

#### Appendix A - City-Province Engagement

The Province of Ontario and Infrastructure Ontario initiated project-specific engagement with the City of Toronto in 2020 to advance the planning and design of Ontario Place. A Terms of Reference (TOR) agreement was executed in 2021, acknowledging mutual interest in collaboration on the redevelopment of the City's waterfront, with focus on the Province's redevelopment of Ontario Place and the City's master planning process for Exhibition Place.

A City-Province Agreement was formalized and executed between the two parties in 2022, which outlined, among other items, roles, responsibilities and commitments in the interest of advancing the Ontario Place redevelopment project along key priority areas: planning, permitting and approvals, specifically development approvals; site-wide servicing renewal, the transfer of City-owned lands at Ontario Place to the Province; and, the development of a parking solution for Ontario Place to address an increase in parking demand.

Pursuant to this agreement, the Province is also participating in a development application approval process for site-wide Official Plan and Zoning By-Law amendments to facilitate the redevelopment, inclusive of tenant (Therme and Live Nation) proposals. City of Toronto Municipal Staff, including review departments and agencies, have been engaged since April 2022 on the site-wide application. A full development application submission, with all required plans, drawings and technical support materials, was made to the City on November 25, 2022 and a resubmission was made on September 13, 2023. Formal comments on the initial (Nov. 25) submission were received May 11, 2023. Details on this process can be found on the City's public development application page: <a href="https://www.toronto.ca/city-government/planning-development/waterfront/current-projects/ontario-place-redevelopment/">https://www.toronto.ca/city-government/planning-development/waterfront/current-projects/ontario-place-redevelopment/</a>

At staff-level, technical working groups were conducted both in the pre-submission and post-submission periods to obtain feedback and inform project development. Information and material have been shared both ways through this process.

In response to collective feedback, the Province has worked with the tenants on a number of changes to the plan, reflected in resubmission materials made available in September 2023. These include:

- Improve the legibility of Ontario Place as a public asset supported by programming provided by the private-sector;
- Create additional free public spaces and add more green roofs and landscaping;
- Reduce the scale and height of the Therme Facility;
- Shift towards more sustainable modes of transportation by increasing the number of bike
  parking spaces, reducing the number of vehicle parking spaces and providing more details on
  transit connections to the site; and,
- Create additional waterfront programming and food and beverage stations around the site.



# Appendix B – TRCA Consultation Activities Record

Group Name	Date	Method	Summary	
Project Team	April 1, 2022	Email	Request for confirmation of participation in the technical review and feedback process.	
			Attachment: Notice of Commencement.	
TRCA	April 5, 2022	Email	Confirmation that TRCA has an interest in the Project. Sharon Lingertat will be the main point of contact and provided a list of additional TRCA staff that may be involved with the Project.	
TRCA	April 8, 2022	Email	Response to Notice of Commencement.	
Project Team	June 14, 2022	Meeting (virtual)	Held meeting with the TRCA. Presented an overview of the Project and anticipated schedule. Reviewed the proposed schedule for meeting with the TRCA and discussed anticipated TRCA engagement tasks and deliverables.	
Project Team	July 19, 2022	Meeting (virtual)	Meeting held with the TRCA. Presented the overall design approach/vision/narrative, the focus zones and developing design concepts. An overview of the draft evaluation criteria was shared.	
TRCA	August 5, 2022	Email	TRCA providing TRCA's comments on the preliminary public realm design concepts, the Shoreplan Coastal Hazard Assessment Memo, and preliminary evaluation criteria.	
Project Team	August 17, 2022	Meeting (virtual)		
Project Team	September 19, 2022	Meeting (virtual)	Meeting held with the TRCA. Shoreplan presented an overview of the Existing Shoreline Conditions Report.	
Project team	November 30, 2022	Meeting (virtual)	Meeting held with the TRCA. Presented new design considerations for the north shore, Brigantine Cove, East Bridge and the South Shore.	
TRCA	December 1, 2022	Meeting (virtual)	Meeting held with Aquatic Habitat Toronto (AHT), including TRCA, and the Project Team. Presentation was given by the Project Team to provide an overview of the south shore, north shore, and cove design concepts (constraints and opportunities and design intent).	
Project Team	January 31, 2023	Meeting (virtual)	Meeting held with the TRCA. Presented a summary of the evaluation of design concepts for each zone.	
Project Team	February 3, 2023	Email	Providing the TRCA with meeting minutes and presentation materials from January 31st meeting and the design concept evaluation matrices for comment.	
Project Team	February 15, 2023	Email	Providing the TRCA with the updated evaluation matrix for Brigantine Cove for comment.	
TRCA	March 20, 2023	Email	Providing the TRCA's comments on the evaluation matrices.	



Group Name	Date	Method	Summary	
Project Team	March 29, 2023	Meeting (virtual)	Meeting held with the TRCA to provide an update on the evaluation and recommended design and to discuss TRCA's comments.	
Aquatic Habitat Toronto	April 6, 2023	Meeting (virtual)	Meeting held with Aquatic Habitat Toronto, TRCA and the Project Team. Presentation was given by the Project Team on the rock berm design.	
Project Team	April 17, 2023	Email	Confirming with Sharon Lingertat that no new items need to be discussed this month for the Project and that the meeting can be cancelled.	
Project Team	May 1, 2023	Email	Response to the TRCA's March 20th comments provided to the TRCA.	
Project Team	July 4, 2023	Email	Providing TRCA with the Notice of Completion and a link to the Draft ESR.	
TRCA	August 31, 2023	Email	TRCA providing a letter with their comments on the Draft ESR.	
Project Team	September 27, 2023	Email	Project Team providing the TRCA with responses to their comments on the Draft ESR.	



# Appendix C – Potential Environmental Impacts, Mitigation Measures and Net Effects (from the Category C Draft ESR)

Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
Physical Environment	Design (landscape design) and construction (grading, landscaping) activities will change the physical environment.	Project footprint	<ul> <li>Implement recommendations from the Ontario Place Existing Shoreline Conditions Report (Shoreplan 2022).</li> <li>Implement recommendations and mitigation measures from the Arborist Report (MH 2023b).</li> <li>Ensure grades across the Project footprint meet or exceed the 100year flood requirements.</li> </ul>	Redevelopment activities will have a positive effect on the physical environment within the Project footprint through improved grading and landscaping.
Environmentally Significant Areas	Construction and operational activities may impact the highly vulnerable aquifer.	Local study area to Regional study area	<ul> <li>Construction</li> <li>Establish soil stockpiles outside of the buffer area for the Ontario Endangered Species Act, where practical.</li> <li>Prohibit entry and equipment storage in environmentally sensitive areas (highly vulnerable aquifer).</li> <li>Operation</li> <li>Limit the use of commercial fertilizer applied to land that may result in a release to groundwater or surface water.</li> <li>Limit pesticide applied to land that may result in a release to groundwater or surface water.</li> <li>Limit the applicable of road salt on roads or parking lots within the Project footprint.</li> <li>Store snow at or above grade.</li> </ul>	The potential net effects for spills (accidents) are in Section 5.4.7.
Soil	Construction activities (excavation) may uncover historical contamination.	Project footprint	<ul> <li>Ensure locations of known contamination (Jacobs 2022) are provided to contractors prior to the initiation of construction activities.</li> <li>Manage contaminated soil by constructing a physical barrier (either fill or hard cap) in areas where impacted soil is being managed in place. It is recommended that fill and hard caps be inspected and maintained to ensure integrity of the barriers.</li> <li>Implement measures from the Soil and Groundwater Management Plan to reduce the risk of contact with potentially contaminated subsurface soils.</li> <li>Implement dust control measures and the prevention of soil tracking by vehicles and personnel from the Project footprint, including wetting soil with water, truck tarping, enforcing reduced speeds for vehicles, providing tire washing stations, and restricting work under high-wind conditions.</li> <li>Manage excavated materials and implement runoff control to minimize contact.</li> <li>Excavated soils requiring offsite disposal will be disposed of per the provisions of O. Reg. 347 and amendments.</li> <li>Imported soil will conform with soil quality standards stipulated in O. Reg. 406/19.</li> <li>Remediate contaminated property as necessary</li> <li>Carry out remediation of soil and/or groundwater contamination in accordance with O. Reg. 153/04 and updates and under the supervisor of a Qualified Person.</li> <li>Ensure good property and materials management practices to minimize negative impacts to the environment.</li> <li>Implement effective soil management and erosion and sediment (ESC) control strategies.</li> <li>Refer to the TRCA's Erosion and Sediment Control Guide for Urban Construction (2019) when developing ESC strategies.</li> <li>Refer to the TRCA's Preserving and Restoring Healthy Soil: Best Practices for Urban Construction growth and survival of planted species providing long term soil stabilization.</li> </ul>	No net effect identified.
Soil	Soil erosion during construction may occur following vegetation or pavement clearing.	Project footprint	<ul> <li>Limit heavy equipment use and storage to the Project footprint and to hard surfaces (asphalt, concrete) where possible.</li> <li>Install silt fencing and other erosion control mechanisms before beginning construction work and maintain it in place until groundcover is re-established or runoff prevention has been installed.</li> <li>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.</li> <li>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. Refer to TRCA's Erosion and Sediment Control Guide for Urban Construction (2019) when developing ESC strategies.</li> </ul>	<ul> <li>Soil loss as a result of construction activities but this will be temporary as soil will be replenished during landscaping of the public realm lands</li> <li>Removal of some asphalt areas and replacement with "green alternatives" (like green pavers) will help offset anticipated soil loss for construction of the underground features (parking structure, link from the main OSC building to the bridge to the pods and Cinesphere)</li> </ul>



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
or Element			Vegetate or cover exposed soil as soon as conditions permit.	
Vegetation	Detailed design (siting of infrastructure) and construction activities (vegetation clearing) will change vegetation on the Project footprint.	Project footprint	<ul> <li>Use grading design to permit maximum retention of existing resources and minimize impacts.</li> <li>Use landscape planting plan to mitigate impacts resulting from tree removal.</li> <li>Limit heavy equipment use and storage to the Project footprint and to hard surfaces (asphalt, concrete) where possible.</li> <li>Install silt fencing and other erosion control mechanisms before beginning construction work and maintain it in place until groundcover is reestablished or runoff prevention has been installed.</li> <li>Enforce retention/protection measures, exercise careful work habits, and implement landscape plan.</li> <li>Flag trees identified for protection in the Arborist Report (MH 2023b).</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>Equipment and vehicles shall not be operated or re-fueled within the dripline of trees not designated for removal.</li> </ul>	<ul> <li>Construction activities will result in the loss or alteration of vegetation.</li> <li>Ultimately, redevelopment activities will improve the overall quality and quantity of vegetation within the Project footprint including increased native vegetation</li> </ul>
			<ul> <li>Vegetation removals beyond the Project footprint will not be completed 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.</li> <li>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.</li> </ul>	
Vegetation	Construction or operational activities may introduce or spread invasive species.	Project footprint	<ul> <li>The Contractor shall implement best management practices to prevent the introduction/spread of invasive plants including proper soil management and equipment clearing protocols, Debris including earth clods or invasive and noxious vegetation material attached to the outside surfaces of equipment is prohibited from entering the Project footprint. 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 Project footprint.</li> <li>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.</li> <li>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).</li> <li>Soil from areas impacted by invasive vegetation shall not be stockpiled for reuse.</li> <li>No invasive species shall be present in fill or topsoil brought on to the site to complete the work.</li> <li>A disposal plan will be required to dispose of invasive species and soils containing invasive species.</li> <li>Disturbed areas requiring cover shall be revegetated as per the landscape architecture plans.</li> <li>Avoid impacts to migratory and breeding birds by implementing the following measures.</li> <li>Individuals, nests, eggs, or young of protected birds shall not be disturbed or destroyed at any time, unless the nest has been abandoned (meaning it must not have been used in the previous breeding seasons during the designated wait period for that species). If the abandoned nest must be damaged, disturbed, destroyed, or removed, Environment and Climate Change Canada must be notified via the online Abandoned Nest</li> </ul>	Introduction or spread of invasive species.
			<ul> <li>Registry.</li> <li>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.</li> <li>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</li> </ul>	



Environment Potential Impacts or Element	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
		<ul> <li>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.</li> <li>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. 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.</li> </ul>	
Wetlands  Design and construction will increase wetlands  Project footprint (Brigg	on the	<ul> <li>Design new wetlands features in consultation with qualified wetland professionals, the TRCA, and Indigenous communities.</li> <li>Ensure wetlands are designed and implemented according to appropriate local conditions.</li> <li>Design wetlands to ensure habitat and hydrological function can be maintained throughout operations.</li> <li>Maintain wetlands and take steps to reduce contamination of wetlands during operations.</li> </ul>	Redevelopment activities will result in a net increase of wetlands within the Project footprint.
Wildlife and Wildlife Habitat  Design (infrastructure construction (physical create a change in wild wildlife habitat.	activities) will	<ul> <li>New light fixtures should be installed with the ability to reduce light levels to decrease illumination during nonoperation times.</li> <li>New light fixtures must use warmer colours (yellow) to reduce potential for increases in attraction by wildlife to light sources.</li> <li>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).</li> <li>Construction</li> <li>Enforce retention/protection measures, exercise careful work habits, and implement landscape plan.</li> <li>Limit heavy equipment use and storage to the project area and to hard surfaces (asphalt, concrete) where possible.</li> <li>Use appropriate signage to increase driver awareness.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>Reduce disturbance to wildlife by implementing the following measures.</li> <li>All equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-def</li></ul>	Design activities and construction activities will contribute to:  Change in wildlife and wildlife habitat including sensory disturbance during construction  Change in wildlife movement during construction  Change in mortality risk during construction



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
or Element			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, 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. 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 (carrying nesting material, alarm calling, acting agitated) 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 Environment and Climate Change Canada.  Avoid impacts to non-SAR bats and mammals by implementing the following measures:  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 31 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.	
Wildlife and Wildlife Habitat	Threats to habitat of threatened species and related habitat.	Local study area	<ul> <li>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.</li> <li>Select a design concept and Project footprint to minimize encroachment to protect known habitat locations.</li> <li>Apply appropriate setbacks from known habitats.</li> </ul>	Design activities and construction activities will contribute to:  Change in wildlife and wildlife habitat including sensory disturbance
			<ul> <li>Avoid impacts on Threatened species.</li> <li>Where species protected under the Provincial Endangered Species Act or their habitat are associated with a project area, implement development restrictions to protect threatened species in the vicinity. Make sure that</li> </ul>	during construction  Change in wildlife movement during construction  Change in mortality risk during construction



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
			future development decisions reflect the existence of this habitat. If required, obtain permits from the MECP under the <i>Endangered Species Act</i> before starting a development. Ensure that there are no impacts to species or their protected habitat.  The Contractor shall immediately notify the Contract Administrator and suspend operations within the area identified by the Contract Administrator if species at risk are suspected or encountered. 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.  A daily pre-construction search of the machinery and the work area shall be implemented to identify the 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.  Avoid any activity that could harm the bird(s) or their nests, eggs, or young if they are using a structure (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)  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, contouring slope faces, or	
			piling materials on the face.	
Aquatic Life and Aquatic Habitat	Change in aquatic species and related habitat.	Local study area	<ul> <li>Maximize grassed areas during design.</li> <li>Modify the redevelopment design to protect or avoid habitat for sensitive species.</li> <li>Develop alternate structure types (e.g., boardwalks, floating decks). and designs to avoid loss of fish habitat.</li> <li>Construction</li> <li>Ensure structure design and placement permits fish passage or does not further impair fish passage.</li> <li>American eel were identified near the south shore of Ontario Place. Appropriate development measures and mitigation should be used to protect the American eel. Where species protected under the Provincial Endangered Species Act or their habitat are associated with a project area, put development restrictions and mitigation measures in place and obtain any necessary permits to protect threatened species in the vicinity and ensure that future development decisions reflect the existence of this habitat.</li> <li>Complete a detailed fisheries assessment during the detailed design phase.</li> <li>Consult with Fisheries and Oceans Canada and submit an application for Authorization under the Fisheries Act, if required.</li> <li>Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation.</li> <li>Any barges required for the use of transporting construction materials or supplies (rock protection) should be operated in a manner to avoid excessive disturbance of the substrates, to limit the amount of suspended sediments.</li> <li>Minimize duration of in-water work to the extent possible.</li> <li>Ensure in-water work areas are isolated.</li> <li>Retain a qualified environmental professional to remove fish from work area and relocate to appropriate location. Obtain applicable permits for moving fish from in-water work areas. 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 clea</li></ul>	<ul> <li>Design activities and construction activities will contribute to:</li> <li>Change in aquatic species and related habitat including sensory disturbance during construction</li> <li>Change in aquatic species movement during construction</li> <li>Change in aquatic species mortality risk during construction</li> <li>Improved habitat following redevelopment activities</li> </ul>



