain suspended within that area until otherwise directed by the Contract Administrator in writing, that the work can proceed; the Contract Administrator must contact a Qualified Biologist for species specific recommendations.

To ensure compliance under Section 9 and/or Section 10 of the ESA, and to protect SAR and SAR habitat during development and operations of the proposed Project activities, the following general mitigation measures are recommended and will be included for protection of Species at Risk:

- A daily pre-construction search of the machinery and the work area shall be implemented to identify presence of SAR.
- If endangered or threatened species are observed in or within the work limits, work shall stop immediately, a photograph shall be taken of the species (if possible) and the SAR shall be allowed to move out of the work area on its own. The Contract Administrator and the MECP shall be notified immediately.

Barn Swallow

Under provincial laws (ESA 2007 and *Ontario Regulation 830/21: Exemptions - Barn Swallow, Bobolink, Eastern Meadowlark and Butternut*), prior to the start of work, the project must have been registered with the MECP under a Notice of Activity (NOA) for Barn Swallow, wherever impacts to Barn Swallow nests are anticipated to occur.

Under an NOA, certain rules apply to the project including:

- Avoid any activity that could harm the bird(s) or their nests, eggs, or young if they are using a structure (i.e., complete work outside of the bird nesting season, before April 1 or after August 31).
- Take steps to prevent the bird(s) from building nests on or entering a structure during their active season (i.e., install exclusion around areas used for bird nesting before April 1 and maintain it until August 31)
- Pay financial restitution for any nests that are removed, damaged, or destroyed.

Any activity that will impact Barn Swallow nests may, as of recently, pay financial compensation into “the Fund” via a Species Conservation Charge under O. Reg. 830/21, using the online registry system. Payment of a Species Conservation Charge must be received by the Ministry at least one day before the activity begins, or within 30-days after registering the activity, whichever is earlier. Any activity registered under a conditional exemption for Barn Swallow that selects the Fund option is required to meet the conditions set out in Section 5 of O. Reg. 830/21, including: preventing adverse effects of the activity on the species and their habitat, preparing a Barn

Swallow Management Plan and, once the activity has commenced, updating the plan in accordance with Section 7 O. Reg. 830/21. A copy of the Barn Swallow Management Plan must be kept for two years after the activity is completed and provided to the Ministry within 14 days of receiving a request for it. As the project will be proceeding in several stages, and there are several stakeholders involved responsible for the various components of the project, it is anticipated that several separate registrations, Species Conservation Charges, and Barn Swallow Management Plans will need to be coordinated, prepared, and submitted.

Bank Swallow

Bank Swallow is listed as a Threatened species in Ontario. Although Bank Swallow nesting habitat was not observed within the AOI, this species has been recorded previously surrounding the AOI, and there is the potential for this species to arrive on site following commencement of construction activities as they are attracted to nesting in loose soils such as those resulting from construction of embankments and slopes, or those found in stockpiles of soils. If work within stockpiles or slopes is required during the breeding bird season, a slope reduction plan should be used to deter nesting by Bank Swallows, and can be achieved by:

- Sloping off stockpiles (using a bulldozer excavator etc.).
- Contouring slope faces.
- Piling materials on the face (exclusion).

Note that any slopes or parts of slopes that are not rendered unsuitable can be occupied as quickly as overnight. For work sites that are operational daily, slopes should be left at 70 degrees or less at the end of each day. Slope reduction measures should continue throughout the breeding bird season (April 1 – August 31) of any year.

7. NATURALIZATION PLAN

Naturalization can be defined as a process of ecological restoration that involves returning an altered or degraded site to a more natural condition through the use of trees, shrubs and flowers that are native to the area (Evergreen, 2001). Urban naturalization is defined as an ecologically based approach to landscape management that seeks to restore environmental integrity to the urban landscape.

Ontario Place is unique in that it is a human-built site and as such cannot be restored to historical ecological conditions. There is opportunity, however, for the site to be developed to a more natural condition compared to its current state by increasing the relative proportion of green space on site, increasing the abundance and diversity of native plant species, and enhancing habitat through not only plantings but habitat enhancement features as well.

This section of this report is intended to identify enhancement strategies and opportunities for naturalizing the site to improve existing natural features. It has been developed in accordance with the terms of reference provided within the City of Toronto Redevelopment Planning Applications Checklist dated September 2021, submitted in support of the proposed redevelopment.

7.1 Parks and Open Spaces

As noted in the introduction, this revitalization includes a comprehensive investment in publicly accessible park and site-wide upgrades. This involves the creation of a series of new animated and fully accessible open spaces across the islands and mainland and the introduction of a new shorelines – with a new beach and opportunities for swimming, fishing, and water recreation.

Conceptual plans identify strategies related to recreational activity, cultural heritage, and natural play areas, all of which will contribute to parks and open spaces at the site. Conceptual plans also identify an increase in tree canopy cover for the site intended to, in part, provide reduce summer peak temperatures and air pollution, and add living beauty to the spaces. Furthermore, preliminary plans propose to increase of the proportion of native species on site compared with current conditions, with the intent of providing higher quality habitat for wildlife,

Due to the site location, inset within Lake Ontario, as well as the lack of green spaces present along Lakeshore Boulevard due to parking areas, pathways, and other impermeable surfaces, the site in its current state is relatively isolated from most plant and wildlife species, providing limited opportunities for emigration or immigration, except for species with high mobility such as birds. Current plans for green spaces at the site include tracts of continuous trees and plantings to the degree possible, particularly on the East Island and on the mainland between Lakeshore Boulevard and Lake Ontario. Therefore, there may be increased opportunities for connectivity of the site with adjacent open spaces off site (e.g., Marilyn Bell Park and Coronation Park) for wildlife post-redevelopment due to plantings on the mainland, as well as improved linkages to various habitat types within the site (e.g., across the East Island or between the East and West Islands via the mainland). The proposed OPPR work proposes to open the waterway between Brigantine Cove and the rest of Lake Ontario by creating a bridge between the mainland and the East Island

over the water in place of the existing structure, which is a permanent barrier. This would allow for increased connectivity between the internal embayments at Ontario Place and Lake Ontario as a whole for some wildlife such as waterfowl, and may therefore increase linkages between open water areas.

7.2 Natural Features and Habitat Enhancement

Conceptual plans for the OPPR identify an increase in tree canopy cover for the site intended to, in part, provide wildlife habitat. The proposed master plan for the OPPR includes wetlands and waterfront forest. Plans for habitat enhancement are being developed within both the OPPR and Therme facility. Therme's Landscape Strategy identifies ecological sustainability, as well as terrestrial and aquatic habitat improvements, at the core of the landscape vision. Therme is proposing approximately 9,300 square metres of innovative wetland habitat, which features habitat creation. Aquatic habitat value will also be increased with shoreline improvements in the protected shore zone.

Conceptual plans identify several strategies related to natural features and habitat enhancement including: increasing tree canopy cover; promoting of biodiversity and rich wildlife habitat through the use of native and resilient planting; increasing habitat types and biodiversity of spaces on the islands through landscape planting and microclimate creation; keeping all developments out of flood hazard zones; and, integrating climate resilient strategies into the design while protecting the aquatic habitat through the enhancement of water quality and shoreline rehabilitation.

In addition to incorporation of natural features and habitat enhancements, conceptual plans for the redevelopment identifies several strategies related to naturalizing development including stormwater management, pervious surfaces, and inclusion of renewable energy and material. For example, proposed plans for Therme include extensive green roofs, as shown in **Figure 12**. As the OPPR and Therme plans continue to develop, it is recommended that further consideration be given to naturalizing development and achieving a net environmental gain for the site.

7.2.1 Natural Feature and Habitat Enhancement Recommendations

As noted above, as a human-built site, Ontario Place cannot be restored to historical ecological conditions, but proposed planting plans can work to create more natural conditions.

Based on the up-to-date existing natural heritage conditions at the site, it is recommended that wildlife and fish habitat enhancement strategies be targeted at species already known to occur on site.

Vegetation, Wildlife and Wildlife Habitat

Based on the current redevelopment plans, there are some areas that provide better opportunities for habitat creation for terrestrial wildlife (i.e., Go Areas) relative to other areas (i.e., No Go Areas). For example, areas within proposed building footprints or parking space provide little opportunity. Approximate Go and No Go Areas for terrestrial habitat, based on the current site plans, can be found in **Figure 13**.

Figure 13: Go No Go Map for Terrestrial Habitat

Landscaping plans for the OPPR and Therme facility are being developed. In general, the intent is to include naturalized elements that represent the native landscape of Ontario. As these plans develop further, it is recommended that plant species lists be refined to best match conditions at the site and to maximize native vegetative cover at the site. Ongoing maintenance, monitoring, and adaptive management are recommended to support the growth and success of all plantings.

The site is known to provide habitat for bats. In particular, Vegetation Survey Areas J and G are considered Candidate Bat Maternity Colonies. Per SWH Habitat Criteria, maternity colonies can be found in tree cavities and vegetation with more than 10 large diameter (>25cm dbh) maternity roost trees per hectare. By increasing tree population and density and allowing trees to grow and age to the point where they develop cavities, hollows and other features that bats can use for maternity roosting, the site's suitability for bat habitat can be improved. As planting plans develop, consideration should be given to including tree species that bats are known to use such as those that are known to provide good cavities for bats to roost in, including Eastern White Pines, Maples, Ashes, Aspens, and Oaks (MNRF Guelph, 2017). Given the time required for trees to age to the size and condition that they are suitable for bats, artificial bat boxes should be considered for installation in as many suitable locations as possible at the site to serve as habitat for roosting bats in the near-term.

Tree Swallows are also known to nest in cavity trees throughout the site, as well as in artificial nesting structures (at Live Nation). Artificial Tree Swallow nesting structures can also be considered for installation at suitable locations at the site to act as habitat for this species in the near-term, until trees on site are suitable. Other avian species observed onsite that could benefit from the inclusion of artificial nesting areas customized to the particular species include Terns and Gulls, as they will readily use artificial islands created for nesting.

The site is known to provide habitat for Midland Painted Turtle (*Chrysemys picta marginata*) and Northern Map Turtle (*Graptemys geographica*). For most turtles, wintering areas are in the same general area as their core habitat, in permanent water bodies and large wetlands; water must be deep enough not to freeze and have soft substrates. As at least one (1) Northern Map Turtle was observed in Vegetation Survey Area F in early spring after ice-out, and in early fall approaching ice-on, this area is considered a Confirmed Turtle Wintering Area. The Toronto and Region Conservation Authority (TRCA) has undertaken restoration work with Area F, which appears to have included installation of habitat features including vegetated islands for basking and basking logs. Similar restoration efforts at other suitable locations are recommended to provide additional basking habitat for turtles. As plans for wetland areas continue to be developed, it is recommended that provision of suitable additional turtle basking habitat in these areas be considered. In addition, created wetlands should include a variety of submerged, emergent, and floating-leaved aquatic vegetation, in order to improve and augment permanent habitat for turtles at the site. Furthermore, although there are no known records of turtles nesting at Ontario Place, this may be due to insufficient or inaccessible existing nesting areas. Installation of artificial nesting areas specifically designed for turtles would be likely to result in successful nesting at this site given the prevalence of breeding sized turtles observed in some areas.

The entire AOI is considered a Confirmed Landbird Migratory Stopover Area. This was assessed based on the 2022 field investigations, during which MH's studies confirmed use of the site by

200 migratory songbirds and/or migrant raptors on at least one (1) day, more than 35 species in total, and at least 10 species on at least five (5) different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. By increasing tree population and density of vegetation, as well as increasing the proportion of native species present and planting species that produce achenes and fruits, or that encourage insects, the site's suitability for bird habitat can be improved. As planting plans develop, consideration should be given to including species that augment habitat for bird species known to use Ontario Place, and to including larger areas of dense, contiguous plantings, wherever possible.

Several Special Concern (SC) and provincially rare (PR) wildlife species were detected over the course of the field surveys, including Great Egret (PR), King Eider (PR), Northern Map Turtle (SC) Pied-billed Grebe (PR), Horned Grebe (SC), Eastern Wood-pewee (SC), Peregrine Falcon (SC), Grasshopper Sparrow (SC), and Monarch (SC) Therefore, the AOI provides confirmed habitat for Special Concern and Rare Wildlife Species and, as plans develop, consideration should be given to providing additional habitat for these special concern and rare wildlife species known to use Ontario Place. For the first five (5) of these species, this includes improving open water and wetland spaces in terms of habitat complexity and floral diversity. For Eastern Wood Pewee, including areas of dense continuous tree plantings within the planting plans will benefit this species, and Peregrine Falcon and Grasshopper Sparrow are believed to be only occasional visitors on site but would also benefit from inclusion of green spaces and naturalization of the site as a whole. Monarchs requires different habitat types depending on their life stage. Adult butterflies require feeding areas containing nectar producing plants and also require Milkweeds (*Asclepias spp.*) to lay their eggs on. Upon hatching from eggs, larval Monarchs require Milkweeds exclusively to feed on. Thusly, habitat creation for this species can be accomplished through including combinations of Milkweeds and flowering species within planting plans and/or garden areas. Given the location of this site within Lake Ontario, there is an opportunity to create Significant Wildlife Habitat for this species (Migratory Butterfly Stopover Areas) by including combinations of field/meadow and forest/woodland habitats and including an abundance of Milkweeds and preferred nectar plants within planting plans. In addition to wildlife, several provincially rare plants were also recorded in the AOI, including Kentucky Coffee-tree, Honey Locust, and Ohio Buckeye. All individuals of these species at Ontario Place are presumed to have been planted versus establishing naturally, and there are opportunities to incorporate these and/or other rare plant species into the site planting plans as they progress.

Based on the field program undertaken by MH in 2022, two (2) terrestrial SAR that are listed as Threatened or Endangered under the ESA were confirmed on site including: Barn Swallow and Chimney Swift. Although creation of nesting habitat for these species is not required based on the anticipated project impacts and proposed mitigation and avoidance measures, both of these species respond positively to nesting on human-made structures designed to suit these species. Therefore, incorporation of artificial nesting structures for Chimney Swift and Barn Swallows could be completed to enhance and improve habitat for these species, if that objective is desired.

Although no snake species have been observed at the site, the post construction conditions at Ontario Place may be conducive to seasonal or occasional inhabitation by several snake species. The primary habitat type for snakes most notably lacking from the site currently, which will remain unavailable following the redevelopment is hibernation habitat. Artificial hibernation sites for

snakes, such as buried coarse rubble and debris piles below frost lines with discrete access areas, can be created during construction activities to assist in providing this key habitat for snakes that is currently absent at Ontario Place, if desired.

Ontario Place has been identified as providing habitat for a variety of mammals that depend on burrows, crevices, dens, and other such features, all of which will be in short supply upon completion of the redevelopment activities given that the vast majority of the site will be upgraded, repaired, recently planted, or newly installed. Therefore, incorporating habitat features for furbearers is recommended where possible, to augment habitat for these species while the site degrades, naturalizes, and matures. Species such as Striped Skunk, Red Fox, and Eastern Cottontail would benefit from intentional brush piles or large diameter deadfall left to provide cover, as well as inclusion of areas of deep, loose soils suitable for digging burrows. Species such as American Mink and Beaver would benefit from creation of wetlands with increased aquatic vegetation, as well as from accessible plantings in riparian areas and shorelines.

Fish and Fish Habitat

The potential for impacts to fish and fish habitat as a result of the proposed developments are discussed above in **Section 6.1.1**. The following enhancements are discussed as partial compensation to improve and benefit the fish and fish habitat present in Lake Ontario, specifically within the Ontario Place Study Area which directly supports fish and fish habitat, including potentially sensitive habitat for the provincially Endangered American Eel. The aquatic environment surrounding Ontario Place has been anthropogenically altered and the surrounding riparian areas are a manicured public space. Significant opportunities exist for restoration and enhancement of the existing aquatic habitat and specific improvements are recommended to occur through collaboration with agencies including Department of Fisheries and Oceans (DFO), Toronto and Region Conservation Authority (TRCA), Aquatic Habitat Toronto (AHT) and others. Habitat restoration, enhancements and offsetting shall be completed to meet agency requirements. Similar to terrestrial habitat, there are some areas that provide better opportunities for fish habitat creation (i.e., Go Areas) relative to other areas (i.e., No Go Areas). Approximate Go and No Go areas for fish habitat, based on the current site plans, can be found in **Figure 14**.

Opportunities for incorporation into the design are intended to include best practices for connectivity and linkage between diversity of habitat types such that their respective function may be accessible to fish and benefit a variety of fish species throughout their life stages. Habitat enhancements are recommended to align with the best practices of AHT and strategies outlined within the TWAHRS. Restoration and enhancements strategies outlined by TWAHRS that are recommended for incorporation into the design include the Surcharged Open Coast Revetment along the shorelines adjacent to the Open Water Habitat (described herein) as well as inclusion of Vegetation Zones, Modified Growth of Submerged Aquatic Vegetation and installation of Underwater Reef habitat. These strategies are targeted to increase diversity and abundance of foraging and refuge habitat for a variety of resident and migrational fish species and should be designed in detail through collaboration with all regulatory agencies such as DFO and TRCA and through partnerships with organizations including AHT such that implementation is incorporated and leveraged throughout the design.

Figure 14: Go No Go Map for Fish Habitat

To benefit the Endangered American Eel specifically, general improvements to the availability and abundance of foraging and refuge habitat is recommended. The American Eels use of Lake Ontario is widespread over a diverse range of habitat conditions, however sensitive spawning habitat is not found within Lake Ontario as the American Eel spawns in the Sargasso Sea. As such, improvements in this regard are unachievable. Within the property of Ontario Place, Lake Ontario provides generic coarse rock substrate along much of the shoreline adjacent to the open water of Lake Ontario which may function as suitable habitat for American Eel (see **Figure 8**). Large coarse rock substrates located in water depths greater than 1 m is suitable habitat for the American Eel and provides refuge and foraging opportunities for the species as cover is provided within the interstitial spacing of the rock. This form of suitable habitat for the Eel was identified to be present at Ontario Place during environmental field assessments and occurs along the southern shoreline of the property, however the species is anticipated to benefit from the proposed increase in abundance and availability of this habitat type.

Therme

The proposed design is anticipated to result in the loss of existing fish habitat (36,000 m^2), the permanent creation (1,095 m^2) of new fish habitat resulting from the new habitat along the eastern wetlands on west island and the construction and installation of the swimming pier and new public bridge, the Gateway Bridge (2,936 m^2) as well as the installation of restorative fish habitat features (25,096 m^2) have the potential to result in permanent alteration to fish habitat in the amount of approximately 28,032 m^2. Further, increase to the connectivity of riparian and shoreline habitat linkages may result through re-naturalization when compared to instances of hardened shorelines which are present under existing conditions.

The restorative opportunities that are recommended will result in permanent residual impacts that are positive to the local fish and fish habitat and include a diversity of features such as Submerged Reef (9,456 m^2), Modified Growth of Submerged Aquatic Vegetation (920 m^2) and Surcharged Open Coast Revetment (10,900 m^2) habitat as well as other aquatic habitat feature enhancements including a Cobble Beach (3,820 m^2) and Modified Growth of Submerged Aquatic Vegetation (920 m^2). These enhancements will be designed in detail through collaboration with all regulatory agencies and partnerships with organizations such as Aquatic Habitat Toronto (AHT). Best practices have been considered and are recommended to continue to be incorporated, leveraged and consistent with research and best management decisions for Toronto's Lake Ontario shoreline. Inclusions such as provision of softened green shoreline edges on the eastern wetland areas on West Island are also anticipated to enhance fish habitat locally and should include considerations from the Modified Growth of Submerged Aquatic Vegetation and the Vegetation Zones Toronto Waterfront Aquatic Habitat Restoration Strategies.

Live Nation

The proposed design is anticipated to result in the loss of existing fish habitat due to the Lakefront Event Pier and associated Terrace along with construction of new pedestrian and service bridges. Restoration and habitat enhancements have not been proposed in this area at this stage of preliminary design however are recommended to be designed in collaboration with AHT, TRCA and other applicable organizations and agencies to align with the strategies outlined within the

Toronto Waterfront Aquatic Habitat Restoration Strategy. Restoration and enhancements strategies outlined by TWAHRS that are recommended for incorporation into the design include installation of Vegetation Zones and installation of Modified Growth of Submerged Aquatic Vegetation. Considerations for softening and increasing the abundance of green shoreline edges on the East Island are also recommended to enhance fish habitat locally.

Ontario Place Public Realm

The OPPR plans propose permanent creation of approximately 755 m^2 of fish habitat resulting from the permanent removal of the existing fill/berm located at the eastern extent of the development site. Brigantine Cove is located immediately west of this area and is a prime opportunity to improve aquatic habitat and create a naturalized shoreline edge. By integrating a variety of aquatic plants, this area could create a variety of wetland conditions which would help establish ecosystems where diverse fish species can thrive. Additional improvement is anticipated to occur within the aquatic habitat conditions in Brigantine Cove through the increased fluvial linkage provided by the proposed new bridge crossing following removal of the fill/berm. This fluvial linkage will assist in removal of the stagnant aquatic conditions and is anticipated to improve conditions throughout Brigantine Cove and beyond.

The strategy for Brigantine Cove is to create a network of wetland spaces with riparian habitat to improve water quality, manage occasional flooding and to create an immersive landscape experience for visitors. To improve water quality within Brigantine Cove the goal is to remove the fill at the East Island access and rebuild access via a bridge. This opportunity is anticipated to repair a portion of the Cove that currently sees stagnant water and debris build up. This implementation would also allow for kayaks to move into the Cove from east of Trillium Park, creating a watercraft connection that could be integral to water base tourism and recreation.

Compared to existing conditions, changes in Brigantine Cove are likely to result due to the increased water circulation, a limiting factor identified within Brigantine Cove which will lead to more diverse temperature gradients and circulation within the relatively shallow Brigantine Cove and inner harbour. It is anticipated that both easterly and westerly winds on Lake Ontario will likely help improve habitat conditions within the inner harbour aquatic environment and as a result, approximately 26,564 m^2 of habitat will be enhanced within Brigantine Cove. Considerations for inclusion of the Modified Growth of Submerged Aquatic Vegetation and the Vegetation Zones strategies from Toronto Waterfront Aquatic Habitat Restoration Strategies may further enhance habitat function. Creation of new planting areas along the water's edge would add texture, attraction, and habitat to the shoreline. Considerations for creating tidepools and water's edge planting zones here are intended to increase habitat and soften the edge of the island.

8. PERMITTING AND APPROVALS

8.1 Fish and Fish Habitat

There are potential negative residual impacts identified during this preliminary stage that are not likely to be mitigated during completion of the detailed fish and fish habitat assessment at the Detailed Design stage.

Fisheries Act

Through the assessment of the potential impacts and mitigations at this preliminary stage, it is *likely* that construction activity cannot be entirely mitigated, and permanent negative residual effects are anticipated. Therefore, DFO should be consulted and an Authorization, if required, must be pursued under the *Fisheries Act*. Permanent negative residual effects are anticipated to persist following the destruction of fish habitat and has the potential to result in Harmful Alteration, Disruption or Destruction of Fish Habitat. Based on preliminary assessment, a *Fisheries Act* Authorization from Fisheries and Oceans Canada (DFO) may be required for the work at Therme, and/or Live Nation developments.

Endangered Species Act

A permit under the *Endangered Species Act* may be required for the Therme and OPPR developments. Works which have the potential to impact individuals of the species or a significant component of the coarse rock habitat of the American Eel may be subject to the provisions of the provincial *Endangered Species Act*. Should in-water work be required at the suitable habitat for American Eel or should significant alteration of existing conditions be proposed and it is anticipated that the coarse rock habitat will be removed or lost permanently, MECP shall be engaged to determine the permitting requirements under the provincial Endangered Species Act. If a permit be deemed necessary due to the proposed work, a permit for the overall benefit of the species may be applied for under section 17(2)(c) of the provincial ESA. Section 17 (2)(c) of the provincial ESA allows for permitting application where overall benefit to the affected specie(s) is demonstrated.

8.2 Terrestrial

Endangered Species Act

Authorizations under the ESA under O. Reg. 830/21 will be required for impacts (removal or damage) to any of the Barn Swallow nests identified within the AOI, since this species receives habitat protection as a Threatened species. Registration of the redevelopment activities under an NOA for Barn Swallows is offered as an alternative to a formal permit for impacts to Barn Swallows. In addition to registration under an NOA, a Barn Swallow Management Plan must be prepared for the project, and financial compensation (Species Conservation Charge) must be paid into the Fund wherever damage, removal or exclusion of Barn Swallow nests will occur.

9. CONCLUSION

9.1 Fish and Fish Habitat

Works within Lake Ontario or along the shoreline have the potential to impact fish habitat or the species of fish that utilize the habitat. The proposed developments and their activities are subject to the provisions of the federal *Fisheries Act* and the provincial *Endangered Species Act*. Where the harmful alteration, disruption or destruction (HADD) of fish habitat or death of fish is anticipated or impacts to a species at risk are anticipated, review by DFO and MECP are required.

It is anticipated that a submission of a Request for Review submission to DFO will be required for works at the Therme and Live Nation developments to determine whether authorization under section 35 (1) of the federal *Fisheries Act* is required. These determinations will occur following further fish and fish habitat assessment and review of Detail Design of the proposed construction and activities. The determination will also outline requirements for submission of a Request for Review to DFO or an Information Gathering Form from MECP for compliance with the *Fisheries Act* and *Endangered Species Act*, respectively.

9.2 Terrestrial

Works within the Ontario Place AOI have the potential to have significant impacts on terrestrial habitat and SAR where stringent mitigation and avoidance measures and revegetation plans are not developed, implemented, and adhered to. The proposed redevelopment and related activities are subject to the requirements and protections of the FWCA, MBCA, ESA, and the Invasive Species Act (2015).

It is anticipated that registrations/exemptions for Barn Swallows under the ESA under will be required, and that several registrations will be required for each of the Therme, OPPR, and Live Nation works.

9.3 Applicable Timing Restrictions for Work

- Due to the presence of warm and cool water fish species, any required in-water works or work on channel banks are anticipated to be permitted between July 16 to March 14 (to be confirmed through consultation with MNRF or TRCA) on Lake Ontario at Ontario Place.
- All vegetation and tree removals and/or clearing operations must be completed after August 31 and before April 1 of any year, outside of the breeding bird active nesting season.
- All demolitions of buildings/structures with nests or potential nesting areas, redevelopment of exterior areas of buildings/structures with nests or potential nesting areas, or removal of features on buildings/structures with nests or potential nesting must be completed after August 31 and before April 1 of any year, outside of the breeding bird active nesting season. Alternatively, exclusion measures must be installed around any building/structure that is the object of an activity in advance of April 1 of any year, to prevent birds from accessing the building/structure for nesting.

- Removals of trees that are potential bat maternity roost trees must not occur during the active bat season, from April 1 to September 30 of any year.
- Wherever work in water (e.g., in-filling, work around building or bridge footings or piers, etc.) must occur during the peak activity period for turtles (i.e., April 1 to October 31), heavy duty silt fencing and turbidity curtains shall be installed within and adjacent to all turtle habitat areas before April 1, to prevent or minimize the risk of harm to turtles by physically preventing turtles from entering the work areas at any time prior to or during construction.
- A slope reduction plan should be used to deter nesting by Bank Swallows in slopes or soil stockpiles between April 1 and August 31 of any year.

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APPENDIX A: Toronto Official Plan - Map 9 Natural Heritage Systems

Note: For Information purposes only
Boundaries are schematic

TORONTO

Natural Heritage System

Not to Scale

Toronto Official Plan

Map 9

Natural Heritage System

February 2019

APPENDIX B: Photographic Record

Figure 1: View, facing southwest, of the West Entrance Building (B92580). June 5, 2020.

Figure 2: View, facing north, of roof of the West Entrance Building (B92580). June 5, 2020.

Figure 3: View of an American Robin nest on the north side of West Entrance Building (B92580). June 20, 2022.

Figure 4: View, facing west, of Landbird/Breeding Bird Survey Transect #1, and Vegetation Survey Area M. July 21, 2022.

Figure 5: View, facing west, of Bridge 6 (B6) and Waterfowl/Shorebird Survey Area #6. May 20, 2022.

Figure 6: View of Barn Swallow nest on girder of Bridge 6 (B6). Barn Swallows also shown in nest and on girder. June 23, 2022.

Figure 7: View, facing north, of Landbird/Breeding Bird Survey Transect #1, and Vegetation Survey Area M. Japanese knotweed (*Reynoutria japonica*), a restricted invasive species, is abundant. August 24, 2022.