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
			<ul> <li>Manage water flowing onto the work site, as well as water being pumped/diverted from the work site such that sediment is filtered out prior to the water entering a waterbody.</li> <li>Any pumps shall be monitored at all times and back-up pumps shall be readily available on-site in the event of pump failure.</li> <li>Contain and stabilize 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 to prevent sedimentation of nearby waterbodies to prevent re-entry. Regular inspection, maintenance and repair of erosion and sediment control measures and structures during the course of construction.</li> <li>Removal of non-biodegradable erosion and sediment control materials once site is stabilized.</li> <li>Prune or top the vegetation instead of grubbing/uprooting.</li> <li>Minimize the removal of natural woody debris, rocks, sand or other materials from the banks, the shoreline or the bed of Lake Ontario 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.</li> <li>As soon as possible in the project process stabilize shoreline or banks disturbed by any activity associated with the project to prevent erosion and/or sedimentation through revegetation with native species (seed) suitable for the site.</li> <li>Restore bed and banks of Lake Ontario to their original contour and gradient; however, if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage must be restored.</li> <li>If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, ensure that this would allow for opportunities to create areas with variable slopes and depths and a range of stone sizes and slopes that may be utilized as part of a design to enhance habitat productivity and fu</li></ul>	
Aquatic Life and Aquatic Habitat	Construction activities may result in a change to water quality.	Local study area	release or leaching of substances into the water that may be deleterious to fish.  Remove or contain contaminated material.  Restrict equipment from entering water.  Set back stockpiles from water bodies.  Use enclosures on structural rehabilitation work.  Limit refueling to designated areas. Where possible, keep refueling areas at least 30 m from a water body and located on hard surfaces (e.g., asphalt, concrete).  Prohibit use of hydraulic cleaning methods in sensitive areas.  Prohibit stockpiling of materials in sensitive areas (e.g., within floodplain of watercourse or other designated areas).  Direct run-off away from sensitive areas.  Develop detailed specifications to address common project-specific environmental effects including, but not limited to water/sediment management, waste management, spills protection.  Limit heavy equipment use and storage to the project area and to hard surfaces (asphalt, concrete) where possible.  Install silt fencing and other erosion control mechanisms before beginning construction work and maintain it in place until groundcover is re-established or runoff prevention has been installed.  Avoid soil movement activities when heavy rains are forecast.  Establish soil stockpiles a minimum of 30 m from a water body.  Establish covers and other erosion control mechanisms to prevent soil loss.  Conduct monitoring of problems or potential problems as necessary.	<ul> <li>No residual impacts identified.</li> <li>Refer to potential residual impacts for spills (Accidents).</li> </ul>



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
			<ul> <li>Excess groundwater collected during construction activities can be disposed of in accordance with O. Reg. 347.</li> <li>The collected groundwater can also be disposed of to the local sewer system, provided appropriate approval is in place and meets the sewer use bylaw discharge limits.</li> </ul>	
			<ul> <li>Carry out Stormwater Management Plan (Study) to minimize water quality impacts to groundwater recharge areas, and incorporate recommended stormwater management practices into the design package.</li> </ul>	
Aquatic Life and Aquatic Habitat	Design and construction activities may result in a change in surface water quantity.	Local study area	<ul> <li>Acquire or protect property for stormwater management ponds (flooding and erosion).</li> <li>Minimize amount of impervious area.</li> <li>Contour and restore areas across the Project footprint to ensure appropriate grades and drainage patterns.</li> </ul>	No residual impacts identified
Floodplains and Shoreline	Change in floodplain.	Local study area	<ul> <li>Carry out sufficient topographical and geotechnical studies to ensure shoreline stability and to inform setback requirements for new infrastructure and buildings.</li> <li>Ensure that permitted development meets the protection work standards and incorporates flood proofing to the flood protection standards specified by TRCA.</li> <li>Design redevelopment plans to address flooding issues currently experienced at the site (raise elevation).</li> <li>Satisfy TRCA permit requirements (legal obtainment of a permit is not required), if applicable.</li> </ul>	Redevelopment activities will improve floodplain conditions across the Project footprint.
Floodplains and Shoreline	Alteration of shoreline.	Project footprint	<ul> <li>Implement recommendations from the Existing Shoreline Conditions Report, including:         <ul> <li>Rehabilitating shoreline areas to ensure they are stable and will continue to function</li> <li>Rehabilitate structures near and above 74.0-m elevation required to protect the backshore at design conditions.</li> </ul> </li> <li>Continue monitoring movement of the breakwater.</li> </ul>	Redevelopment activities will improve floodplain conditions across the Project footprint.
Atmospheric Environment	Increase in air emissions during construction.	Local study area to regional study area	<ul> <li>Include special provisions in contract to ensure no unnecessary idling of vehicles.</li> <li>Provide dust control / suppression.</li> <li>Locate contractors' yards away from sensitive areas.</li> <li>Use incentive / disincentive clauses in contract to reduce the duration of construction.</li> <li>Control equipment exhaust, dust and odour during construction.</li> </ul>	Temporary increase in air emissions
Atmospheric Environment	Increase in noise during construction.	Local study area	<ul> <li>Restrict night-time operations.</li> <li>Require equipment to be in good repair.</li> <li>Conform with local bylaws as to hours of construction.</li> </ul>	Temporary increase in noise.
Atmospheric Environment	Increase in noise during operations.	Not applicable—redevelopment of the public realm is not anticipated to increase noise levels beyond existing conditions.	Not applicable	Not applicable
Climate Change	Change in Project schedule.	Project footprint	<ul> <li>Monitor weather conditions. If a major storm or weather event is predicted or occurs, inspect the Project site prior to continuing work to identify and implement corrective actions.</li> <li>If burning is required onsite, obtain applicable permits and adhere to conditions included in the permit.</li> <li>Ensure an appropriately trained emergency contact is on site during construction activities.</li> <li>Monitor weather conditions. If a major storm or weather event is predicted, ensure Project equipment is moved to a location that will reduce the potential for damage, including rollover.</li> </ul>	Severe weather may result in delays to the Project schedule.
Climate Change	Change in Modes of Transportation	Local study area	<ul> <li>Significantly increase transit and active transportation improvements.</li> <li>Implement incentive-based and education-based transportation demand management measures.</li> </ul>	Shift to more sustainable modes of travel to Ontario Place with significant transit and active transportation improvements to minimize impacts from parking garage and increased number of visitors to public realm.
Recreation	Change in recreation opportunities including access to the water and number of pathways.	Project footprint	<ul> <li>Construction</li> <li>Provide signage for trail and cycling routes notifying users of applicable closures during construction.</li> <li>Provide alternate access, if possible.</li> <li>Provide community relations program (e.g., provide information on timing of construction, project schedule, contact person to deal with day-to-day issues).</li> <li>Provide contractor incentives to maintain or shorten construction schedule.</li> <li>Schedule construction to avoid disruption of peak outdoor activities of residents.</li> </ul>	Change in recreation opportunities including access to the water and number of pathways



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
Recreation	Change to navigation and navigation safety.	Local study area	<ul> <li>Design</li> <li>Prior to construction, determine if project activities are categorized as major or minor works.</li> <li>Apply for approval through the Navigation Protection Program prior to the initiation of construction activities.</li> <li>Construction</li> <li>Notify appropriate authorities and licensees prior to the commencement of work in or around water.</li> <li>Post warning signs during times of in-water work.</li> <li>Facilitate navigation through the construction site, to the extent possible, or assist in allowing waterway users to pass.</li> <li>Ensure waterway users are notified of construction schedules.</li> <li>Follow all safety precautions and regulations.</li> </ul>	Temporary impacts to navigation and navigation safety during construction.
Education	Change in educational opportunities.	Project footprint	<ul> <li>Include educational opportunities in final design.</li> <li>Continue consultation and engagement with Indigenous communities to identify design ideas that increases cultural aspects within the Project footprint.</li> </ul>	Increase in educational aspects during operations.
Site Experience	Change in site experience including comfort (e.g., shade), and accessibility.	Project footprint	<ul> <li>Design</li> <li>Ensure all public realm areas meet applicable accessibility standards.</li> <li>Include shade and protection from wind and rain throughout the Project footprint.</li> <li>Construction</li> <li>Provide community relations program (e.g., provide information on timing of construction, project schedule, contact person to deal with day-to-day issues).</li> </ul>	Redevelopment activities will create a positive change in the site experience for public realm users.
Archaeology	Disturbance of previously unidentified archaeological resources.	Not applicable – the potential to discover archaeological resources is low based on studies conducted at the Project footprint.	Not applicable	Not applicable
Built and Cultural Heritage	Disruption of cultural heritage resources including:  Removal and alteration of waterbodies and landscape features (including mature trees)  Demolition and removal of contributing built features (including the Village Clusters, Bridge 6, Marina East Light House)  Alteration of views to the Pavilion  Potential reduction of the prominence of the pods and Cinesphere	Local study area	<ul> <li>General</li> <li>Follow advice regarding potential heritage impacts, alternative options, appropriate mitigation measures, and implementing the use of acceptable heritage designs, materials and methodologies to minimize impacts.</li> <li>Review and follow guidance outlined in the approved Strategic Conservation Plan.</li> <li>Engage applicable and appropriate stakeholders, communities, and/or individuals that have an interest in the cultural heritage value of the property.</li> <li>Complete HIA for all proposed activities that may impact the heritage attributes of cultural heritage value of the property (HIA currently underway by ERA and a future HIA will be prepared for the OSC once the design is further developed)</li> <li>Once the HIA is complete for Ontario Place</li> <li>Implement mitigation measures as outlined in the forthcoming final "Ontario Place: Heritage Impact Assessment" by ERA and any future HIA for the OSC</li> <li>Implement conditions outlined in the Minister's Consent for the removal or demolition of any buildings or structures on site.</li> </ul>	The proposed mitigation measures, subject to review and acceptance, will have a positive impact on the intangible cultural heritage value of Ontario Place while achieving the goals of the public realm redevelopment.
Built and Cultural Heritage	Design will change the existing character of the area (architecture).	Project footprint	<ul> <li>Design</li> <li>Review and follow guidance outlined in the approved Strategic Conservation Plan</li> <li>Follow advice regarding potential heritage impacts, alternative options, appropriate mitigation measures, and implementing the use of acceptable heritage designs, materials and methodologies to minimize impacts.</li> <li>Once the HIA is complete</li> <li>Implement mitigation measures as outlined in the forthcoming final "Ontario Place: Heritage Impact Assessment" by ERA and any future HIA for the OSC.</li> <li>Implement conditions outlined in the Minister's Consent for the removal or demolition of any buildings or structures on site.</li> </ul>	<ul> <li>Redevelopment activities will require the removal or demolition of all existing structures.</li> <li>The new proposed buildings will improve the existing character across the Project footprint.</li> </ul>



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
Indigenous Culture	Design and construction activities will create a change to Indigenous culture.	Local study area	<ul> <li>Continue to engage with Indigenous communities in assessment planning and refinement of mitigation measures.</li> <li>Continue to engage Indigenous communities with an interest in the Project to integrate Indigenous design principles and placemaking into the final design.</li> <li>Work with Indigenous communities to identify features of important (e.g., native vegetation, wildlife, water quality).</li> </ul>	Redevelopment activities are anticipated to improve Indigenous culture within the LSA.
Transportation Network	Design and construction will change the transportation networks within the LSA.	Local study area	<ul> <li>Design</li> <li>Consult transit authorities to minimize conflicts.</li> <li>Consult response agencies during design to minimize disruption and coordinate activities.</li> <li>Construction</li> <li>Maintain liaison and coordinate construction with transit authorities on public transit routes.</li> <li>Eliminate or reduce impediments to present traffic flow on existing transportation routes.</li> <li>Maintain liaison and coordinate construction with responding agencies.</li> </ul>	Traffic will increase in and around the LSA during construction.  Redevelopment activities are designed to attract park users, resulting in an increase in traffic during operations.
Transportation Network	Increase in traffic from Ontario Science Centre and underground parking providing more spaces available onsite	Local study area	<ul> <li>Travel demand management and increased transit opportunities to offset the number of single-occupancy vehicles arriving to the site.</li> <li>Opportunities for increased modes of travel (cycling and pedestrian) with improved connections to Exhibition Place, Martin Goodman Trail and transit with onsite mobility or transit hub.</li> <li>Provide bicycle parking and long-term bicycle parking spaces.</li> <li>Provide electric vehicle parking spaces</li> </ul>	Traffic will increase in and around the LSA during operation of the site. Onsite parking facilities will handle approximately 10% of visitors during peak periods with majority of remaining visitors arriving by sustainable modes of travel. Fewer parking spaces compared to increase in number of visitors means more us of sustainable modes of transport.
Waste Management	Construction and operations will change the amount of waste generated onsite.	Project footprint	<ul> <li>Construction</li> <li>All construction-related waste is to be collected and disposed of in designated containers or approved facilities.</li> <li>Collect all waste materials on a regular basis and remove waste from the site during construction.</li> <li>Ensure all hazardous waste materials generated on site are properly identified, collected, stored and disposed of.</li> <li>Identify a local licensed landfill that will accept hazardous material. Obtain waste disposal records, where warranted.</li> <li>Avoid waste disposal sites and contaminated property.</li> <li>Monitor work near waste disposal site as necessary to ensure absence of contamination.</li> <li>Operations</li> <li>Ensure proper waste receptacles are on site (recycling, organics).</li> <li>Encourage food and beverage operations to offer sustainable packaging to reduce plastics and waste across the site.</li> </ul>	Increase in waste during construction and operations.
Potential for Accidents	Small spills during construction could contaminate or otherwise change water quality, aquatic habitat, soil or terrestrial habitat.	Project footprint	<ul> <li>Limit heavy equipment use and storage to the project area and to hard surfaces (e.g., asphalt, concrete) where possible.</li> <li>Prepare a Spill Response Plan that outlines the measures that will be implemented, such as spill kits, and drip pans under all non-mobile machinery; this must be kept onsite at all times.</li> <li>Contain and clean up spills quickly and effectively.</li> <li>Report spills quickly and accurately.</li> <li>Monitor work in vicinity of contaminated property as necessary to ensure absence of contamination.</li> <li>Remediate contamination in accordance with legislation and guidelines.</li> <li>Ensure good property and materials management practices to minimize negative impacts to the environment.</li> <li>Minimize duration of in-water work to the extent possible.</li> <li>Prevent debris from entering Lake Ontario.</li> <li>Contain and stabilize waste material (dredging spoils, construction waste and materials, uprooted or cut aquatic plants, accumulated debris) above the high-water mark of nearby waterbodies to prevent re-entry.</li> <li>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.</li> </ul>	<ul> <li>Depending on the location and volume, a spill may contaminate:         <ul> <li>Water and associated habitat</li> <li>Soil</li> <li>Vegetation and associated habitat</li> </ul> </li> </ul>



Environment or Element	Potential Impacts	Spatial Boundary	Mitigation/Monitoring Measures	Net Effects
			<ul> <li>Ensure materials such as paint, primers, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse.</li> <li>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.</li> <li>Contact applicable agencies if there is likelihood for impacts to fisheries or wildlife resources within Lake Ontario or any other watercourses as a result of the work.</li> <li>If soil contamination is identified while the project is being carried out:         <ul> <li>Stop work immediately and notify proponent or its designate.</li> <li>Engage an environmental consultant to investigate the soil and/or groundwater contamination and advise about the next steps before initiating work again.</li> </ul> </li> <li>Carry out site- or item-specific monitoring or testing, or both, to identify contamination and determine viable options where necessary.</li> </ul>	
Potential for Accidents	Transportation accidents.	Local study area	<ul> <li>Encourage multi-passenger vehicle use for transport of construction crews to and from the Project footprint.</li> <li>Restrict access points to established areas and deter unauthorized access.</li> <li>Follow a Traffic Management Plan during construction to reduce the potential for accidents.</li> </ul>	Transportation accident.
Potential for Accidents	Damage to utilities or underground infrastructure during construction.	Project footprint	<ul> <li>Consult utilities (electricity/water/sewer/gas/telephone/cable) to minimize disruption and coordinate activities.</li> <li>Maintain liaison with utilities.</li> </ul>	Disruption of services.



Appendix D – Natural Heritage Existing Conditions Report and Natural Heritage Impact Study



# **Natural Heritage Existing Conditions Report**

for the

# **Redevelopment of Ontario Place**

Presented to:

**Infrastructure Ontario** 



# **TABLE OF CONTENTS**

				Page		
1.	INTRODUCTION					
	1.1	Project Location				
	1.2	About this Report				
2.	POLICY CONTEXT			6		
	2.1	Munic	cipal			
		2.1.1	City of Toronto Official Plan	6		
	2.2	Provin	ncial	6		
		2.2.1	Toronto and Region Conservation Authority	6		
		2.2.2	Provincial Policy Statement	6		
		2.2.3	Endangered Species Act	7		
		2.2.4	Fish and Wildlife Conservation Act	7		
		2.2.5	Environmental Protection Act	7		
	2.3	Feder	al	8		
		2.3.1	Species at Risk Act	8		
		2.3.2	Migratory Birds Convention Act	8		
		2.3.3	Fisheries Act	8		
3.	MET	METHODS				
	3.1	Consultation				
	3.2	Background Documents				
	3.3	Pre-S	Pre-Survey Background Review			
	3.4	Field I	nvestigations	12		
		3.4.1	Species at Risk Bat Surveys	16		
		3.4.2	Landbird Migratory Stopover Surveys	19		
		3.4.3	Waterfowl and Shorebird Stopover and Staging Surveys	19		
		3.4.4	Breeding Bird Surveys	21		
		3.4.5	Nest Searches of Buildings, Bridges, and other Structures	21		
		3.4.6	Amphibian Breeding Surveys	22		
		3.4.7	Reptile Hibernaculum and Turtle Wintering Area Surveys	24		
		3.4.8	Turtle Nesting Area Surveys	24		
		3.4.9	Mammalian Surveys	24		
		3.4.10	Invertebrate Surveys	25		

		3.4.11	Vegetation Surveys and Ecological Land Classification (ELC)2	5		
4.	NATUF	RAL HE	RITAGE FEATURES AND FUNCTIONS2	6		
	4.1	Design	ated Natural Areas2	6		
	4.2	Physio	graphy and Soils2	6		
	4.3	Vegeta	tion and Ecological Land Classification (ELC)2			
	4.4	Wildlife and Wildlife Habitat				
		4.4.1	Avifauna3	3		
		4.4.2	Herpetofauna4	4		
		4.4.3	Mammals4	5		
		4.4.4	Invertebrates4	6		
		4.4.5	Significant Wildlife Habitat4	6		
		4.4.6	Wildlife Species at Risk4	7		
	4.5	Fish ar	nd Fish Habitat4	8		
		4.5.1	Fish Species at Risk5	6		
	4.6	Assess	sment of Significance and Sensitivity5	8		
		4.6.1	Significant Habitat of Endangered and Threatened Species5	8		
		4.6.2	Significant Wetlands and Significant Coastal Wetlands5	9		
		4.6.3	Significant Woodlands5	9		
		4.6.4	Significant Valleylands5	9		
		4.6.5	Significant Wildlife Habitat5	9		
		4.6.6	Significant Areas of Natural and Scientific Interest5	9		
5.	REFER	RENCE	S6	0		
LIST	OF FI	GURE	ES			
Figure	1: Key	Map of	Ontario Place AOI, within the City of Toronto	3		
Figure	2: Desi	gnated	Areas Surrounding the AOI and Study Area	4		
Figure	3: Bat F	Roost T	ree and Bat Acoustic Monitoring Locations at Ontario Place	18		
Figure	4.4.6       Wildlife Species at Risk       47         4.5       Fish and Fish Habitat       48         4.5.1       Fish Species at Risk       56         4.6       Assessment of Significance and Sensitivity       58         4.6.1       Significant Habitat of Endangered and Threatened Species       58         4.6.2       Significant Wetlands and Significant Coastal Wetlands       59         4.6.3       Significant Woodlands       59         4.6.4       Significant Valleylands       59         4.6.5       Significant Wildlife Habitat       59         4.6.6       Significant Areas of Natural and Scientific Interest       59         REFERENCES       60         OF FIGURES         1: Key Map of Ontario Place AOI, within the City of Toronto       3         2: Designated Areas Surrounding the AOI and Study Area       4         3: Bat Roost Tree and Bat Acoustic Monitoring Locations at Ontario Place       18         4: Avian Survey Locations at Ontario Place       20         5: Herpetofauna Survey Locations at Ontario Place       23         6: ELC Communities and Vegetation Survey Areas at Ontario Place       27         7: Invasive Species Areas at Ontario Place       29					
Figure	4.6.3 Significant Woodlands					
Figure 6: ELC Communities and Vegetation Survey Areas at Ontario Place						
Figure 7: Invasive Species Areas at Ontario Place						
Figure 8: Shore and Open Water Habitat Characterization Map						

Figure 9: Fish Species at Risk Map Based on Field Observation
LIST OF TABLES
Table 1: Summary of Survey Dates and Conditions
Table 2: Summary of Survey Areas and Bird Nests Identified on Buildings/Bridges/Structures 35
Table 3: Ontario Place Fish Species Pre-Survey Data Search Results
Table 4: Open Water Transect Survey Data Results
APPENDICES
APPENDIX A: Toronto Official Plan - Map 9 Natural Heritage Systems
APPENDIX B: List of Tree and Plant Species of Importance to MCFN
APPENDIX C: Photographic Record
APPENDIX D: Plant List
APPENDIX E: Wildlife List
APPENDIX F: Terrestrial Species at Risk and Nesting Locations Mapping 2022
APPENDIX G: Significant Wildlife Screening for Eco-Region 7E
APPENDIX H: Terrestrial Species at Risk Screening and Summary of Habitat 2022
APPENDIX I: West Island Shoreline Brief (Baird, 2022)

# 1. INTRODUCTION

This Natural Heritage Existing Conditions Report has been prepared by Morrison Hershfield (MH) on behalf of Infrastructure Ontario and in support of Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications to enable the renewal and redevelopment of Ontario Place ("the site"). Originally submitted in November 2022, the development proposal for Ontario Place has been refined through extensive collaboration and feedback from the City, the public, Indigenous groups and key stakeholders.

The key changes in the Revised Proposal include:

- 1. A new design for the West Island Entrance Pavilion reoriented to prioritize public access points around and above the building, which has been reduced in height by 3m.
- 2. An additional ~4 acres of public space on the West Island through the expansion of public landscape over the roof of the Therme building.
- 3. A volume reduction of 25% for the Therme main building and a decrease of 5-10m in height across much of the building.
- 4. Prioritizing sustainable travel modes by decreasing the number of vehicular parking spaces by 226 spots, increasing the number of bike parking spaces by 577 spots, and collaborating with Metrolinx to expand transit options to Ontario Place.
- 5. Expanding the range of programming by investing in more food and beverage options, creating more places for Indigenous ceremony, and introducing new waterfront activity zones.

The Revised Proposal includes the extensive renewal of the entire Ontario Place site as a year-round waterfront destination for all Ontarians. The centrepiece of the revitalization is the revitalized parkland, including upwards of 50 acres of new and improved publicly accessible open space. A series of new open spaces across the mainland, a large new park on the East Island, and a new West Island shoreline and roof park that features public gathering spaces and water recreation activities. The intention is that all these spaces are stitched together with Trillium Park and cohesively managed for public access by the Province.

Investment in active transportation infrastructure is proposed to provide convenient and safe access throughout Ontario Place, including a continuous multi-use trail along the waterfront and enhanced connections to Martin Goodman Trail and the GO/Ontario Line Exhibition Station. Consolidation of mainland parking, pick-up/drop-off, and loading facilities into a below-grade structure will allow for public realm and tenant development opportunities while providing school and tour group bus, drop-off and loading access and 1,892 underground parking spaces plus 632 retained surface spaces for shared use by all Ontario Place visitors.

Integrated within the park, Ontario Place will feature a series of tenant attractions that provide year-round interest to visitors. New and enhanced tenant destinations will include:

Therme: A new family-friendly, all-season water entertainment destination designed to accommodate up to 14,000 visitors per day, offering something for all ages, including pools, waterslides, botanical spaces to relax, as well as sports performance and recovery services. Outside, the public will enjoy around 16 acres of free, publicly accessible gathering spaces, parkland, gardens, and a sand beach as serving amities.

- **Live Nation:** The adaptive re-use of the existing Budweiser Stage to create a year-round, 20,000 seat concert facility that is able to be fully enclosed during winter (11,000 indoor seats) or featuring open lawn space in summer.
- Ontario Science Centre: A new facility for the Ontario Science Centre that makes use of the heritage pods and Cinesphere structures as well as a new landmark building on the mainland, currently shown at 4 stories (subject to the ongoing EA process and subsequent rezoning).

The requested planning approvals will focus on the first phase of development. The proposed OPA applies to the full extent of the Ontario Place site and will provide a long-term framework for the site, including for planned near-term public realm and infrastructure improvements, as well as policy direction for future tenant investments. The proposed ZBA also applies to the full extent of the site but is scoped to provide direction to early implementation of the Therme facility, public realm and below-grade parking structure investments. Future ZBA applications may be required to secure approval for the Budweiser Stage renewal and the Ontario Science Centre facility, which are intended to be developed in a later phase.

This report documents existing natural heritage features and functions at the site.

### 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 natural heritage existing conditions studies. 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

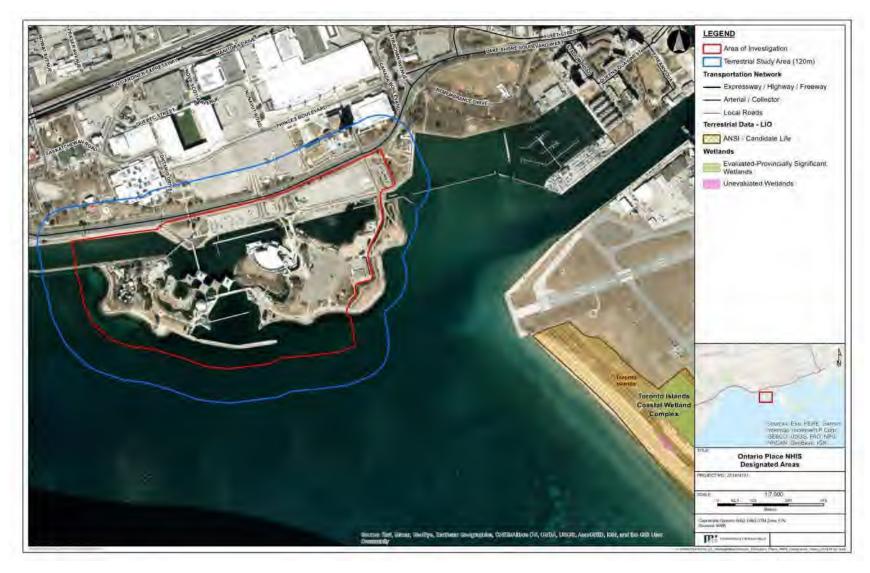


Figure 2: Designated Areas Surrounding the AOI and Study Area

# 1.2 About this Report

This Report is intended to be an objective, science-based study, prepared by qualified experts, which identifies key natural heritage features and functions on site.

A Natural Heritage Impact Study, identifying the potential development impacts on these features, and ways to minimize and mitigate negative impacts to the natural heritage system has been prepared under separate cover and 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 Report is intended to inform 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 Report has been developed in accordance with established guidelines, as part of the OPA and ZBA applications, to address background/context and identify natural heritage features and functions.

#### 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) (GC, 2017). 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 Report 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 upto-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 Report. 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 Report. 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, 2022, 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. As part of consultation with Mississaugas of the Credit First Nation (MCFN), a List of Tree and Plant Species of Importance to MCFN was provided and is included in **Appendix B**.

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
- Curve Lake First Nation
- Hiawatha First Nation
- Haudenosaunee Confederacy Chiefs Council

## 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 Report, 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 Report 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 subsections provide 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**). **Sections 3.4.1** to **3.4.11** provide detailed information on all surveys completed in 2022. A photographic record of the field investigations can be found in **Appendix C**.

During the 2023 field season, additional surveys specific to turtles and bats were undertaken by MH. The methods and results of these surveys are summarized in this report. Detailed documentation is provided under separate cover.

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

<sup>\*</sup> 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. In 2023, MH undertook active acoustic monitoring at all previously assessed locations at the site. This involved 19 stations where surveys were conducted twice between June 5 and June 27, 2023.

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. In 2023, one (1) passive acoustic monitor (SM4s) was deployed on the Live Nation grounds from May 29 to June 12 and June 12 to July 10, 2023.

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.

In 2023, surveys in suitable overwintering areas were undertaken between April 10 and April 26, 2023.

# 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.

In 2023, turtle nesting surveys were undertaken between May 29 and July 7, 2023

# 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) were completed in fall 2022 and are documented under separate cover.

# 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 most up-to-date arborist assessment for the site, approximately 2,136 trees exist on site. Of these, approximately 507 are 30 cm in diameter or greater, while the remaining 1,629 are less than 30 cm in diameter. The health condition of trees – ranked as excellent, good, fair, poor, or dead –  $\geq$ 30 cm diameter on site was predominately excellent (33%) and good (46%) trees, with some fair (9%), poor (8%), and dead (4%) trees. Of these trees  $\geq$ 30 cm diameter, the proportion of native and non-native trees on site is 45% native species and 48% non-native species, with 7% 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.

Until recently, Kentucky Coffee-tree (*Gymnocladus dioicus*) was listed as provincially threatened. As of January 25, 2023, this species was reclassified under the ESA as threatened in its native range (which includes Elgin, Essex, Lambton, Middlesex, Norfolk and Oxford Counties and the Municipality of Chatham-Kent) and is not at risk in all other jurisdictions in Ontario (including Toronto). TRCA classifies this species as non-native to the Toronto region (L+).

Outside of its 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 native range is either unknown or very difficult to determine (Environment Canada, 2014).

This species is listed as threatened in Schedule 1 of the federal SARA. 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 SARA.



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 D** 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 Report.

#### 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 Touchme-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 E 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 F** 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. **Table 2** provides a summary of all nests identified on buildings, bridges, and other structures in the AOI, and **Appendix F** 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	Appendix F Migratory Bird Nesting Observations  Appendix F Page # (s)
OPC A1 - East Causeway Gatehouse	B92537	East Island	OPPR	No bird nesting 15
OPC A2 - Maintenance Building	B92579	East Island	OPPR	<ul><li>No bird nesting</li><li>16, 17</li></ul>
OPC A3 - Administration Building	B92578	East Island	OPPR	<ul> <li>One (1) non-MBCA protected House Sparrow nest in door frame/overhang on east side of building</li> </ul>
OPC B1 – Bridge 1	B1	East Island/Mainland	OPPR	<ul> <li>Thirty-one (31) MBCA protected Barn Swallow nests on/under bridge on girders/supports</li> </ul>
Bridge 1A	B1A	East Island/Mainland	Live Nation	<ul> <li>One (1) MBCA protected Barn Swallow nest on/under bridge on girders/supports</li> <li>One (1) MBCA protected American Robin nest on/under bridge on girders/supports</li> <li>One (1) non-MBCA protected House Sparrow nest on/under bridge on girders/supports</li> </ul>
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 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 F Page # (s)
OPC B4 - Bridge 4	B4	East Island	OPPR and Live Nation	<ul> <li>One (1) MBCA protected Eastern Phoebe nest on/under bridge on girders/supports</li> </ul>	9
OPC B5 - Bridge 5	B92575	East Island/West Island	OPPR	<ul> <li>Six (6) MBCA protected Barn Swallow nests on/under bridge on girders/supports</li> </ul>	5, 9
OPC B6 - Bridge 6	B6	Mainland/West Island	Therme	<ul> <li>Six (6) MBCA protected Barn Swallow nests on/under bridge on girders/supports</li> </ul>	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	<ul> <li>Nesting area for colony of MBCA protected Cliff Swallows; ~500-1000 nests within grooves in underside of bridge</li> </ul>	5, 8, 9
OPC B10 - Bridge 10	B92572	Mainland/West Island	OPPR and Therme	<ul> <li>Nesting area for colony of MBCA protected Cliff Swallows; ~400-500 nests within grooves in underside of bridge</li> <li>One (1) MBCA protected House Finch nest in grooves in underside of bridge</li> <li>One (1) non-MBCA protected House Sparrow nest in grooves in underside of bridge</li> </ul>	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 F Page # (s)
Budweiser Stage Footprint (and associated outbuildings)	LN	East Island	Live Nation	<ul> <li>Twenty-five (25) MBCA 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)</li> <li>One (1) MBCA protected American Robin nest on/under ledge of upper patio (at northeast corner of main building behind stage)</li> <li>One (1) MBCA protected American Robin nest on/under deck (at northwest corner behind stage) on girders/supports</li> <li>One (1) non-MBCA protected Common Grackle nest on/under deck (at northwest corner behind stage) on girders/supports</li> </ul>	8, 12
OPC C1 - Cinesphere	B92569	West Island	Adjacent to OPPR and Therme	Three (3) MBCA 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 F 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	<ul> <li>Two (2) non-MBCA protected House Sparrow and European Starling nests on/under awning</li> </ul>	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	<ul> <li>One (1) MBCA protected American Robin nest on north side of building on girder/support under roof</li> </ul>	12
OPC - E5 - Round Hut	B92563	East Island	OPPR	Five (5) <b>MBCA</b> 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 protected Barn	9

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix F Page # (s)
Marina Village Building				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 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	00
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 protected Barn Swallow nest on/under awning on northwest side of building	6
OPC - MVW2 -	B92550	West Island	Therme and	Thirty-four (34) MBCA protected Barn	6

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix F Page # (s)
West Marina Village Building			OPPR	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	<ul> <li>Nesting area for colony of MBCA protected Cliff Swallows; ~1000-1500 nests within grooves in underside of buildings</li> <li>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)</li> </ul>	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	<ul> <li>One (1) MBCA protected Barn Swallow nest on/under awning on southeast side of building</li> <li>Three (3) MBCA protected American Robin nests on/under awnings on</li> </ul>	2

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations  Appendix F Page # (s)
				southeast side of building
OPC - W4 - Commons West Building	B92546	West Island	Therme	<ul> <li>One (1) MBCA protected Barn</li> <li>Swallow nest on/under awning on east side of building</li> </ul>
OPC - W5 - Waterfall Stage	B92545	West Island	Therme	<ul><li>No bird nesting</li><li>2</li></ul>
OPC - W6 - Electrical Sub Station	B92544	West Island	Therme	<ul><li>No bird nesting</li><li>2</li></ul>
OPC - W7 - Commons North Washroom	B92543	West Island	Therme	<ul><li>No bird nesting</li><li>2</li></ul>
OPC - W8 - Dry Storage Building	B92542	West Island	Therme	No bird nesting 2
OPC - W9 - Commons South Washrooms	B92541	West Island	Therme	<ul><li>No bird nesting</li><li>2</li></ul>
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	<ul> <li>Two (2) MBCA protected American         Robin nests on the bridge between         B92538-7 and B92538-8</li> <li>One (1) non-MBCA protected House         Sparrow nest under the bridge</li> </ul>
				Sparrow nest under the bridge between B92538-7 and B92538-6

Building/Structure Name	Building/Structure Label or B# (Where Known)	General Location within AOI	Stakeholder /Lease Area Location	Migratory Bird Nesting Observations	Appendix F Page # (s)
OPC - WE1 - West Entrance Building	B92580	West Island	Therme	<ul> <li>One (1) MBCA protected American Robin nest on north side of the building, on top of metal pipe/metal detail over doorway</li> </ul>	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	ТВ	West Island	Therme	No bird nesting	3
Dock 1	D1	West Island	Therme	One (1) MBCA 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	<ul> <li>Five (5) MBCA protected Barn Swallow nests on/under Marina dock on girders/supports</li> </ul>	6
Breakwater	BW	West Island	OPPR and Therme	Eighteen (18) MBCA 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) <b>MBCA</b> 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 Bridge Element	SB3	West Island	OPPR	Two (2) <b>MBCA</b> protected Barn Swallow nests on/under bridge on	5

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

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 F**). 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 E** 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 F** 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.

During the 2023 field season, turtle species observed on site included Midland Painted Turtle, Northern Map Turtle, and Red-eared Slider.