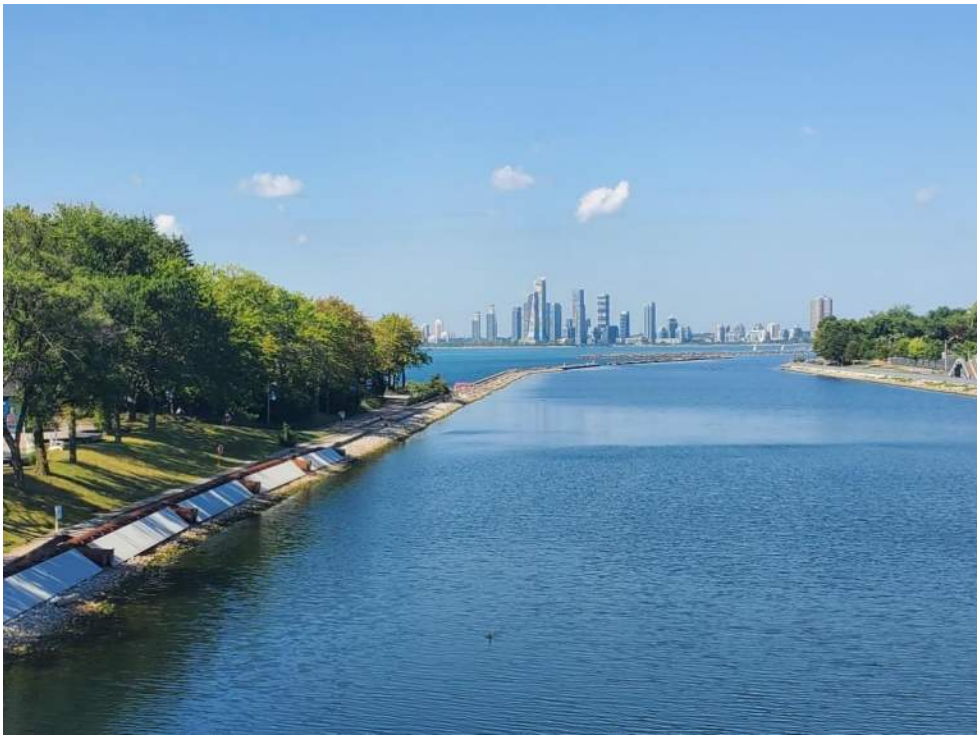

Figure 8: View, facing west, of Waterfowl/Shorebird Survey Area 6 (right), Landbird/Breeding Bird Survey Transect #2 (left), and Amphibian Call Station #2. August 24, 2022.

Figure 9: View, facing north, of Commons Food Building (B92547) on West Island, where Barn Swallows and American Robins nest under awnings. Hundreds of Cliff Swallows can be seen perched on strings of lights. July 12, 2022.

Figure 10: View, facing northeast, of Commons North East Building (B92581). June 20, 2022.

Figure 11: View, facing north, of Commons North Building (B92548). June 20, 2022.

Figure 12: View, facing northwest, of Commons Food Building (B92547) where Barn Swallows and American Robins nest under awnings. June 20, 2022.

Figure 13: View of American Robin nest on Commons Food Building (B92547). June 20, 2022.

Figure 14: View of Barn Swallow nest on Commons Food Building (B92547). Barn Swallow visible sitting in nest. June 20, 2022.

Figure 15: View, facing north, of Commons West Building (B92546). June 20, 2022.

Figure 16: View of canopy on Commons West Building (B92546) where Barn Swallows nest. June 20, 2022.

Figure 17: View of Barn Swallow nest on top of light fixture on Commons West Building (B92546). July 12, 2022.

Figure 18: View, facing south, of the front of the Waterfall Stage (B92545). June 20, 2022.

Figure 19: View, facing east, of the side of Waterfall Stage Building (B92545). June 20, 2022.

Figure 20: View, facing west, of the Electrical Sub Station Building (B92544). June 20, 2022.

Figure 21: View, facing north, of the canopy between the Commons North Washroom (B92543) and the Dry Storage Building (B92542). June 20, 2022.

Figure 22: View, facing east, of Landbird/Breeding Bird Survey Transect #2 and Vegetation Survey Area O. The Commons North Washroom (B92543) and the Dry Storage Building (B92542) are also visible (right). August 24, 2022.

Figure 23: View, facing northwest, of Bat Acoustic Monitoring Area #5 and a portion of Landbird/Breeding Bird Survey Transect #2. The Wilderness Adventure Ride is also visible in the background. July 2, 2020.

Figure 24: View, facing west, of the Commons South Washrooms (B92541). A portion of Landbird/Breeding Bird Survey Transect #6 is also visible in the background. June 20, 2022.

Figure 25: View, facing northwest, of the West Island Commons buildings and Bridge 13 (B13). June 20, 2022.

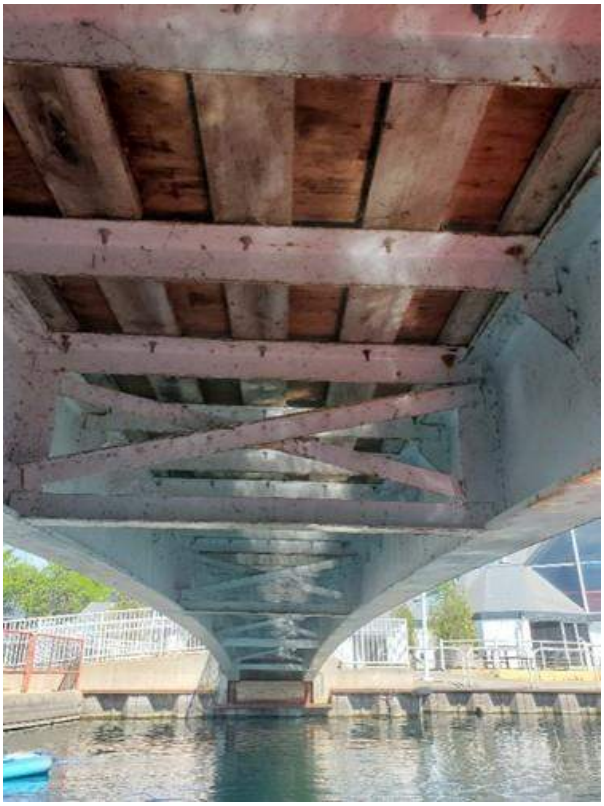

Figure 26: View, facing northwest, of the underside of Bridge 13 (B13) showing potential bird nesting habitat. June 23, 2022.

Figure 27: View, facing south, of the Driving Shed (W13) and part of Landbird/Breeding Bird Survey Transect #7. August 31, 2022.

Figure 28: View, facing north, of the Ride Maintenance Building (B92540). July 5, 2022.

Figure 29: View, facing east, of the Ride Maintenance Building (B92540). July 5, 2022.

Figure 30: Covered platform in the Ride Maintenance Building (B92540) area, showing potential suitable nesting area for birds. July 5, 2022.

Figure 31: View, facing south, of the Ride Maintenance Building (B92540) area, showing Vegetation Survey Area J in the background. July 5, 2022.

Figure 32: View, facing northwest, of the Ride Maintenance Building (B92540) area. July 5, 2022.

Figure 33: View, facing west, of Landbird/Breeding Bird Survey Transect #2 and Vegetation Survey Area J. August 24, 2022.

Figure 34: View, facing north, of Landbird/Breeding Bird Survey Transect #3 and a portion of Vegetation Survey Area J. August 24, 2022.

Figure 35: View, facing northwest, of Waterfowl/Shorebird Survey Area #5. American Minks were observed in this area on the shoreline. August 24, 2022.

Figure 36: View, facing south, of the West Island south lookout. June 20, 2022.

Figure 37: View, facing east, from the West Island south lookout, showing Waterfowl/Shorebird Survey Area #4 and Amphibian Call Station #3. August 24, 2022.

Figure 38: View, facing northwest, of Landbird/Breeding Bird Survey Transect #4, Vegetation Survey Area J, and Bat Acoustic Monitoring Area #3. October 11, 2022.

Figure 39: View, facing west, of the Silo Assembly Space (B92539), part of the Interconnected Silos Complex (B92538) and Bat Acoustic Monitoring Area #2. July 7, 2020.

Figure 40: View, facing north, of the bridge between silos B92538-7 and B92538-8 in the Interconnected Silos Complex and of Landbird/Breeding Bird Survey Transect #5. July 12, 2022.

Figure 41: View of American Robin nest on bridge between silos B92538-7 and B92538-8 in the Interconnected Silos Complex. July 12, 2022.

Figure 42: View, facing northeast, of the Wilderness Adventure Ride and part of Landbird/Breeding Bird Survey Transect #6. July 7, 2022.

Figure 43: View, facing south, of covered entrance to the Interconnected Silos Complex at B92538-9. July 12, 2022.

Figure 44: View, facing northwest, of the West Island beach area, and part of Landbird/Breeding Bird Survey Transect #8. August 24, 2022.

Figure 45: View, facing north, of an access tunnel to the Wilderness Adventure Ride near the east end of Landbird/Breeding Bird Survey Transect #4. July 12, 2022.

Figure 46: View, facing north, of Vegetation Survey Areas I and P, Landbird/Breeding Bird Survey Transect #7 (left), Bat Acoustic Monitoring Area #4 (left), and a portion of Waterfowl/Shorebird Survey Area #1. July 5, 2022.

Figure 47: View, facing southwest, of the Temple Bell (TB). July 12, 2022.

Figure 48: View, facing northeast, of the Cinesphere (B92569), Secondary Ramp Elements 5 &6 (SB5, SB6), Dock 2 (D2), and Vegetation Survey Areas P and I. August 24, 2022.

Figure 49: View facing northwest of a portion of Vegetation Survey Area I. July 12, 2022.

Figure 50: View of Barn Swallow nest on Secondary Dock Element 1 (SB1). June 23, 2022.

Figure 51: View of the Secondary Tower Ramp Element (SB7) leading to the Cinesphere (B92569) and Bridge 10 (B92572).

Figure 52: View of Barn Swallow nest under Secondary Ramp Element 6 (SB6). June 23, 2022.

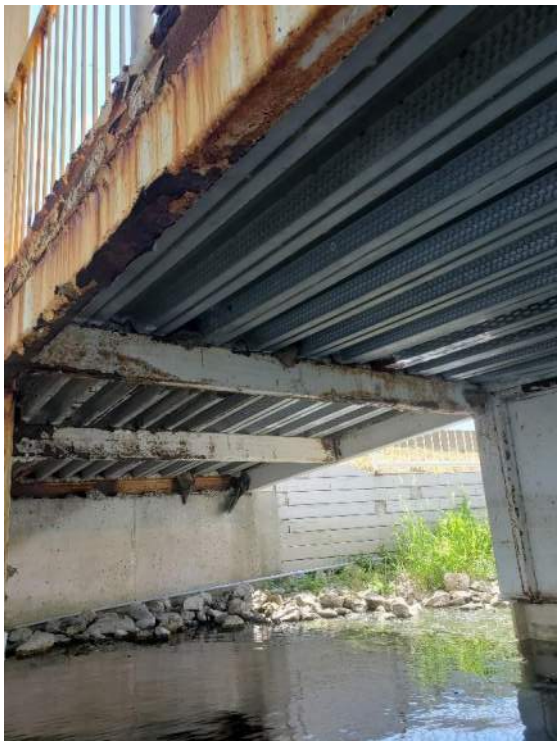

Figure 53: View, facing southeast, of prevalent Barn Swallow nesting under Secondary Tower Ramp Element 7 (SB7) at Cinesphere (B92569). June 23, 2022.

Figure 54: View of Cliff Swallow nests in grooves in underside of Secondary Tower Ramp Element 7 (SB7). June 23, 2022.

Figure 55: View of a partial, old, inactive American Robin nest on Secondary Tower Ramp Element 7 (SB7) awning. June 23, 2022.

Figure 56: View, facing east of Landbird/Breeding Bird Survey Transects #7 and #8, Vegetation Survey Area I (left), Vegetation Survey Area H (right). October 11, 2022.

Figure 57: View facing, southeast of Landbird/Breeding Bird Survey Transect #8 and Vegetation Survey Area H. October 11, 2022.

Figure 58: View, facing south, of the Marina West Washrooms (B92551) and the West Marina Village Building (B92550). June 5, 2020.

Figure 59: View, facing south, of Barn Swallow nesting area under awning at the Marina West Washrooms (B92551) and the West Marina Village Building (B92550). June 20, 2022.

Figure 60: View of Barn Swallow nest on canopy at the Marina West Washrooms (B92551). June 20, 2022.

Figure 61: View of Barn Swallow nest on light fixture under awning directly northeast of West Marina Village Building (B92550). June 20, 2022.

Figure 62: View of Barn Swallow nest under awning directly northeast of West Marina Village Building (B92550). June 20, 2022.

Figure 63: View, facing south, of Bridge 5 (B92575) and the marina area. Waterfowl/Shorebird Survey Area #1 is visible in the foreground (north of B5) and Waterfowl/Shorebird Survey Area #3 is visible in the background (south of B5). July 22, 2022.

Figure 64: View of a Barn Swallow nest on girder of Dock 3 (D3). June 23, 2022.

Figure 65: View of Barn Swallow nest under the West Marina Village Building (B92550) deck. June 23, 2022.

Figure 66: View, facing east, of West Marina Village Building (B92550) deck that provides Barn Swallow nesting habitat underneath, and of Waterfowl/Shorebird Survey Area #3. June 23, 2022.

Figure 67: View, facing west, of the West Marina Village Building (B92550) roof providing Barn Swallow nesting habitat. June 20, 2022.

Figure 68: View, facing east, of the Breakwater (BW). October 11, 2022.

Figure 69: View, facing south, of westernmost nook providing Barn Swallow nesting habitat in Breakwater (BW). June 20, 2022.

Figure 70: View of Barn Swallow nests built on pipes/conduits on Breakwater (BW). A Barn Swallow is visible in a nest. June 23, 2022.

Figure 71: View of Barn Swallow nests on metal girder on Breakwater (BW). June 23, 2022.

Figure 72: View of Barn Swallow nest in crevice within nook on the north side of the Breakwater (BW). June 23, 2022.

Figure 73: View, facing east, of the east end of the Breakwater (BW) with a viewing platform that provides a nesting area for Barn Swallows. October 11, 2022.

Figure 74: View, facing north, of Bridge 5 (B92575) and Pods 3-5 (B92549-3, B92549-4, B92549-5), providing nesting areas for Barn Swallows and Cliff Swallows, respectively. June 23, 2022.

Figure 75: View of a Barn Swallow nest on the underside of Bridge 5 (B92575). October 11, 2022.

Figure 76: View of a Barn Swallow nest on a pipe underneath of Bridge 5 (B92575). October 11, 2022.

Figure 77: View of a Barn Swallow nest on the girders underneath of Bridge 5 (B92575). October 11, 2022.

Figure 78: View, facing south of Bridge 10 (B92572) and the Pavilion Pods (B92549 - 1-5), which provide nesting areas for thousands of Cliff Swallows. June 16, 2021.

Figure 79: Example of the grooves in underside of the Pavilion Pods (B92549 - 1-5), each providing nesting habitat for Cliff Swallows.

Figure 80: Close-up example of the metal grooves in underside of the Pavilion Pods (B92549 - 1-5) that provide Cliff Swallow nesting habitat. Cliff Swallow nests are visible in the end of each groove. June 16, 2022.

Figure 81: View of Cliff Swallow nests built on the underside of the Pavilion Pods (B92549 - 1-5). June 16, 2022.

Figure 82: View, facing west towards Pod 5 (B92549-5), of the lower ramp of Bridge 9 (B92573). July 5, 2022.

Figure 83: View, facing west towards Pod 5 (B92549-5), of the upper portion of Bridge 9 (B92573). July 5, 2022.

Figure 84: View of an American Robin nest on the exterior of Pod 5 (B92549-5) at the entrance from Bridge 9 (B92573). July 5, 2022.

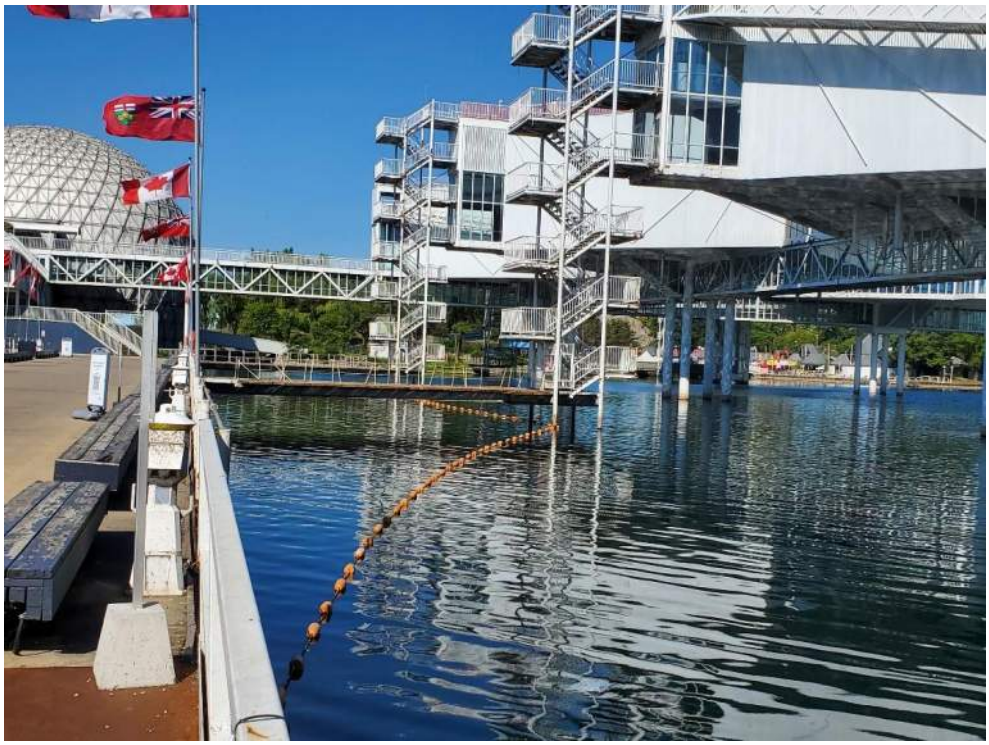

Figure 85: View, facing west along Bridge 5 (B92575), of Secondary Bridge 3 (SB3) and Secondary Bridge 4 (SB4), each providing nesting habitat for Barn Swallows. August 24, 2022.

Figure 86: View, facing southwest, of the East Marina Village Building (B92557). June 5, 2020.

Figure 87: View of Barn Swallow nest under the awning on the East Marina Village Building (B92557). June 20, 2022.

Figure 88: View, facing east, of Landbird/Breeding Bird Survey Transect #9 and Marina North Washroom Building (B92556). June 5, 2020.

Figure 89: View, facing northwest, of Bridge 4 (B4). A portion of Landbird/Breeding Bird Survey Transect #9 and Waterfowl/Shorebird Survey Area #7 is also shown. June 23, 2022.

Figure 90: View, facing east, of a portion of the Marina North East Building (B92555) providing Barn Swallow habitat under deck visible in photo. June 20, 2022.

Figure 91: Barn Swallow nests on light fixtures under deck on the Marina North East Building (B92555). A Barn Swallow is visible sitting on a nest. June 20, 2022.

Figure 92: View, facing northwest, of the Marina North East Building (B92555) providing Barn Swallow nesting habitat where building extends over water, and directly on windows. June 20, 2022.

Figure 93: Example of Barn Swallow nest on a glass window on the Marina North East Building (B92555). June 23, 2022.

Figure 94: View of a Barn Swallow nest on a girder under the Marina North East Building (B92555). June 23, 2022.

Figure 95: View, facing northwest of the sitting area on top of the Marina East Washroom Building (B92554).

Figure 96: View, facing southwest, of exterior of the Marina East Washroom (B92554), and part of Bat Acoustic Monitoring Area #10.

Figure 97: View, facing south, of the Marina East Tuck Shop (B92553) and Marina East Lighthouse (B92552).

Figure 98: View of the East Island South Building (B92566) and the East Island South Washroom (B92565). June 5, 2022.

Figure 99: View, facing north, of Landbird/Breeding Bird Survey Transect #10, Vegetation Survey Area F, and Bridge 3 (B3). July 21, 2022.

Figure 100: View, facing northeast, of Waterfowl/Shorebird Survey Area #7, Landbird/Breeding Bird Survey Transect #10, and Vegetation Survey Areas F and E. A Great Blue Heron is visible, standing on a log. June 28, 2022.

Figure 101: View, facing west, of Bridge 2A (B2A) providing Barn Swallow habitat. June 23, 2022.

Figure 102: View of Barn Swallow nest on girder of Bridge 2 (B2A). June 23, 2022.

Figure 103: View of Barn Swallow nests on underside of the Live Nation deck over water. June 23, 2022.

Figure 104: View, facing southwest, of the underside of the Live Nation deck over water providing Barn Swallow nesting habitat, with Bridge 2A (B2A) visible in the background. June 23, 2022.

Figure 105: View, facing southwest, of Bridge 2 (B2) and surrounding walkways. June 20, 2022.

Figure 106: View, facing north, of Live Nation deck over water providing Barn Swallow nesting habitat southwest of Bridge 2 (B2). Algae bloom in channel also visible August 24, 2022.

Figure 107: View of Barn Swallow nest on girders under Live Nation deck over water southwest of Bridge 2 (B2). June 23, 2022.

Figure 108: View of Barn Swallow nests on girders under Live Nation deck over water southwest of Bridge 2 (B2). June 23, 2022.

Figure 109: View, facing southwest, of the underside of Bridge 2 (B2). June 23, 2022.

Figure 110: View of Eastern Phoebe nest on girder underneath Bridge 2 (B2). June 23, 2022.

Figure 111: View, facing northwest, of the unnamed concrete bridge northwest of Bridge 2 (B2). June 23, 2022.

Figure 112: View of a Barn Swallow nest on cables in the unnamed concrete bridge northwest of Bridge 2 (B2). June 23, 2022.

Figure 113: View, facing northeast, of the Budweiser Stage and lawn in Live Nation limits. May 25, 2022.

Figure 114: View, facing northwest, of the Budweiser Stage seating and stage area. July 12, 2022.

Figure 115: View, facing west, of Live Nation grounds north of Budweiser Stage. July 12, 2022.

Figure 116: View, facing south, of the stairs from the Budweiser Stage lawn leading to Bridge 4 (B4). The stairs go through Vegetation Survey Area G. July 12, 2022.

Figure 117: View, facing southeast, of the rear building on Budweiser Stage Lawn east of Bridge 9 (B92573). July 5, 2022.

Figure 118: View, facing north, of the loading docks on Live Nation grounds. July 12, 2022.

Figure 119: View, facing east, of Live Nation decks and lounges on the north side of the Budweiser Stage. July 12, 2022.

Figure 120: View of an American Robin nest under the ledge of a roof over a patio behind (northeast of) Budweiser Stage. July 12, 2022

Figure 121: View, facing east, of the northwest decks over water on Live Nation grounds. The underside of the deck provides bird nesting habitat for Barn Swallows, American Robin and Common Grackle. June 23, 2022.

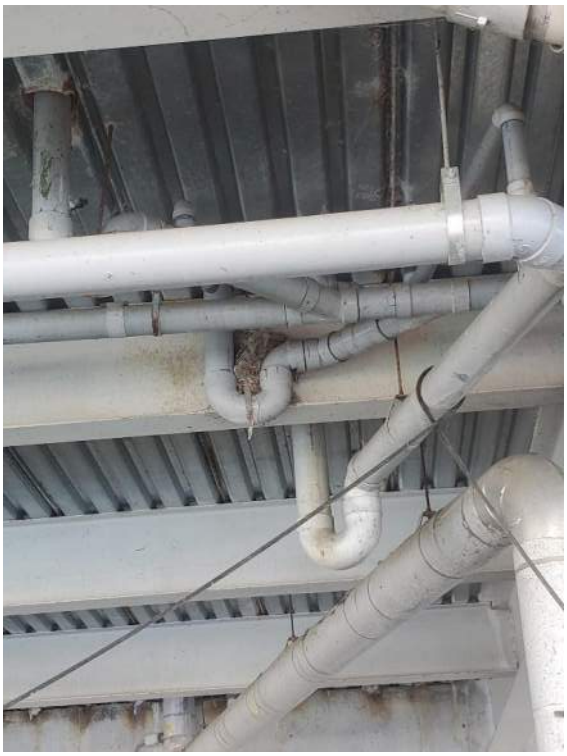

Figure 122: View of Barn Swallow nest on pipes under deck over water in the northwest of Live Nation grounds. June 23, 2022.

Figure 123: View of a Barn Swallow nest on girder on the northwest decks of Live Nation grounds. June 23, 2022.

Figure 124: View, facing south, of Landbird/Breeding Bird Survey Transect #14, Bat Acoustic Monitoring Area #7, and the entrance to the Riverwalk Washrooms (B92562). June 5, 2020.

Figure 125: View, facing east, of Bridge 1A (B1A) and Bridge 1 (B1). June 23, 2022.

Figure 126: View of a Barn Swallow nest on a girder on Bridge 1A (B1A). June 23, 2022.

Figure 127: View, facing west, of the underside of Bridge 1 (B1) which provides Barn Swallow nesting habitat. June 23, 2022.

Figure 128: View of Barn Swallow nests on girders under Bridge 1 (B1). June 23, 2022.

Figure 129: View of Barn Swallow nest on girders under Bridge 1 (B1). June 23, 2022.

Figure 130: View, facing south, of the Centre Entrance Guest Services Building (B92567). June 20, 2022.

Figure 131: View, facing north, of the Centre Entrance Retail building (B92568). June 20, 2022.

Figure 132: View, facing east, of the Landbird/Breeding Bird Survey Transect #13 and Waterfowl/Shorebird Survey Area #1. October 11, 2022.

Figure 133: View, facing east, of patio and umbrella structure east of the Round Hut (B92563). August 24, 2022.

Figure 134: View, facing northeast, of the Round Hut (B92563) and a small part of Landbird/Breeding Bird Survey Transect 13. June 5, 2022.

Figure 135: View of under roof of the Round Hut (B92563) showing. Barn Swallow nests in the rafters at the roof peak. June 20, 2022.

Figure 136: View of Barn Swallows and their nest under ledge of the roof of the Round Hut (B92563). June 20, 2022.

Figure 137: View, facing northeast, of Echo Beach with part of Landbird/Breeding Bird Survey Transect #13 visible behind the stage. August 12, 2022.

Figure 138: View, facing west, of the Administration Building (B92578) Entrance. June 5, 2020

Figure 139: View of House Sparrow nest in the roof at the entrance to the Administration Building (B92578). June 20, 2022.

Figure 140: View, facing south, of the Maintenance Building (B92579). June 20, 2022

Figure 141: View, facing south, of large area of pavement (multi-use area) toward Vegetation Survey Area D. October 11, 2022.

Figure 142: View, facing northeast, of part of Landbird/Breeding Bird Survey Transect #12 and a portion of Vegetation Survey Area D. July 21, 2022.

Figure 143: View, facing northwest, of the Central Entrance Offices (B92534) and the Central Entrance Structure (B92533). June 20, 2022.

Figure 144: View, facing southeast, of the Central Entrance Structure (B92533). June 20, 2022.

Figure 145: View, facing northeast, of the Central Entrance Structure (B92533) and Bat Acoustic Monitoring Area #9. October 11, 2022.

Figure 146: View, facing northeast, of Waterfowl/Shorebird Survey Area #1, Landbird/Breeding Bird Survey Area #15 (left), and Amphibian Call Station #7 (background). October 11, 2022.

Figure 147: View, facing northwest, of Parking Lot 1 on the mainland. October 11, 2022.

Figure 148: View, facing west, of Bridge 8 (B8). October 11, 2022.

Figure 149: View of juvenile Barn Swallows perched on railing beside West Marina Village Building (B92550). June 20, 2022

Figure 150: View of Barn Swallow juveniles and adults, perched on wire beside Echo Beach. August 24, 2022.

Figure 151: View of large flock of Cliff Swallows flying over the West Island Commons buildings. July 12, 2022.

Figure 152: View of a deceased Cliff Swallow, likely resulting from a window strike at the West Marina Village Building (B92550). June 20, 2022.

Figure 153: View of a Double-crested Cormorant perched on a boat in the Marina. August 24, 2022.

Figure 154: View of deceased Double-crested Cormorant, dead fish, and a potentially toxic algae bloom near Dock 2 (D2) west of the Cinesphere (B92569). August 24, 2022.

Figure 155: View of a deceased Red-necked Grebe in water beside Landbird/Breeding Bird Survey Transect #7 (in Vegetation Survey Area P). August 24, 2022.

Figure 156: View of two Painted Turtles, one basking on log, along Turtle Emergence Transect Survey Route near Amphibian Call Station #5 (in Vegetation Survey Area F). May 5, 2022

Figure 157: View of a Northern Map Turtle basking on floating structure along Turtle Emergence Transect Survey Route near Amphibian Call Station #5 (in Vegetation Survey Area F). June 23, 2022

Figure 158: View of a Great Egret under an unnamed dock on the far east side of Waterfowl Survey Area #1.

Figure 159: View of a Canada Goose nest on the shoreline beside Bridge 1A (B1A). May 25, 2022.

Figure 160: View of a flock of Mallards resting on the shore at the north end of Bridge B1A (B1A) just outside of Waterfowl/Shorebird Survey Area #1. August 24, 2022.

Figure 161: View of Raccoon tracks visible in the dust at the Ride Maintenance Building (B92540) area. July 5, 2022.

Figure 162: View of a Red-tailed Hawk in Vegetation Survey Area I. October 11, 2022.

Figure 163: View of a Red-necked Grebe in Waterfowl/Shorebird Survey Area #1 near the entrance to Waterfowl/Shorebird Survey Area #7. April 18, 2022.

Figure 164: View of a King Eider along the pier at the far west end of Waterfowl/Shorebird Survey Area #6. April 5, 2022.

Figure 165: View of WIS-1 - Open Water Beach Shoreline habitat. May 14, 2021.