#### 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.

Bat surveys undertaken in 2023 found no SAR bats were present on site.

#### 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 F** 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 G 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), Barn Swallow (SC), 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 F** 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 H**. 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 F** for the mapped locations of these observations:

- Chimney Swifts (Threatened under ESA and SARA) were observed foraging within the AOI.
- Barn Swallows (Special Concern under ESA) were identified nesting on numerous structures, buildings, and bridges, and in large numbers (refer to **Table 2**).
- 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, as of January 25, 2023, Barn Swallow is classified as Special Concern under the ESA. Barn Swallow was re-examined and designated special concern by COSEWIC in May 2021. Based on this recent assessment by COSEWIC, it is anticipated that the status of Barn Swallow under SARA will be changed from threatened to special concern. It is noted, however, that as of June 2023, Barn Swallow remains listed as a threatened in Schedule 1 of SARA..

# 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



Figure 8: Shore and Open Water Habitat Characterization Map

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 design life; it is deteriorated and in need of replacement/rehabilitation (Baird, 2022; **Appendix I**). 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	Х	
American Eel	X		
Atlantic Salmon		Х	
Black Crappie		Х	X
Blacknose Dace		Х	
Bluegill	X	Х	Х
Bluntnose Minnow	X	Х	
Bowfin	X	Χ	Х
Brook Stickleback	X	Х	
Brook Trout		Х	Х
Brown Bullhead	X	Х	Х
Brown Trout	Х	Х	Х

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

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

#### **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	37	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 (MECP, 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 7°C (DFO, 2016). Spawning migrations and habitat requirements for spawning are largely unknown (DFO, 2016). 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

Chimney Swifts which are listed as Threatened and receive protection of habitat and individuals under the ESA, were identified on site; 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.

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, riprap, 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

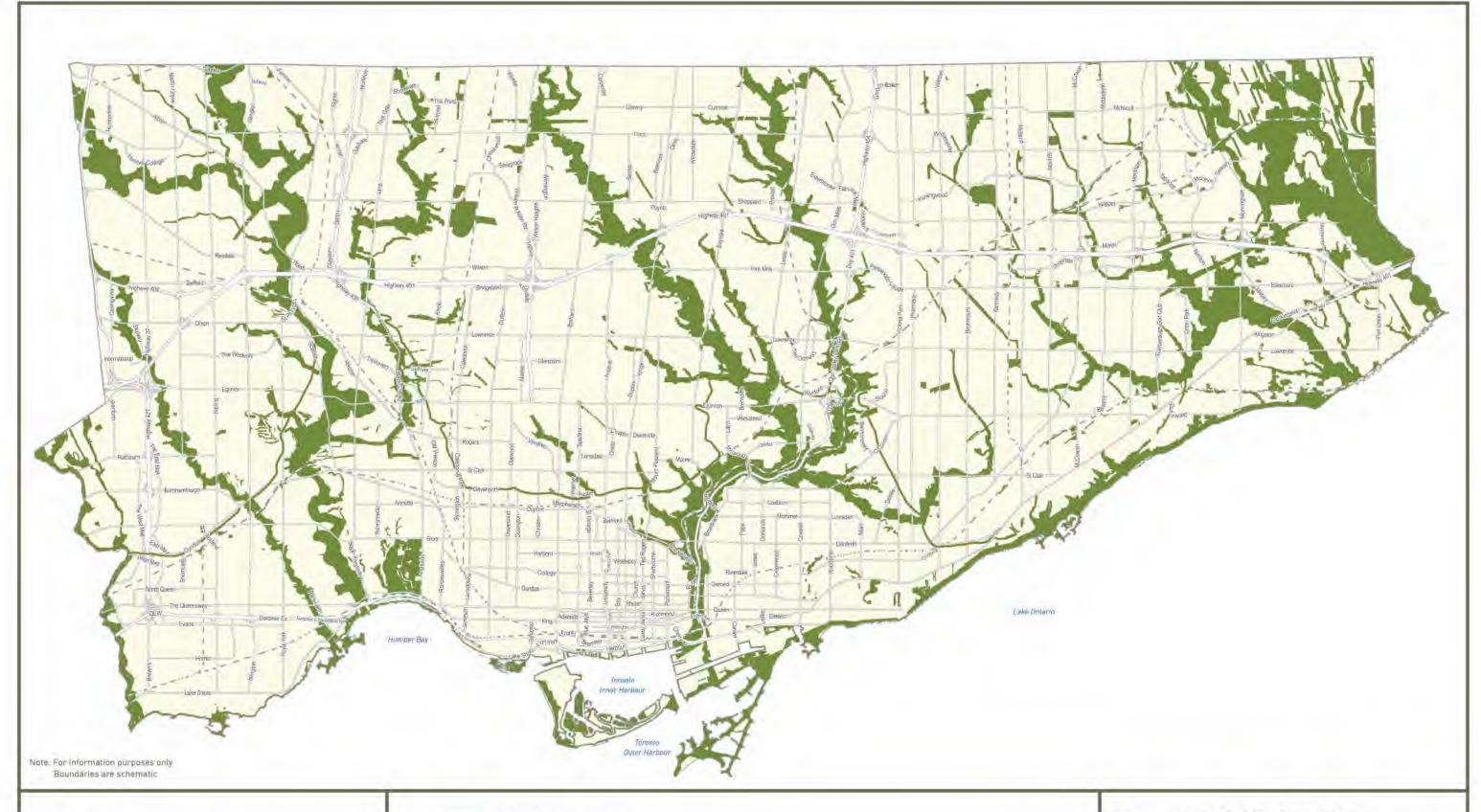
There are no ANSIs at or within 120 m of Ontario Place.

## 5. REFERENCES

- Baird & Associates Coastal Engineers Ltd (Baird). October 20, 2022. Therme West Island Shoreline Protection Memorandum Rev 3. Internal resource
- Bird Studies Canada (BSC). 2009. Marsh Monitoring Program Participant's Handbook for Surveying Amphibians. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency
- City of Toronto. 2022. Official Plan. Accessed from https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/official-plan/
- Credit Valley Conservation (CVC). 2021. Migratory Waterfowl and Shorebird Stopover Habitat Survey Protocol. Accessed from https://cvc.ca/wp-ontent/uploads/2021/09/rpt\_MigWaterfowlShorebird\_Protocol\_f\_-compressed-20210615.pdf
- Environment and Climate Change Canada (ECCC). 2007. A Guide to the Species At Risk Act (SARA). Accessed from https://www.registrelep-sararegistry.gc.ca/6AC53F6B-550E-473D-9BDB-1CCBF661F521/fedland-eng.pdf
- Environment and Climate Change Canada (ECCC). 2014. Kentucky Coffee-tree (*Gymnocladus dioicus*): recovery strategy 2014. Accessed from https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategi60anada60ycky-coffee-tree-2014.html
- Environment and Climate Change Canada (ECCC). 2016. Ontario Shorebird Survey Training Manual and Protocol. Accessed from https://wildlife-species.canada.ca/bird-status/methodes-methods-eng.aspx?sY=2019&sL=e
- Department of Fisheries and Oceans Canada (DFO). 2016. Management Plan for Deepwater Sculpin (Myoxocephalus thompsonii) in Canada (Great Lakes-Western St. Lawrence populations). Species at Risk Act Management Series. Fisheries and Oceans Canada, Ottawa. vi + 30 pp. Accessed from <a href="https://publications.gc.ca/collections/collection\_2017/mpo-dfo/En3-5-74-2016-eng.pdf">https://publications.gc.ca/collections/collection\_2017/mpo-dfo/En3-5-74-2016-eng.pdf</a>
- Government of Canada (GC). 2017. Birds protected under the Migratory Birds Convention Act. Accessed from https://www.canada.ca/en/environment-climate-change/services/migratory-birds-legal-protection/convention-act.html
- Government of Canada (GC), 2022. New Migratory Birds Regulations, 2022. https://www.canada.ca/en/environment-climate-change/services/migratory-game-bird-hunting/status-update-modernization-regulations.html
- Infrastructure Ontario (IO). 2020. Technical Field Guide (TFG) for IO Service Providers and Successful Respondents of the Natural Heritage Services Source List Version 3.2. Internal document
- Lee, Harold. 2008. Southern Ontario Ecological Land Classification: Vegetation Type List via Ministry of Natural Resources and Forestry

- Ministry of Environment, Conservation and Parks (MECP). 2018.Ontario Recovery Strategy Series, Shortnose Cisco. Accessed from https://files.ontario.ca/shortnose-cisco-recovery-strategy-en.pdf
- Ministry of Natural Resources. March 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp
- Ministry of Natural Resources and Forestry. 2011. Bird and Bird Habitat: Guidelines for Wind Power Projects. Accessed from https://www.ontario.ca/page/birds-and-bird-habitats-guidelines-windpower-projects
- Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat EcoRegion Criteria Schedule 7E. Accessed from https://www.ontario.ca/document/significant-wildlife-habitat-ecoregional-criteria-schedules-ecoregion-6e
- Ministry of Natural Resources and Forestry, Guelph. 2017. Survey Protocol for Species at Risk Bats within Treed Habitats. 13p
- Ministry of Natural Resources and Forestry. 2022. Kentucky coffeetree. Accessed from https://www.ontario.ca/page/kentucky-coffeetree
- Natural Heritage Information Centre (NHIC). 2022. Natural Heritage Information Centre Makea-map. Accessed from https://www.lioapplications.lrc.gov.on.ca/Natural\_Heritage/index.html?viewer=Natural\_Heritage.Natural\_Heritage&locale=en-CA
- Naughton. 2012. The Natural History of Canadian Mammals. Toronto, Buffalo, London: University of Toronto Press. 472 p
- Ontario Breeding Bird Atlas. 2005. Accessed from www.birdsontario.org/atlas/atlasmain.html
- Ontario Butterfly Atlas Online (OBA) . 2022.. Accessed from http://www.ontarioinsects.org/atlas\_online.htm
- Ontario Reptile and Amphibian Atlas (ORAA). 2022. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario's reptiles and amphibians. Accessed from http://www.ontarionature.org/atlas
- SARA. 2022. Species at Risk Act. Accessed from https://laws-lois.justice.gc.ca/PDF/S-15.3.pdf
- Savanta. 2014. The Ontario Place Comprehensive Natural Heritage Review. Internal document
- Shoreplan Engineering Services. 2022. Ontario Place Existing Shoreline Conditions Report. 105 p
- Smith. 1990. North American Ornithological Atlas Committee Handbook for Atlasing Breeding Birds. Accessed from https://naturecounts.ca/norac/atlasbirders.htm
- Waterfront Regeneration Trust (WRT). 2001. Toronto and Region Remedial Action Plan. Clean Waters, Healthy Habitats. Progress Report

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





Natural Heritage System

# **Toronto Official Plan**

Map 9

Natural Heritage System

February 2019

APPENDIX B: List of Tree and Plant Species of Importance to MCFN

## Ontario Place Redevelopment Project

## List of Tree and Plant Species of Importance to MCFN

(Based on trees and plants reported to occur at the Ontario Place site in the 2022 Natural Heritage Impact Study)

Trees and Large Shrubs	Plants
Red Maple	Common Yarrow
Silver Maple	Common Milkweed
Sugar Maple	Red-osier Dogwood
Eastern Cottonwood	Purple-lead Willow-herb
Largetooth Aspen	Wild Strawberry
Trembling Aspen	Spotted Jewelweed
Eastern Red Cedar	Iris Species
Tamarack	Common Juniper
White Spruce	Swamp Candles
Red Pine	Fragrant White Water-lily
Eastern White Pine	Common Evening Primrose
White Birch	Common Plantain
Black Walnut	Heal-all
White Oak	Wild Red Raspberry
Swamp White Oak	Black Raspberry
Bur Oak	Marsh Skullcap
Red Oak	Purple-stem Aster
White Elm	Canada Yew
Slippery Elm	Narrow-leaved Cattail
Eastern White Cedar	Blue Vervain
American Basswood	
Speckled Alder	
American Beech	
Black Cherry	
Cherry Species	
Chokecherry	

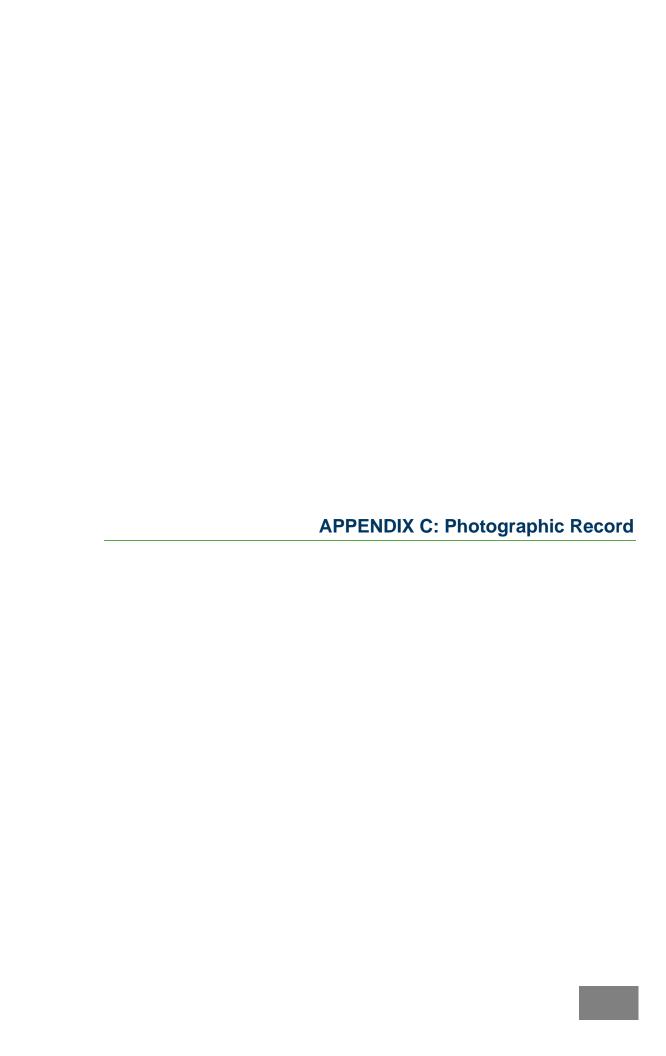




Figure 1: View, facing southwest, of the West Entrance Building (B92580). June 5, 2020.



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

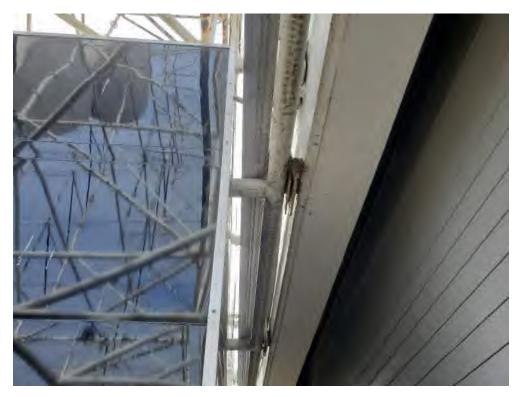


Figure 3: View of an American Robin nest on the north side of West Entrance Building (B92580). June 20, 2022.

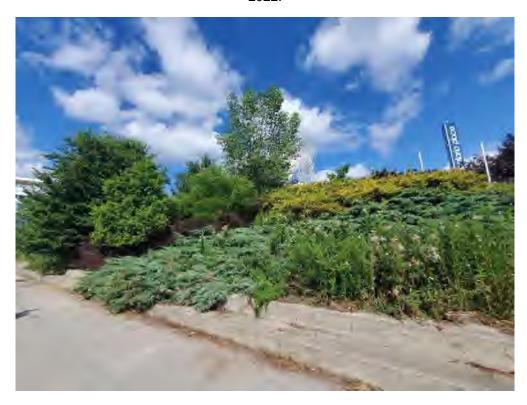


Figure 4: View, facing west, of Landbird/Breeding Bird Survey Transect #1, and Vegetation Survey Area M. July 21, 2022.



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.

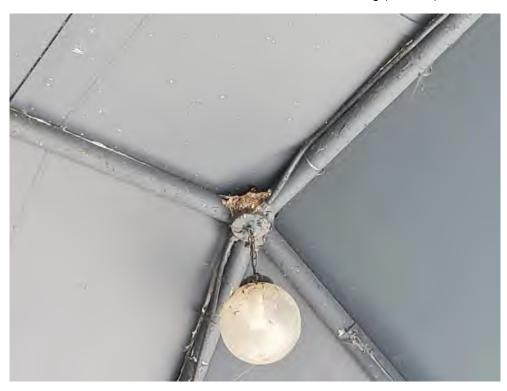


Figure 14: View of Barn Swallow nest on Commons Food Building (B92547). Barn Swallow visible sitting in nest. June 20, 2022.



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.

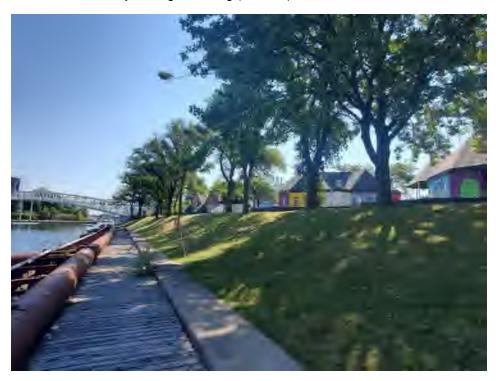


Figure 22: View, facing east, of Landbird/Breeding Bird Survey Transect #2 and Vegetation Survey Area O. The Commons North Washroom (B92543) and the Dry Storage Building (B92542) are also visible (right). August 24, 2022.



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.