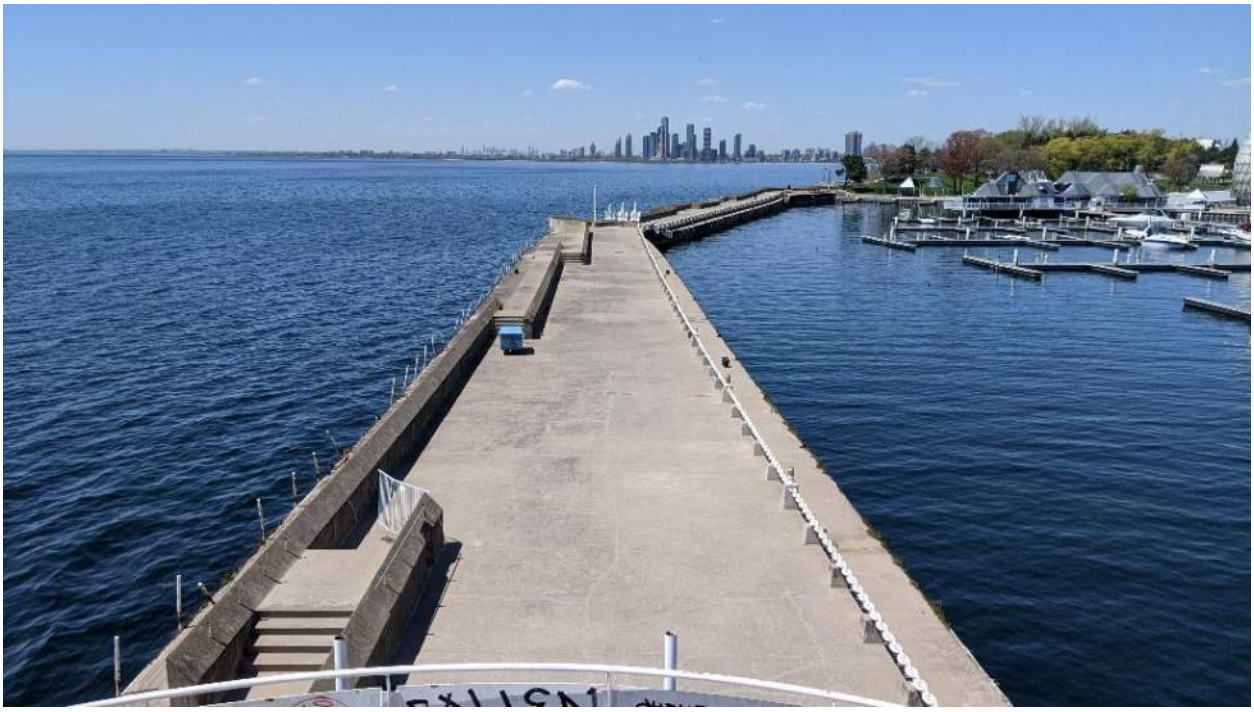

Figure 166: View of WIS-3 – Open Water Vertical Walled Shoreline habitat. May 14, 2021.

Figure 167: View of EIS-1 - Open Water Protected Sloped Shoreline habitat. May 5, 2021.

Figure 168: View of EIS-2 – Open Water Protected Sloped Shoreline habitat underwater imagery. May 5, 2021.

Figure 169: View of MB-5 - Marina Basin Vertical Walled Shoreline habitat. May 12, 2021.

Figure 170: View of MB-2 - Marina Basin Vertical Walled Shoreline habitat underwater imagery. May 5, 2021.

Figure 171: View of MB-3 – Marina Basin Protected Sloped Shoreline habitat. May 12, 2021.

Figure 172: View of LN-2 – Marina Basin Protected Sloped Shoreline habitat underwater imagery. May 5, 2021.

Figure 173: View of BB-4 – Back Channel Vertical Walled Shoreline habitat. May 13, 2021.

Figure 174: View of BC-1 – Back Channel Vertical Walled Shoreline habitat underwater imagery. May 4, 2021.

Figure 175: View of BB-3 – Back Channel Protected Sloped Shoreline habitat. May 12, 2021.

Figure 176: View of LN-1 – Back Channel Protected Sloped Shoreline habitat underwater imagery. May 4, 2021.

Figure 177: View of LO17 - Basin Habitat. May 4, 2021.

Figure 178: View of LO16 – Marina Basin Habitat. May 4, 2021.

Figure 179: View of LO7 – Open Water Habitat – May 4, 2021.

APPENDIX C: Plant List

Plant Species Recorded in the Ontario Place AOI during 2022 Field Investigations

Scientific Name	Common Names	Vegetated Area (s)	CC	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Acer ginnala	Amur Maple	I, H, C, J		5	-2	SNA			L+
Acer negundo	Manitoba Maple	G, M, J, D	0	0		S5			L+?
Acer platanoides	Norway Maple	F, J	0	5	-3	SNA			L+
Acer rubrum	Red Maple	N, K	4	0		S5			L4
Acer saccharinum	Silver Maple	K, J, E, O, H	5	-3		S5			L4
Acer saccharum	Sugar Maple	G, K, J	4	3		S5			L5
Acer X freemani	Freeman's Maple		6	-5		S5			L4
Achillea millefolium	Common Yarrow			3	-1	SNA			L+
Acorus americanus	Sweetflag	F, G	8	-5		S4			L3
Aesculus glabra	Ohio Buckeye		10	-1		S1			L+
Aesculus hippocastanum	Horse Chestnut			5	-1	SE2			L+
Ailanthus altissima	Tree-of-heaven	M, D, E, F, J		5	-1	SNA			L+
Alliaria petiolata	Garlic Mustard	G, M, J		0	-3	SNA			L+
Alnus glutinosa	European Alder	F		-2	-3	SE4			L+
Alnus incana ssp. *rugosa*	Speckled Alder		6	-5		S5			L3
Alnus sp.	Alder species								
Ambrosia artemisiifolia	Common Ragweed		0	3		S5			L5
Amelanchier sp.	Serviceberry Species	G, F							
Amelanchier laevis	Smooth Juneberry		5	5		S5			L4
Anagallis arvensis	Scarlet Pimpernel	I, J							N/A
Anthriscus sylvestris	Wild Chervil	J		5	-2	SNA			L+
Arctium lappa	Great Burdock	M, F, G, D, K		3	X	SNA			L+
Arctium sp.	Burdock Species	I, G, J							
Artemisia absinthium	Common Wormwood	J		5	-1	SNA			L+
Artemisia vulgaris	Common Mugwort	G		5	-1	SNA			L+
Asclepias syriaca	Common Milkweed	M, D, H, J	0	5		S5			L5
Berberis thunbergii	Japanese Barberry	M		3	-3	SNA			L+
Betula papyrifera	White Birch	J, N	2	3		S5			L4
Betula pendula	European White Birch	N		0	-3	SNA			L+
Betula sp.	Birch Species	C, J							
Bidens sp.	Beggar-ticks Species	J							
Bromus sp.	Brome Species	F, J							
Campanula rapunculoides	European Bellflower	G		5	-2	SNA			L+
Carduus acanthoides	Spiny Plumeless Thistle	D		5	-1	SNA			L+
Catalpa speciosa	Northern Catalpa	M		3	-1	SNA			L+
Celastrus orbiculatus	Oriental Bittersweet	J		5	-1	SNA			L+
Centaurea stoebe	Spotted Knapweed	J		5	-3	SNA			L+
Ceratophyllum demersum	Common Coontail	F	4	-5		S5			L4
Cercis canadensis	Canadian Redbud		8	3		SX			
Cercis sp.	Redbud species								
Chamaesyce sp.	Spurge Species	J							

Plant Species Recorded in the Ontario Place AOI during 2022 Field Investigations

Scientific Name	Common Names	Vegetated Area (s)	CC	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Chenopodium album	Lamb's Quarters	J		3	-1	SNA			L+
Cichorium intybus	Chicory	K, J, O		5	-1	SNA			L+
Cirsium arvense	Canada Thistle	I, G, M, F, D, J		3	-1	SNA			L+
Cirsium vulgare	Bull Thistle	I, J	0	3	-1	SNA			L+
Clematis virginiana	Virgin's Bower	J	3	0		S5			L5
Convolvulus arvensis	Field Bindweed	I		5	-1	SNA			L+
Convolvulus sp.	Bindweed Species	I, G, M, F, D, J	0	0					
Cornus alternifolia	Alternate-leaved Dogwood	G	6	3		S5			L5
Cornus racemosa	Grey Dogwood	G, I, J	2	0		S5			L5
Cornus sericea	Red-osier Dogwood	I, M, F, G, D	2	-3		S5			L5
Cornus sp.	Dogwood Species	M							
Corylus cornuta	Beaked Hazelnut	I, F	5	3		S5			L4
Cotoneaster divaricatus	Spreading Cotoneaster	M		5	X	SNA			L+
Crataegus pruinose	Waxy-fruited Thorn		4	5		S4?			L3
Crataegus sp.	Hawthorn Species	J							
Cynanchum rossicum	Pale Swallowwort	J		5		SNA			L+
Daucus carota	Wild Carrot	I, M, H, F, E, D, K, J		5	-2	SNA			L+
Diplotaxis tenuifolia	Wall Rocket	I		5	-3	SNA			L+
Echium vulgare	Viper's Bugloss	I, E, D, J		5	-2	SNA			L+
Elaeagnus angustifolia	Russian Olive			4	-1	SE3			L+
Elaeagnus sp.	Olive species								
Elodea canadensis	Canada Waterweed	F, P	4	-5		S5			L4
Elymus sp.	Wild Rye Species	J							
Epilobium coloratum	Purple-leaf Willow-herb	M, K, J	3	-5		S5			L5
Epipactis helleborine	Broad-leaved Helleborine	F		3	-2	SNA			L+
Erigeron annuus	Daisy Fleabane	I, E, J	0	3		S5			L5
Erigeron sp.	Fleabane Species	K							
Euonymus sp.	Euonymus Species	E, J							
Fagus grandifolia	American Beech	G	6	3		S4			L4
Fagus sylvatica	European Beech								
Forsythia sp.	Forsythia Species	J							
Fragaria virginiana	Wild Strawberry	I, E, J	2	3		S5			L5
Fraxinus americana	White Ash	J	4	3		S4			L5
Fraxinus excelsior	European Ash	E		3		SNA			L+
Fraxinus pennsylvanica	Red Ash	I, G, F, K, J, M, E, H	3	-3		S4			L5
Fraxinus sp.	Ash species								
Galium sp.	Bedstraw Species	F							
Geum sp.	Avens Species	M, F, E, K, J							
Gleditsia triacanthos	Honey Locust	D, K, J, E	8	0		S2?			L+
Gymnocladus dioicus	Kentucky Coffee-tree		6	5		S3	THR	THR	L+
Hypericum perforatum	Common St. John's-wort	I, M, F, G, D, K, J		5	-3	SNA			L+

Plant Species Recorded in the Ontario Place AOI during 2022 Field Investigations

Scientific Name	Common Names	Vegetated Area (s)	CC	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Impatiens capensis	Spotted Jewelweed	I, G, F, J	4	-3		S5			L5
Iris sp.	Iris Species	I							
Juglans nigra	Black Walnut		5	3		S4			L5
Juniperus communis	Common Juniper	I	4	3		S5			L3
Juniperus sp.	Juniper Species	M							
Juniperus virginiana	Eastern Red Cedar	G	4	3		S5			L5
Lactuca sp.	Lettuce Species	K, J							
Larix decidua	European Larch	J		5	-1	SNA			L+
Larix laricina	Tamarack			7	-3	S5			L3
Leonurus cardiaca	Motherwort	G		5	-2	SNA			L+
Leucanthemum vulgare	Ox-eye Daisy	I, J		5	-1	SNA			L+
Ligustrum vulgare	Common Privet	J		3	-2	SNA			L+
Lilium philadelphicum	Wood Lily	D	8	0		S5			LX
Linaria vulgaris	Butter-and-eggs	I, M, D, K, J		5	-1	SNA			L+
Lonicera canadensis	Fly Honeysuckle	M	6	3		S5			L3
Lonicera sp.	Honeysuckle Species	I, M, F, E, K, J							
Lotus corniculatus	Bird's-foot Trefoil	I, M, H, F, E, J		3		SNA			L+
Lycopus europaeus	European Water-horehound	I, F		-5		SNA			L+
Lysimachia arvensis	Scarlet Pimpernel	I, J		3	-1	SNA			N/A
Lysimachia terrestris	Swamp Candles	I	6	-5		S5			L3
Lythrum salicaria	Purple Loosestrife	I, J		-5	-3	SNA			L+
Malus sp.	Crabapple Species	H, J							
Medicago lupulina	Black Medick	I, G, H, F, K, J		3	-1	SNA			L+
Melilotus albus	White Sweet-clover	I, D, K, J		3	-3	SNA			L+
Melilotus officinalis	Yellow Sweet-clover	I		3	-1	SNA			L+
Mentha sp.	Mint Species	I							
Morus alba	White Mulberry	G, M, J, I, M		0	-3	SNA			L+
Myosotis sp.	Forget-me-not Species	I, F							
Nepeta cataria	Catnip	I		1	-2	SNA			L+
Nymphaea odorata	Fragrant White Water-lily	P	5	-5		S5			L3
Oenothera biennis	Common Evening-primrose	I, M, F, D, J	0	3		S5			L5
Parthenocissus quinquefolia	Virginia Creeper	G, D, J	6	3		S4?			L5
Parthenocissus vitacea	Thicket Creeper	I	4	3		S5			L5
Pastinaca sativa	Wild Parsnip	F		5	-3	SNA			L+
Persicaria maculosa	Spotted Lady's-Thumb	J		-3	-1	SNA			L+
Persicaria sp.	Smartweed Species	I, F, J							
Phalaris arundinacea	Reed Canary Grass	I, F, D	0	-3		S5			L+?
Phragmites australis ssp. australis	Common Reed	M, D		-3		SNA			L+
Physocarpus opulifolius	Ninebark	M	5	-3		S5			L3
Picea abies	Norway Spruce	J		5	-1	SNA			L+
Picea glauca	White Spruce		6	3		S5			L3

Plant Species Recorded in the Ontario Place AOI during 2022 Field Investigations

Scientific Name	Common Names	Vegetated Area (s)	CC	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Picea pungens	Blue Spruce			3		SNA			L+
Pinus nigra	Austrian Pine	C, I, J, N, K, D, H		5	-1	SNA			L+
Pinus resinosa	Red Pine	K, J	8	3		S5			L1
Pinus strobus	Eastern White Pine		4	3		S5			L4
Pinus sylvestris	Scots Pine	J		3	-3	SNA			L+
Plantago lanceolata	English Plantain	I, H, F, E, J		3	-1	SNA			L+
Plantago major	Common Plantain	F, D, K, J		3	-1	SNA			L+
Populus balsamifera	Balsam Poplar	J, M	4	-3		S5			L5
Populus deltoides	Eastern Cottonwood	D, C, J	4	0		S5			L5
Populus grandidentata	Largetooth Aspen	J	5	5		S5			L4
Populus tremuloides	Trembling Aspen		2	0		S5			L5
Potamogeton crispus	Curly Pondweed	F, P		-5	-1	SE5			L+
Potentilla anserina ssp. anserina	Silverweed	I, F, J	5	-3		S5			L5
Potentilla norvegica	Rough Cinquefoil	I	0	0		S5			L+?
Potentilla sp.	Cinquefoil Species	H, K							
Prunella vulgaris	Heal-all	I, F, J	0	0		S5			L5
Prunus glandulosa	Dwarf Flowering Almond					SNA			L+
Prunus serotina	Black Cherry		3	3		S5			L5
Prunus sp.	Cherry Species	J, M, J							
Prunus virginiana	Chokecherry	K	2	3		S5			L5
Quercus alba	White Oak		6	3		S5			L3
Quercus bicolor	Swamp White Oak		8	-4		S4			
Quercus macrocarpa	Bur Oak		5	1		S5			L4
Quercus rubra	Red Oak	K, J, N, E	6	3		S5			L4
Ranunculus sp.	Buttercup Species	G							
Reynoutria japonica	Japanese Knotweed	M, D		3	-1	SNE			L+
Rhamnus cathartica	Common Buckthorn	J		0	-3	SNA			L+
Rhus aromatica	Fragrant Sumac	K	8	5		S5			L+
Rhus typhina	Staghorn Sumac	I, D, K, J	1	3		S5			L5
Ribes sp.	Currant Species	G							
Robinia pseudoacacia	Black Locust	D, G, F, J		3	-3	SNA			L+
Rosa sp.	Rose Species	I, G, F, D							
Rubus idaeus	Wild Red Raspberry	F	2	3		S5			L5
Rubus occidentalis	Black Raspberry	G	2	5		S5			L5
Rudbeckia hirta	Black-eyed Susan	J	0	3		S5			L4
Rumex crispus	Curly Dock	I, M, F, E, D, J		0	-2	SNA			L+
Salix alba	White Willow	I, G, E, D	0	-3	-2	SNA			L+
Salix sp.	Willow species								
Salix X fragilis	Crack Willow	J		0	-3	SNA			L+
Schoenoplectus pungens	Common Three-square Bulrush	I	6	-5		S5			L4
Scutellaria galericulata	Marsh Skullcap	I	6	-5		S5			L5

Plant Species Recorded in the Ontario Place AOI during 2022 Field Investigations

Scientific Name	Common Names	Vegetated Area (s)	CC	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Securigera varia	Crown-vetch	I, F, D, J		5	-2	SNA			L+
Sedum sp.	Stonecrop Species	I, J							
Silene latifolia	Bladder Campion	I, E, J		5		SNA			L+
Solanum dulcamara	Bittersweet Nightshade	I, G, F, D, K, J		0	-2	SNA			L+
Solidago canadensis	Canada Goldenrod	I, F, J	1	3		S5			L5
Solidago sp.	Goldenrod Species	I, G, M, E, D, K							
Sonchus sp.	Sow-thistle Species	I, M, D, J							
Sorbus americana	American Mountain-ash			8	1	S5			LU
Sorbus aucuparia	European Mountain-ash	K, J		5	-2	SNA			L+
Spiraea sp.	Meadowsweet Species	M							
Stellaria media	Common Chickweed	I, J		3	-1	SNA			L+
Symphyotrichum puniceum	Purple-stem Aster	I	6	-5		S5			L5
Symphyotrichum sp.	Aster Species	G, M, F, D, K							
Syringa vulgaris	Common Lilac	J		5	-2	SNA			L+
Tanacetum vulgare	Tansy	J		5	-1	SNA			L+
Taraxacum officinale	Common Dandelion	H, E, K, J, O		3	-2	SNA			L+
Taxus canadensis	Canada Yew	D, J	7	3		S4			L3
Thuja occidentalis	Eastern White Cedar	I, J, G	4	-3		S5			L5
Tilia americana	American Basswood		4	3		S5			L5
Tilia cordata	Small-leaved Linden	G		5		SNA			L+
Toxicodendron radicans	Poison-ivy	J	2	0		S5			L5
Trifolium pratense	Red Clover	E, K, J		3	-2	SNA			L+
Tripleurospermum perforata	Scentless Chamomile	J		0	-1	SNA			L+
Tussilago farfara	Coltsfoot	I, E, J		3	-2	SNA			L+
Typha angustifolia	Narrow-leaved Cattail	J	0	-5	0	SNA			L+
Ulmus americana	White Elm	G	3	-3		S5			L5
Ulmus glabra	Wych Elm	G, F, I, J, M		3		SNA			L+
Ulmus parviflora	Chinese Elm								
Ulmus pumila	Siberian Elm	I, M, D, C, J, O		35	-1	SNA			L+
Ulmus rubra	Slippery Elm	M	6	0		S5			L3
Ulmus sp.	Elm Species	N							
Urtica dioica	Slender Stinging Nettle	F	2	0		SNA			L+
Verbascum thapsus	Common Mullein	I, F, G, J		5	-2	SNA			L+
Verbena hastata	Blue Vervain	F, G	4	-3		S5			L5
Viburnum acerifolium	Maple-leaved Viburnum	F	6	5		S5			L3
Viburnum lentago	Nannyberry	J	4	0		S5			L5
Vicia cracca	Cow Vetch	I, M, D, J		5	-1	SNA			L+
Vitis riparia	Riverbank Grape	I, G, M, J	0	0		S5			L5

Floristic Summary and Assessment		
Species Diversity		
Total Species:	**163**	
Native Species:	**81**	50%
Exotic Species	**82**	50%
Genus only	39	
TOTAL	202	
S1-S3 Species	3	4%
S4 Species	11	14%
S5 Species	66	82%
Co-efficient of Conservatism and Floral Quality Index		
Co-efficient of Conservatism (CC) (average)	**4.22**	
CC 0 to 3 lowest sensitivity	27	33%
CC 4 to 6 moderate sensitivity	42	52%
CC 7 to 8 high sensitivity	11	14%
CC 9 to 10 highest sensitivity	1	1%
Floral Quality Index (FQI)	**38.00**	
Presence of Weedy & Invasive Species		
Mean weediness	**-1.49**	
Weediness = -1 low potential invasiveness	32	39%
Weediness = -2 moderate potential invasiveness	21	26%
Weediness = -3 high potential invasiveness	16	20%
Presence of Wetland Species		
Average wetness value	1.64	
Upland	42	26%
Facultative upland	59	36%
Facultative	27	17%
Facultative wetland	17	10%
Obligate wetland	15	9%

CC - Coefficient of Conservatism. This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific habitat integrity.

CW - Coefficient of Wetness. This value, ranging from -5 (obligate wetland) to 5 (upland) provides the probability of a species occurring in wetland or upland habitats.

SRank - Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. S4 and S5 species are apparently secure to secure in the province. Species ranked S1-S3 are considered to be rare in Ontario.

Conservation Status Ranks	
S1	**Critically Imperiled:** At very high risk of extirpation due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
S2	**Imperiled:** At high risk of extirpation due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3	**Vulnerable:** At moderate risk of extirpation due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S4	**Apparently Secure:** At a fairly low risk of extirpation due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S5	**Secure:** At very low or no risk of extirpation due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
SH	**Possibly Extirpated:** Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present, but not enough to state this with certainty. Includes species without documentation in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation or that a species has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present.
SX	**Presumed extirpated:** Species is believed extirpated with virtually no likelihood of rediscovery despite intensive searches of historical and appropriate habitat.
Variant Status Ranks	
SNA	**Not applicable:** Species is not a suitable target for conservation activities (e.g. non-native species, hybrids without conservation value, long-distance aerial migrants).
S#S#	**Range Rank:** A numeric range rank to indicate any range of uncertainty about the status of the species or ecosystem
SU	**Unrankable:** Species is currently unrankable due to lack of, or substantially conflicting, information about status and trends
S#?	**Inexact or Uncertain Numeric Rank**
Breeding Status Qualifier	
B	**Breeding:** Conservation status refers to the breeding population of the species in the nation or state/province.
N	**Non-breeding:** Conservation status refers to the non-breeding population of the species in the nation or state/province.
M	**Migrant:** Species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the nation or state/province.

LRank – Toronto and Region Conservation Authority (TRCA) assigns regional ranks that set conservation priorities within Toronto and Region. These ranks are not legal designations.

L1	Species of Regional Conservation Concern: Regionally scarce due to either accidental occurrence or extreme sensitivity to human impacts
L2	Species of Regional Conservation Concern: Somewhat more abundant and generally slightly less sensitive than L1 species
L3	Species of Regional Conservation Concern: Generally less sensitive and more abundant than L1 and L2 ranked species
L4	Species of Urban Conservation Concern: Occur throughout the region but could show declines if urban impacts

	are not mitigated effectively.
L5	Species that are considered secure throughout the region
L+	Introduced species: Not native to the Toronto region
LX	Extirpated species: Species not recorded in the region in the past 10 years
LV	sporadic breeder ("Vagrant"); species not recorded in the region in the past 10 years
L#?	Inexact/Unconfirmed Rank

APPENDIX D: Wildlife List

Avifauna Recorded within the AOI in 2022

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
American Black Duck	*Anas rubripes*	Not at Risk	L3	S4	BB, WS
American Crow	*Corvus brachyrhynchos*	Not at Risk	L5	S5	LB
American Goldfinch	*Spinus tristis*	Not at Risk	L5	S5	BB, IN, LB, WS
American Kestrel	*Falco sparverius*	Not at Risk	L4	S4	LB
American Redstart	*Setophaga ruticilla*	Not at Risk	L4	S5B	LB
American Robin	*Turdus migratorius*	Not at Risk	L5	S5	BB, IN, LB, WS
Baltimore Oriole	*Icterus galbula*	Not at Risk	L5	S4B	BB, LB
Barn Swallow	*Hirundo rustica*	Threatened	L4	S4B	BB, IN, WS
Bay-breasted Warbler	*Setophaga castanea*	Not at Risk	N/A	S5B	LB
Belted Kingfisher	*Megaceryle alcyon*	Not at Risk	L4	S5B, S4N	IN, LB, WS
Black-and-white Warbler	*Mniotilta varia*	Not at Risk	L2	S5B	LB
Blackburnian Warbler	*Setophaga fusca*	Not at Risk	L3	S5B	LB
Black-capped Chickadee	*Parus atricapillus*	Not at Risk	L5	S5	LB
Black-crowned Night Heron	*Nycticorax nycticorax*	Not at Risk	L3	S3B, S2N, S4M	IN, LB, WS
Blackpoll Warbler	*Setophaga striata*	Not at Risk	N/A	S5B	LB
Black-throated Green Warbler	*Setophaga virens*	Not at Risk	L3	S5B	LB
Blue Jay	*Cyanocitta cristata*	Not at Risk	L5	S5	BB, LB
Blue-grey Gnatcatcher	*Polioptila caerulea*	Not at Risk	L4	S4B	BB, LB
Blue-headed Vireo	*Vireo solitarius*	Not at Risk	L3	S5B	LB
Brown Creeper	*Certhia americana*	Not at Risk	L3	S5	LB
Brown-headed Cowbird	*Molothrus ater*	Not at Risk	L5	S5	BB, IN, LB, WS
Bufflehead	*Bucephala albeola*	Not at Risk	N/A	S5	WS
Canada Goose	*Branta canadensis*	Not at Risk	L5	S5	BB, IN, WS
Cape May Warbler	*Setophaga tigrina*	Not at Risk	N/A	S5B	LB
Carolina Wren	*Thryothorus ludovicianus*	Not at Risk	L4	S4	LB
Cedar Waxwing	*Bombycilla cedrorum*	Not at Risk	L5	S5	BB, LB
Chestnut-sided Warbler	*Setophaga pensylvanica*	Not at Risk	L3	S5B	LB

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
Chimney Swift	*Chaetura pelagica*	Threatened	L4	S3B	BB, LB
Chipping Sparrow	*Spizella passerina*	Not at Risk	L5	S5B, S3N	IN, LB, WS
Cliff Swallow	*Petrochelidon pyrrhonota*	Not at Risk	L5	S4S5B	BB, IN, WS
Common Goldeneye	*Bucephala clangula*	Not at Risk	N/A	S5	WS
Common Grackle	*Quiscalus quiscula*	Not at Risk	L5	S5	BB, IN, LB, WS
Common Loon	*Gavia immer*	Not at Risk	N/A	S5	WS
Common Merganser	*Mergus merganser*	Not at Risk	L3	S5	WS
Common Raven	*Corvus corax*	Not at Risk	L4	S5	LB
Common Tern	*Sterna hirundo*	Not at Risk	L3	S4B	BB, IN
Common Yellowthroat	*Geothlypis trichas*	Not at Risk	L4	S5B, S3N	BB, LB
Cooper's Hawk	*Accipiter cooperii*	Not at Risk	L4	S4	LB
Dark-eyed Junco	*Junco hyemalis*	Not at Risk	N/A	S5	IN, LB, WS
Double-crested Cormorant	*Nannopterum auritum*	Not at Risk	L3	S5B, S4N	BB, IN, WS
Downy Woodpecker	*Dryobates pubescens*	Not at Risk	L5	S5	IN, LB, WS
Eastern Kingbird	*Tyrannus tyrannus*	Not at Risk	L4	S4B	BB, LB
Eastern Phoebe	*Sayornis phoebe*	Not at Risk	L5	S5B	IN, LB, WS
Eastern Towhee	*Piplio erythrophthalmus*	Not at Risk	L3	S4B, S3N	LB
Eastern Wood-pewee	*Contopus virens*	Special Concern	L4	S4B	LB
Empidonax sp.					LB
European Starling	*Sturnus vulgaris*	Not at Risk	L+	SNA	BB, LB
Field Sparrow	*Spizella pusilla*	Not at Risk	L4	S4B, S3N	LB
Gadwall	*Mareca strepera*	Not at Risk	L4	S4B, S4N, S5M	WS
Golden-crowned Kinglet	*Regulus satrapa*	Not at Risk	L3	S5	IN, LB, WS
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern	L2	S4B	LB
Gray Catbird	*Dumetella carolinensis*	Not at Risk	L4	S5B, S3N	BB, LB
Great Blue Heron	*Ardea herodias*	Not at Risk	L3	S4	IN
Great Crested Flycatcher	*Myiarchus crinitus*	Not at Risk	L4	S5B	IN, LB
Great Egret	*Ardea alba*	Not at Risk	L3	S2B, S3M	IN, WS

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
Hairy Woodpecker	*Dryobates villosus*	Not at Risk	L4	S5	IN, LB, WS
Hermit Thrush	*Catharus guttatus*	Not at Risk	L3	S5B, S4N	LB
Herring Gull	*Larus argentatus*	Not at Risk	L3	S4B, S5N	BB, IN, LB, WS
Hooded Merganser	*Lophodytes cucullatus*	Not at Risk	L3	S5	WS, IN
Horned Grebe	*Podiceps auritus*	Special Concern	N/A	S1B, S3N, S4M	WS
House Finch	*Haemorhous mexicanus*	Not at Risk	L+	SNA	BB, IN, LB, WS
House Sparrow	*Passer domesticus*	Not at Risk	L+	SNA	BB, IN, LB, WS
House Wren	*Troglodytes aedon*	Not at Risk	L5	S5B	IN, LB, WS
Killdeer	*Charadrius vociferus*	Not at Risk	L4	S4B	BB, IN, LB, WS
King Eider	*Somateria spectabilis*	Not at Risk	N/A	SHB, S2N	IN, WS
Least Flycatcher	*Empidonax minimus*	Not at Risk	L4	S5B	LB
Lincoln's Sparrow	*Melospiza lincolnii*	Not at Risk	N/A	S5B	LB
Long-tailed Duck	*Clangula hyemalis*	Not at Risk	N/A	S3B, S5N	WS
Magnolia Warbler	*Setophaga magnolia*	Not at Risk	L3	S5B	LB
Mallard	*Anas platyrhynchos*	Not at Risk	L5	S5	BB, IN, LB WS
Mourning Dove	*Zenaida macroura*	Not at Risk	L5	S5	BB, LB
Mute Swan	*Cygnus olor*	Not at Risk	L+	SNA	IN, WS
Nashville Warbler	*Leiothlypis ruficapilla*	Not at Risk	L3	S5B	LB
Northern Cardinal	*Cardinalis cardinalis*	Not at Risk	L5	S5	BB, IN, LB, WS
Northern Flicker	*Colaptes auratus*	Not at Risk	L4	S5	IN, LB, WS
Northern Harrier	*Circus hudsonius*	Not at Risk	L2	S5B, S4N	IN
Northern Mockingbird	*Mimus polyglottos*	Not at Risk	L4	S4	IN, WS
Northern Parula	*Setophaga americana*	Not at Risk	N/A	S5B	LB
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Not at Risk	L4	S4B	BB, IN
Palm Warbler	*Setophaga palmarum*	Not at Risk	N/A	S5B	IN, LB, WS

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
Peregrine Falcon	*Falco peregrinus*	Special Concern	L4	S4	IN
Pied-billed Grebe	*Podilymbus podiceps*	Not at Risk	L3	S4B, S2N	WS
Purple Finch	*Haemorhous purpureus*	Not at Risk	L4	S5	LB
Red-breasted Merganser	*Mergus serrator*	Not at Risk	N/A	S5	WS
Red-breasted Nuthatch	*Sitta canadensis*	Not at Risk	L5	S5	BB, LB
Red-eyed Vireo	*Vireo olivaceus*	Not at Risk	L4	S5B	LB
Red-necked Grebe	*Podiceps grisegena*	Not at Risk	L3	S3	WS
Red-tailed Hawk	*Buteo jamaicensis*	Not at Risk	L5	S5	LB, IN
Red-winged Blackbird	*Agelaius phoeniceus*	Not at Risk	L5	S5	BB, IN, LB, WS
Ring-billed Gull	*Larus delawarensis*	Not at Risk	L4	S5	BB, IN, LB, WS
Ring-necked Duck	*Aythya collaris*	Not at Risk	L2	S5B, S4N	WS
Rock Pigeon	*Columba livia*	Not at Risk	L+	SNA	BB, LB
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Not at Risk	L4	S5B	LB
Ruby-crowned Kinglet	*Corthylio calendula*	Not at Risk	LV	S5B, S3N	IN, LB, WS
Ruby-throated Hummingbird	*Archilochus colubris*	Not at Risk	L4	S5B	LB
Savannah Sparrow	*Passerculus sandwichensis*	Not at Risk	L4	S5B, S3N	LB
Solitary Sandpiper	*Tringa solitaria*	Not at Risk	N/A	S4B, S5M	WS
Song Sparrow	*Melospiza melodia*	Not at Risk	L5	S5	BB, IN, LB, WS
Spotted Sandpiper	*Actitis macularius*	Not at Risk	L4	S5B	WS, IN
Swainson's Thrush	*Catharus ustulatus*	Not at Risk	N/A	S5B	LB
Tree Swallow	*Tachycineta bicolor*	Not at Risk	L4	S4S5B	BB, IN, LB, WS
Turkey Vulture	*Cathartes aura*	Not at Risk	L5	S5B, S3N	LB
Warbling Vireo	*Vireo gilvus*	Not at Risk	L5	S5B	BB, IN, LB, WS
White-breasted Nuthatch	*Sitta carolinensis*	Not at Risk	L4	S5	BB, LB
White-crowned Sparrow	*Zonotrichia leucophrys*	Not at Risk	L3	S5B, S3N	LB
White-throated Sparrow	*Zonotrichia albicollis*	Not at Risk	L3	S5	IN, LB, WS
White-winged Scoter	*Melanitta deglandi*	Not at Risk	N/A	S4B, S5N	WS

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
Wilson's Warbler	*Cardellina pusilla*	Not at Risk	N/A	S5B	LB
Winter Wren	*Troglodytes hiemalis*	Not at Risk	L3	S5B, S4N	IN, WS
Wood Duck	*Aix sponsa*	Not at Risk	L4	S5B, S3N	IN
Yellow Warbler	*Setophaga petechia*	Not at Risk	L5	S5B	BB, LB
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Not at Risk	L3	S5B, S3N	IN, LB
Yellow-rumped Warbler	*Setophaga coronata*	Not at Risk	L3	S5B, S4N	IN, LB, WS

Surveys Observed

BB – Breeding Bird Survey

IN – Incidental Observation (occurring outside of a targeted survey)

LB – Landbird Migratory Stopover Survey

WS – Waterfowl or Shorebird Stopover and Staging Survey

Herpetofauna Recorded within the AOI in 2022

Common Name	Scientific Name	ESA Status	L Rank	S-Rank	Location Observed
American Toad	*Anaxyrus americanus*	Not at Risk	L4	S5	Recorded calling at Amphibian Call Station #6 & #7
Midland Painted Turtle	*Chrysemys picta marginata*	Not at Risk	L3	S4	Observed along Turtle Wintering Area Survey Route, near Amphibian Call Station #5
Northern Map Turtle	*Graptemys geographica*	Special Concern	L2	S3	Observed along Turtle Wintering Area Survey Route, near Amphibian Call Station #5
Red-eared Slider	*Trachemys scripta elegans*	Not at Risk	L+	SNA	Observed along Turtle Wintering Area Survey Route, near Amphibian Call Station #5

Mammals Recorded within the AOI in 2022

Common Name	Scientific Name	ESA Status	L Rank	S-Rank	Location Observed
American Mink	*Mustela vison*	Not at Risk	L4	S4	Observed along West Island shoreline on Breeding Bird Survey Transect #3
Beaver	*Castor canadensis*	Not at Risk	L4	S5	Observed in Waterfowl/shorebird Survey Area #1, #3, & #7
Big Brown Bat	*Eptesicus fuscus*	Not at Risk	L4	S4	Detected within Bat Acoustic Monitoring Area #3, #11 & #12

Common Name	Scientific Name	ESA Status	L Rank	S-Rank	Location Observed
Eastern Cottontail	*Sylvilagus floridanus*	Not at Risk	L4	S5	Observed on Breeding Bird Survey Transect #12 on pathway to B92578
Eastern Grey Squirrel	*Sciurus carolinensis*	Not at Risk	L5	S5	Present in all treed locations on the property
Eastern Red Bat	*Lasiurus borealis*	Not at Risk	LX	S4	Detected within Bat Acoustic Monitoring Area #11 & #12
Hoary Bat	*Lasiurus cinereus*	Not at Risk	LX	S4	Detected within Bat Acoustic Monitoring Area #3, #5, #7, #11 & #12
Raccoon	*Procyon lotor*	Not at Risk	L5	S5	Evidence (scat, tracks, feeding evidence, etc.) observed throughout AOI
Red Fox	*Vulpes vulpes*	Not at Risk	L4	S5	Possible burrows and scat in northeast part of vegetation survey area J, near Wilderness Adventure Ride
Red Squirrel	*Tamiasciurus hudsonicus*	Not at Risk	L4	S5	Observed on West Island on Breeding Bird Survey Transect #4 and #6
Silver-haired Bat	*Lasionycteris noctivagans*	Not at Risk	N/A	S4	Detected within Bat Acoustic Monitoring Area #3, #11 & #12
Striped Skunk	*Mephitis mephitis*	Not at Risk	L5	S5	Observed in vegetation survey area J and on Breeding Bird Survey Transect #10
Vole Species	*Microtus sp.*	Not at Risk			North shoreline of Waterfowl/shorebird Survey Area #7

Invertebrates Recorded within the AOI in 2022

Common Name	Scientific Name	ESA Status	L Rank	S-Rank	Location Observed
Bald faced Wasp	*Dolichovespula maculata*	Not at Risk	N/A	S4	
Cabbage White	*Pieris rapae*	Not at Risk	N/A	SNA	
Cicadas	*Cicadidae* sp.				Present in numerous treed locations within the AOI
Crickets	*Orthoptera* sp.				Present in numerous locations throughout the AOI
European Honey Bee	*Apis mellifera*	Not at Risk	N/A	SNA	Present in numerous areas with flowering plants
Grasshoppers	*Orthoptera* sp.				Present in numerous vegetated areas throughout the AOI
Katydids	*Orthoptera* sp.				Present in numerous vegetated areas throughout the AOI
Monarch	*Danaus plexippus*	Special Concern	N/A	S2N, S4B	Observed within Vegetation Survey Areas D, M, and I.

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S3	**Vulnerable:** At moderate risk of extirpation due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
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SX	**Presumed extirpated:** Species is believed extirpated with virtually no likelihood of rediscovery despite intensive searches of historical and appropriate habitat.
Variant Status Ranks	
SNA	**Not applicable:** Species is not a suitable target for conservation activities (e.g. non-native species, hybrids without conservation value, long-distance aerial migrants).
S#S#	**Range Rank:** A numeric range rank to indicate any range of uncertainty about the status of the species or ecosystem
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S#?	**Inexact Numeric Rank**
Breeding Status Qualifier	
B	**Breeding:** Conservation status refers to the breeding population of the species in the nation or state/province.
N	**Non-breeding:** Conservation status refers to the non-breeding population of the species in the nation or state/province.
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L3	Species of Regional Conservation Concern: Generally less sensitive and more abundant than L1 and L2 ranked species
L4	Species of Urban Conservation Concern: Occur throughout the region but could show declines if urban impacts

	are not mitigated effectively.
L5	Species that are considered secure throughout the region
L+	Introduced species: Not native to the Toronto region
LX	Extirpated species: Species not recorded in the region in the past 10 years
LV	sporadic breeder ("Vagrant"); species not recorded in the region in the past 10 years
L#?	Inexact/Unconfirmed Rank

APPENDIX E: Terrestrial Species at Risk and Nesting Locations Mapping 2022

LEGEND

Nests without MBCA Protection

- Common Grackle
- European Starling
- House Sparrow

MBCA Protected Nests

- American Robin
- Cliff Swallow
- Eastern Phoebe
- House Finch
- Cliff Swallow Nesting Colonies
- Tree Swallow Nesting Boxes

SAR Observations

Special Concern

- Eastern Wood - Pewee
- Grasshopper Sparrow
- Horned Grebe
- Map Turtle
- Monarch
- Peregrine Falcon

Threatened

- Barn Swallow (Nest)
- Chimney Swift

Coordinate System: NAD 1983 UTM Zone 17N
Sources: MNR

MORRISON HERSHFIELD

SCALE: 1:4,150

0 30 60 120 180
Meters

TITLE:
Ontario Place NHIS
Locations of Terrestrial SAR and Bird Nests on Buildings/Structures

PROJECT NO.: 201934101

Ontario Place, Toronto, Ontario

DATE: **November 2022**

ENVIRONMENTAL SERVICES DEPARTMENT

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LEGEND

Nests without MBCA Protection

- Common Grackle
- European Starling
- House Sparrow

MBCA Protected Nests

- American Robin
- Cliff Swallow
- Eastern Phoebe
- House Finch
- Cliff Swallow Nesting Colonies
- Tree Swallow Nesting Boxes

SAR Observations

Special Concern

- Eastern Wood - Pewee
- Grasshopper Sparrow
- Horned Grebe
- Map Turtle
- Monarch
- Peregrine Falcon

Threatened

- Barn Swallow (Nest)
- Chimney Swift

Coordinate System: NAD 1983 UTM Zone 17N
Sources: MNR

MORRISON HERSHFIELD

SCALE: 1:650

0 5 10 20 30

Meters

TITLE:

Ontario Place NHIS
Locations of Terrestrial SAR and Bird Nests on Buildings/Structures

PROJECT NO.: 201934101

Ontario Place, Toronto, Ontario

DATE: **November 2022**

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LEGEND

Nests without MBCA Protection

- Common Grackle
- European Starling
- House Sparrow

MBCA Protected Nests

- American Robin
- Cliff Swallow
- Eastern Phoebe
- House Finch
- Cliff Swallow Nesting Colonies
- Tree Swallow Nesting Boxes

SAR Observations

Special Concern

- Eastern Wood - Pewee
- Grasshopper Sparrow
- Horned Grebe
- Map Turtle
- Monarch
- Peregrine Falcon

Threatened

- Barn Swallow (Nest)
- Chimney Swift

Coordinate System: NAD 1983 UTM Zone 17N
Sources: MNR

MORRISON HERSHFIELD

SCALE: 1:650

0 5 10 20 30
Meters

TITLE:
Ontario Place NHIS
Locations of Terrestrial SAR and Bird Nests on Buildings/Structures

PROJECT NO.: 201934101

Ontario Place, Toronto, Ontario

DATE: **November 2022**

ENVIRONMENTAL SERVICES DEPARTMENT

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LEGEND

Nests without MBCA Protection

- Common Grackle
- European Starling
- House Sparrow

MBCA Protected Nests

- American Robin
- Cliff Swallow
- Eastern Phoebe
- House Finch
- Cliff Swallow Nesting Colonies
- Tree Swallow Nesting Boxes

SAR Observations

Special Concern

- Eastern Wood - Pewee
- Grasshopper Sparrow
- Horned Grebe
- Map Turtle
- Monarch
- Peregrine Falcon

Threatened

- Barn Swallow (Nest)
- Chimney Swift

Coordinate System: NAD 1983 UTM Zone 17N
Sources: MNR

MORRISON HERSHFIELD

SCALE: 1:650

0 5 10 20 30

Meters

TITLE:

Ontario Place NHIS
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B92549-1
B92549-2
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B92549-5
B92575
B92572
B92569
SB1
x2
SB2
SB3
x2
SB4
x3
SB5
D1
SB6
x2
SB7
x8
x11
x2
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

Nests without MBCA Protection

- Common Grackle
- European Starling
- House Sparrow

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- American Robin
- Cliff Swallow
- Eastern Phoebe
- House Finch
- Cliff Swallow Nesting Colonies
- Tree Swallow Nesting Boxes

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Special Concern

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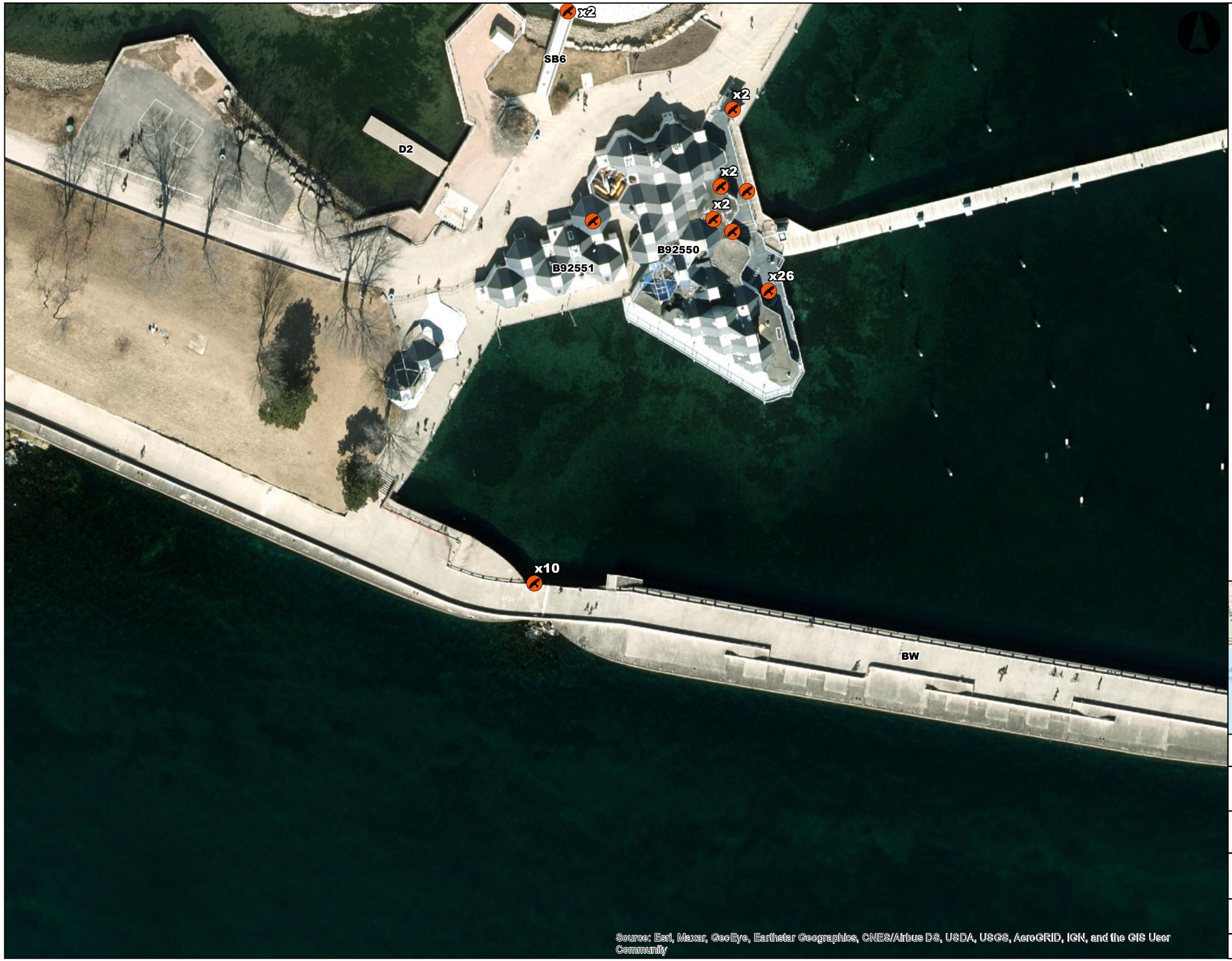

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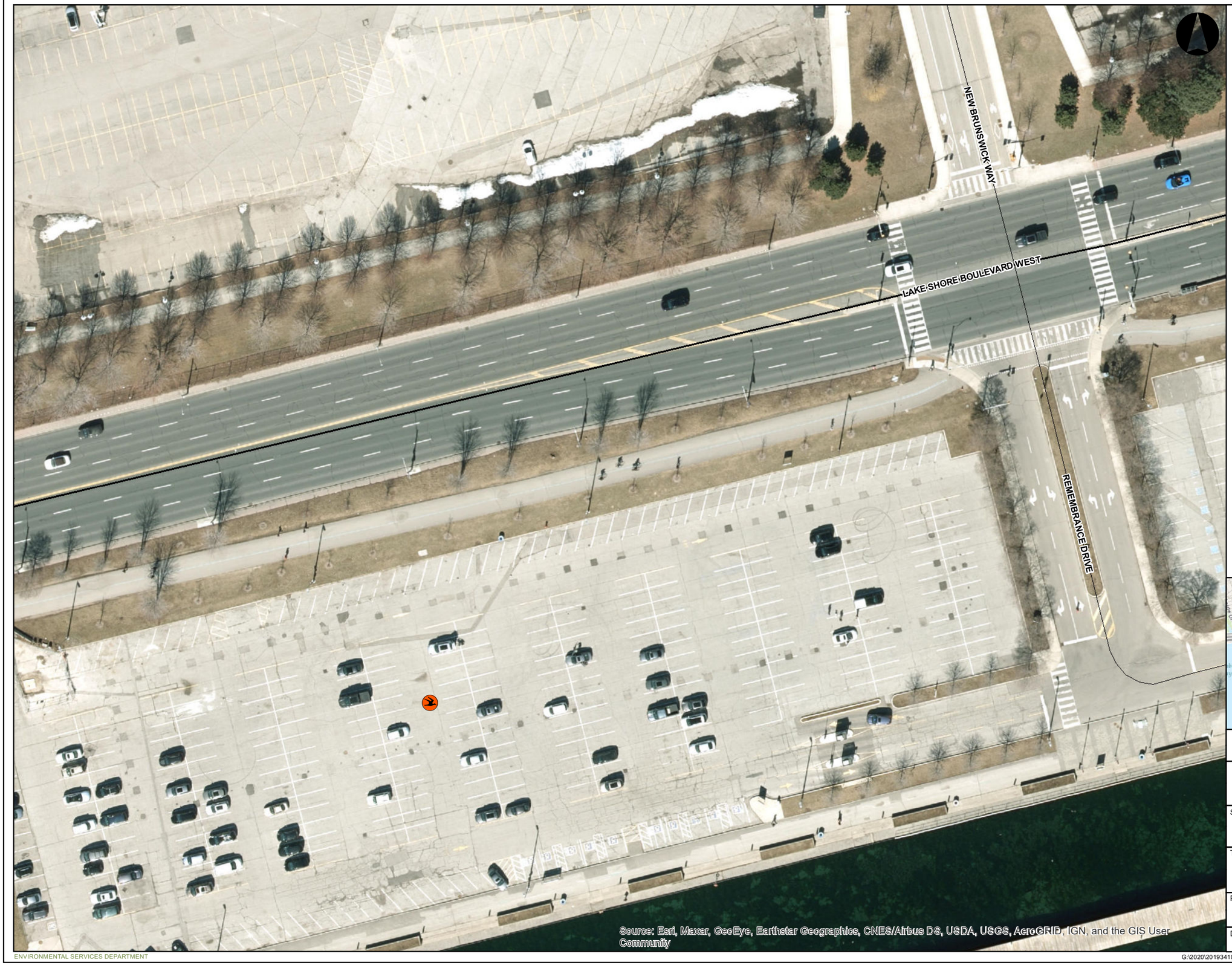

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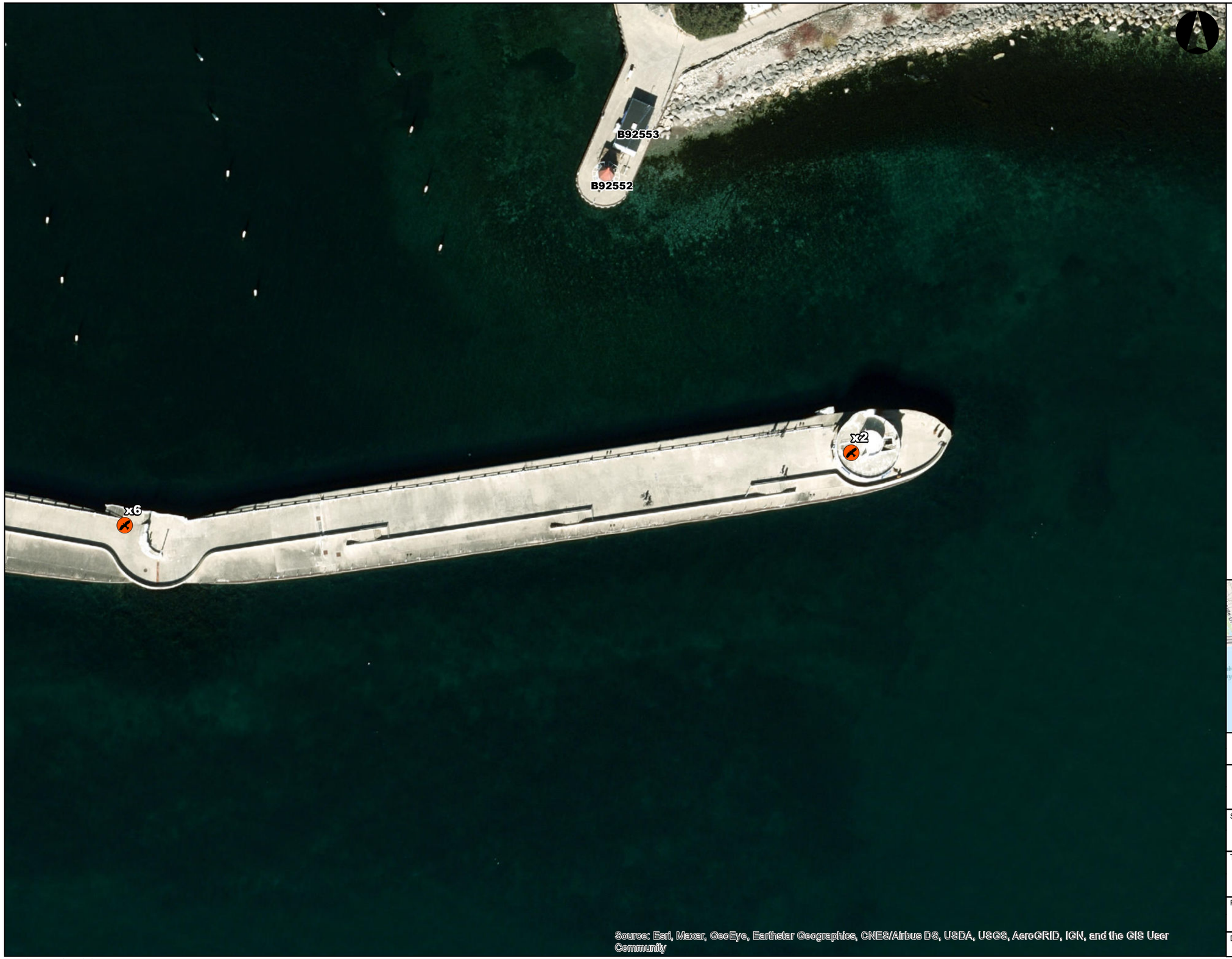

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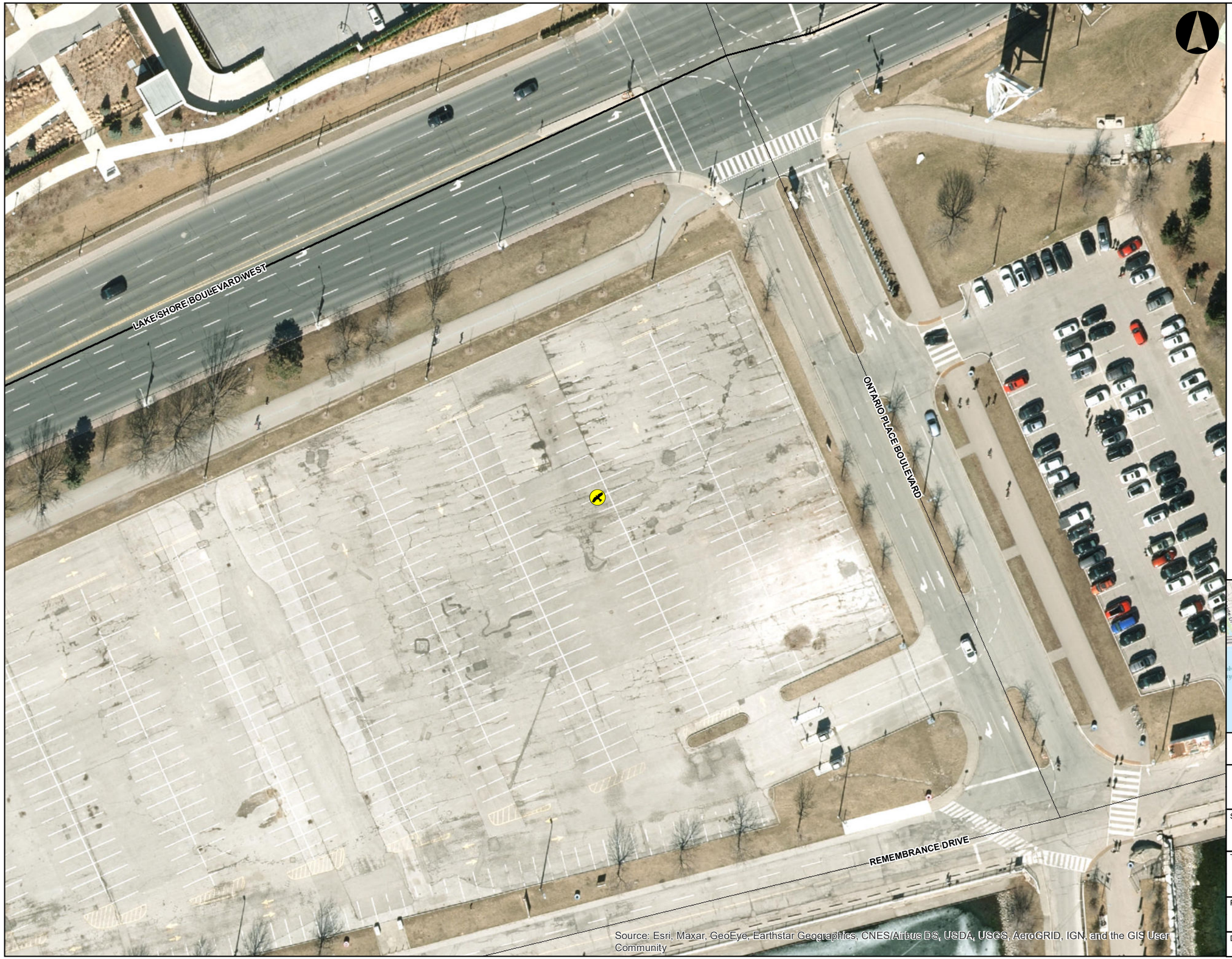