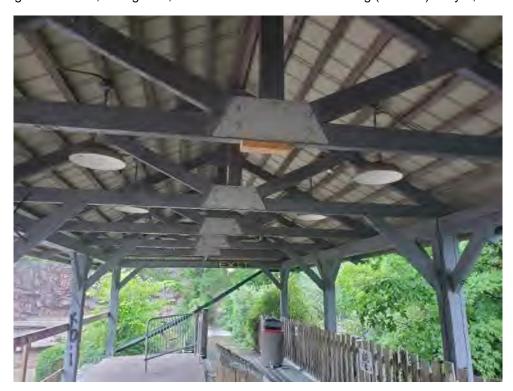


Figure 30: Covered platform in the Ride Maintenance Building (B92540) area, showing potential suitable nesting area for birds. July 5, 2022.



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.

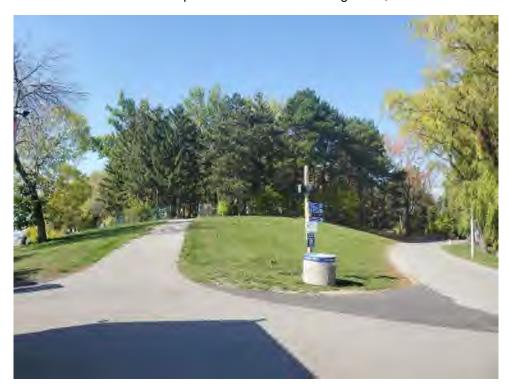


Figure 38: View, facing northwest, of Landbird/Breeding Bird Survey Transect #4, Vegetation Survey Area J, and Bat Acoustic Monitoring Area #3. October 11, 2022.



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.

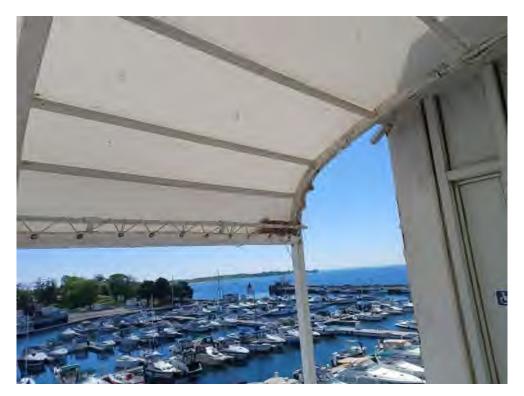


Figure 55: View of a partial, old, inactive American Robin nest on Secondary Tower Ramp Element 7 (SB7) awning. June 23, 2022.



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.

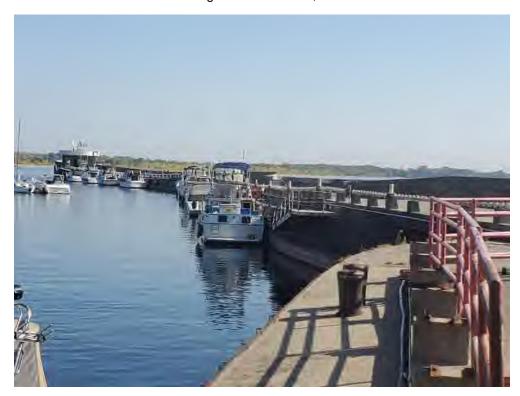


Figure 68: View, facing east, of the Breakwater (BW). October 11, 2022.



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

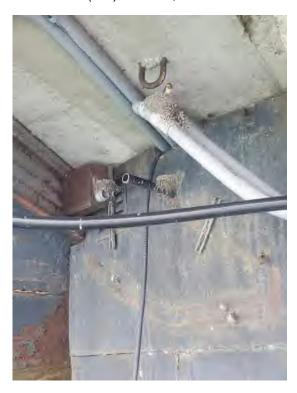


Figure 70: View of Barn Swallow nests built on pipes/conduits on Breakwater (BW). A Barn Swallow is visible in a nest. June 23, 2022.



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.

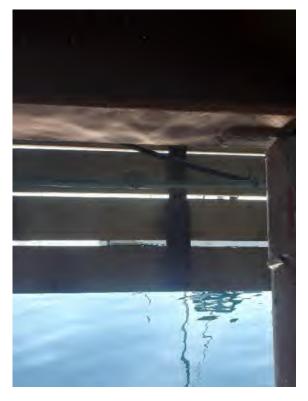


Figure 76: View of a Barn Swallow nest on a pipe underneath of Bridge 5 (B92575). October 11, 2022.



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.

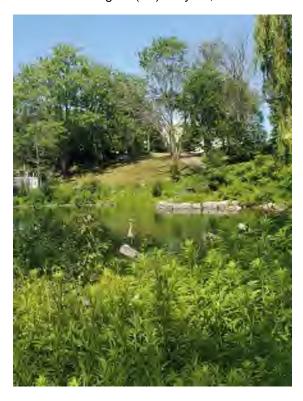


Figure 100: View, facing northeast, of Waterfowl/Shorebird Survey Area #7, Landbird/Breeding Bird Survey Transect #10, and Vegetation Survey Areas F and E. A Great Blue Heron is visible, standing on a log. June 28, 2022.



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.

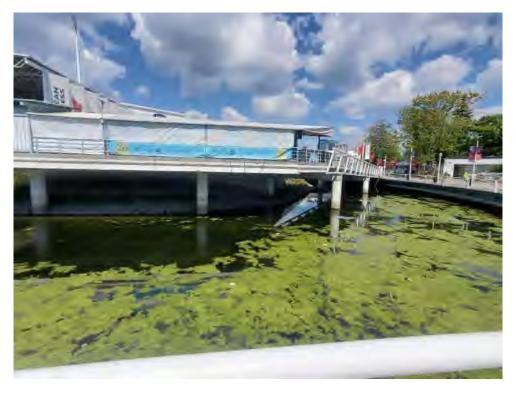


Figure 106: View, facing north, of Live Nation deck over water providing Barn Swallow nesting habitat southwest of Bridge 2 (B2). Algae bloom in channel also visible August 24, 2022.

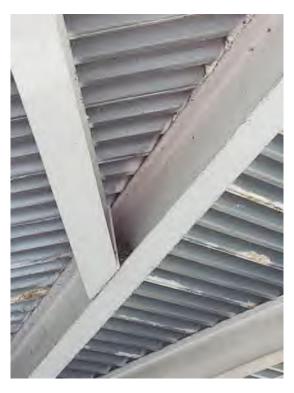


Figure 107: View of Barn Swallow nest on girders under Live Nation deck over water southwest of Bridge 2 (B2). June 23, 2022.



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.

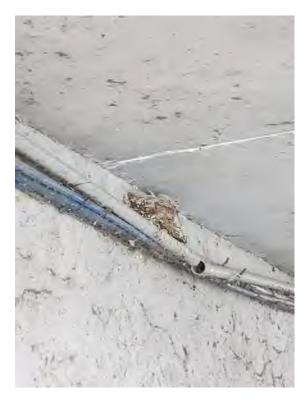


Figure 112: View of a Barn Swallow nest on cables in the unnamed concrete bridge northwest of Bridge 2 (B2). June 23, 2022.



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

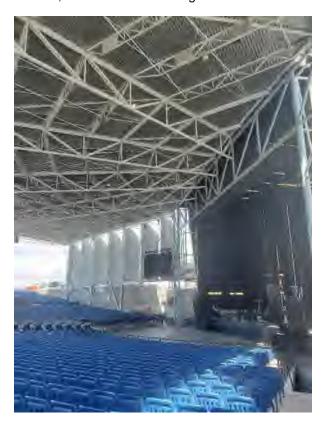


Figure 114: View, facing northwest, of the Budweiser Stage seating and stage area. July 12, 2022.



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.

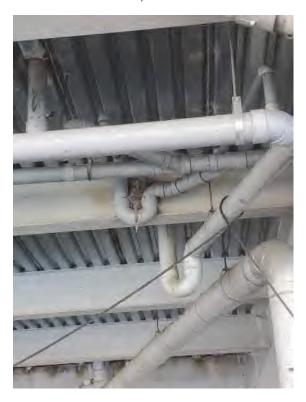


Figure 122: View of Barn Swallow nest on pipes under deck over water in the northwest of Live Nation grounds. June 23, 2022.

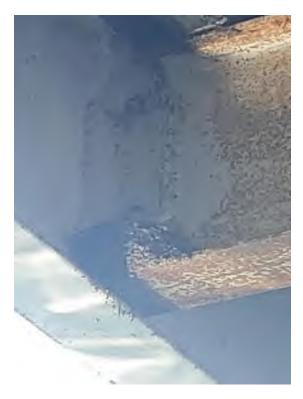


Figure 123: View of a Barn Swallow nest on girder on the northwest decks of Live Nation grounds. June 23, 2022.



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.

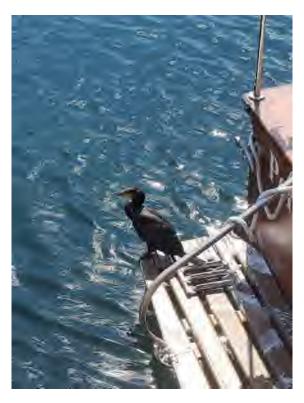


Figure 153: View of a Double-crested Cormorant perched on a boat in the Marina. August 24, 2022.



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

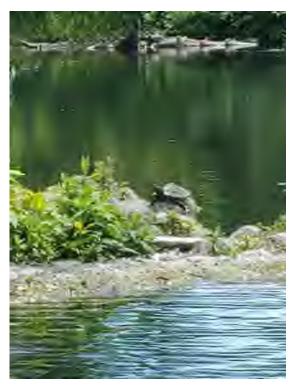


Figure 157: View of a Northern Map Turtle basking on floating structure along Turtle Emergence Transect Survey Route near Amphibian Call Station #5 (in Vegetation Survey Area F). June 23, 2022



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.

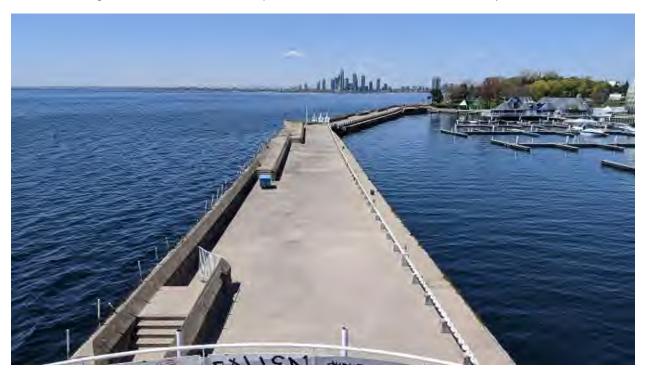


Figure 166: View of WIS-3 – Open Water Vertical Walled Shoreline habitat. May 14, 2021.



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 D: Plant List** 

Scientific Name	Common Names	Vegetated Area (s)	СС	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	Х	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							

Scientific Name	Common Names	Vegetated Area (s)	СС	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	1		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	М							
Corylus cornuta	Beaked Hazelnut	I, F	5	3		S5			L4
Cotoneaster divaricatus	Spreading Cotoneaster	М		5	Х	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	1		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	Е		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 in its native range	THR	L+

Scientific Name	Common Names	Vegetated Area (s)	сс	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Hypericum perforatum	Common St. John's-wort	I, M, F, G, D, K, J		5	-3	SNA			L+
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	М							
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	1	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	1							
Morus alba	White Mulberry	G, M, J, I, M		0	-3	SNA			L+
Myosotis sp.	Forget-me-not Species	I, F							
Nepeta cataria	Catnip	1		1	-2	SNA			L+
Nymphaea odorata	Fragrant White Water-lily	Р	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	1	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	М	5	-3		S5			L3
Picea abies	Norway Spruce	J		5	-1	SNA			L+

Scientific Name	Common Names	Vegetated Area (s)	СС	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Picea glauca	White Spruce		6	3		S5			L3
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	1	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

Scientific Name	Common Names	Vegetated Area (s)	СС	CW	WI	S Rank	SARO Status	COSEWIC Status	L Rank
Scutellaria galericulata	Marsh Skullcap	I	6	-5		S5			L5
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	М							
Stellaria media	Common Chickweed	I, J		3	-1	SNA			L+
Symphyotrichum puniceum	Purple-stem Aster	1	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	М	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	<b>Critically Imperiled:</b> 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	<b>Imperiled:</b> At high risk of extirpation due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.				
S3	<b>Vulnerable:</b> 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	<b>Apparently Secure:</b> 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	<b>Secure:</b> 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	<b>Possibly Extirpated:</b> 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	<b>Presumed extirpated:</b> Species is believed extirpated with virtually no likelihood of rediscovery despite intensive searches of historical and appropriate habitat.				
Variant Status Ra	nks				
SNA	<b>Not applicable:</b> 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	<b>Unrankable:</b> 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				
В	<b>Breeding:</b> Conservation status refers to the breeding population of the species in the nation or state/province.				
N	<b>Non-breeding:</b> Conservation status refers to the non-breeding population of the species in the nation or state/province.				
М	<b>Migrant:</b> 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 E: 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	Special Concern	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

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
Chestnut-sided Warbler	Setophaga pensylvanica	Not at Risk	L3	S5B	LB
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

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
Great Egret	Ardea alba	Not at Risk	L3	S2B, S3M	IN, WS
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

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
Palm Warbler	Setophaga palmarum	Not at Risk	N/A	S5B	IN, LB, WS
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 Iudovicianus	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

Common Name	Scientific Name	SARO/ESA Status	L Rank	S Rank	Surveys Observed
White-winged Scoter	Melanitta deglandi	Not at Risk	N/A	S4B, S5N	WS
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

Common Name	Scientific Name	ESA Status	L Rank	S-Rank	Location Observed
Big Brown Bat	Eptesicus fuscus	Not at Risk	L4	S4	Detected within Bat Acoustic Monitoring Area #3, #11 & #12
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

Common Name	Scientific Name	ESA Status	L Rank	S-Rank	Location Observed
Monarch	Danaus plexippus	Special Concern	N/A	S2N, S4B	Observed within Vegetation Survey Areas D, M, and I.

**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.

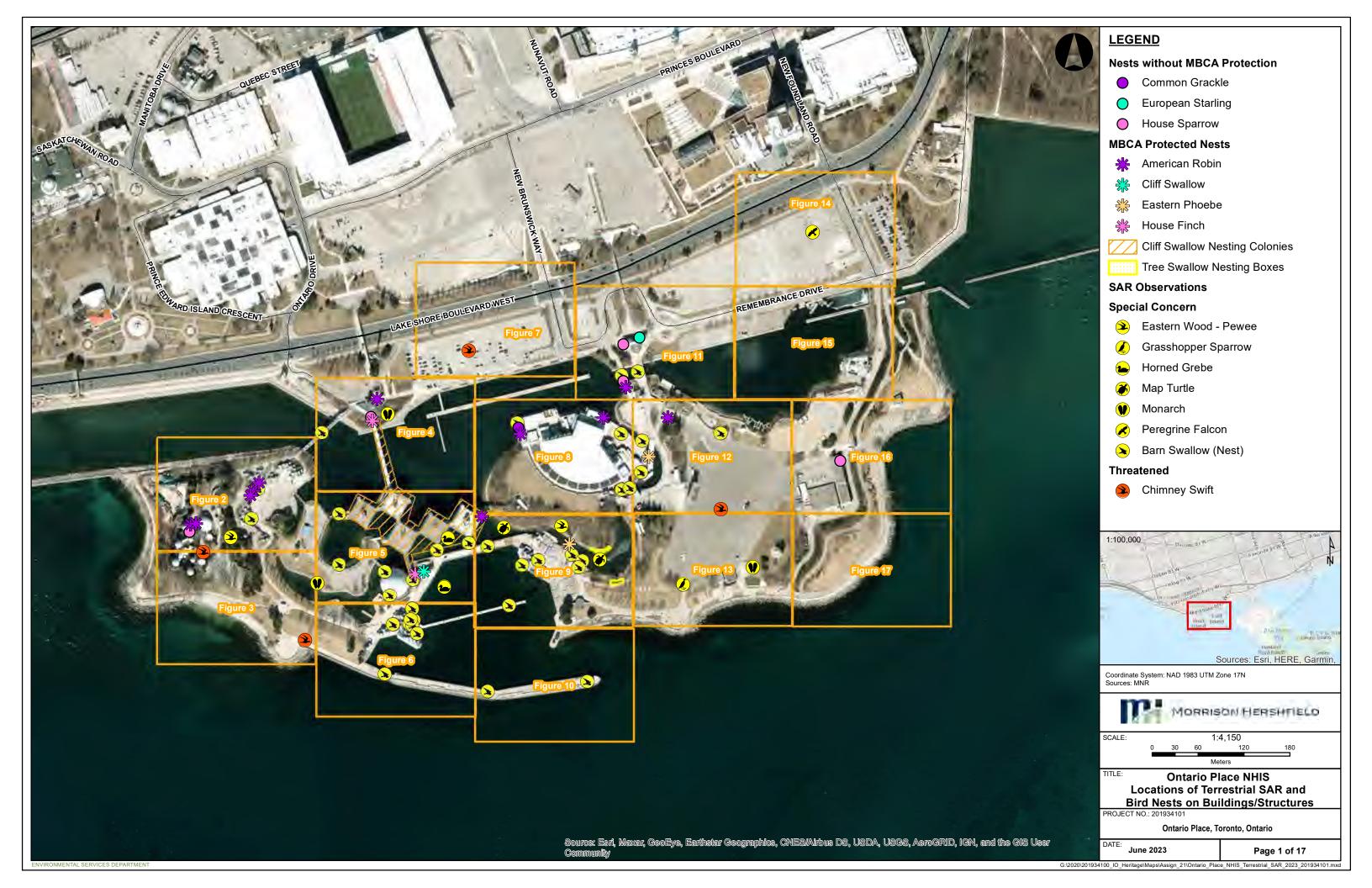
Conservation	Status Ranks			
S1	<b>Critically Imperiled:</b> At very high risk of extirpation due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.			
S2	<b>Imperiled:</b> At high risk of extirpation due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.			
S3	<b>Vulnerable:</b> 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	<b>Apparently Secure:</b> 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	<b>Secure:</b> 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	<b>Possibly Extirpated:</b> 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	<b>Presumed extirpated:</b> Species is believed extirpated with virtually no likelihood of rediscovery despite intensive searches of historical and appropriate habitat.			
Variant Status	Ranks			
SNA	<b>Not applicable:</b> 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 Numeric Rank			
Breeding Statu	us Qualifier			
В	<b>Breeding:</b> Conservation status refers to the breeding population of the species in the nation or state/province.			
N	<b>Non-breeding:</b> Conservation status refers to the non-breeding population of the species in the nation or state/province.			
M	<b>Migrant:</b> 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	Sp	pecies of Regional Conservation Concern: Regionally scarce due to either accidental occurrence or extreme
	ser	ensitivity to human impacts