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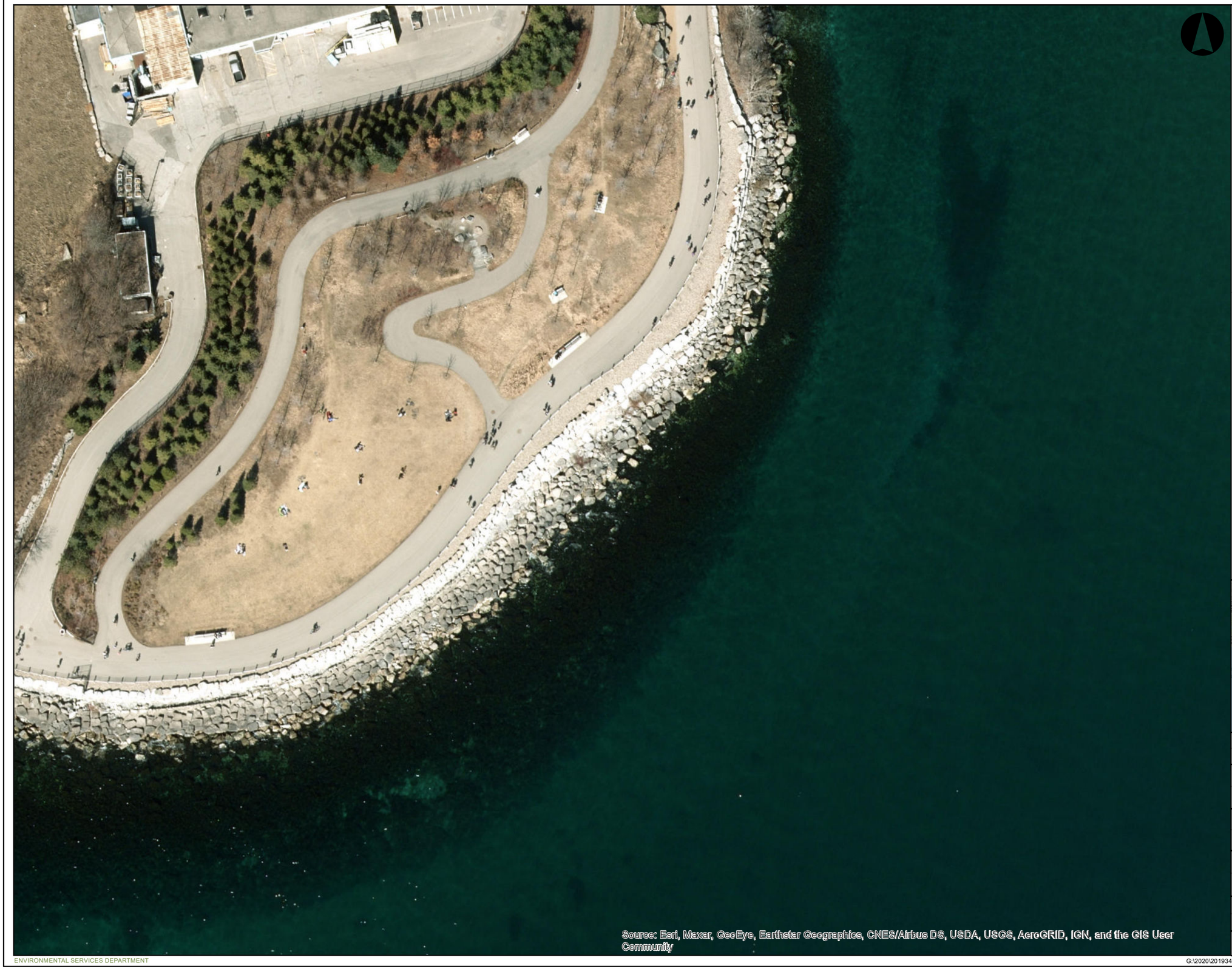

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APPENDIX F: Significant Wildlife Screening for Eco-Region 7E

Table 1: Significant Wildlife Habitat Screening for Eco-Region 7E

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
Seasonal Concentration Areas of Animals				
Waterfowl Stopover and Staging Areas (Terrestrial) Rationale: Habitat important to migrating waterfowl.	CUM1 or CUT1 and evidence of annual spring flooding from melt water or run-off within these Ecosites. Fields with seasonal flooding and waste grains in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.	▪ Fields with sheet water during Spring (mid-March to May). ▪ Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. ▪ Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available. Species: *American Black Duck, Northern Pintail, Gadwall, Blue-winged Teal, Green-winged Teal, American Wigeon, Northern Shoveler, Tundra Swan*	Studies carried out and verified presence of an annual concentration of any listed species: ▪ Any mixed species aggregations of 100 or more individuals required. ▪ The flooded field ecosite habitat plus a 100-300m radius, dependent on local site conditions and adjacent land use is the significant wildlife habitat. ▪ Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	**Not Present** No flooded fields are present within the AOI. There is no potential for terrestrial waterfowl stopover and staging areas.
Waterfowl Stopover and Staging Area (Aquatic) Rationale: Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7	▪ Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. ▪ These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Species: *Canada Goose, Cackling Goose, Snow Goose, American Black Duck, Northern Pintail, Northern Shoveler, American Wigeon, Gadwall, Green-winged Teal, Blue-winged Teal, Hooded Merganser, Common Merganser, Lesser Scaup, Greater Scaup, Long-tailed Duck, Surf Scoter, White-winged Scoter, Black Scoter, Ring-necked Duck, Common Goldeneye, Bufflehead, Redhead, Ruddy Duck, Red-breasted Merganser, Brant, Canvasback*	Studies carried out and verified presence of: ▪ Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days. ▪ Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. ▪ The combined area of the ELC ecosites and a 100m radius area is the SWH. ▪ Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. ▪ Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded).	**Not Present** Lake Ontario and the associated bays and ponds within the AOI had potential to provide waterfowl stopover and staging habitat. Potential stopover areas were surveyed during spring and fall migration periods. An aggregation of 100 or more of the listed species was only recorded on one day. Ruddy Ducks, Canvasbacks, and Redheads did not use the AOI for staging. Therefore, this SWH is not present.
Shorebird Migratory Stopover Area Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	BBO1, BBO2, BBS1, BBS2, BBT1, BBT2, SDO1, SDS2, SDT1, MAM1, MAM2, MAM3, MAM4, MAM5	▪ Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. ▪ Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. ▪ Sewage treatment ponds and storm water ponds do not qualify as a SWH. Species: *Greater Yellowlegs, Lesser Yellowlegs, Marbled Godwit, Hudsonian Godwit, Black-bellied Plover, American Golden-Plover, Semipalmated Plover, Solitary Sandpiper, Spotted Sandpiper, Semipalmated Sandpiper, Pectoral Sandpiper, White-rumped Sandpiper, Baird’s Sandpiper, Least Sandpiper, Purple Sandpiper,*	Studies confirming: ▪ Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). ▪ Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. ▪ The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area. ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	**Not Present** Ontario Place is located on the shore of Lake Ontario. The shoreline of Ontario Place includes large armour rock, cobble, and grassy areas. There was potential for the shoreline to be used by migrating shorebirds. Potential stopover areas were surveyed during spring and fall migration periods. Less than 3 listed species were recorded within the AOI with approximately 1% of the required shorebird use days. Therefore, this SWH is not present.

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
		Stilt Sandpiper, Short-billed Dowitcher, Red-necked Phalarope, Whimbrel, Ruddy Turnstone, Sanderling, Dunlin		
Raptor Wintering Area Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	▪ The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. ▪ Raptor wintering (hawk/owl) sites need to be > 20 ha with a combination of forest and upland. ▪ Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. ▪ Field area of the habitat is to be wind swept with limited snow depth or accumulation. ▪ Eagle sites have open water and large trees and snags available for roosting. Species: *Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, Snowy Owl* Special Concern: *Short-eared Owl, Bald Eagle*	Studies confirm the use of these habitats by: ▪ One or more Short-eared Owls or One of more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. ▪ To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. ▪ The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area. ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	**Not Present** The AOI is primarily urban and does not contain a suitable mixture of forest and upland habitat. In addition, suitable available naturalized areas total less than 20 ha in size. Therefore, this SWH is not present.
Bat Hibernacula Rationale: Bat hibernacula are rare habitats in all Ontario landscapes.	Bat Hibernacula may be found in these ecosites: CCR1, CCR2, CCA1, CCA2 (Note: buildings are not considered to be SWH)	▪ Hibernacula may be found in caves, mine shafts, underground foundations, and Karsts. ▪ Active mine sites should not be considered as SWH. The locations of bat hibernacula are relatively poorly known. Species: *Big Brown Bat, Tri-coloured Bat*	▪ All sites with confirmed hibernating bats are SWH. ▪ The area includes 200m radius around the entrance of the hibernaculum for most development types and 1000m for wind farms. ▪ Studies are to be conducted during the peak swarming period (Aug. – Sept.). ▪ Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”.	**Not Present** Ontario Place does not contain suitable, natural hibernation sites. There is some potential for several buildings to provide hibernation sites, however, buildings do not qualify as SWH.

Bat Maternity Colonies
Rationale: Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.
	Maternity colonies considered SWH are found in forested Ecosites.
	All ELC Ecosites in ELC Community Series:
	FOD, FOM, SWD, SWM
		▪ Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).
		▪ Maternity roosts are not found in caves and mines in Ontario.
		▪ Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife trees.
		▪ Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2.
		▪ Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.
		Species:
		Big Brown Bat, Silver-haired Bat
			▪ Maternity Colonies with confirmed use by:
			  ▪ >10 Big Brown Bats
			  ▪ >5 Adult Female Silver-haired Bats
			▪ The area of the habitat includes the entire woodland, or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies.
			▪ Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitat: Guidelines for Wind Power Projects”.
				Candidate SWH
				Ontario Place contains one forested community and one woodland community. Therefore, there is potential for bat maternity colonies to be present. Big Brown and/or Silver-haired Bats were detected within the AOI on multiple occasions. It is possible that these species have maternity roosts within the AOI, however, the abundance of individuals within the AOI cannot be quantified.

Turtle Wintering Areas Rationale: Generally, sites are the only known sites in the area. Sites with the highest	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO	▪ For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. ▪ Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. ▪ Man-made ponds such as sewage lagoons or storm water	▪ Presence of 5 over-wintering Midland Painted Turtles is significant. ▪ One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. ▪ The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river,	**Confirmed SWH** Both Midland Painted Turtles and Northern Map Turtles were observed along the turtle wintering area transect route near amphibian call station #5. Water is presumed deep enough or to have enough

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
number of individuals are most significant.	Northern Map Turtle: Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	ponds should not be considered SWH. Species: *Midland Painted Turtle* Special Concern: *Northern Map Turtle, Snapping Turtle*	the deep- water pool where the turtles are over wintering is the SWH. ▪ Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. May). Congregation of turtles is more common where wintering areas are limited and therefore significant.	flow such that it does not entirely freeze. In addition, suitable substrate (muck) appears to be available in this area. One Northern Map Turtle was observed in the early spring and the onset of fall. Therefore, this area is considered confirmed SWH.
Reptile Hibernaculum Rationale: Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.	▪ For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line, such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. ▪ Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. ▪ Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Species: *Eastern Gartersnake, Northern Watersnake, Northern Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, Northern Ring-necked Snake, Milksnake* Special Concern: *Eastern Ribbonsnake*	Studies confirming: ▪ Presence of snake hibernacula used by a minimum of five individuals of a snake sp. Or; individuals of two or more snake spp. ▪ Congregations of a minimum of five individuals of a snake sp. Or; individuals of two or more snake spp. Near potential hibernacula (eg. Foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). ▪ Note: If there are Special Concern Species present, then site is SWH. ▪ Note: Sites for hibernation possess specific habitat parameters (e.g., temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e., strong hibernation site fidelity). Other critical life processes (e.g., mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH.	**Not Present** Reptiles may overwinter wherever there is access below the frost line including subterranean sites and other naturally sheltered areas. No snakes were observed within the AOI at any time. Therefore, this SWH is not present.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff) Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1, CUT1, CUS1, BLO1, BLS1, BLT1, CLO1, CLS1, CLT1	▪ Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. ▪ Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. ▪ Does not include a licensed/permitted Mineral Aggregate Operation. Species: *Cliff Swallow* *Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)*	Studies confirming: ▪ Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. ▪ A colony identified as SWH will include a 50m radius habitat area from the peripheral nests. ▪ Field surveys to observe and count swallow nests are to be completed during the breeding season. ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	**Not Present** Ontario Place has a well-established Cliff Swallow population with an estimated maximum of 12,240 active nests present. Despite being present in very high numbers, this species nests exclusively on buildings and other human-made structures within the AOI. Therefore, the site does not meet the criteria of SWH.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) Rationale: Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	SWM2, SWM3, SWM5, SWM6, SWD1, SWD2, SWD3, SWD4, SWD5, SWD6, SWD7, FET1	▪ Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. ▪ Most nests in trees are 11 to 15 m from ground, near the top of the tree. Species: *Great Blue Heron, Black-crowned Night-Heron, Great Egret, Green Heron*	Studies confirming: ▪ Presence of 2 or more active nests of Great Blue Heron or other listed species. ▪ The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH. ▪ Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to	**Not Present** Based on field investigations, these species were not found to be nesting on site and no evidence of previous nesting on site for these species was observed. Therefore, this SWH is not present.

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
			August) or by evidence such as the presence of fresh guano, dead young and/or eggshells.	
Colonially - Nesting Bird Breeding Habitat (Ground) Rationale: Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM, CUT, CUS	▪ Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. ▪ Brewer's Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. Species: *Herring Gull, Great Black-backed Gull, Little Gull, Ring-billed Gull, Common Tern, Caspian Tern, Brewer's Blackbird*	Studies confirming: ▪ Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern. ▪ Presence of 5 or more pairs for Brewer's Blackbird. ▪ Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. ▪ The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH. ▪ Studies would be done during May/June when actively nesting. ▪ Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".	**Not Present** No nests of any of the listed species were observed within the AOI. It is expected that juveniles observed within the AOI are from large breeding populations nearby, such as those known to nest at Tommy Thompson Park. Therefore, this SWH is not present.
Migratory Butterfly Stopover Areas Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Combination of ELC Community Series; need to have present one Community Series from each land class: Field: CUM, CUT, CUS Forest: FOC, FOD, FOM, CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	▪ A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Erie or Lake Ontario. ▪ The habitat is typically a combination of field and forest and provides the butterflies with a location to rest prior to their long migration south. ▪ The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. ▪ Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes. Species: *Painted Lady, Red Admiral* Special Concern: *Monarch*	Studies confirm: ▪ The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). ▪ MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. ▪ Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. ▪ MUD of >5000 **or** >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.	**Not Present** Ontario Place is located on the shoreline of Lake Ontario and is a highly developed site where vegetated areas are subject to much disturbance. A suitable combination of undisturbed forest and field is not present within the AOI. In addition, very few Monarchs were observed on site during field investigations. Therefore, this SWH is not present.
Landbird Migratory Stopover Areas Rationale: Sites with a high diversity of species as well as high numbers are most significant.	All Ecosites associated with These ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD	▪ Woodlots >5 ha in size and within 5 km of Lake Erie and Lake Ontario. ▪ If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat. ▪ If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Erie and Lake Ontario are more significant. ▪ Sites have a variety of habitats; forest, grassland and wetland complexes. ▪ The largest sites are more significant. ▪ Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Erie and Lake Ontario are Candidate SWH.	Studies confirm: ▪ Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. ▪ Studies should be completed during spring (Mar to May) and fall (Aug to Oct) migration using standardized assessment techniques. ▪ Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects.	**Confirmed** Migratory stopover surveys confirmed the use of the habitat by more than 200 birds/day during peak migration. In addition, more than 35 total species were recorded with at least 10 different species on more than 5 survey dates. Therefore this SWH is confirmed.

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
		Species: *All migratory songbirds, All migrant raptors species*		
Deer Winter Congregation Areas Rationale: Deer movement during winter in the southern areas of Eco-Region 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	All Forested Ecosites with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD Conifer plantations much smaller than 50 ha may also be used.	▪ Woodlots >100 ha in size or if large woodlots are rare in a planning area, woodlots >50ha. ▪ Deer movement during winter in the southern areas of Eco-Region 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. ▪ Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha. ▪ Woodlots with high densities of deer due to artificial feeding are not significant. Species: *White-tailed Deer*	Studies confirm: ▪ Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. ▪ Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. ▪ Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques, ground or road survey, or a pellet count deer density survey.	**Not Present** Based on MNRF mapping and the conditions on site, deer wintering yards are not present within or surrounding the AOI.
Rare Vegetation Communities				
Cliffs and Talus Slopes Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO, CLO, TAS, CLS, TAT, CLT	▪ A Cliff is vertical to near vertical bedrock >3m in height. ▪ A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. ▪ Most cliff and talus slopes occur along the Niagara Escarpment.	▪ Confirm any ELC Vegetation Type for Cliffs or Talus Slopes.	**Not Present** This vegetation community is not present within the AOI.
Sand Barren Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1, SBS1, SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket- like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	▪ Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. ▪ Vegetation can vary from patchy and barren to tree covered, but less than 60%. ▪ A sand barren area >0.5ha in size.	▪ Confirm any ELC Vegetation Type for Sand Barrens. ▪ Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.).	**Not Present** This vegetation community is not present within the AOI.
Alvar Rationale: Alvars are extremely rare habitats in Eco-Region 7E.	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1, CUW2 **Five Alvar Indicator Species:** 1) *Carex crawei* 2) *Panicum philadelphicum* 3) *Eleocharis compressa* 4) *Scutellaria parvula* 5) *Trichostema brachiatum* These indicator species are very specific to Alvars within Eco-Region 7E	▪ An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. ▪ Vegetation cover varies from patchy to barren with a less than 60% tree cover. ▪ An Alvar site > 0.5 ha in size. ▪ Alvar is particularly rare in Eco-Region 7E where the only known sites are found in the western islands of Lake Erie.	Field studies that identify four of the five **Alvar Indicator Species** at a Candidate Alvar site is Significant. ▪ Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). ▪ The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses.	**Not Present** This vegetation community is not present within the AOI.
Old Growth Forest	Forest Community Series:	▪ Old Growth forests are characterized by heavy mortality or	▪ Field Studies will determine:	**Not Present**

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
Rationale: Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Eco-Region 7E.	FOD, FOC, FOM, SWD, SWC, SWM	turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris. ▪ Woodland area is >0.5ha.	▪ If dominant trees species of the area are >140 years old, then the area containing these trees is Significant Wildlife Habitat. ▪ The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present). ▪ The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH. ▪ Determine ELC vegetation types for the forest area containing the old growth characteristics.	The forested ecosite within the study area is relatively young and does not have a multi-layered canopy, snags, and downed woody debris typical of an old growth forest. This habitat is not present within the AOI.
Savannah Rationale: Savannahs are extremely rare habitats in Ontario.	TPS1, TPS2, TPW1, TPW2, CUS2	▪ A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. ▪ In Eco-Region 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). ▪ No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.	▪ Field studies confirm one or more of the Savannah indicator species listed in Appendix N of the SWHTG should be present. Note: Savannah plant spp. list from Eco-Region 7E should be used ▪ Area of the ELC Ecosite is the SWH. ▪ Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.).	**Not Present** This vegetation community is not present within the AOI.
Tallgrass Prairie Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1, TPO2	▪ A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. ▪ In Eco-Region 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). ▪ No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.	▪ Field studies confirm one or more of the Prairie indicator species listed in Appendix N of the SWHTG should be present. Note: Prairie plant spp. list from Eco-Region 7E should be used. ▪ Area of the ELC Ecosite is the SWH. ▪ Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.).	**Not Present** This vegetation community is not present within the AOI.
Other Rare Vegetation Communities Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	▪ Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps. ▪ ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M of the SWHTG. ▪ The OMNRF/NHIC will have up to date listing for rare vegetation communities.	▪ Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWTG. ▪ Area of the ELC Vegetation Type polygon is the SWH.	**Not Present** No rare vegetation communities were present within the AOI.
Specialized Habitat for Wildlife				
Waterfowl Nesting Area Rationale: Important to local waterfowl populations, sites with greatest number of species and highest	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2,	▪ A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. ▪ Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding	Studies confirmed: ▪ Presence of 3 or more nesting pairs for listed species excluding Mallards, or presence of 10 or more nesting pairs for listed species including Mallards. ▪ Any active nesting site of an American Black Duck is considered significant. ▪ Nesting studies should be completed during the spring	**Not Present** 3 or more nesting pairs of the listed species, excluding mallards, or the presence of 10 or more nesting pairs of the listed species, including mallards, were not present on site. Breeding bird surveys confirmed the presence of one nesting pair

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
number of individuals are significant.	SWD3, SWD4 Note: Includes adjacency to Provincially Significant Wetlands	nests. ▪ Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. Species: *American Black Duck, Northern Pintail, Northern Shoveler, Gadwall, Blue-winged Teal, Green-winged Teal, Wood Duck, Hooded Merganser, Mallard*	breeding season (April - June). ▪ Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". ▪ A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest.	of mallards and the probable presence of a second pair. However, no other listed species were found to be nesting on site. Therefore, this SWH is not present within the AOI.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat Rationale: Nest sites are fairly uncommon in Eco-Region 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM, and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	▪ Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. ▪ Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. ▪ Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms). Species: *Osprey* Special Concern: *Bald Eagle*	Studies confirm the use of these nests by: ▪ One or more active Osprey or Bald Eagle nests in an area. ▪ Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. ▪ For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH ccvii, maintaining undisturbed shorelines with large trees within this area is important. ▪ For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. ▪ To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥ 3 years or suspected of not being used for >5 years before being considered not significant. ▪ Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to mid-August. ▪ Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".	**Not Present** Neither Bald Eagle nor Osprey nests were present on site during 2022 field investigation completed by MH. These species were also not observed within the AOI. Therefore, this SWH is not present within the AOI.
Woodland Raptor Nesting Habitat Rationale: Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD, and CUP3	▪ All natural or conifer plantation woodland/forest stands >30ha with >4ha of interior habitat. Interior habitat determined with a 200m buffer. ▪ Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. ▪ In disturbed sites, nests may be used again, or a new nest will be in close proximity to an old nest. Species: *Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl, Broad-winged Hawk*	Studies confirm: ▪ Presence of 1 or more active nests from species list is considered significant. ▪ Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha area of habitat is the SWH. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest). ▪ Barred Owl – A 200m radius around the nest is the SWH. ▪ Broad-winged Hawk and Coopers Hawk– A 100m radius around the nest is the SWH. ▪ Sharp-Shinned Hawk – A 50m radius around the nest is the SWH. ▪ Conduct field investigations from early March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.	**Not Present** Suitable forest habitat is not present within the AOI. Treed areas on Ontario Place grounds are small and do not provide interior forest habitat.

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
Turtle Nesting Areas Rationale: These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Exposed mineral soil (sand or gravel) areas adjacent (<100m) or within the following ELC Ecosites: MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, BOO1, FEO1	▪ Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. ▪ For an area to function as a turtle- nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. ▪ Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. Species: *Midland Painted Turtle* Special Concern: *Northern Map Turtle, Snapping Turtle*	Studies confirm: ▪ Presence of 5 or more nesting Midland Painted Turtles. ▪ One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. ▪ The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. ▪ Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. ▪ Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method.	**Not Present** Both Midland Painted Turtle and Northern Map Turtle have been observed on site. However, no evidence of turtle nesting was observed anywhere within the AOI. Therefore, this SWH is not present
Seeps and Springs Rationale: Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	▪ Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. ▪ Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species. Species: *Wild Turkey, Ruffed Grouse, Spruce Grouse, White-tailed Deer, Salamander spp.*	Field Studies confirm: ▪ Presence of a site with 2 or more seeps/springs should be considered SWH. ▪ The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat.	**Not Present** No seeps or springs are present within the AOI. Therefore, this SWH is not present.
Amphibian Breeding Habitat (Woodland) Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	▪ Presence of a wetland, pond or woodland pool (including vernal pools) >500m^2 (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. ▪ Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat. Species: *Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog*	Studies confirm: ▪ Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3. ▪ A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. ▪ The habitat is the wetland area plus a 230m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat.	**Not Present** There are no woodland or forest pools or wetlands within the AOI and these species were not detected during amphibian calling surveys (where applicable). Therefore, this SWH is not present.
Amphibian Breeding Habitat (Wetlands) Rationale: Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	ELC Community Classes SW, MA, FE, BO, OA, and SA. Typically, these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic	▪ Wetlands>500m^2 (about 25m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. ▪ Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. ▪ Bullfrogs require permanent water bodies with abundant emergent vegetation.	Studies confirm: ▪ Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3. **or** Wetland with confirmed breeding Bullfrogs are significant. ▪ The ELC ecosite wetland area and the shoreline are the SWH.	**Not Present** Suitable wetlands are not present within the AOI and these species were not detected during amphibian calling surveys (where applicable). Therefore, this SWH is not present.

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
	species (e.g. Bull Frog) may be adjacent to woodlands.	Species: *Eastern Newt, American Toad, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog*	▪ A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. ▪ If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered.	
Woodland Area-Sensitive Bird Breeding Habitat Rationale: Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest songbirds.	All Ecosites associated with these ELC Community Series: FOC, FOM, FOD, SWC, SWM, SWD	▪ Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30ha. ▪ Interior forest habitat is at least 200 m from forest edge habitat. Species: *Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery, Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Scarlet Tanager, Winter Wren, Pileated Woodpecker* Special Concern: *Canada Warbler* Threatened: *Cerulean Warbler*	Studies confirm: ▪ Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. ▪ Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. ▪ Conduct field investigations in spring and early summer when birds are singing and defending their territories. ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**Not Present** Large stands of mature trees and interior forest habitat are not present within the AOI. Therefore, this SWH is not present within the AOI.
Habitats of Species of Conservation Concern Considered SWH				
Marsh Breeding Bird Habitat Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1 For Green Heron: All SW, MA, and CUM1 sites.	▪ Nesting occurs in wetlands. ▪ All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. ▪ For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Species: *American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Green Heron, Trumpeter Swan* Special Concern: *Black Tern, Yellow Rail*	Studies confirm: ▪ Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren **or** breeding by any combination of 4 or more of the listed species. ▪ Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. ▪ Area of the ELC ecosite is the SWH. ▪ Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**Not Present** Suitable marsh breeding habitat does not exist within the AOI. In addition, none of the listed species were observed during nesting season or during breeding bird surveys. Therefore, this SWH is not present.
Open Country Bird Breeding Habitat Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	CUM1, CUM2	▪ Large grassland areas (includes natural and cultural fields and meadows) >30 ha. ▪ Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). ▪ Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. ▪ The indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Species: *Upland Sandpiper, Vesper Sparrow, Northern Harrier, Savannah Sparrow* Special Concern: *Grasshopper Sparrow, Short-eared Owl*	Field Studies confirm: ▪ Presence of nesting or breeding of 2 or more of the listed species. ▪ A field with 1 or more breeding Short-eared Owls is to be considered SWH. ▪ The area of SWH is the contiguous ELC ecosite field areas. ▪ Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”.	**Not Present** Large grassland areas are not present within the AOI. Therefore, this SWH is not present.

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
Shrub/Early Successional **Bird Breeding Habitat** Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records.	CUT1, CUT2, CUS1, CUS2, CUW1, CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	▪ Large field areas succeeding to shrub and thicket habitats>10ha in size. ▪ Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row- cropping, haying or live- stock pasturing in the last 5 years). ▪ Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. ▪ Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Species: Indicator Spp.: *Brown Thrasher, Clay-coloured Sparrow* Common Spp.: *Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher* Special Concern: *Golden-winged Warbler* Endangered: *Yellow-breasted Chat*	Field Studies confirm: ▪ Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species. ▪ A habitat with breeding Yellow- breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. ▪ The area of the SWH is the contiguous ELC ecosite field/thicket area. ▪ Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories ▪ Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”	**Not Present** Large field areas succeeding to shrub and thicket are not present within the AOI. Therefore, this SWH is not present.
Terrestrial Crayfish Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare.	MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, MAS1, MAS2, MAS3, SWD, SWT, SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish.	▪ Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. ▪ Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. ▪ Both species are a semi- terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually, the soil is not too moist so that the tunnel is well formed. Species: *Chimney or Digger Crayfish; (Fallicambarus fodiens)* *Devil Crayfish or Meadow Crayfish; (Cambarus diogenes)*	Studies Confirm: ▪ Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. ▪ Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. ▪ Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult.	**Not Present** Terrestrial crayfish and their habitat are not present within the AOI. Therefore, this SWH is not present.
Special Concern and Rare Wildlife Species Rationale: These species are quite rare or have experienced significant population declines in Ontario.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	▪ When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites. ▪ Expert advice should be sought as many of the rare spp. have little information available about their requirements. Species: *All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).*	Studies Confirm: ▪ Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. ▪ The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat.	**Confirmed SWH** The following rare (S1-S3) and/or special concern (SC) species were observed within the AOI: ▪ Eastern Wood-pewee (SC) ▪ Grasshopper Sparrow (SC) ▪ Horned Grebe (SC) ▪ Northern Map Turtle (SC) ▪ King Eider ▪ Great Egret ▪ Pied-billed Grebe ▪ Peregrine Falcon (SC) ▪ Monarch (SC) ▪ Kentucky Coffee-tree ▪ Honey Locust

Wildlife Habitat	Candidate SWH		Confirmed SWH	Assessment
	ELC Ecosites	Habitat Criteria	Defining Criteria	
				▪ Ohio Buckeye The following species were not observed within the AOI during 2022 investigations but may also be present: ▪ Snapping Turtle (SC)
Animal Movement Corridors				
Amphibian Movement Corridors Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species.	▪ Movement corridors between breeding habitat and summer habitat. ▪ Movement corridors must be determined when Amphibian Breeding Habitat is confirmed as SWH. Species: *Eastern Newt, American Toad, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog*	▪ Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. ▪ Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant. ▪ Corridors should have at least 15m of vegetation on both sides of waterway or be up to 200m wide of woodland habitat and with gaps <20m. ▪ Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat.	**Not Present** SWH amphibian breeding habitat is not present within the AOI or its vicinity. Therefore, amphibian movement corridors are also not present within the AOI.
Significant Wildlife Habitat Exceptions for Eco-districts within Eco-Region 7E				
Bat Migratory Stopover Area Rationale: Stopover areas for long distance migrant bats are important during fall migration. ▪ **Eco-Districts: 7E-2**	No specific ELC types.	▪ Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas. ▪ This is the only known bat migratory stopover habitat based on current information. Species: *Hoary Bat, Eastern Red Bat, Silver-haired Bat*	▪ Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration. ▪ The confirmation criteria and habitat areas for this SWH are still being determined.	**Not Present** The AOI is not in a known stopover location and is unlikely to provide suitable conditions for stopover habitat.

APPENDIX G: Terrestrial Species at Risk Screening and Summary of Habitat 2022

SPECIES AT RISK HABITAT AT ONTARIO PLACE

Species Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
Invertebrates	Karner Blue	*Plebejus melissa samuelis*	EXT	EXT	▪ Restricted to where wild lupine grows – in sandy soils, sandy pine barrens, beach dunes, and oak savannahs.	▪ This species is extirpated from (no longer present in) Ontario, and there is no suitable habitat for this species at this site.	▪ Ontario Butterfly Atlas (OBA)
Invertebrates	Monarch	*Danaus plexippus*	SC	SC	▪ Breeding occurs in farmlands, along roadsides and in ditches, open wetlands, dry sandy areas, short and tall grass prairies, riverbanks, irrigation ditches, arid valleys, south-facing hillsides, and gardens – where Milkweed species are found. ▪ Foraging/nectaring habitat may overlap with breeding habitat but needs to contain flowering plants that provide nectar sources such as Goldenrods, Asters and various Clovers.	▪ This species has been **confirmed** on site nectaring, however, breeding (caterpillars or eggs) has not been confirmed.	▪ Ontario Butterfly Atlas (OBA)
Invertebrates	Mottled Duskywing	*Erynnis martialis*	END	NS	▪ Mottled Duskywings tend to live in dry habitats with sparse vegetation such as within open barrens, sandy patches among woodlands, and in alvars. In Ontario, they will only deposit their eggs on two closely related plants: New Jersey Tea and Prairie Redroot. ▪ Larvae overwinter as mature larvae, emerging as adults between mid-May and late June. In southwestern Ontario, a second brood matures in early July and takes flight between mid-July and late August.	▪ The host species for Mottled Duskywing are not present on site, therefore there is no habitat for this species.	▪ Ontario Butterfly Atlas (OBA)
Avifauna	Bank Swallow	*Riparia riparia*	THR	THR	▪ Nesting occurs in burrows in vertical faces in silt and sand deposits, in both natural settings (banks of rivers and lakes) and human-made settings (active sand and gravel pits). ▪ They breed in colonies ranging from several to a few thousand pairs.	▪ This species was not detected during targeted surveys and there is no suitable nesting habitat for this species within the AOI.	▪ Ontario Breeding Bird Atlas (OBBA)
Avifauna	Barn Swallow	*Hirundo rustica*	THR	THR	▪ Breeding and nesting occur in and on artificial structures, including barns and other outbuildings, bridges, and culverts. ▪ Prefer various types of open habitats for foraging, including grassy fields, pastures, various agricultural crops, along waterbodies, waterways, and rights-of-way, and in wetlands.	▪ This species has been **confirmed** nesting on numerous buildings and structures on site, and utilizes the majority of the site for foraging.	▪ Ontario Breeding Bird Atlas (OBBA)
Avifauna	Bobolink	*Dolichonyx oryzivorus*	THR	THR	▪ Foraging and breeding habitat is primarily found within meadows, fields and agricultural crops with tall grasses. ▪ Row crops and pastures with high shrub densities are typically avoided.	▪ There is no suitable habitat on site for this species.	▪ Ontario Breeding Bird Atlas (OBBA)
Avifauna	Chimney Swift	*Chaetura pelagica*	THR	THR	▪ Foraging habitat is often concentrated near water, where insects are the most abundant. ▪ Nesting habitat is historically in hollow trees, but as those became less abundant due to logging they have adopted brick chimneys, wells and large concrete sewer pipes for nesting and roosting.	▪ This species has been **observed** on site foraging, however, this species does not utilize the site for nesting.	▪ Ontario Breeding Bird Atlas (OBBA)
Avifauna	Common Nighthawk	*Chordeiles minor*	SC	THR	▪ Breeding habitat preference is in large open areas with little to no vegetation, such as sand dunes, beaches, logged and burned areas, in forest clearings, on rocky	▪ There species is absent from the site, as they have not been detected during targeted, species-specific surveys.	▪ Ontario Breeding Bird Atlas (OBBA)

SPECIES AT RISK HABITAT AT ONTARIO PLACE

Species Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
					outcrops, rock barrens, and in prairies, marshes, peatbogs, and pastures. Although they may also nest in cultivated fields, orchards, in parks, on gravel roofs, and along gravel roads or railways, they tend to occupy natural sites.		
Avifauna	Eastern Meadowlark	*Sturnella magna*	THR	THR	▪ Habitat is most common in native grasslands, pastures and savannas. Anthropogenic habitats are also used which includes hayfields, young orchards, golf courses, grassy roadside verges, and herbaceous fencerows. ▪ Breeding habitat is usually in large tracts of grasslands with a minimum area of 5 hectares. ▪ Scattered trees, shrubs, telephone poles and fence posts are used as elevated song perches.	▪ There is no suitable habitat on site for this species.	▪ Ontario Breeding Bird Atlas (OBBA)
Avifauna	Eastern Wood-pewee	*Contopus virens*	SC	SC	▪ Habitat preference is a mid-canopy layer of forest clearings and edges of deciduous and mixed forests. Most abundant in intermediate-aged and mature forest stands with little understory vegetation. ▪ The Horned Grebe is found across North America and Eurasia. Most of its North American breeding range is located in Canada, extending from northwestern Ontario to British Columbia and north to Alaska (Western population). A small, isolated breeding population also exists in Quebec, where it is limited to the Magdalen Islands. ▪ The Horned Grebe is a rare breeder in Ontario. Following the breeding season, most individuals migrate from inland freshwater nesting sites to coastal marine sites, although some individuals overwinter on large bodies of freshwater.	▪ This species has been **confirmed** on site during the breeding season, but was not confirmed as breeding.	▪ Ontario Breeding Bird Atlas (OBBA) ▪ Natural Heritage Information Centre (NHIC)
Avifauna	Grasshopper Sparrow	*Ammodramus savannarum*	SC	SC	▪ Lives in open grassland areas with well-drained, sandy soils in breeding season. It will also nest in hayfields and pasture, as well as alvars, prairies and occasionally in grain crops such as barley, and prefers areas that are sparsely vegetated. ▪ A short-distance migrant that leaves Ontario in the fall to migrate to the southeastern United States and Central America for the winter.	▪ This species was **confirmed** on site during spring migration.	▪ N/A; observed on site
Avifauna	Horned Grebe	*Podiceps auritus*	SC	SC	▪ The Horned Grebe usually nests in small ponds, marshes and shallow bays that contain areas of open water and emergent vegetation. Nests are usually located within a few metres of open water. In Canada, it's breeding range extends from northwestern Ontario to British Columbia and north to Alaska (Western population). It is a rare breeder in Ontario. ▪ Following the breeding season, most individuals migrate from inland freshwater nesting sites to coastal marine sites, though some individuals overwinter on large bodies of freshwater.	▪ This species was **confirmed** on site during spring migration.	▪ N/A; observed on site

SPECIES AT RISK HABITAT AT ONTARIO PLACE

Species Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
Avifauna	Least Bittern	*Ixobrychus exilis*	THR	THR	▪ Found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. ▪ Builds a nest above the water line in stands of dense vegetation, hidden among the cattails. Nests are almost always built near open water, which is needed for foraging, as this species eats mostly frogs, small fish, and aquatic insects.	▪ There is no suitable habitat on site for this species.	▪ Natural Heritage Information Centre (NHIC)
Avifauna	Peregrine Falcon	*Contopus cooperi*	SC	SC	▪ Usually nest on tall, steep cliff ledges close to large bodies of water. In the absence of natural nesting features, some will nest on ledges and roofs of tall buildings, even in busy downtown areas, as cities offer a good year-round supply of pigeons and starlings to feed on.	▪ This species has been **observed** on site in flight and likely hunting, however, this species does not utilize the site for nesting.	▪ Ontario Breeding Bird Atlas (OBBA)
Avifauna	Wood Thrush	*Hylocichla mustelina*	THR	THR	▪ Breeding habitat includes moist, deciduous hardwood or mixed stands, which usually have thick deciduous undergrowth and tall trees used as singing perches. ▪ Nesting usually takes place in lower elevations with a closed canopy cover and a high variety of deciduous tree species. These areas are usually shaded with an open forest floor that has moist soil and decaying leaf litter.	▪ There is no suitable habitat on site for this species.	▪ Ontario Breeding Bird Atlas (OBBA)
Herpetofauna	Blanding's Turtle	*Emydoidea blandingii*	THR	END	▪ Live in shallow water, usually in large wetlands and shallow lakes with an abundance of aquatic plants. ▪ May be found hundreds of metres from the nearest water body, especially while searching for mates or traveling to nesting sites. ▪ Hibernate in the mud at the bottom of permanent water bodies.	▪ There is no suitable habitat for this species, as wetlands with floating and/or emergent aquatic plants are not present, and they have not been detected during targeted, species-specific surveys.	▪ Ontario Reptile and Amphibian Atlas (ORAA)
Herpetofauna	Eastern Hog-nosed Snake	*Heterodon platirhinos*	THR	THR	▪ Specializes in hunting and eating toads, and usually only occurs where toads can be found. ▪ Prefers sandy, well-drained habitats such as dunes, beaches, and dry forests, where they can lay eggs and hibernate. They use their up-turned snout to dig burrows below the frost line in the sand where eggs are deposited.	▪ There is no suitable habitat on site for this species and they were not detected during targeted surveys.	▪ Ontario Reptile and Amphibian Atlas (ORAA)
Herpetofauna	Eastern Musk Turtle	*Sternotherus odoratus*	SC	SC	▪ Found in ponds, lakes, marshes, and rivers that have slow-moving water, abundant emergent vegetation, clean water, and muddy bottoms that can be utilized for hibernation. ▪ Nesting habitat is variable, but is close to the water and exposed to direct sunlight. Nesting females dig shallow excavations in soil, decaying vegetation and rotting wood, or lay eggs in muskrat lodges, on the open ground, or in rock crevices.	▪ There is no suitable habitat on site for this species as wetlands with clean water and with floating and/or emergent aquatic plants are not present.	▪ Ontario Reptile and Amphibian Atlas (ORAA)
Herpetofauna	Eastern Ribbonsnake	*Thamnophis sauritus*	SC	SC	▪ Typically found close to water, particularly in marshes, where it feeds on frogs and small fish. Can dive in	▪ There is no suitable habitat on site for this species and they were not detected during targeted surveys.	▪ Ontario Reptile and Amphibian Atlas (ORAA)

SPECIES AT RISK HABITAT AT ONTARIO PLACE

Species Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
					shallow water, especially if it is fleeing from a potential predator. ▪ Congregate in underground burrows or rock crevices to hibernate in groups.		
Herpetofauna	Northern Map Turtle	*Graptemys geographica*	SC	SC	▪ Inhabits rivers and lakeshores where it basks on emergent rocks, fallen trees, etc., throughout the spring and summer. Require high-quality water that supports mollusc prey as well as suitable basking sites with an unobstructed view so that they can retreat immediately into the water if startled. ▪ In winter, hibernates on the bottom of deep, slow-moving sections of river.	▪ This species has been **observed** basking in early spring and throughout the summer on the west side of the East Island. This species likely overwinters at this site as well.	▪ Ontario Reptile and Amphibian Atlas (ORAA) ▪ Natural Heritage Information Centre (NHIC)
Herpetofauna	Queensnake	*Regina septemvittata*	END	END	▪ An aquatic species that is seldom found more than a few metres from the water. Prefers rivers, streams and lakes with clear water, rocky or gravel bottoms, lots of cover to hide, and an abundance of crayfish (their primary prey). ▪ Often hibernating in groups with other snakes, amphibians and even crayfish, suitable hibernation sites include abutments of old bridges and crevices in bedrock.	▪ There is no suitable habitat on site for this species and they were not detected during targeted surveys.	▪ Natural Heritage Information Centre (NHIC)
Herpetofauna	Snapping Turtle	*Chelydra serpentina*	SC	SC	▪ Habitat preference is characterized by shallow water with a soft mud bottom. Individuals can be found in ponds, sloughs, shallow bays, marshes, shallow river edges, slow streams or areas combining several wetland habitats. ▪ Nesting areas typically include sand and gravel areas along waterways and roadways (road shoulders and driveways), though they may also nest in gardens and lawns. ▪ Hibernation sites include waterbodies and wetlands with continuous flow throughout the winter. In muddy locations, they burry deep into substrates, and in marshy areas they overwinter under mats of vegetation or detritus.	▪ This species has not been observed on site though is **likely present** in the same general location as the Northern Map Turtle (on the west side of the East Island).	▪ Ontario Reptile and Amphibian Atlas (ORAA)
Mammals	Little Brown Myotis Northern Myotis Tri-colored Bat Eastern small-footed myotis	*Myotis lucifugus* *Myotis septentrionalis* *Perimyotis subflavus* *Myotis leibii*	END END END END	END END END NS	▪ Maternity roosts usually occur in large-diameter trees with cavities, cracks, or crevices, as well as in buildings (attics, soffits, barns, etc.). Day roosting areas and areas used by non-breeding individuals are less restricted and more numerous. ▪ Foraging habitat is found in forest gaps, along waterways/over waterbodies, along forest edges, or at edges of meadows, and in other locations where insects are abundant. ▪ Hibernation sites include humid areas that are cold but do not freeze such as in caves, mines, rock crevices, and unheated basements.	▪ There is no suitable habitat for these species, as they have not been detected during targeted, species-specific surveys.	▪ N/A; range extends into area
Fish	American Eel	*Anguilla rostrata*	END	NS	▪ Over the course of its life, the American Eel can be found in both salt and fresh water. Many consider the American	▪ This species has been **confirmed** on site, within Lake Ontario.	▪ Toronto and Region Conservation Authority (TRCA)

SPECIES AT RISK HABITAT AT ONTARIO PLACE

Species Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
					Eel to have the broadest diversity of habitats of any fish species in the world. ▪ In Canada, it is found in fresh water and saltwater areas that are accessible from the Atlantic Ocean. This area extends from Niagara Falls in the Great Lakes up to the mid-Labrador coast. In Ontario, American Eels can be found as far inland as Algonquin Park.		

* *Endangered Species Act, 2007* (ESA) and *Species at Risk Act* (SARA) statuses: EXT – Extirpated, END – Endangered, THR – Threatened, SC – Special Concern, NS – No Status.

APPENDIX H: West Island Shoreline Brief (Baird, 2022)

W.F. Baird & Associates Coastal Engineers Ltd.

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Phone | +1 905 845 5385 Email | oakville@baird.com

Memorandum

Reference # 13471.201.M1.R3_West Island Shoreline Brief

Status: Final

October 20, 2022

Attention: **Mark Lawson, Therme Group Canada Inc.**

CC: Chris Salloum, Therme Group Canada Inc.

From: Mark Kolberg

RE: Therme West Island, Ontario Place – Shoreline Protection

This memorandum briefly discusses the existing shoreline conditions at the West Island, Ontario Place. The problems and opportunities are summarized and the proposed shoreline protection improvements for the Therme project are identified.

Summary of Proposed Shoreline Improvements at West Island

Primary Elements

The primary elements of the proposed shoreline improvements by Therme at the West Island are presented in Figure 1 and include the west shore beach and north peninsula, west headland and submerged reef, south shore revetment, east headland, north wall, and east shore. Typical concept cross-sections for the primary outer shoreline improvements, showing the armour stone primary protection and toe berm, core stone, beach cobbles/pebbles, submerged stone reef, and clean fill, are presented in Figure 2:

- west shore beach (Section A; Station -0+075)
- west headland and submerged reef (Section B; Station 0+095)
- west headland (Section C; Station 0+200)
- south shore (Section D; Station 0+325)
- east headland (Section E; Station 0+500).

A concept section through the north peninsula is presented in Figure 3. At the north side of the north peninsula a floating walkway will run parallel to the existing breakwater wall; floating canoe/kayak finger docks will extend perpendicular to floating walkway. The pier that extends to the north of the north peninsula at the west end of the site will extend out over the existing shore and will be pile-supported. Along the north wall a retaining wall structure will be required to accommodate the increased elevation and width of the public multipurpose trail and access. The north peninsula itself will be a filled structure enclosed with vertical walls around the perimeter of the south side. The pier that extends to the south will be pile-supported. At the east shore the existing hard-edge treatments will be replaced with a naturalized, green wetland edge.

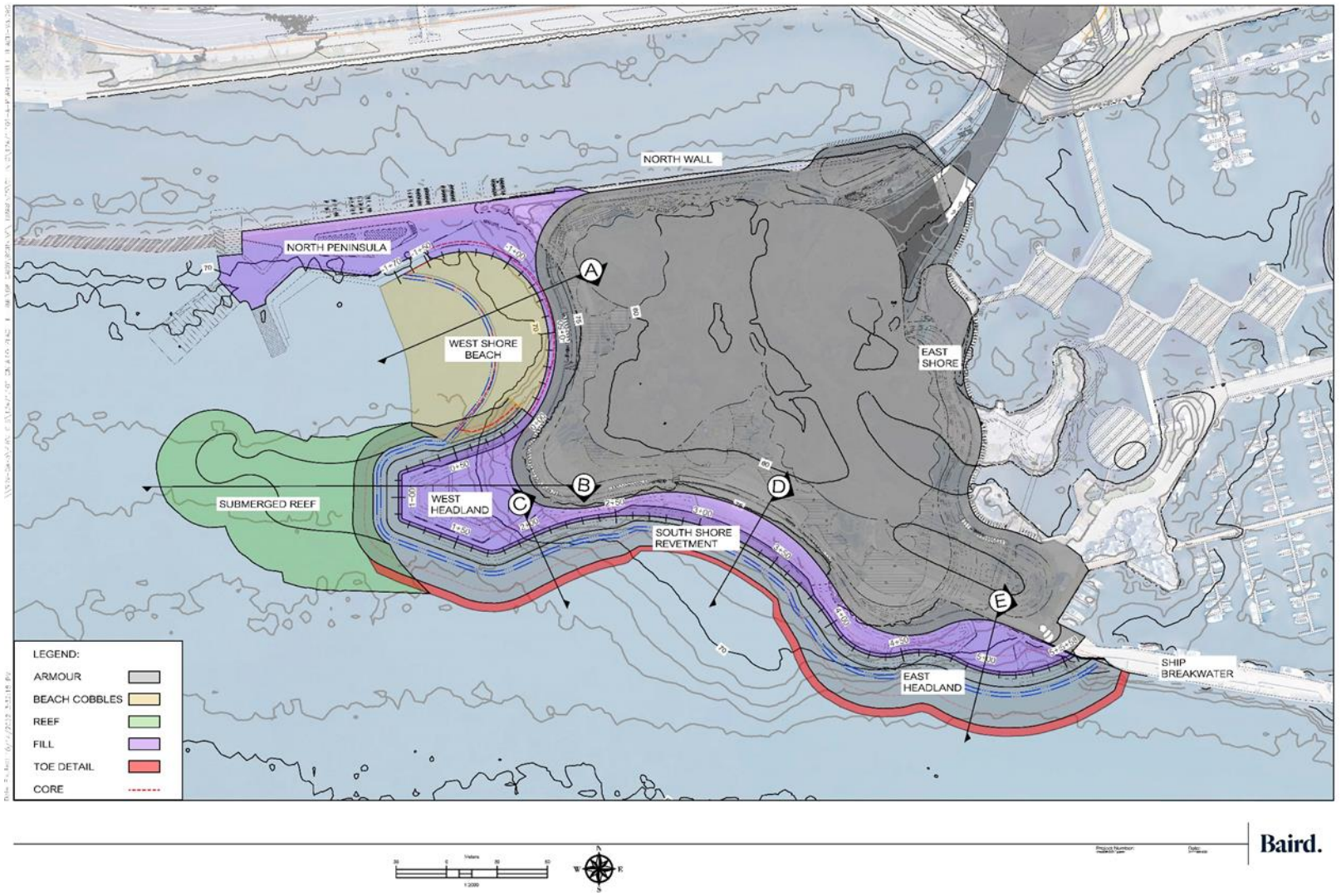
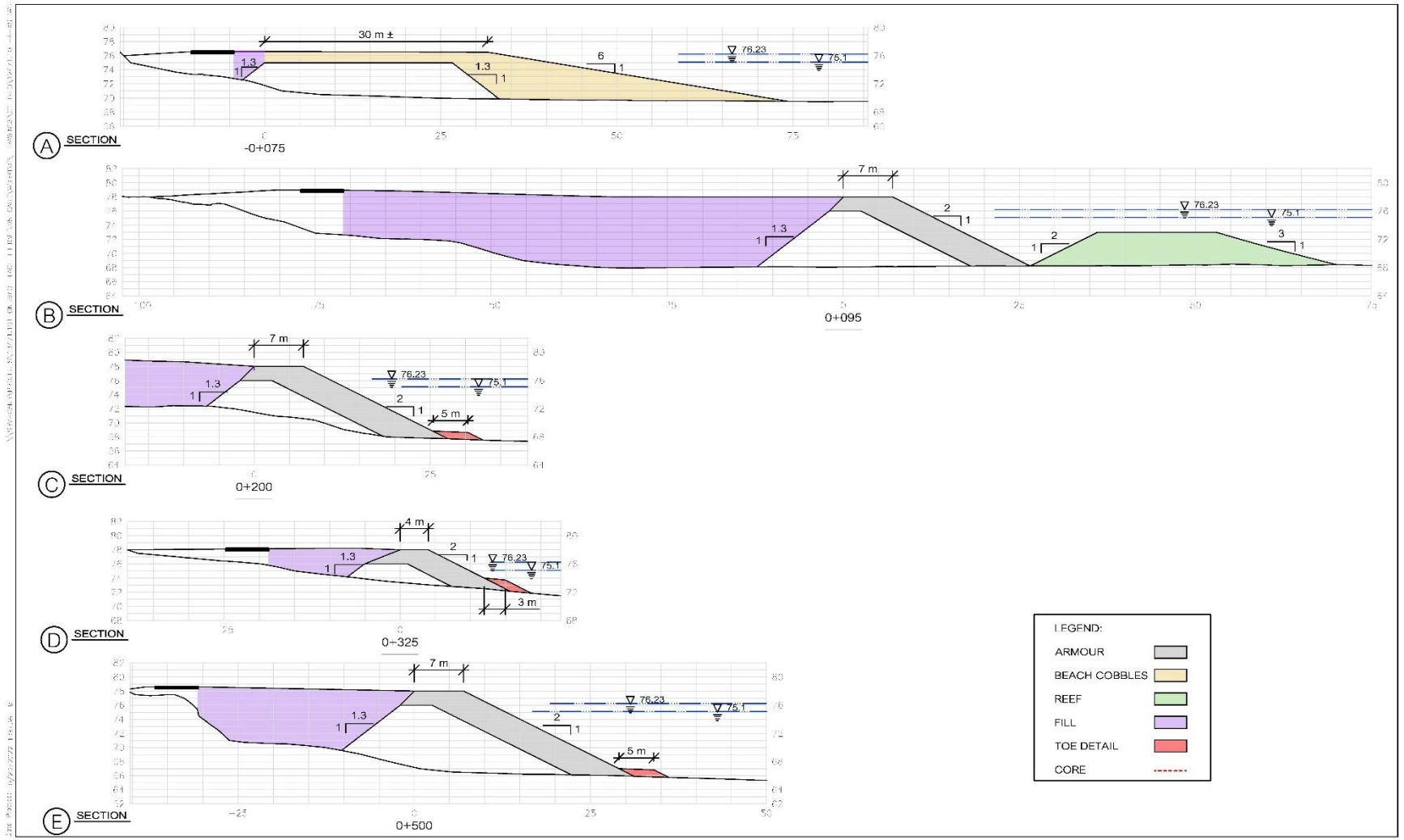


Figure 1: Concept plan of primary elements of proposed shoreline, West Island Ontario Place



Baird.

Figure 2: Schematic cross-sections of proposed outer shoreline, West Island Ontario Place

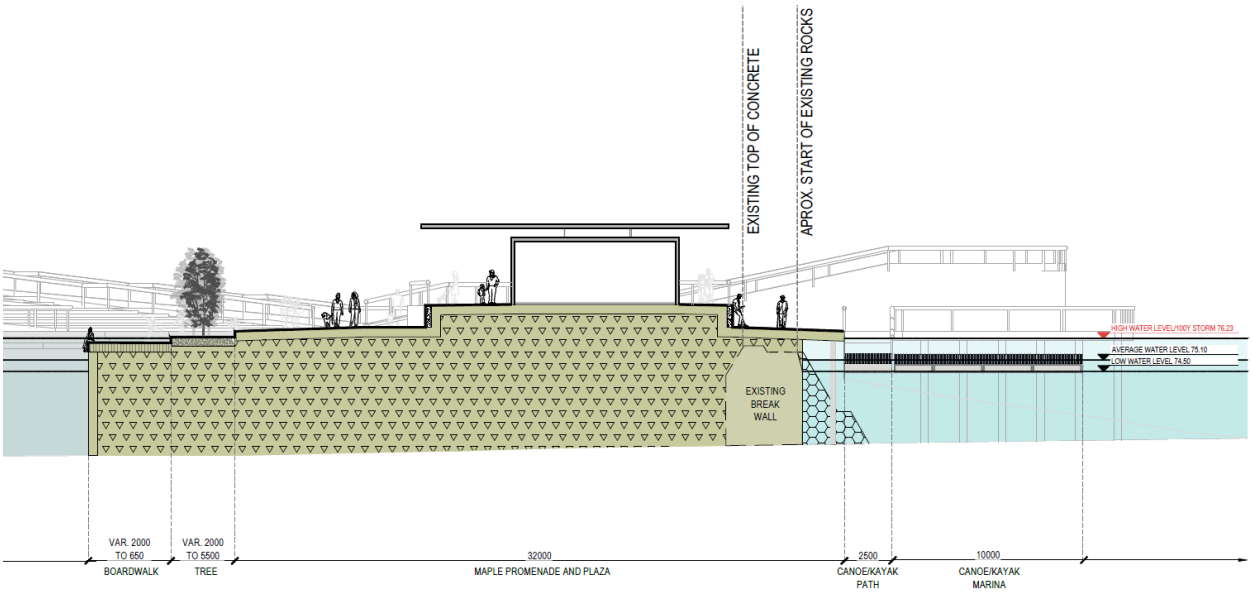


Figure 3: Concept section at north peninsula (south side on left side of figure; north side with canoe/kayak area on right hand side of figure)

West Island Shoreline Problems and Opportunities

The problems and the opportunities with the existing West Island shoreline with respect to shoreline protection, public space and connectivity to the water, and aquatic habitat are summarized in Table 1. To address these issues, the proposed shoreline improvements at the West Island are intended to serve three key purposes:

- rehabilitate the shoreline protection to meet present day coastal engineering design standards for erosion and flooding hazards at the 100-year storm, including resiliency measures for climate change, and an updated 100-year flood level based on recent scientific advances; provide a further 50-year design life for the West Island
- provide enhanced public space and connectivity to the water
- improve aquatic habitat.

Proposed Lakefill Areas

The enhanced shoreline at the West Island will be achieved by additional lakefilling around the perimeter of the existing lakefill that created the original West Island. The proposed lakefill areas at the West Island are shown in Figure 4. The various lakefill area classifications are defined in Figure 5. The estimated surface area of land created by lakefill at the West Island is 36,000 m^2, including at the outer shore (Area A), the north wall, and the east shore (Area B). The new lakefill area under the water supporting the land is 25,200 m^2, including the shore works (Area C) and the submerged reef (Area D). At the east shore of the West Island, about 1100 m^2 of new water area is created (Area E) where it is now existing land. The lakefill areas are summarized in Table 2. The distance along the shoreline, from the east headland at the ship breakwater to the west end of the north peninsula is 580 m.

Table 1: Summary of Ontario Place West Island Shoreline Problems and Opportunities

Issues	Problems	Opportunities
Shoreline Protection	• Existing shoreline protection around perimeter of original West Island lakefill is beyond initial 50-year design life; lakefill perimeter and protection is damaged and deteriorated and in need of replacement/rehabilitation.	• Rehabilitate/replace the shoreline protection to meet present day shoreline engineering design standards for erosion and flooding hazards at the 100-year storm and provide a further 50-year design life, preserving the integrity of the lakefill; allow terraced section for improved public access.
	• Higher design water levels due to the Lake Ontario regulation plan and climate change impacts increases the risk of future erosion and flooding damage.	• New shoreline protection design will include an updated 100-year flood level based on recent scientific advances and resiliency measures for climate change.
Public Space and Connectivity to the Water	• Public space along the water's edge at the perimeter of the lakefill is narrow with only limited connection to the water's edge.	• Increase the width of the perimeter public realm for pedestrians, cyclists, and emergency vehicles; provide waterfront park amenities and canoe/kayak docking.
	• The existing ad hoc rubble beach on the south shore is narrow; it is inundated at higher water levels, which further restricts the space available public use. The beach is insufficient to protect the lakefill from serious erosion.	• Provide a wider beach at west shore with a higher crest elevation to provide more public space and improve shoreline protection, even at higher water levels; submerged reef at west headland helps shelter beach.
Aquatic Habitat	• Lack of aquatic habitat features along the shoreline.	• Enhance aquatic habitat features consistent with Toronto Waterfront Aquatic Habitat Restoration Strategy (TWARS), including submerged reef and surcharged open coast revetments.
	• East shore lagoon has hard, vertical edges (e.g., timber pilings, steel sheet piles); water is stagnant.	• Provide soft, green shoreline edge at east shore and improve function of lagoon as a wetland.