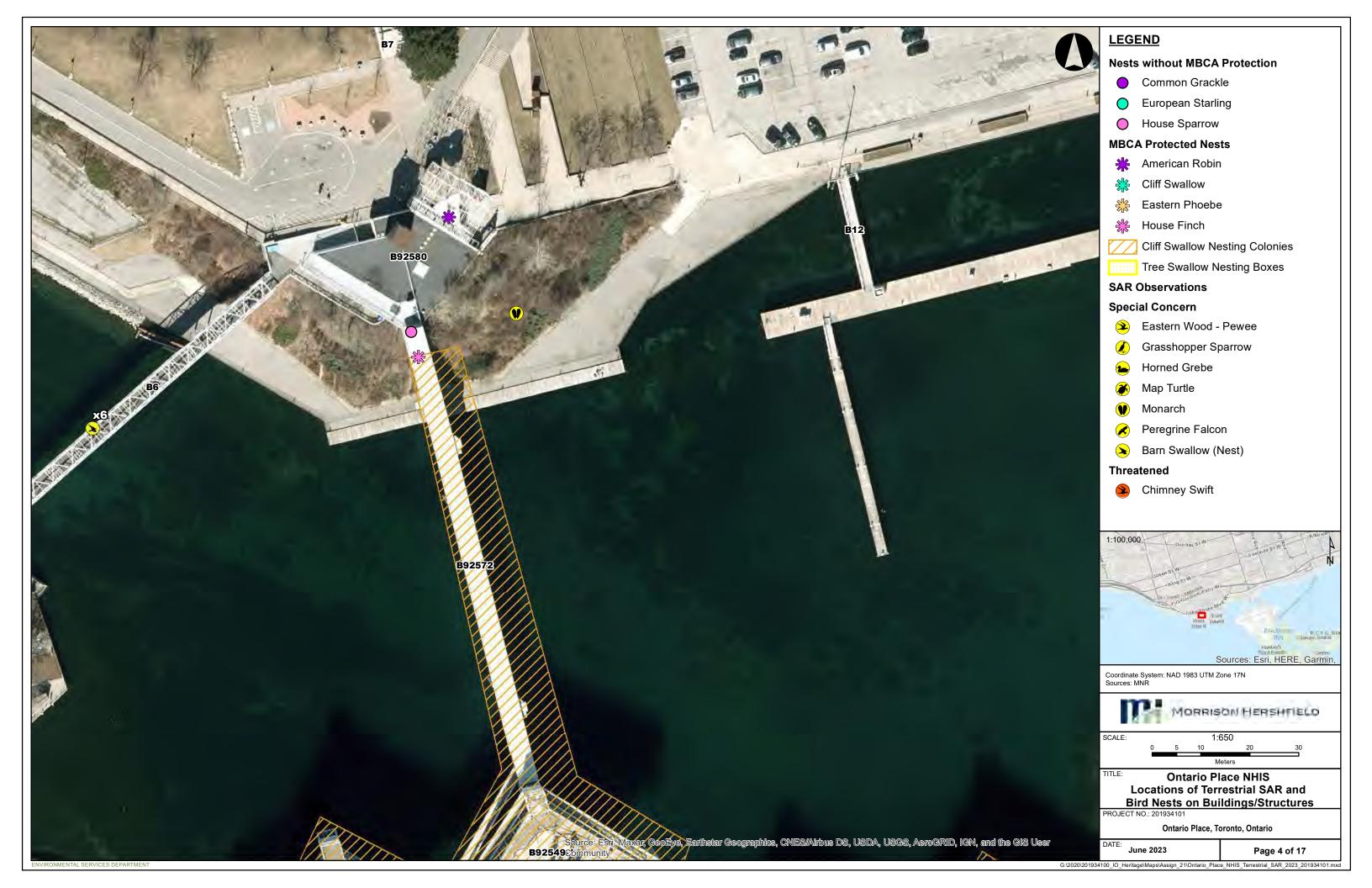
L2	Species of Regional Conservation Concern: Somewhat more abundant and generally slightly less sensitive than L1 species
L3	Species of Regional Conservation Concern: Generally less sensitive and more abundant than L1 and L2 ranked species
L4	Species of Urban Conservation Concern: Occur throughout the 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 F: Terrestrial Species at Risk and Nesting Locations Mapping 2022

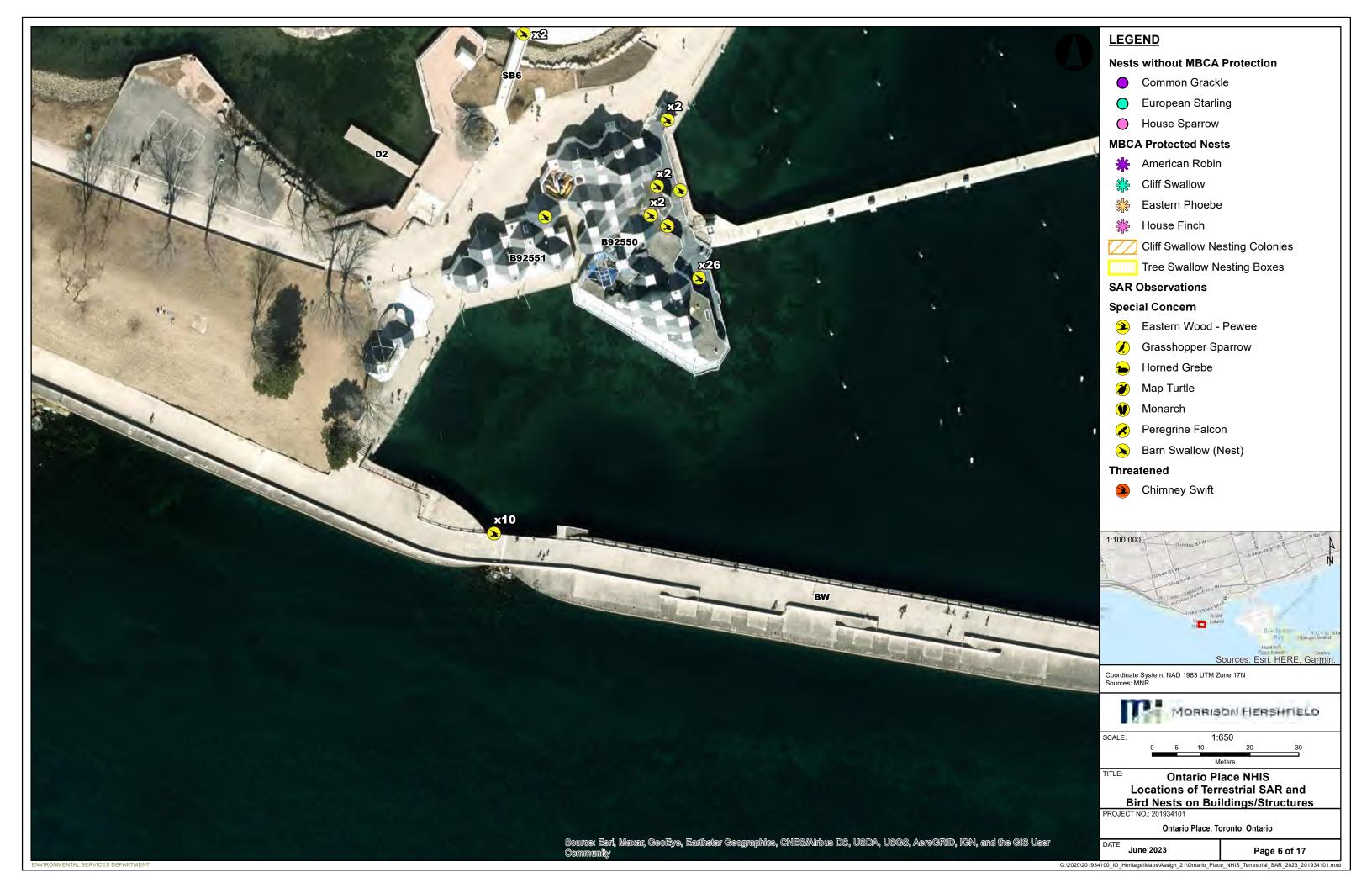


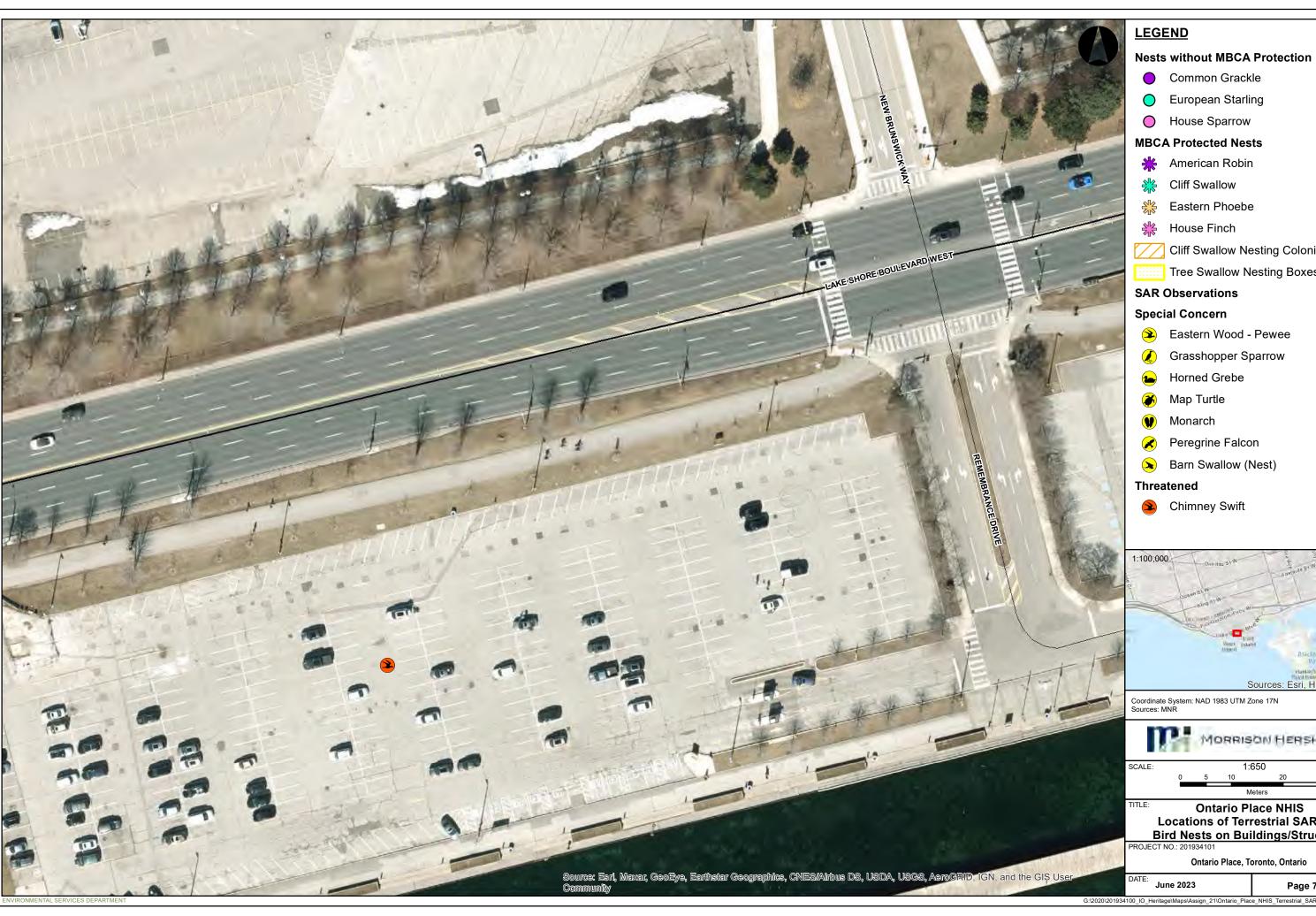












- Cliff Swallow Nesting Colonies
- Tree Swallow Nesting Boxes
- Grasshopper Sparrow