Table 2: Summary of Lakefill Areas, West Island Ontario Place

Lakefill Area Designation (Figure 4)	Lakefill Area Description	Lakefill Area (m2)	
A	New Lakefill Above Water	31,700 m^2	
B	New Lakefill Above Water (East Shore)	4,300 m^2	
	Total Surface Area of New Lakefill Above Water		*36,000 m^2*
C	New Lakefill Below Water	15,700 m^2	
D	New Submerged Reef (Lakefill Below Water)	9,500 m^2	
	Total Surface Area of New Lakefill Below Water		*25,200 m^2*
E	New Water Area Created from Existing Lakefill	1100 m^2	

Proposed Lakefill Volumes

A preliminary estimate of the shoreline lakefill volumes, including stone protection material, stone core, beach material, reef material, and clean fill is approximately 279,000 m^3; a breakdown of the lakefill volume is provided in Table 3. The pier is pile-supported above the water (see Figure 4) and does not require significant filling in the lake. The fill material will meet the requirements of the Ontario Fill Quality Guide for Shore Filling.

Table 3: Preliminary Lakefilling Volumes at West Island

	Armour & Core Stone Material (m^3)	Beach Material (m^3)	Clean Fill (m^3)	Reef Stone (m^3)
West Shore (Beach and North Peninsula)	16,000	24,000	36,000	N/A
West Headland	51,000	N/A	29,000	N/A
South Shore	10,000	N/A	10,000	N/A
East Headland	37,000	N/A	20,000	N/A
Submerged Reef	N/A	N/A	N/A	30,000
North Wall	3000	N/A	N/A	N/A
East Shore	N/A	N/A	13,000	N/A
Total Material Type	117,000 m^3	24,000 m^3	108,000 m^3	30,000 m^3
		Total Lakefill Volume		**279,000 m^3**

Figure 4: West Island lakefill areas (see Figure 5 for definition of areas)

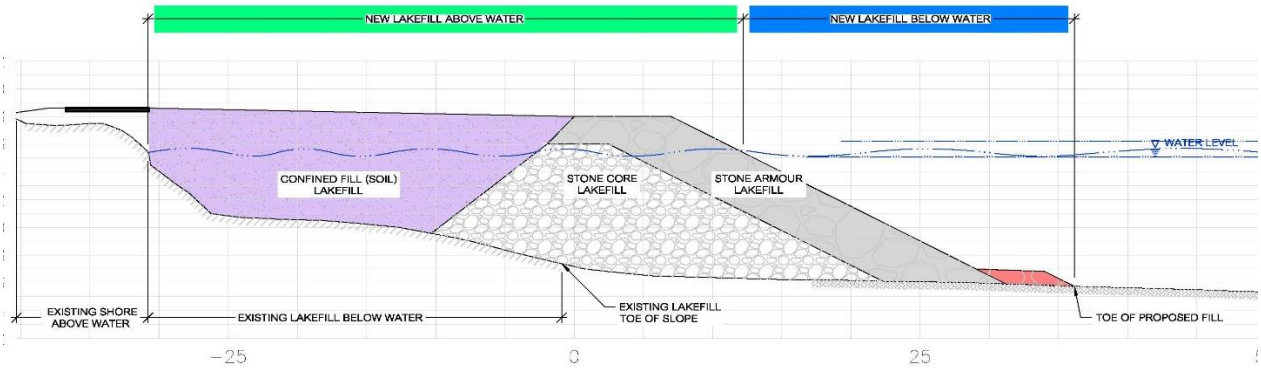


Figure 5: Definition sketch of new lakefill areas above water and new lakefill areas below water

Existing Shoreline Conditions at West Island

Overview

Ontario Place was created in the 1970s by lakefilling using construction rubble (e.g., broken concrete, brick) and excavated soil material from construction sites. The outer shoreline of the West Island lakefill, directly exposed to Lake Ontario on the south and west sides, was protected by stone and grouted-stone revetments, stacked stone and rubble. The sheltered shorelines on the north and east sides of the West Island are protected with vertical bulkhead walls (steel sheet pile or timber pile walls) and rip rap stone revetments. The existing structures were designed in accordance with engineering design practices common at the time and may have been considered to have a working design life of about 50 years. Continuous exposure to waves, ice and high-water levels over the past 50 years has deteriorated the protection works on the south and west shorelines to the point that they have effectively reached the end of their design life.

Previous condition assessments (Shoreplan, 2012[1]; Jacobs, 2020[2]) reported on the condition of the various shoreline sections at Ontario Place; their findings, along with more recent observations of the shoreline at the West Island are summarized later in this memorandum.

Higher design water levels due to the Lake Ontario regulation plan and climate change impacts increases the risk of future erosion and flooding damage at the West Island shoreline. For example, numerical modelling being undertaken by Baird for the project shows that the shoreline at the West Island is inundated by wave uprush and overtopping at high water level; Figure 6 provides a snapshot of three-dimensional numerical modelling of wave action at high water showing severe wave overtopping and flooding of the narrow rubble beach at the south shore and the stone revetment at the east headland. Figure 7 shows an example of more detailed numerical modelling of wave uprush and overtopping being completed by Baird for the West Island project. It can be seen in Figure 7 that even at a location approximately 24 m inland from the crest of the existing shoreline, average wave overtopping rates and maximum wave overtopping volumes greatly exceed accepted practice guidelines (e.g., EurOtop[3]).

[1] Shoreplan Engineering Limited, 2012. Ontario Place Preliminary Coastal Assessment, Technical Memorandum, November 30.
[2] Jacobs, 2020. Ontario Place Coastal Assessment, Technical Memorandum No. 1, December 18.
[3] EurOtop, 2018. Manual on wave overtopping of sea defences and related structures. An overtopping manual largely based on European research, but for worldwide application.

The extent of inland shoreline flooding at the West Island identified by earlier studies (Shoreplan, 2013[4]; Jacobs, 2020) using empirical methods is summarized in Table 4. The flooding estimates vary significantly but demonstrate the inland flooding hazard at the existing shoreline. Baird is completing a detailed analysis of inundation at the shoreline using an updated determination of the 100-year flood, including recent (2022) estimates of climate change effects.

Table 4: Previous Estimates of Inland Extent of Shoreline Flooding due to Wave Action (measured from location of 100-year flood level)

Location	Shoreplan (2012) *(75.8 m GSC)**	Jacobs (2020) *(76.1 m)**
West Shore (CS-10)	13 m	65 m
West Headland (CS-9)	5 m	39 m
South Shore (CS-8)	16 m	19 m
East Headland (CS-6)	34 m	18 m
Ship Breakwater (CS-5)	Not determined	48 m

** (100-year Flood Level Used)*

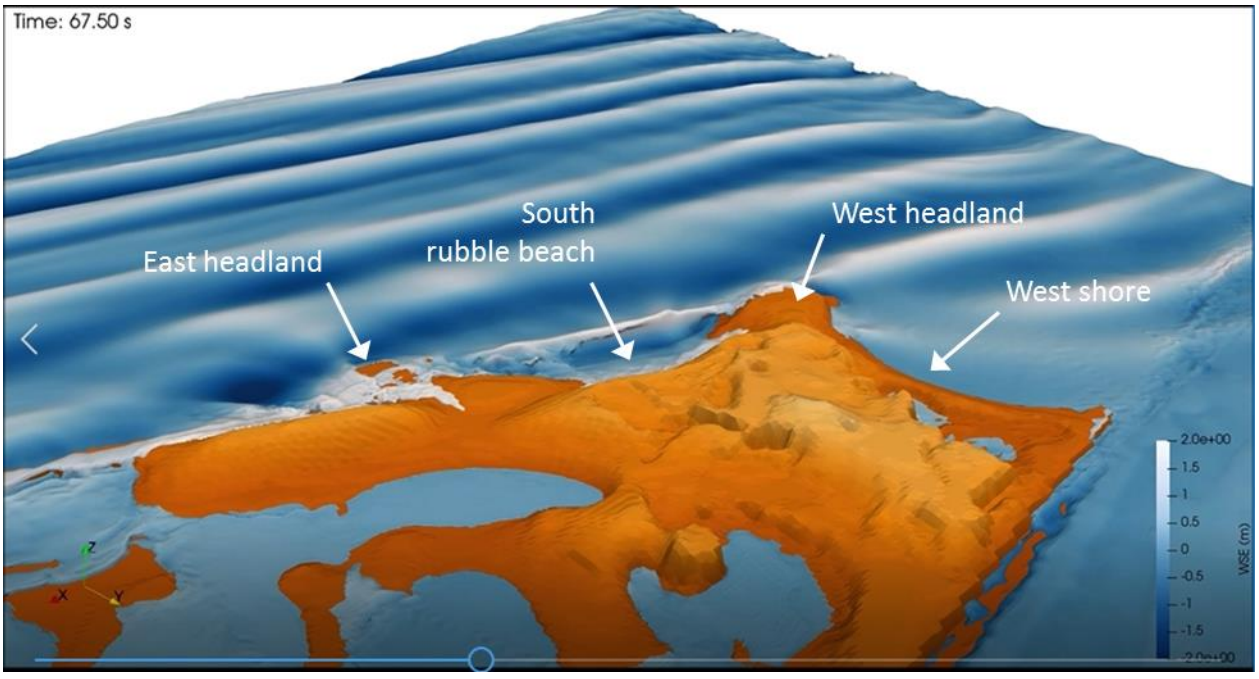


Figure 6: Example of inundation at existing West Island shoreline at high water (Baird)

[4] Shoreplan Engineering Limited, 2013. Ontario Place Preliminary Coastal Assessment, Wave Uprush, April 24.

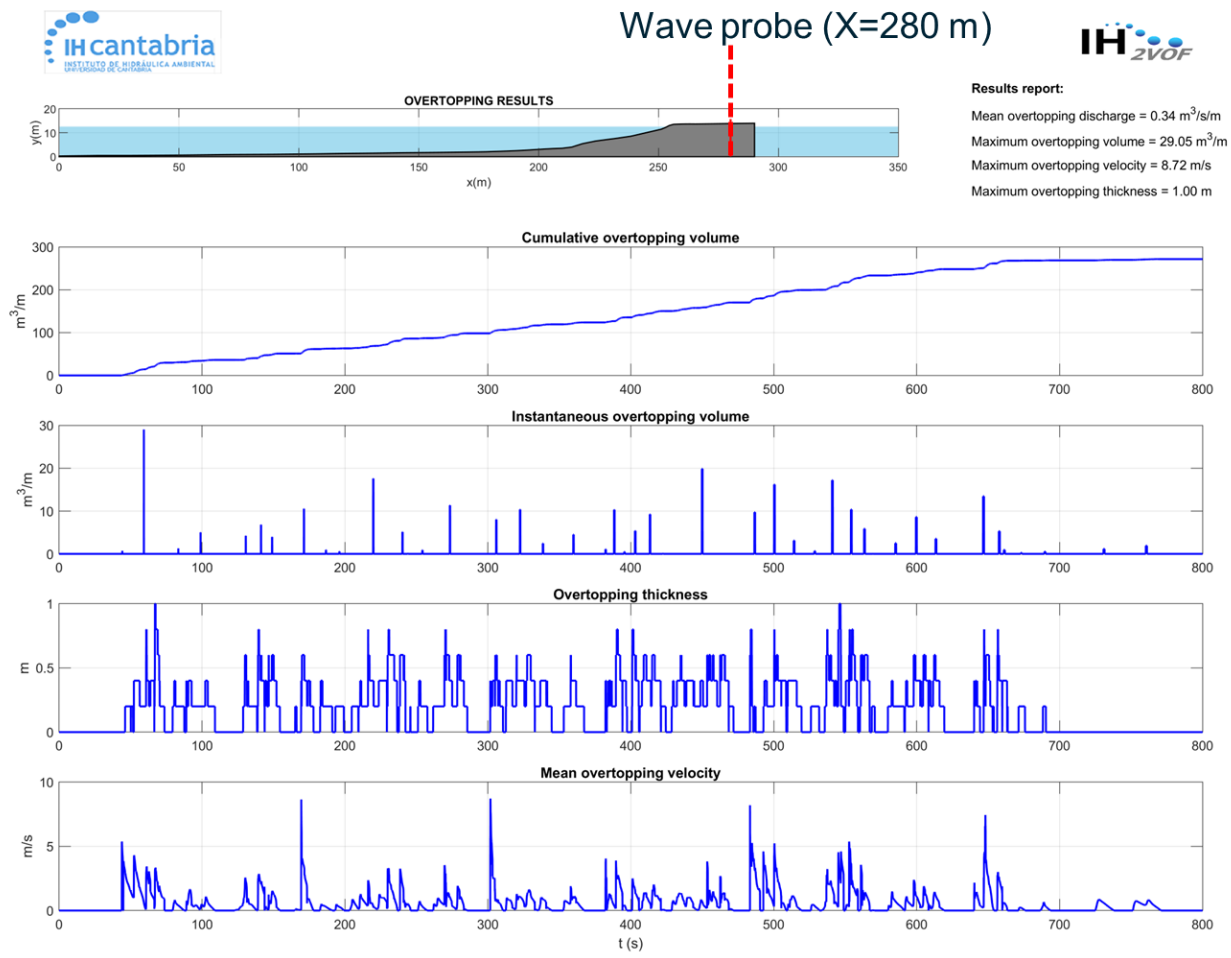


Figure 7: Example of numerical modelling of wave overtopping of existing shoreline, West Island Ontario Place (Baird)

Shoreline Sections

West Shore

The west shore is protected with a stacked armour stone seawall and random stone. The previous condition assessments did not identify specific defects with the stacked wall, however recent site visits have revealed that a section of the stacked wall has collapsed (see Figure 8). Shoreplan (2012) identified that at design high water levels the structures would be overtopped by waves and the backshore would be flooded. The nearly vertical shorewall does not offer public access to the water's edge. The width of the existing walkway behind the shorewall is narrow, crowding pedestrians and cyclists.

West Headland

The west headland is protected with a grouted stone revetment with additional armour stone on the lower part of the slope. Jacobs (2020) did not identify specific defects; however, Jacobs noted that the underwater portion

of the structure was not inspected and damage to and disruption around the toe of the structure, and movement of stone below the waterline were not assessed. Baird noted significant damage to the armour layer at the west headland during a site visit on April 29, 2022, including loss of armour cover, exposure of underlying smaller stone material, and cracking of the grouted slope (see Figure 9). Deterioration of the armoured slopes at older lakefill sites is not an uncommon occurrence in Toronto. A multibeam hydrographic survey has been undertaken along the outer shore of the West Island; the data is being processed and the results will inform the shoreline protection design process.

South Shore

The south shore, between the west and east headlands, consists of a rubble beach formed by the gradual degradation of the concrete rubble lakefill. Jacobs (2020) noted that the beach area appears to be generally narrow and possibly subject to a high degree of movement and erosion with extensive cliffing observed at the eastern side. The overall condition of the beach area was assessed by Jacobs (2020) as FAIR to POOR. Shoreplan (2012) reported similar findings. Due to the narrow width and relatively low elevation of the beach, it is inundated at high water levels (see Figure 6) with waves attacking the backshore. Ongoing erosion of the lakefill perimeter is evident at the shore (see Figure 10). The width of the existing walkway along the south shore is narrow and subject to flooding and wave overtopping.

East Headland

The east headland is protected with a grouted stone revetment with additional armour stone on the lower part of the slope. Baird noted significant damage to the grouted armour layer at the east headland during a site visit on April 29, 2022 (see Figure 11). Jacobs (2020) reported that several cracks were observed in the grouted stone revetment and some undercutting and loss of material was observed near the waterline (see Figure 12). Jacobs also identified that there is the possibility of additional undercutting below the waterline, which could eventually cause the revetment to collapse; however, they did not assess the damage below the waterline. Jacobs (2020) assessed the overall condition of the east headland revetment as POOR TO SERIOUS. Shoreplan (2012) also reported that the grout between the armour stones at the east headland was broken up and that there were large voids in the structure. Shoreplan concluded that the east headland was in poor condition and in need of repair. The crest elevation of the east headland is low relative to the design high water level and is subject to significant wave overtopping and flooding (see Figure 6).

North Wall

The north side of the West Island consists of a timber crib with a concrete cap that formed the original breakwater that existed prior to the construction of Ontario Place. The crib structure is now protected with an existing stone revetment that was installed around 2015 for the PanAm Games. The revetment is in good condition, but the walkway level is low and in poor condition. The crest elevation of the north wall is lower than the 100-year flood levels and the area is subject to flooding. Jacobs (2020) assessed the overall condition of the flood defence as FAIR. The width of the walkway is narrow, crowding pedestrians and cyclists; it does not provide adequate space for emergency vehicle access.

East Shore

The east shore of the West Island is protected with various structures, including steel sheet piling, timber piling, armour stone walls and rip rap revetments. The shoreline elevation is lower than the 100-year flood level and is subject to flooding at high water levels. Jacobs (2020) assessed the steel sheet piling, armour stone units wall and riprap conditions as SATISFACTORY TO FAIR. Jacobs (2020) noted that the area protected by timber piling showed signs of decay, and some damage to the anchorages; the overall condition of the timber piling flood defence was assessed by Jacobs as POOR.

Ship Breakwaters

The marina breakwater consists of three ship hulls set on a stone berm. The ship hulls have a concrete cap, and it is understood that they are filled with stone (Shoreplan, 2012). Shoreplan (2012) concluded that the design life of the ship breakwaters might be extended by maintenance and rehabilitation of the stone berm or construction of a new stone revetment along the face of the ship hulls. Jacobs (2020) reported that damage around the toe berm was not assessed and provided an overall rating of the condition as FAIR to POOR; Jacobs did not determine a residual life for the ship breakwaters.

Figure 8: Collapsed portion of stacked armour stone seawall at west shore

Figure 9: Damaged armour protection at west headland (Baird 2022-04-29)

Figure 10: Significant erosion of lakefill at south shore (Baird 2021-01-30)

Figure 11: View of deteriorated grouted revetment at east headland (Baird 2022-04-29)

Figure 12: Deterioration of grouted stone revetment at east headland (from Jacobs, 2020)

Proposed Shoreline Work at West Island

The shoreline design will rehabilitate the shoreline protection to meet present day coastal engineering design standards for erosion and flooding at 100-year storm and will include resiliency measures for climate change including an updated 100-year flood level based on recent scientific advances. The shoreline design will be in accordance with accepted coastal engineering design practice with a design life of 50 years. The proposed shoreline works at the various sections of the West Island are described in the following paragraphs.

West Shore and Beach and North Peninsula

At the west shore, the existing stacked armour stone seawall is to be replaced with a pebble beach (Figure 2, Section A, Sta. -0+075). The beach at the west shore will have a crest width of about 30 m at elevation 76.5 m and will slope down at an estimated grade of 1:6 (horizontal:vertical). The pebble beach will significantly reduce wave uprush and the risk of flooding at the backshore that presently occurs. The proposed beach is located at the west shore because it is not practical to expand the existing rubble beach at the south shore due to the deep water at the south shore.

The inner portion of the structure will be constructed with stone core material. The existing stacked armour stone at the west shore will be salvaged and reused in the armour stone protection elsewhere at the project. The proposed beach will enhance the public realm as it will be substantially larger in area than the present ad hoc rubble beach on the south shore, particularly at higher water levels. The walkway width will be increased to provide improved public space and emergency access.

At the north side of the proposed beach the expanded area, “north peninsula”, provides enhanced public realm space, including park amenities and canoe/kayak docking, and serves to “anchor” the beach protection. The north peninsula itself will be a filled structure enclosed with vertical walls around the perimeter of the south side. The pier that extends to the south will be pile-supported. One of the functions of the submerged reef at the west headland is to provide additional wave sheltering for the west beach; the submerged reef is discussed in more detail later in this memorandum.

West Headland

The existing west headland is being extended about 80 m in length to provide wave sheltering for the proposed beach protection at the west shore. At the same time, the expanded headland provides increased public space for programming.

The expanded headland will be protected with a new armour stone structure (Figure 2, Sections B and C, Sta. 0+095 and Sta. 0+200 respectively) that will provide an appropriate level of erosion and flood protection at the 100-year storm and will have a design life of 50 years. The proposed concept level design of the headland protection is a multiple layer armour stone structure with a crest elevation of about 78.0 m. A schematic of the armour layer is shown in Figure 13. The proposed concept is based on a proven design developed by Baird for the Western Beaches breakwater located just to the west of the project (Figure 14). The design included physical modelling (Figure 15) and has performed well since 2006, including during high water levels in 2017 and record high water levels in 2019. The existing armour stone at the west headland will be salvaged and reused in the new protection. Figure 16 shows an example of numerical modelling by Baird of wave overtopping of the proposed shoreline protection structure at the 100-year flood level, indicating its effectiveness.

The proposed armouring will have greater porosity than the existing structure; this will improve aquatic habitat conditions. A portion of the stone armouring for the proposed headland will incorporate stepped terracing for public access at the crest and upper slope at selected areas; an example of terraced armour stone designed by Baird at Sunnyside is shown in Figure 17).

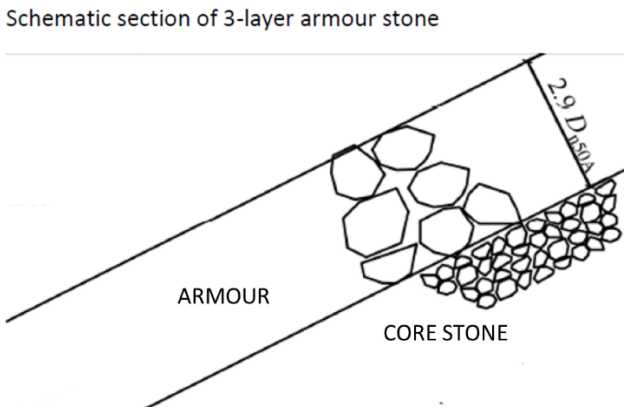


Figure 13: Schematic of multiple layer armour protection

Figure 14: Armour protection at Western Beaches breakwater (Baird)

Figure 15: Physical modelling of Western Beaches breakwater armouring (Baird)

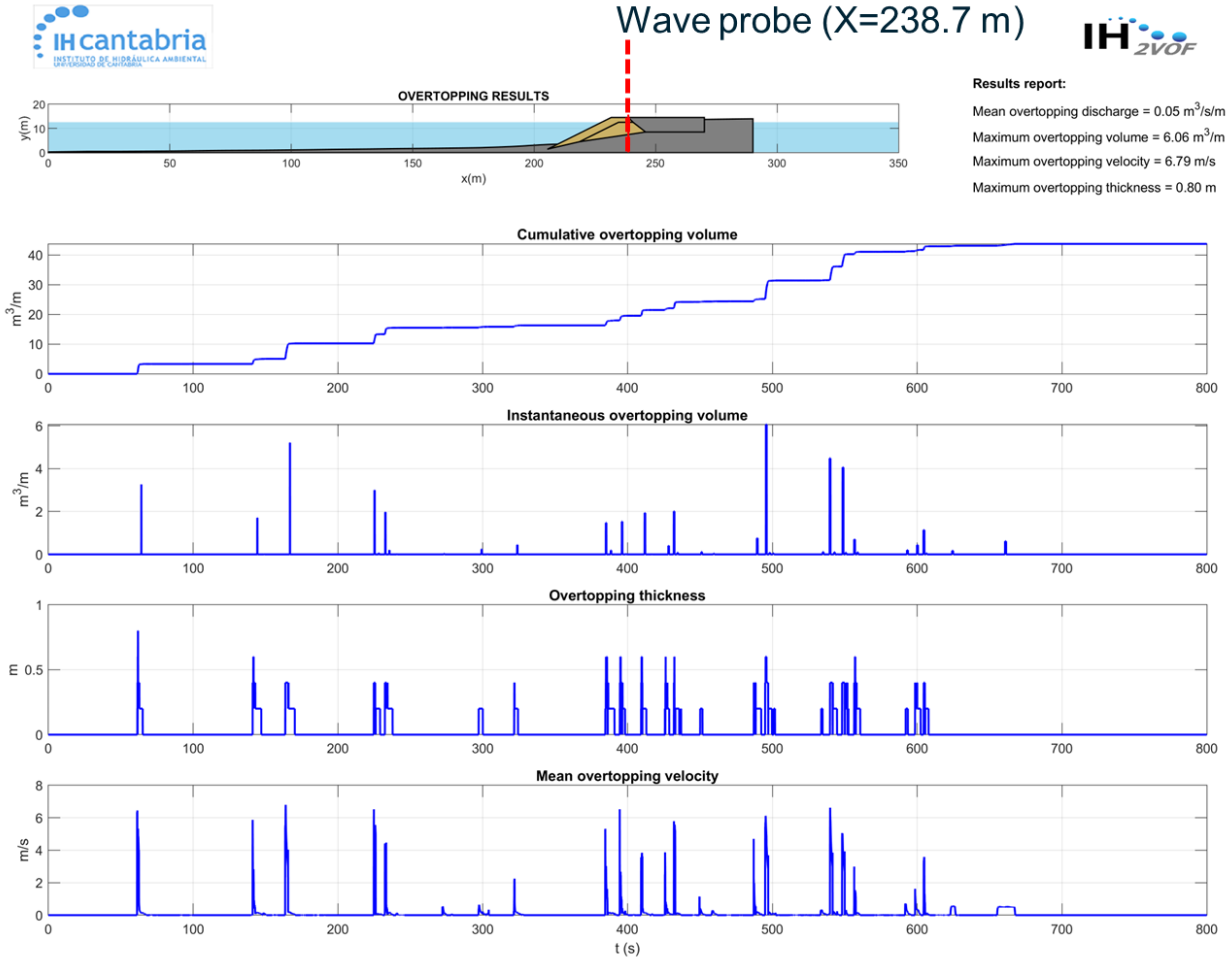


Figure 16: Example of numerical modelling of wave overtopping of proposed shoreline protection concept, West Island Ontario Place (Baird)

Figure 17: Example of terraced armour stone at Sunnyside (photo courtesy TRCA)

Submerged Reef

A submerged stone reef structure will be installed off the southwesterly end of the new expanded west headland (Section B, Figure 2, Sta. 0+095). The reef will be constructed with stone material and will serve two purposes: the first is to provide additional wave sheltering for the west beach protection; and the second is to enhance the aquatic habitat and compensate for habitat areas lost by the lakefilling above the water. Additional off-site aquatic habitat measures may be required; this will be determined through discussions with Aquatic Habitat Toronto.

South Shore

At the south shore, the ongoing erosion of the existing lakefill perimeter will be addressed by the installation of a new armour stone revetment (Figure 2, Section D, Sta. 0+325) with a crest elevation of 78.0 m. The revetment will provide a proper level of erosion and flood protection with a design life of 50 years and will replace the existing narrow beach which is submerged at the 100-year flood level. A new, larger beach is proposed for the west shore where the water depth is less than offshore of the south shore; the deep water at the south shore makes it impractical to provide a wide beach at the south shore. The public realm has been widened along the south shore to improve public accessibility and emergency vehicle access. The location of the proposed revetment allows for an additional wave overtopping protection buffer.

East Headland

The damaged east headland is being replaced with an expanded headland and a new armour stone revetment structure with a proper level of erosion and flood protection and a design life of 50 years. The armour protection will be like the proposed armour protection for the west headland. A typical section of the proposed structure is presented in Figure 2 (Section E, Sta. 0+500). The existing armour stone at the east headland will be salvaged and reused in the new protection.

The proposed armouring will have greater porosity than the existing structure; this will improve aquatic habitat conditions. A portion of the stone armouring for the proposed east headland will incorporate stepped terracing for public access. The expanded east headland will increase public realm area to provide the required programming space. The proposed expansion of the east headland will extend along the lakeside face of a portion of the westerly most breakwater (see Figure 1) and provide improved protection to the ship breakwater.

North Wall

The north wall is presently protected with an existing stone revetment that is in good condition. The walkway along the north wall is too narrow for public and emergency access and is in poor condition. While the area is sheltered from wave action, the crest elevation of the north wall and shoreline is still subject to flooding at high water levels. The public realm walkway will be expanded at the north wall to provide a safe width for emergency vehicle access and the top elevation will be increased to protect against flooding. To accommodate the increased width and elevation of the public walkway and access along the north wall, a retaining wall structure and some lakefill will be required.

At the north side of the north peninsula a floating walkway will run parallel to the existing breakwater wall; floating canoe/kayak finger docks will extend perpendicular to floating walkway. The pier that extends to the north of the north peninsula at the west end of the site will extend out over the existing shore and will be pile-supported.

East Shore

The existing hard-edge treatment of the east shore (e.g., steel sheet piling, timber piling, armour stone walls and rip rap revetments) will be replaced with a naturalized, green wetland edge that will enhance the aquatic habitat. The shoreline level will raised provide greater flood protection for the backshore areas. The design of the wetland area is ongoing in consultation with stakeholders (e.g., Aquatic Habitat Toronto).

Aquatic Habitat Restoration Techniques

Aquatic habitat restoration and enhancement techniques are being proposed at the West Island. The habitat planning is underway, and details are not yet developed. Measures being considered include various techniques presented in the Toronto Waterfront Aquatic Habitat Restoration Strategy (TWARS):

- surcharged open coast revetment (Figure 18) along the outer shoreline
- underwater reefs (Figure 19) under the footprint of the pile supported pier
- modified growth of submerged aquatic vegetation (Figure 20) along the north wall
- vegetation zones (Figure 21) at the east shore wetland.

Habitat measures will be located within the land transfer and right-to-access for maintenance boundaries.