# MORRISON HERSHFIELD

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

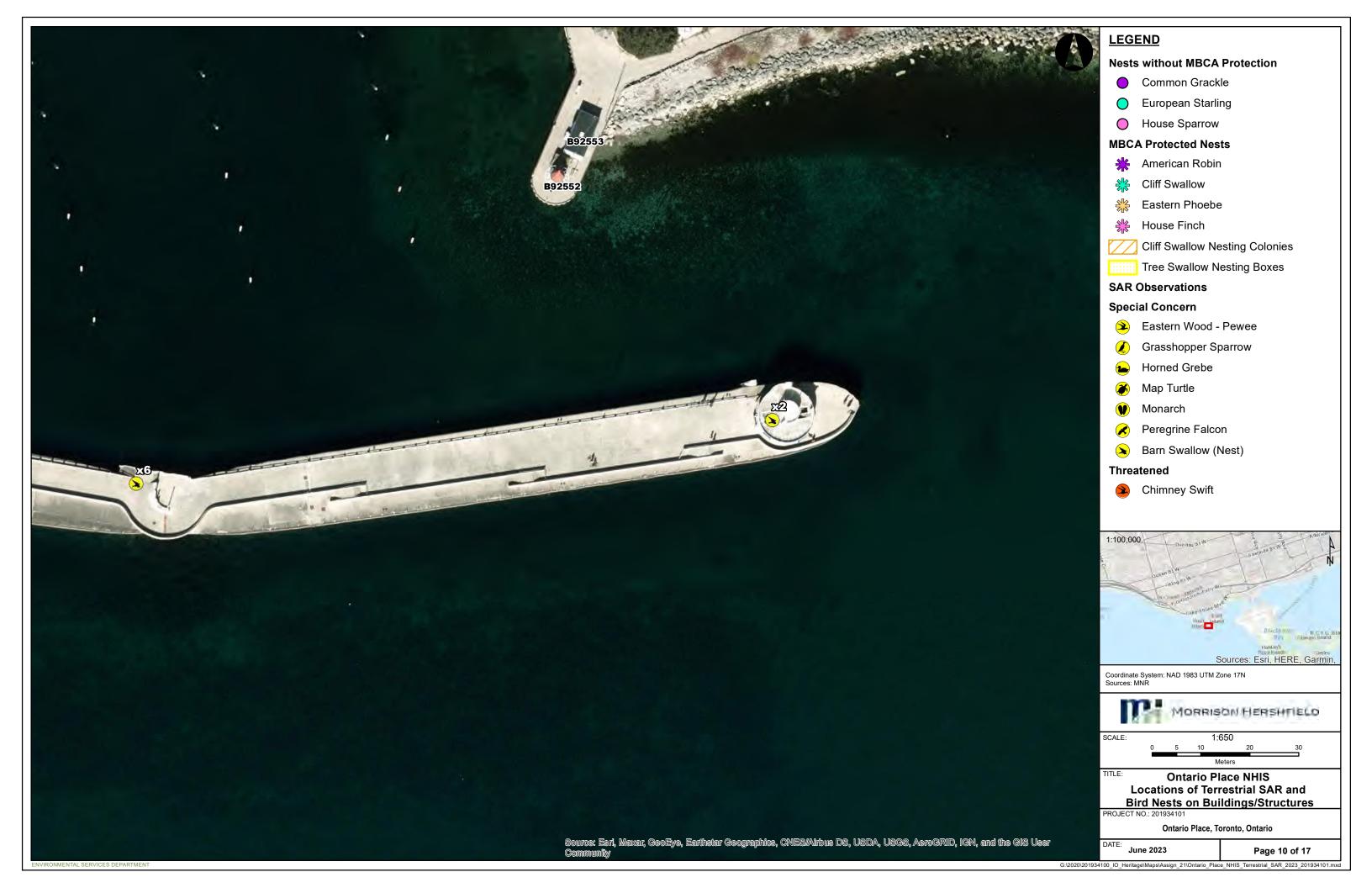
Ontario Place, Toronto, Ontario

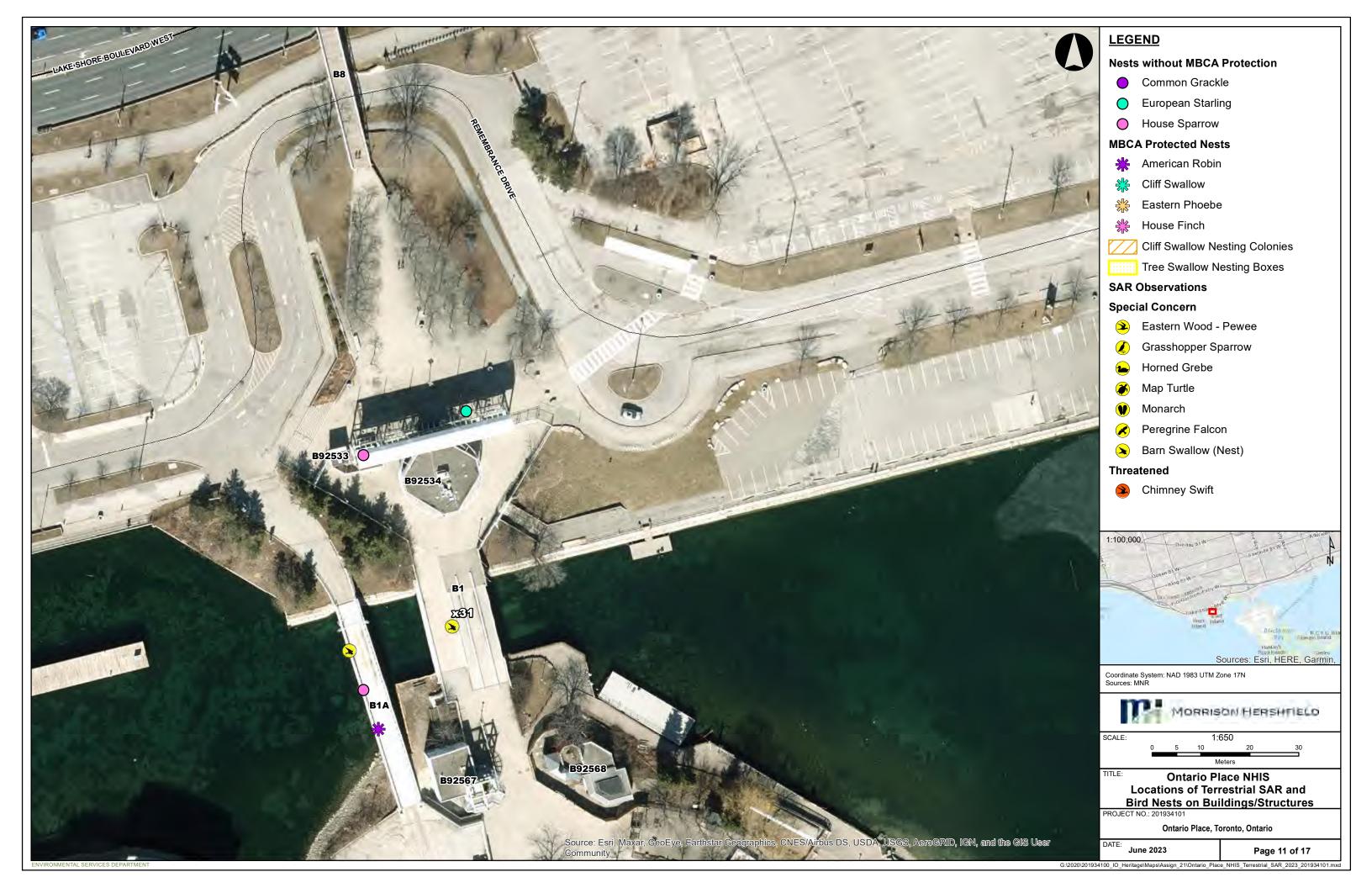
Page 7 of 17

G:\2020\201934100\_IO\_Heritage\Maps\Assign\_21\Ontario\_Place\_NHIS\_Terrestrial\_SAR\_2023\_201934101.mxd



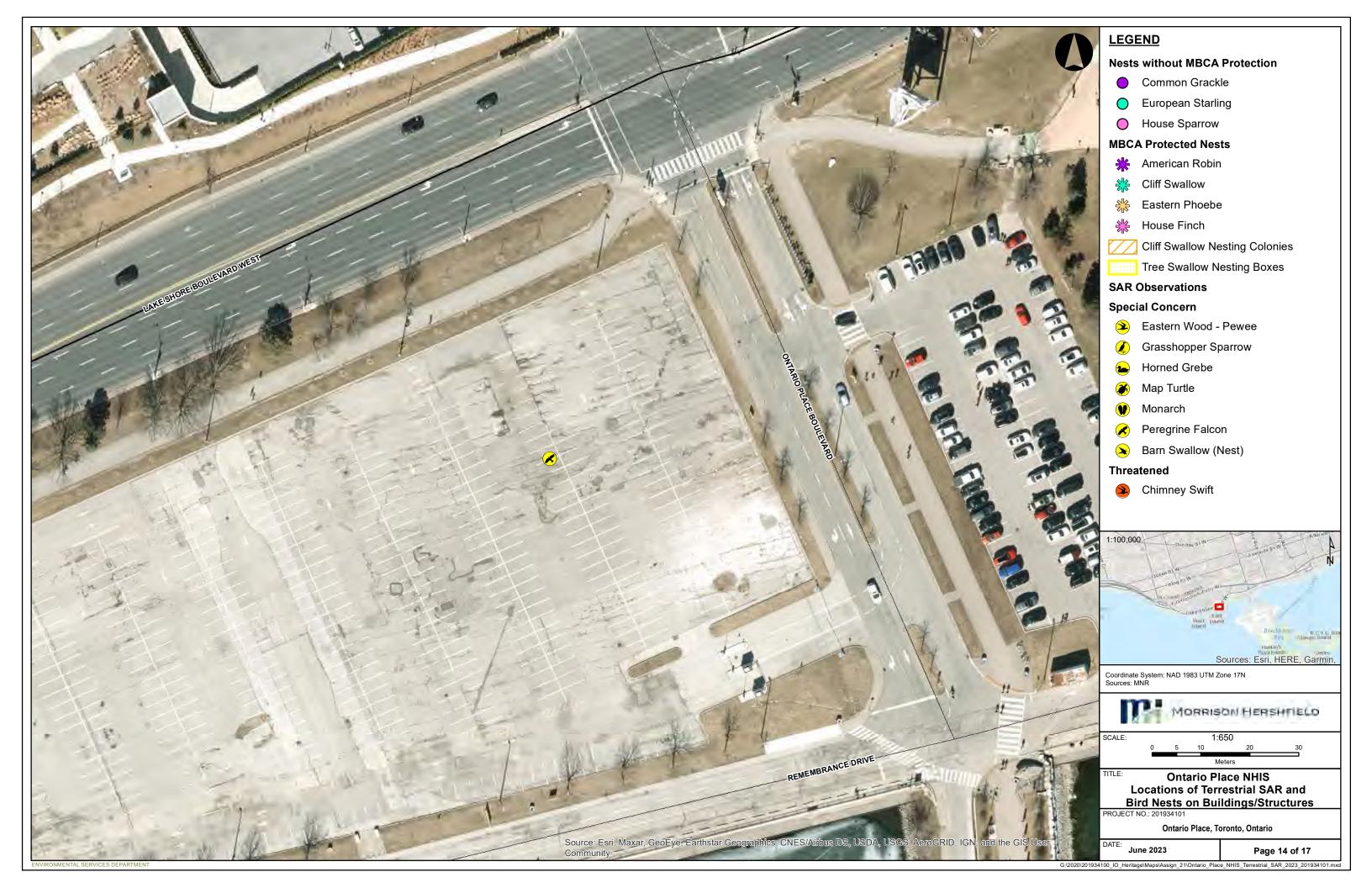






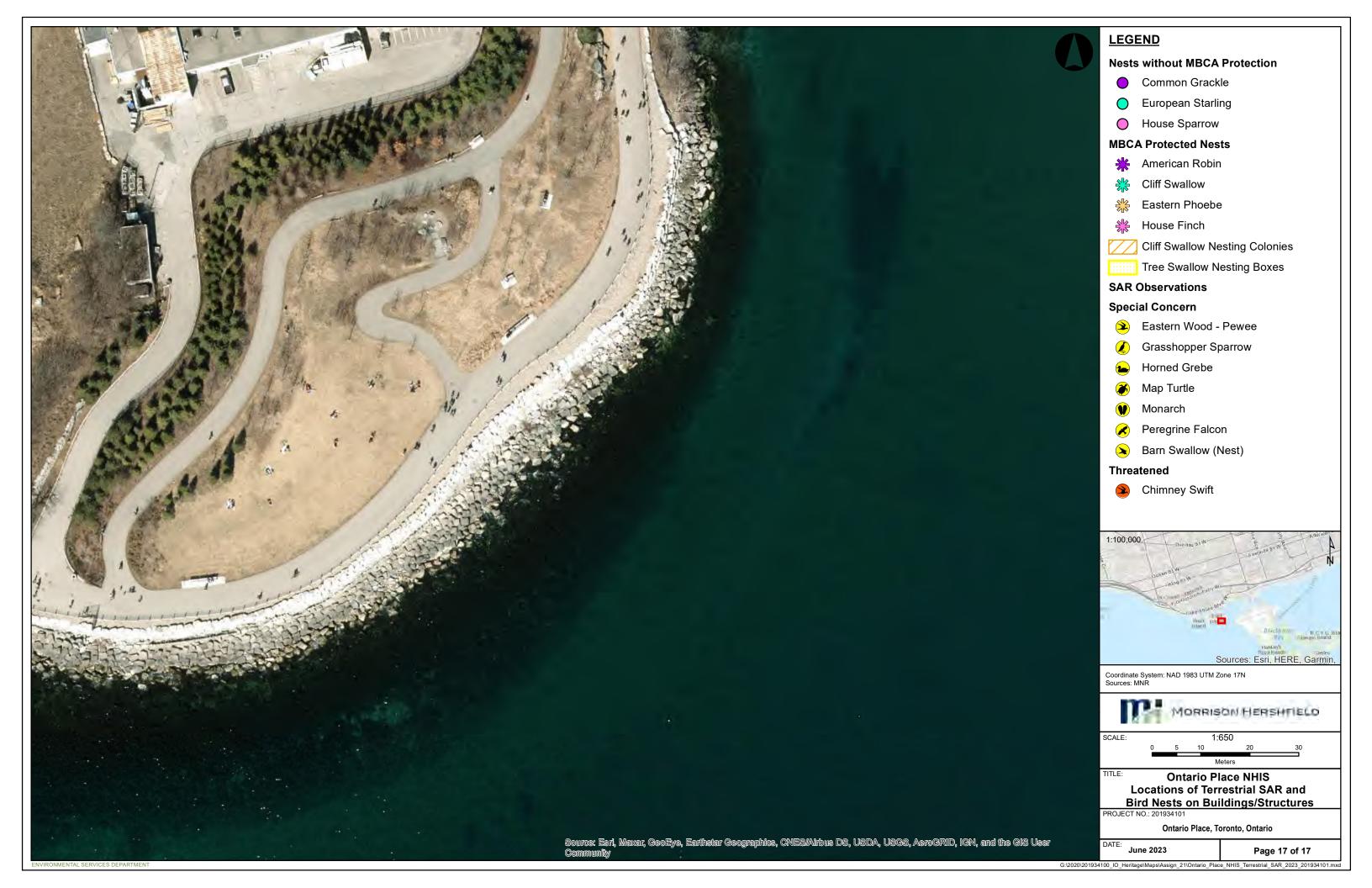












**APPENDIX G: Significant Wildlife Screening for Eco-Region 7E** 

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

AND DISCUSSION	Candidate SWH		Confirmed SWH	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment
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.	<ul> <li>Fields with sheet water during Spring (mid-March to May).</li> <li>Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.</li> <li>Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.</li> <li>Species:         American Black Duck, Northern Pintail, Gadwall, Blue-winged Teal, Green-winged Teal, American Wigeon, Northern Shoveler, Tundra Swan     </li> </ul>	<ul> <li>Studies carried out and verified presence of an annual concentration of any listed species:</li> <li>Any mixed species aggregations of 100 or more individuals required.</li> <li>The flooded field ecosite habitat plus a 100-300m radius, dependent on local site conditions and adjacent land use is the significant wildlife habitat.</li> <li>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).</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> </ul>	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	<ul> <li>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.</li> <li>These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water).</li> <li>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     </li> </ul>	<ul> <li>Studies carried out and verified presence of:</li> <li>Aggregations of 100 or more of listed species for 7 days, results in &gt; 700 waterfowl use days.</li> <li>Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH.</li> <li>The combined area of the ELC ecosites and a 100m radius area is the SWH.</li> <li>Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> <li>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).</li> </ul>	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	<ul> <li>Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats.</li> <li>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.</li> <li>Sewage treatment ponds and storm water ponds do not qualify as a SWH.</li> <li>Species:</li> <li>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,</li> </ul>	<ul> <li>Studies confirming:</li> <li>Presence of 3 or more of listed species and &gt; 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).</li> <li>Whimbrel stop briefly (&lt;24hrs) during spring migration, any site with &gt;100 Whimbrel used for 3 years or more is significant.</li> <li>The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> </ul>	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.

AND DISC. Habitan	Candidate SWH		Confirmed SWH	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment
		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).	<ul> <li>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.</li> <li>Raptor wintering (hawk/owl) sites need to be &gt; 20 ha with a combination of forest and upland.</li> <li>Least disturbed sites, idle/fallow or lightly grazed field/meadow (&gt;15ha) with adjacent woodlands.</li> <li>Field area of the habitat is to be wind swept with limited snow depth or accumulation.</li> <li>Eagle sites have open water and large trees and snags available for roosting.</li> <li>Species:         <ul> <li>Rough-legged Hawk, Red-tailed Hawk, Northern Harrier, American Kestrel, Snowy Owl</li> </ul> </li> <li>Special Concern: Short-eared Owl, Bald Eagle</li> </ul>	<ul> <li>Studies confirm the use of these habitats by:</li> <li>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.</li> <li>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.</li> <li>The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> </ul>	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)	<ul> <li>Hibernacula may be found in caves, mine shafts, underground foundations, and Karsts.</li> <li>Active mine sites should not be considered as SWH. The locations of bat hibernacula are relatively poorly known.</li> <li>Species:</li> <li>Big Brown Bat, Tri-coloured Bat</li> </ul>	<ul> <li>All sites with confirmed hibernating bats are SWH.</li> <li>The area includes 200m radius around the entrance of the hibernaculum for most development types and 1000m for wind farms.</li> <li>Studies are to be conducted during the peak swarming period (Aug. – Sept.).</li> <li>Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects".</li> </ul>	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	<ul> <li>Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).</li> <li>Maternity roosts are not found in caves and mines in Ontario.</li> <li>Maternity colonies located in Mature deciduous or mixed forest stands with &gt;10/ha large diameter (&gt;25cm dbh) wildlife trees.</li> <li>Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2.</li> <li>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.</li> <li>Species:</li> <li>Big Brown Bat, Silver-haired Bat</li> </ul>	<ul> <li>Maternity Colonies with confirmed use by:         <ul> <li>&gt;10 Big Brown Bats</li> <li>&gt;5 Adult Female Silver-haired Bats</li> </ul> </li> <li>The area of the habitat includes the entire woodland, or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies.</li> <li>Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitat: Guidelines for Wind Power Projects".</li> </ul>	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	<ul> <li>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.</li> <li>Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen.</li> <li>Man-made ponds such as sewage lagoons or storm water</li> </ul>	<ul> <li>Presence of 5 over-wintering Midland Painted Turtles is significant.</li> <li>One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant.</li> <li>The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river,</li> </ul>	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

Milalisa Habisas	Candidate SWH		Confirmed SWH	A
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment
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. <u>Species:</u> <i>Midland Painted Turtle</i> Special Concern: <i>Northern Map Turtle, Snapping Turtle</i>	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.	<ul> <li>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.</li> <li>Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line.</li> <li>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.</li> <li>Species:</li> <li>Eastern Gartersnake, Northern Watersnake, Northern Red-bellied Snake, Northern Brownsnake, Smooth Green Snake, Northern Ring-necked Snake, Milksnake</li> <li>Special Concern: Eastern Ribbonsnake</li> </ul>	<ul> <li>Studies confirming:         <ul> <li>Presence of snake hibernacula used by a minimum of five individuals of a snake sp. Or; individuals of two or more snake spp.</li> <li>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).</li> </ul> </li> <li>Note: If there are Special Concern Species present, then site is SWH.</li> <li>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.</li> </ul>	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	<ul> <li>Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area.</li> <li>Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles.</li> <li>Does not include a licensed/permitted Mineral Aggregate Operation.</li> <li>Species:         <ul> <li>Cliff Swallow</li> </ul> </li> <li>Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)</li> </ul>	<ul> <li>Studies confirming:</li> <li>Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season.</li> <li>A colony identified as SWH will include a 50m radius habitat area from the peripheral nests.</li> <li>Field surveys to observe and count swallow nests are to be completed during the breeding season.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> </ul>	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	<ul> <li>Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.</li> <li>Most nests in trees are 11 to 15 m from ground, near the top of the tree.</li> <li>Species:</li> <li>Great Blue Heron, Black-crowned Night-Heron, Great Egret, Green Heron</li> </ul>	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	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment
			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	<ul> <li>Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas.</li> <li>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.</li> <li>Species:         Herring Gull, Great Black-backed Gull, Little Gull, Ring-billed Gull, Common Tern, Caspian Tern, Brewer's Blackbird     </li> </ul>	<ul> <li>Studies confirming:</li> <li>Presence of &gt; 25 active nests for Herring Gulls or Ring-billed Gulls, &gt;5 active nests for Common Tern or &gt;2 active nests for Caspian Tern.</li> <li>Presence of 5 or more pairs for Brewer's Blackbird.</li> <li>Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant.</li> <li>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 &lt;3.0ha with a colony is the SWH.</li> <li>Studies would be done during May/June when actively nesting.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> </ul>	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.	<ul> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>Species:</li> <li>Painted Lady, Red Admiral</li> <li>Special Concern: Monarch</li> </ul>	<ul> <li>Studies confirm:</li> <li>The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct).</li> <li>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.</li> <li>Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD.</li> <li>MUD of &gt;5000 or &gt;3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.</li> </ul>	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	<ul> <li>Woodlots &gt;5 ha in size and within 5 km of Lake Erie and Lake Ontario.</li> <li>If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat.</li> <li>If multiple woodlands are located along the shoreline those Woodlands &lt;2km from Lake Erie and Lake Ontario are more significant.</li> <li>Sites have a variety of habitats; forest, grassland and wetland complexes.</li> <li>The largest sites are more significant.</li> <li>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.</li> </ul>	<ul> <li>Studies confirm:</li> <li>Use of the habitat by &gt;200 birds/day and with &gt;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.</li> <li>Studies should be completed during spring (Mar to May) and fall (Aug to Oct) migration using standardized assessment techniques.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects.</li> </ul>	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	A
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment
		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.	<ul> <li>Woodlots &gt;100 ha in size or if large woodlots are rare in a planning area, woodlots &gt;50ha.</li> <li>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.</li> <li>Large woodlots &gt; 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.</li> <li>Woodlots with high densities of deer due to artificial feeding are not significant.</li> <li>Species:</li> <li>White-tailed Deer</li> </ul>	<ul> <li>Studies confirm:</li> <li>Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF.</li> <li>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.</li> <li>Studies should be completed during winter (Jan/Feb) when &gt;20cm of snow is on the ground using aerial survey techniques, ground or road survey, or a pellet count deer density survey.</li> </ul>	Not Present  Based on MNRF mapping and the conditions on site, deer wintering yards are not present within or surrounding the AOI.
Rare Vegetation Commu	ınities			
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	<ul> <li>A Cliff is vertical to near vertical bedrock &gt;3m in height.</li> <li>A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.</li> <li>Most cliff and talus slopes occur along the Niagara Escarpment.</li> </ul>	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%.	<ul> <li>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.</li> <li>Vegetation can vary from patchy and barren to tree covered, but less than 60%.</li> <li>A sand barren area &gt;0.5ha in size.</li> </ul>	<ul> <li>Confirm any ELC Vegetation Type for Sand Barrens.</li> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover are exotic sp.).</li> </ul>	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	<ul> <li>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.</li> <li>Vegetation cover varies from patchy to barren with a less than 60% tree cover.</li> <li>An Alvar site &gt; 0.5 ha in size.</li> <li>Alvar is particularly rare in Eco-Region 7E where the only known sites are found in the western islands of Lake Erie.</li> </ul>	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