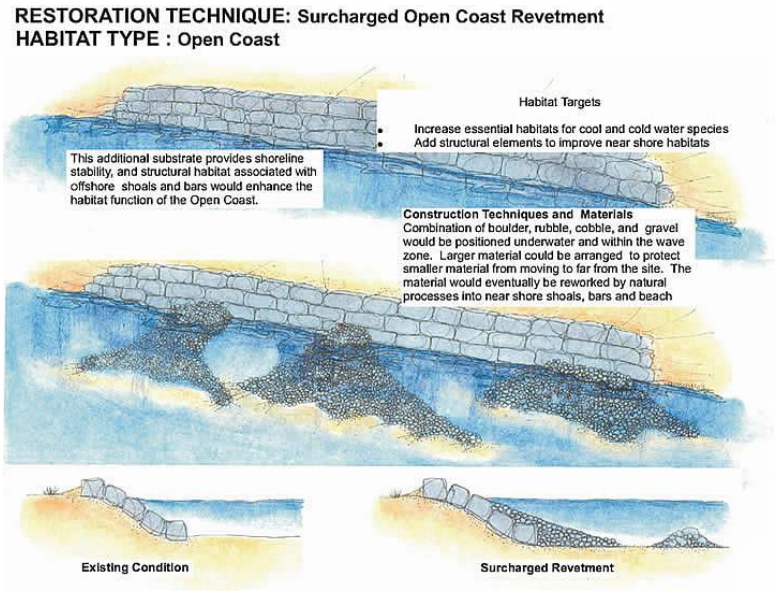


Figure 18: Surcharged open coast revetment (TWARS)

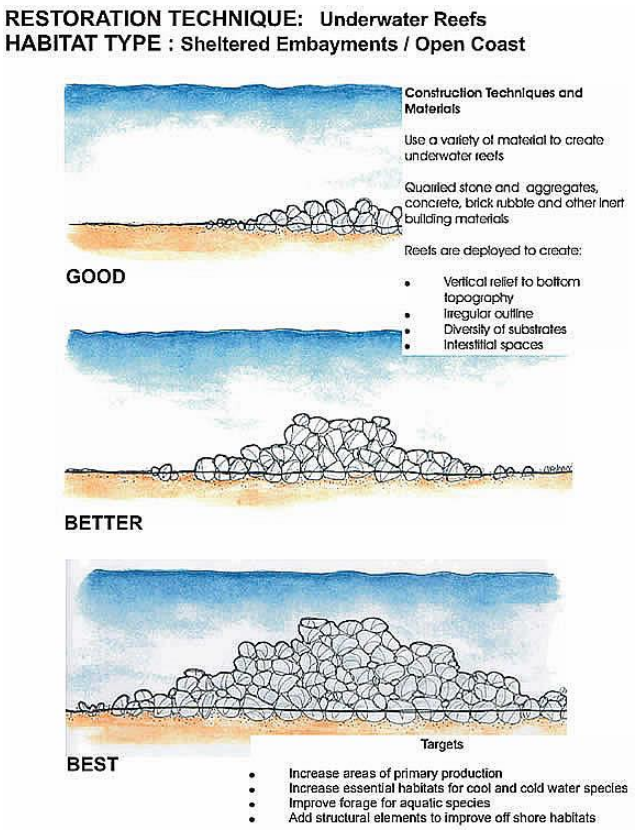


Figure 19: Underwater reefs (TWARS)

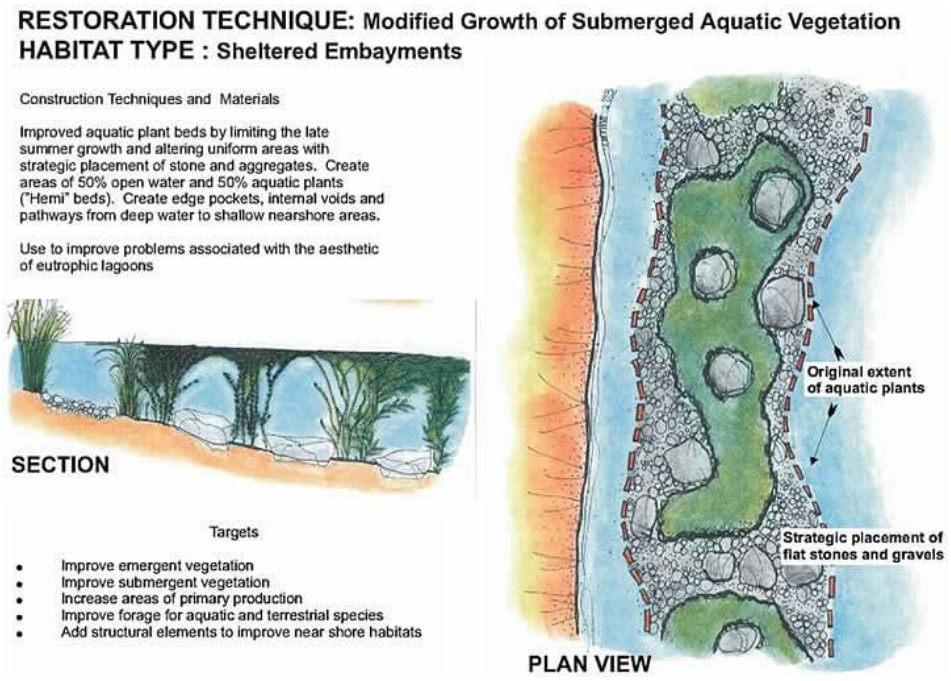


Figure 20: Modified growth of submerged aquatic vegetation (TWARS)

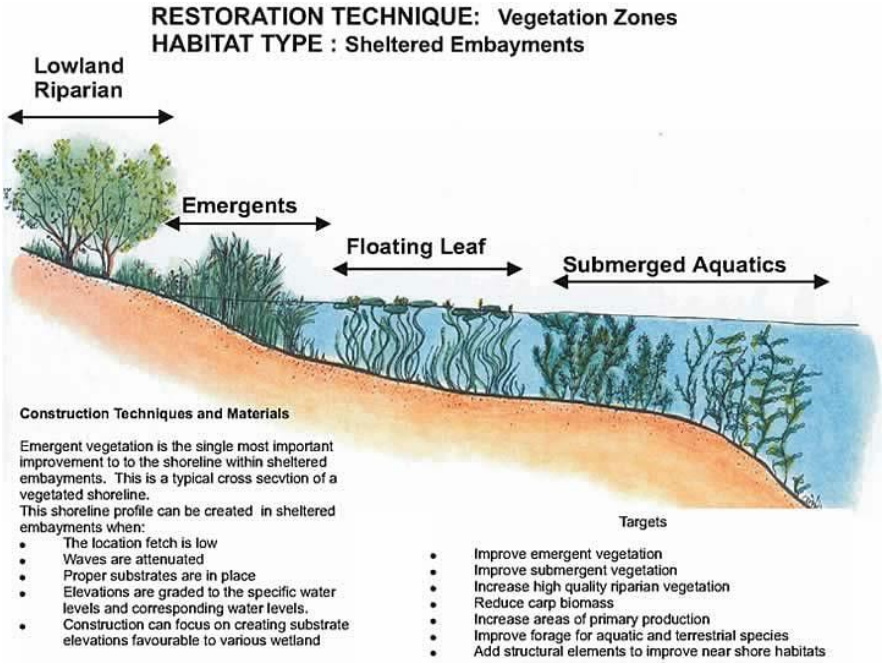


Figure 21: Vegetation zones (TWARS)

APPENDIX I: Pathway of Effects

Table 1: Aquatics Effects Assessment Summary Table – Therme Development

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Potential Death of Fish or HADD (Y/N)
Lake Ontario	**Vegetation Clearing**	Alteration of riparian vegetation Bank stability and exposed soils Change in external nutrient/energy inputs	Minimize vegetation removal where possible and proper clearing and grubbing techniques shall be utilized. All retained vegetation will be delineated and protected. Top soil and seed/sod disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur per **OPSS 802** and **OPSS 803** Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Clearing shall be completed in accordance with the specifications outlined in **OPSS 201** Clearing of native vegetation will be limited to primarily grasses/forbs and shrubs. Preserve mature woody vegetation along stream banks in order to maintain shading, bank stability and external nutrient inputs, where possible. Incorporate riparian plantings.	No residual effects anticipated	NO
	Grading	Change in slope Change in land drainage patterns Bank stability and exposed soils	Heavy machinery access will be limited to pre-defined areas within the site and along the banks of Lake Ontario. The waterbody will not be treated as machinery staging at any time. Banks disturbed by construction, access and/or staging will be re-established to increase bank stability and make less susceptible to erosion. Re-instate and re-stabilize banks of waterbody disturbed during construction to pre-construction or better condition. Grading operations must be completed as per **OPSS 206.** Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Top soil will be replaced after grading operations as per **OPSS 802**.	No residual effects anticipated	NO

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Death of Fish or HADD (Y/N)
	Excavation	Removal of topsoil Change in slope and drainage Bank stability and exposed soils	Work will be carried out within the anticipated in-water timing window between July 16 to March 14 (to be confirmed with MNRF and TRCA) when water levels are depressed and outside of critical fish spawning and rearing times. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** All in-water excavation work which is anticipated to have potential to result in increased turbidities will be addressed with appropriate mitigation measures designed through consultation with DFO and TRCA. Any work area dewatering will be directed to a flat vegetated area at least 30 m from the receiving waterbody or ditch line and outlet into a filter bag (also 30 m from surface water features) to allow sediments to settle out before re-entering the waterbody. Re-instate and re-stabilize banks of waterbody disturbed during construction to pre-construction or better condition. Excavation will be completed in accordance with **OPSS 902**	No residual effects anticipated	NO
	Riparian Planting	Change in vegetation species composition Bank stability and exposed soils	Minimize vegetation removal where possible and proper clearing and grubbing techniques will be utilized. All retained vegetation will be delineated and protected. Top soil and seed/sod disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Design and implement vegetation rehabilitation plan following construction to re-plant riparian vegetation to pre-construction or better condition.	No residual effects anticipated	NO

	Use of Industrial Equipment	Oil, grease and fluid leaks from equipment Bank stability and exposed soils Resuspension and entrainment of sediment	Ensure machinery is not leaking fuels or lubricants on a daily basis. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Operation of equipment in waterbodies or on waterbody banks shall be carried out according to **OPSS 182** Ensure machinery is stored/fuelled 30 m away from the watercourse Have spill kits onsite and drip pans under all non-mobile machinery.	No residual effects anticipated	NO
	Placement of material and structure in water	Change in habitat structure and cover Change in aquatic macrophytes (vegetation) Change in food supply	Installation and removal of turbidity curtain as per **OPSS 805,** where necessary**.** All in-water works or work on channel banks are anticipated to be permitted between July 16 to March 14 (to be confirmed through consultation with MNRF or TRCA).	Works consisting of lake infill and/or occupation of the lake bed. Permanent destruction of fish habitat as a result of 44,815 m2 of lake infilling. Permanent alteration of 55,805 m2 of fish habitat as a result of alteration including restorative fish habitat enhancements and installation of the swimming pier and installation and widening of bridges on West and East Island.	YES

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Death of Fish or HADD (Y/N)
	Organic Debris Management	Removal of organic material Bank stability and exposed soils	Regular inspection, removal, and disposal of waste materials and sediment. No stockpiles of material within 30 m of a watercourse. Restore waterbody banks to pre-existing or better condition and seed/sod to establish vegetative cover per **OPSS 803**.	No residual effects anticipated	NO
	Addition or Removal of Aquatic Vegetation	Change in nutrient inputs Change in habitat cover and structure Re-suspension and entrainment of sediment	Minimize the removal of aquatic vegetation where possible to retain adequate cover and habitat for food sources (i.e. invertebrates) that are important to the YOY/juvenile life stages of fish. Where increased turbidities are anticipated, incorporate appropriate mitigation measures identified through consultation with DFO or TRCA.	No residual effects anticipated	NO
	Wastewater Management	Input of contaminants Nutrient loading	Ensure that work does not occur during rain events to avoid the input of contaminated run-off from entering the waterbody. Use of properly installed temporary erosion and sediment controls per **OPSS 805** to prevent contaminated/sediment laden run-off water from entering the waterbody. Run-off water that has entered the work area must be extracted and filtered through a sediment filtering system (i.e. sediment bag or trap etc.) that is located >30m from the watercourse on a flat vegetated area.	No residual effects anticipated	NO
	Structure Removal	Change in substrate composition Re-suspension and entrainment of sediment Change in habitat and cover	Design and implement a plan to prevent entry of potentially deleterious materials to the waterbody. All work will be completed to respect the anticipated in-water timing window of works permitted between July 16 and March 14 (to be confirmed with MNRF or TRCA). Design and implement erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805**	No residual effects anticipated	NO

Table 1: Aquatics Effects Assessment Summary Table – Public Realm Development

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Potential Death of Fish or HADD (Y/N)
Lake Ontario	**Vegetation Clearing**	Alteration of riparian vegetation Bank stability and exposed soils Change in external nutrient/energy inputs	Minimize vegetation removal where possible and proper clearing and grubbing techniques shall be utilized. All retained vegetation will be delineated and protected. Top soil and seed/sod disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur per **OPSS 802** and **OPSS 803** Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Clearing shall be completed in accordance with the specifications outlined in **OPSS 201** Clearing of native vegetation will be limited to primarily grasses/forbs and shrubs. Preserve mature woody vegetation along stream banks in order to maintain shading, bank stability and external nutrient inputs, where possible. Incorporate riparian plantings.	No residual effects anticipated	NO
	Grading	Change in slope Change in land drainage patterns Bank stability and exposed soils	Heavy machinery access will be limited to pre-defined areas within the site and along the banks of Lake Ontario. The waterbody will not be treated as machinery staging at any time. Banks disturbed by construction, access and/or staging will be re-established to increase bank stability and make less susceptible to erosion. Re-instate and re-stabilize banks of waterbody disturbed during construction to pre-construction or better condition. Grading operations must be completed as per **OPSS 206.** Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Top soil will be replaced after grading operations as per **OPSS 802**.	No residual effects anticipated	NO

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Death of Fish or HADD (Y/N)
	Excavation	Removal of topsoil Change in slope and drainage Bank stability and exposed soils	Work will be carried out within the in-water timing window between July 16 to March 14 when water levels are depressed and outside of critical fish spawning and rearing times. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** All in-water work which is anticipated to have potential to result in increased turbidities will be addressed with appropriate mitigation measures designed through consultation with DFO and TRCA. Any work area dewatering will be directed to a flat vegetated area at least 30 m from the receiving waterbody or ditch line and outlet into a filter bag (also 30 m from surface water features) to allow sediments to settle out before re-entering the waterbody. Re-instate and re-stabilize banks of waterbody disturbed during construction to pre-construction or better condition. Excavation will be completed in accordance with **OPSS 902**	No residual effects anticipated	NO
	Riparian Planting	Change in vegetation species composition Bank stability and exposed soils	Minimize vegetation removal where possible and proper clearing and grubbing techniques will be utilized. All retained vegetation will be delineated and protected. Top soil and seed/sod disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Design and implement vegetation rehabilitation plan following construction to re-plant riparian vegetation to pre-construction or better condition.	No residual effects anticipated	NO
	Use of Industrial Equipment	Oil, grease and fluid leaks from equipment Bank stability and exposed soils Resuspension and entrainment of sediment	Ensure machinery is not leaking fuels or lubricants on a daily basis. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Operation of equipment in waterbodies or on waterbody banks shall be carried out according to **OPSS 182** Ensure machinery is stored/fuelled 30 m away from the watercourse Have spill kits onsite and drip pans under all non-mobile machinery.	No residual effects anticipated	NO

	Placement of material and structure in water	Change in habitat structure and cover Change in aquatic macrophytes (vegetation) Change in food supply	Installation and removal of turbidity curtain as per **OPSS 805,** as necessary. All work will be completed with respect to the anticipated in-water timing window of works permitted between July 16 and March 14 (to be confirmed with MNRF or TRCA.	Preliminary design indicates works are consisting of shoreline modification within existing footprint and mitigations can avoid residual impacts to fisheries. Should lake infill and/or occupation of the lake bed beyond the existing foot print be designed, further fisheries review is required.	NO

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Death of Fish or HADD (Y/N)
	Organic Debris Management	Removal of organic material Bank stability and exposed soils	Regular inspection, removal, and disposal of waste materials and sediment. No stockpiles of material within 30 m of a watercourse. Restore waterbody banks to pre-existing or better condition and seed/sod to establish vegetative cover per **OPSS 803**.	No residual effects anticipated	NO
	Addition or Removal of Aquatic Vegetation	Change in nutrient inputs Change in habitat cover and structure Re-suspension and entrainment of sediment	Minimize the removal of aquatic vegetation where possible to retain adequate cover and habitat for food sources (i.e. invertebrates) that are important to the YOY/juvenile life stages of fish. All in-water work which is anticipated to have potential to result in increased turbidities will be addressed with appropriate mitigation measures designed through consultation with DFO and TRCA.	No residual effects anticipated	NO
	Wastewater Management	Input of contaminants Nutrient loading	Ensure that work does not occur during rain events to avoid the input of contaminated run-off from entering the waterbody. Use of properly installed temporary erosion and sediment controls per **OPSS 805** to prevent contaminated/sediment laden run-off water from entering the waterbody. Run-off water that has entered the work area must be extracted and filtered through a sediment filtering system (i.e. sediment bag or trap etc.) that is located >30m from the watercourse on a flat vegetated area.	No residual effects anticipated	NO
	Structure Removal	Change in substrate composition Re-suspension and entrainment of sediment Change in habitat and cover	Design and implement a plan for all in-water work and prevent entry of potentially deleterious materials to the waterbody. All work will be completed to respect the anticipated in-water timing window of works permitted between July 16 and March 14 (to be confirmed through consultation with MNRF or TRCA). Design and implement erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805**	Permanent creation of 755 m2 of fish habitat as a result of removal of the existing fill located at the eastern extent of the development.	NO

Table 1: Aquatics Effects Assessment Summary Table – Live Nation Development

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Potential Death of Fish or HADD (Y/N)
Lake Ontario	**Vegetation Clearing**	Alteration of riparian vegetation Bank stability and exposed soils Change in external nutrient/energy inputs	Minimize vegetation removal where possible and proper clearing and grubbing techniques shall be utilized. All retained vegetation will be delineated and protected. Top soil and seed/sod disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur per **OPSS 802** and **OPSS 803** Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Clearing shall be completed in accordance with the specifications outlined in **OPSS 201** Clearing of native vegetation will be limited to primarily grasses/forbs and shrubs. Preserve mature woody vegetation along stream banks in order to maintain shading, bank stability and external nutrient inputs, where possible. Incorporate riparian plantings.	No residual effects anticipated	NO
	Grading	Change in slope Change in land drainage patterns Bank stability and exposed soils	Heavy machinery access will be limited to pre-defined areas within the site and along the banks of Lake Ontario. The waterbody will not be treated as machinery staging at any time. Banks disturbed by construction, access and/or staging will be re-established to increase bank stability and make less susceptible to erosion. Re-instate and re-stabilize banks of waterbody disturbed during construction to pre-construction or better condition. Grading operations must be completed as per **OPSS 206.** Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Top soil will be replaced after grading operations as per **OPSS 802**.	No residual effects anticipated	NO

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Death of Fish or HADD (Y/N)
	Excavation	Removal of topsoil Change in slope and drainage Bank stability and exposed soils	Work will be carried out within the anticipated in-water timing window between July 16 to March 14 (to be confirmed with MNRF or TRCA) when water levels are depressed and outside of critical fish spawning and rearing times. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** All in-water work which is anticipated to have potential to result in increased turbidities will be addressed with appropriate mitigation measures designed through consultation with DFO and TRCA. Any work area dewatering will be directed to a flat vegetated area at least 30 m from the receiving waterbody or ditch line and outlet into a filter bag (also 30 m from surface water features) to allow sediments to settle out before re-entering the waterbody. Re-instate and re-stabilize banks of waterbody disturbed during construction to pre-construction or better condition. Excavation will be completed in accordance with **OPSS 902**	No residual effects anticipated	NO
	Riparian Planting	Change in vegetation species composition Bank stability and exposed soils	Minimize vegetation removal where possible and proper clearing and grubbing techniques will be utilized. All retained vegetation will be delineated and protected. Top soil and seed/sod disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding can occur. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Design and implement vegetation rehabilitation plan following construction to re-plant riparian vegetation to pre-construction or better condition.	No residual effects anticipated	NO
	Use of Industrial Equipment	Oil, grease and fluid leaks from equipment Bank stability and exposed soils Resuspension and entrainment of sediment	Ensure machinery is not leaking fuels or lubricants on a daily basis. Design and implement temporary erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805** Operation of equipment in waterbodies or on waterbody banks shall be carried out according to **OPSS 182** Ensure machinery is stored/fuelled 30 m away from the watercourse Have spill kits onsite and drip pans under all non-mobile machinery.	No residual effects anticipated	NO

	Placement of material and structure in water	Change in habitat structure and cover Change in aquatic macrophytes (vegetation) Change in food supply	Installation and removal of turbidity curtain as per **OPSS 805,** as necessary. All work will respect the anticipated in-water timing window of works permitted between July 16 and March 14 (to be confirmed by MNRF or TRCA).	Preliminary design indicates works are consisting of creation of a Lakefront Event Pier and associated Terrace. Lake infill and/or occupation of the lake bed beyond the existing foot print results in the permanent destruction of 8,815 m2 of fish habitat. New Pedestrian and Service Bridges are proposed and result in permanent alteration of 1,209 m2 of fish habitat. Further fisheries assessment is required as design details for the Lakefront Event Pier and associated Terrace as well as pedestrian and service bridges are confirmed.	YES

Waterbody	Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measures	Residual Effects	Death of Fish or HADD (Y/N)
	Organic Debris Management	Removal of organic material Bank stability and exposed soils	Regular inspection, removal, and disposal of waste materials and sediment. No stockpiles of material within 30 m of a watercourse. Restore waterbody banks to pre-existing or better condition and seed/sod to establish vegetative cover per **OPSS 803**.	No residual effects anticipated	NO
	Addition or Removal of Aquatic Vegetation	Change in nutrient inputs Change in habitat cover and structure Re-suspension and entrainment of sediment	Minimize the removal of aquatic vegetation where possible to retain adequate cover and habitat for food sources (i.e. invertebrates) that are important to the YOY/juvenile life stages of fish. Isolate the waterbody from the work area and conduct all work in the dry or in turbidity curtain isolation per **OPSS 805**.	No residual effects anticipated	NO
	Wastewater Management	Input of contaminants Nutrient loading	Ensure that work does not occur during excessive waves to avoid the input of contaminated run-off from entering the waterbody. Use of properly installed temporary erosion and sediment controls per **OPSS 805** to prevent contaminated/sediment laden run-off water from entering the waterbody. Run-off water that has entered the work area must be extracted and filtered through a sediment filtering system (i.e. sediment bag or trap etc.) that is located >30m from the	No residual effects anticipated	NO
	Structure Removal	Change in substrate composition Re-suspension and entrainment of sediment Change in habitat and cover	Design and implement a plan to prevent entry of potentially deleterious materials to the waterbody. All work will respect the anticipated in-water timing window of works permitted between July 16 and March 14 (to be confirmed by MNRF or TRCA). Design and implement erosion and sediment controls to contain the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbody using details outlined in **OPSS 805**	No residual effects anticipated	NO

APPENDIX J: Proposed Plant Species, per Planting Area, within Therme Public Landscape

Oak Point

Common Name	Scientific Name
Red Oak	Quercus rubra
White Oak	Quercus alba
Bur Oak	Quercus macrocarpa
Chinkapin Oak	Quercus muehlenbergii
Shumard Oak	Quercus shumardii
Eastern Redbud	Cercis Canadensis
Sassafras	Sassafras albidum
Blue Beech	Carpinus caroliniana
Flowering Dogwood	Cornus florida
White Pine	Pinus strobus
Jack Pine	Pinus banksiana
Balsam Fir	Abies balsamea
Red Pine	Pinus Resinosa
Red Osier Dogwood	Cornus Sericea
Nannyberry	Viburnum lentago
Highbush Cranberry	Viburnum opulus
Bunchberry	Cornus canadensis
Red Elderberry	Sambucus racemosa
Big Bluestem	Andropogon gerardii
Sand Dropseed	Sporobolus cryptandrus
Little Bluestem	Schizachyrium scoparium
Wild Geranium	Geranium maculatum
Canadian Goldenrod	Soldiago canadensis
Northern Bush-honeysuckle	Diervilla lonicera

Ontario Trail

Common Name	Scientific Name
White Oak	Quercus alba
Bur Oak	Quercus macrocarpa
Eastern Redbud	Cercis canadensis
Sienna Glen Maple	Acer x freemanii 'Sienna'
Canadian Hawthorn	Crataegus canadensis
Flowering Dogwood	Cornus florida
American Beech	Fagus grandifolia
Tamarack	Larix laricina
Emerald City Tulip Tree	Liriodendron tulipifera 'Emerald City'
Smooth Sumac	Rhus glabra
Eastern Hemlock	Tsuga canadensis
Red Osier Dogwood	Cornus Sericea
Big Bluestem	Andropogon gerardii
Little Bluestem	Schizachyrium scoparium
Wild Geranium	Geranium maculatum
Meadow Rose	Rosa blanda
Meadosweet	Spiraea alba
Palm Sedge Grass	Carex muskingumensis

Sugar Bush

Common Name	Scientific Name
Sugar Maple	Acer saccharum
Fall Fiesta Sugar Maple	Acer saccharum 'Bailsta'
Legacy Sugar Maple	Acer saccharum 'Legacy'
Red Osier Dogwood	Cornus Sericea
Bunchberry	Cornus canadensis
Red Elderberry	Sambucus racemosa
Little Bluestem	Schizachyrium scoparium
Northern Bush-honeysuckle	Diervilla lonicera
Wild Geranium	Geranium maculatum
Meadosweet	Spiraea alba
Appalachian Sedge	Carex appalachica
Fragrant Sumac	Rhus aromatica

The Gateway

Common Name	Scientific Name
Endowment Sugar Maple	Acer saccharum 'Endowment'
Flowering Dogwood	Cornus florida
Autumn Treasure American Hophornbeam	Ostrya virginiana
Trembling Aspen	Populus tremuloides
Red Oak	Quercus rubra
Red Osier Dogwood	Cornus Sericea
Little Bluestem	Schizachyrium scoparium
Northern Bush-honeysuckle	Diervilla lonicera
Bayberry	Myrica pensylvanica
Fragrant Sumac	Rhus aromatica
Meadow Rose	Rosa blanda
Marmo Freeman Maple	Acer x freemanii 'Marmo'
Sienna Glen Maple	Acer x freemanii "Sienna"

Maple Promenade

Common Name	Scientific Name
Endowment Sugar Maple	Acer saccharum 'Endowment'
Firefall Maple	Acer x freemanii 'Firefall'
Marmo Freeman Maple	Acer x freemanii 'Marmo'
Sienna Glen Maple	Acer x freemanii 'Sienna'
Canadian Serviceberry	Amelanchier canadensis
Serviceberry spp.	Amelanchier spp.
Eastern Redbud	Cercis canadensis
American Beech	Fagus grandifolia
Jack Pine	Pinus banksiana
White Pine	Pinus strobus
Sassafras	Sassafras albidum
Red Osier Dogwood	Cornus Sericea
Little Bluestem	Schizachyrium scoparium
Wild Geranium	Geranium maculatum
Northern Bush-honeysuckle	Diervilla lonicera
American Beach Grass	Ammophila breviligulata
Side Oats Grama	Bouteloua curtipendula
Appalachian Sedge	Carex appalachica
Bayberry	Myrica pensylvanica
Fragrant Sumac	Rhus aromatica

Wetland Innovation Zone

Common Name	Scientific Name
Pawpaw	Asimina triloba
Renci' Renaissance Reflection Pape	Betula papyrifera
Flowering Dogwood	Cornus florida
Northern Splendor' Northern Sple	Nyssa sylvatica
White Oak	Quercus alba
Eastern Hemlock	Tsuga canadensis
Foxglove species	Agalinis sp.
Silver Maple	Acer saccharinum
Short-awned Foxtail	Alopecurus aequalis
Beggar-ticks species	Bidens sp.
Grass species	Calamagrostis sp.
Marsh Marigold	Caltha palustris
Lady's Slipper species	Cypripedium sp.
Boneset species	Eupatorium sp.
Spotted Touch-me-not	Impatiens capensis
Mint species	Mentha sp.
Monkey-flower species	Mimulus sp.
Willow species	Salix sp.
Aster species	Symphyotrichum sp.
Speedwell species	Veronica sp.
Sweetflag	Acorus americanus
Plantain species	Alisma sp.
Water Arum	Calla palus
Sedge species	Carex sp.
Sedge species	Cyperus sp.
Spike-rush species	Eleocharis sp.
Horsetail species	Equisetum sp.
Iris species	Iris sp.
Water-horehound species	Lycopus sp.
Pickerel-weed	Pontederia cordata
Arrowhead species	Sagittaria sp.
Bulrush species	Schoenoplectus sp.
Bulrush species	Scirpus sp.
Bur-reed species	Sparganium sp.
Bladder-wort species	Utricularia sp.
Cattail species	Typha sp.
Rush species	Juncus sp.
Milfoil species	Myriophyllum sp.
Smartweed species	Persicaria amphibia
Bulrush species	Schoenoplectus sp.
Wild rice species	Zizania sp.
Coontail species	Ceratophyllum sp.
Water Star-grass	Heteranthera dubia
Quillwort species	Isoetes sp.
Water-shield	Brasenia schreberi
Duckweed species	Lemna sp.
Pond-lily species	Nuphar sp.
Floating-heart	Nymphoides cordata
Pondweed species	Potamogeton sp.
Great Duckweed	Spirodela polyrhiza

Elm Restoration Area

Common Name	Scientific Name
Unknown; presumed Elm spp.	Unknown; presumed *Ulmus spp* .