MCL IPC- Hall Year		Candidate SWH	Confirmed SWH	Accepament	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment	
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.	<ul> <li>If dominant trees species of the area are &gt;140 years old, then the area containing these trees is Significant Wildlife Habitat.</li> <li>The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present).</li> <li>The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH.</li> <li>Determine ELC vegetation types for the forest area containing the old growth characteristics.</li> </ul>	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	<ul> <li>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</li> <li>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).</li> <li>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.</li> </ul>	<ul> <li>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</li> <li>Area of the ELC Ecosite is the SWH.</li> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover are exotic sp.).</li> </ul>	Not Present This vegetation community is not present within the AOI.	
Tallgrass Prairie Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1, TPO2	<ul> <li>A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has &lt; 25% tree cover.</li> <li>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).</li> <li>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.</li> </ul>	<ul> <li>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.</li> <li>Area of the ELC Ecosite is the SWH.</li> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover are exotic sp.).</li> </ul>	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.	<ul> <li>Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.</li> <li>ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M of the SWHTG.</li> <li>The OMNRF/NHIC will have up to date listing for rare vegetation communities.</li> </ul>	<ul> <li>Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWTG.</li> <li>Area of the ELC Vegetation Type polygon is the SWH.</li> </ul>	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,	<ul> <li>A waterfowl nesting area extends 120 m from a wetland (&gt; 0.5 ha) or a wetland (&gt;0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (&lt;0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur.</li> <li>Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding</li> </ul>	<ul> <li>Studies confirmed:</li> <li>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.</li> <li>Any active nesting site of an American Black Duck is considered significant.</li> <li>Nesting studies should be completed during the spring</li> </ul>	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	

MICHAEL HARRIST		Candidate SWH	Confirmed SWH	<b>A</b>
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment
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	<ul> <li>breeding season (April - June).</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> <li>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.</li> </ul>	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	<ul> <li>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</li> <li>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.</li> <li>Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms).</li> <li>Species:         Osprey         Special Concern: Bald Eagle     </li> </ul>	<ul> <li>Studies confirm the use of these nests by:</li> <li>One or more active Osprey or Bald Eagle nests in an area.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>To be significant a site must be used annually. When found inactive, the site must be known to be inactive for &gt;3 years or suspected of not being used for &gt;5 years before being considered not significant.</li> <li>Observational studies to determine nest site use, perching sites and foraging areas need to be done from early March to mid-August.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> </ul>	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	<ul> <li>All natural or conifer plantation woodland/forest stands &gt;30ha with &gt;4ha of interior habitat. Interior habitat determined with a 200m buffer.</li> <li>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.</li> <li>In disturbed sites, nests may be used again, or a new nest will be in close proximity to an old nest.</li> <li>Species:</li> <li>Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Redshouldered Hawk, Barred Owl, Broad-winged Hawk</li> </ul>	<ul> <li>Studies confirm:</li> <li>Presence of 1 or more active nests from species list is considered significant.</li> <li>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).</li> <li>Barred Owl – A 200m radius around the nest is the SWH.</li> <li>Broad-winged Hawk and Coopers Hawk– A 100m radius around the nest is the SWH.</li> <li>Sharp-Shinned Hawk – A 50m radius around the nest is the SWH.</li> <li>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.</li> </ul>	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.

Milalista Habitat		Candidate SWH	Confirmed SWH	Assassment	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment	
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	<ul> <li>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.</li> <li>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.</li> <li>Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</li> <li>Species:         Midland Painted Turtle     </li> <li>Special Concern: Northern Map Turtle, Snapping Turtle</li> </ul>	<ul> <li>Studies confirm:</li> <li>Presence of 5 or more nesting Midland Painted Turtles.</li> <li>One or more Northern Map Turtle or Snapping Turtle nesting is a SWH.</li> <li>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.</li> <li>Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat.</li> <li>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.</li> </ul>	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.	<ul> <li>Any forested area (with &lt;25% meadow/field/pasture) within the headwaters of a stream or river system.</li> <li>Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.</li> <li>Species:</li> <li>Wild Turkey, Ruffed Grouse, Spruce Grouse, White-tailed Deer, Salamander spp.</li> </ul>	<ul> <li>Field Studies confirm:</li> <li>Presence of a site with 2 or more seeps/springs should be considered SWH.</li> <li>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.</li> </ul>	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.	<ul> <li>Presence of a wetland, pond or woodland pool (including vernal pools) &gt;500m² (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.</li> <li>Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.</li> <li>Species:</li> <li>Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog</li> </ul>	<ul> <li>Studies confirm:</li> <li>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.</li> <li>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.</li> <li>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.</li> </ul>	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	<ul> <li>Wetlands&gt;500m² (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.</li> <li>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.</li> <li>Bullfrogs require permanent water bodies with abundant emergent vegetation.</li> </ul>	<ul> <li>Studies confirm:</li> <li>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.</li> <li>The ELC ecosite wetland area and the shoreline are the SWH.</li> </ul>	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 Hebre		Candidate SWH	Confirmed SWH	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	- Assessment
	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	<ul> <li>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.</li> <li>If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered.</li> </ul>	
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	<ul> <li>Habitats where interior forest breeding birds are breeding, typically large mature (&gt;60 yrs old) forest stands or woodlots &gt;30ha.</li> <li>Interior forest habitat is at least 200 m from forest edge habitat. Species:         Yellow-bellied Sapsucker, Red-breasted Nuthatch, Veery, Blueheaded Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Ovenbird, Scarlet Tanager, Winter Wren, Pileated Woodpecker</li></ul>	<ul> <li>Studies confirm:</li> <li>Presence of nesting or breeding pairs of 3 or more of the listed wildlife species.</li> <li>Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH.</li> <li>Conduct field investigations in spring and early summer when birds are singing and defending their territories.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"</li> </ul>	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 C	Conservation Concern Conside	ered 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.	<ul> <li>Nesting occurs in wetlands.</li> <li>All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present.</li> <li>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.</li> <li>Species:         <ul> <li>American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Green Heron, Trumpeter Swan</li> <li>Special Concern: Black Tern, Yellow Rail</li> </ul> </li> </ul>	<ul> <li>Studies confirm:</li> <li>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.</li> <li>Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH.</li> <li>Area of the ELC ecosite is the SWH.</li> <li>Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"</li> </ul>	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	<ul> <li>Large grassland areas (includes natural and cultural fields and meadows) &gt;30 ha.</li> <li>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).</li> <li>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.</li> <li>The indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</li> <li>Species:</li> <li>Upland Sandpiper, Vesper Sparrow, Northern Harrier, Savannah Sparrow</li> <li>Special Concern: Grasshopper Sparrow, Short-eared Owl</li> </ul>	<ul> <li>Field Studies confirm:</li> <li>Presence of nesting or breeding of 2 or more of the listed species.</li> <li>A field with 1 or more breeding Short-eared Owls is to be considered SWH.</li> <li>The area of SWH is the contiguous ELC ecosite field areas.</li> <li>Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects".</li> </ul>	Not Present Large grassland areas are not present within the AOI. Therefore, this SWH is not present.

MCI DCC III-1 Co.		Candidate SWH	Confirmed SWH	Assassment	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	Assessment	
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	<ul> <li>Large field areas succeeding to shrub and thicket habitats&gt;10ha in size.</li> <li>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).</li> <li>Shrub thicket habitats (&gt;10 ha) are most likely to support and sustain a diversity of these species.</li> <li>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.</li> <li>Species:</li> <li>Indicator Spp.: Brown Thrasher, Clay-coloured Sparrow</li> <li>Common Spp.: Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher</li> <li>Special Concern: Golden-winged Warbler</li> <li>Endangered: Yellow-breasted Chat</li> </ul>	<ul> <li>Field Studies confirm:</li> <li>Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.</li> <li>A habitat with breeding Yellow- breasted Chat or Goldenwinged Warbler is to be considered as Significant Wildlife Habitat.</li> <li>The area of the SWH is the contiguous ELC ecosite field/thicket area.</li> <li>Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"</li> </ul>	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.	<ul> <li>Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish.</li> <li>Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water.</li> <li>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.</li> <li>Species:         Chimney or Digger Crayfish; (Fallicambarus fodiens)         Devil Crayfish or Meadow Crayfish; (Cambarus diogenes)     </li> </ul>	<ul> <li>Studies Confirm:</li> <li>Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites.</li> <li>Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH.</li> <li>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.</li> </ul>	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.	<ul> <li>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.</li> <li>Expert advice should be sought as many of the rare spp. have little information available about their requirements.</li> <li>Species:</li> <li>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).</li> </ul>	<ul> <li>Studies Confirm:</li> <li>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.</li> <li>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.</li> </ul>	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	A	
Wildlife Habitat	ELC Ecosites	Habitat Criteria	Defining Criteria	- Assessment	
Animal Movement Corri	dors			<ul> <li>Ohio Buckeye</li> <li>The following species were not observed within the AOI during 2022 investigations but may also be present:</li> <li>Snapping Turtle (SC)</li> </ul>	
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.	<ul> <li>Movement corridors between breeding habitat and summer habitat.</li> <li>Movement corridors must be determined when Amphibian Breeding Habitat is confirmed as SWH.</li> <li>Species:         <ul> <li>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</li> </ul> </li> </ul>	<ul> <li>Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites.</li> <li>Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant.</li> <li>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 &lt;20m.</li> <li>Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat.</li> </ul>	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 Habi	tat Exceptions for Eco-distric	ts 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.	<ul> <li>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.</li> <li>This is the only known bat migratory stopover habitat based on current information.</li> <li>Species:         Hoary Bat, Eastern Red Bat, Silver-haired Bat     </li> </ul>	<ul> <li>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.</li> <li>The confirmation criteria and habitat areas for this SWH are still being determined.</li> </ul>	Not Present The AOI is not in a known stopover location and is unlikely to provide suitable conditions for stopover habitat.	

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

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	<ul> <li>Restricted to where wild lupine grows – in sandy soils, sandy pine barrens, beach dunes, and oak savannahs.</li> </ul>	<ul> <li>This species is extirpated from (no longer present in) Ontario, and there is no suitable habitat for this species at this site.</li> </ul>	<ul> <li>Ontario Butterfly Atlas (OBA)</li> </ul>
Invertebrates	Monarch	Danaus plexippus	SC	SC	<ul> <li>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.</li> <li>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.</li> </ul>	This species has been <b>confirmed</b> on site nectaring, however, breeding (caterpillars or eggs) has not been confirmed.	Ontario Butterfly Atlas (OBA)
Invertebrates	Mottled Duskywing	Erynnis martialis	END	NS	<ul> <li>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.</li> <li>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.</li> </ul>	The host species for Mottled Duskywing are not present on site, therefore there is no habitat for this species.  The host species for Mottled Duskywing are not present on site, therefore there is no habitat for this species.	<ul> <li>Ontario Butterfly Atlas (OBA)</li> </ul>
Avifauna	Bank Swallow	Riparia riparia	THR	THR	<ul> <li>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).</li> <li>They breed in colonies ranging from several to a few thousand pairs.</li> </ul>	<ul> <li>This species was not detected during targeted surveys and there is no suitable nesting habitat for this species within the AOI.</li> </ul>	<ul> <li>Ontario Breeding Bird Atlas (OBBA)</li> </ul>
Avifauna	Barn Swallow	Hirundo rustica	SC	THR	<ul> <li>Breeding and nesting occur in and on artificial structures, including barns and other outbuildings, bridges, and culverts.</li> <li>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.</li> </ul>	<ul> <li>This species has been confirmed nesting on numerous buildings and structures on site, and utilizes the majority of the site for foraging.</li> </ul>	<ul> <li>Ontario Breeding Bird Atlas (OBBA)</li> </ul>
Avifauna	Bobolink	Dolichonyx oryzivorus	THR	THR	<ul> <li>Foraging and breeding habitat is primarily found within meadows, fields and agricultural crops with tall grasses.</li> <li>Row crops and pastures with high shrub densities are typically avoided.</li> </ul>	<ul> <li>There is no suitable habitat on site for this species.</li> </ul>	<ul> <li>Ontario Breeding Bird Atlas (OBBA)</li> </ul>
Avifauna	Chimney Swift	Chaetura pelagica	THR	THR	<ul> <li>Foraging habitat is often concentrated near water, where insects are the most abundant.</li> <li>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.</li> </ul>	This species has been <b>observed</b> 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	<ul> <li>There species is absent from the site, as they have not been detected during targeted, species-specific surveys.</li> </ul>	<ul> <li>Ontario Breeding Bird Atlas (OBBA)</li> </ul>

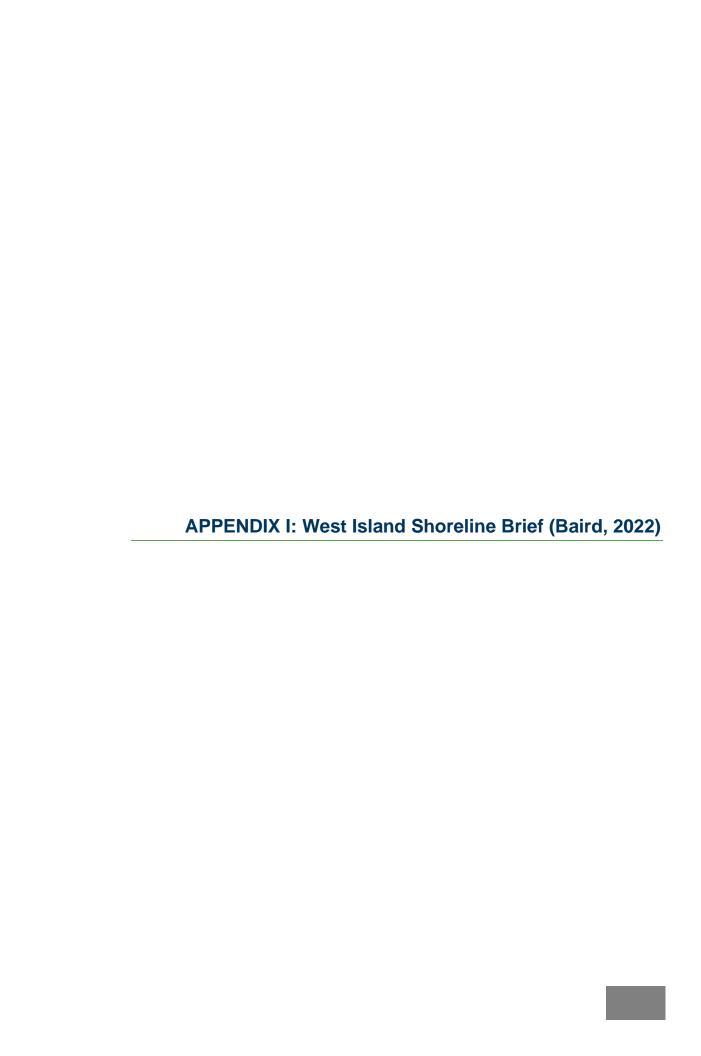
Species Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
					outcrops, rock barrens, and in prairies, marshes, peatbogs, and pastures. Although they may also nest in cultivated fields, 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	<ul> <li>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.</li> <li>Breeding habitat is usually in large tracts of grasslands with a minimum area of 5 hectares.</li> <li>Scattered trees, shrubs, telephone poles and fence posts are used as elevated song perches.</li> </ul>	There is no suitable habitat on site for this species.	Ontario Breeding Bird Atlas (OBBA)
Avifauna	Eastern Wood- pewee	Contopus virens	SC	SC	<ul> <li>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.</li> <li>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.</li> <li>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.</li> </ul>	This species has been <b>confirmed</b> on site during the breeding season, but was not confirmed as breeding.  season, but was not confirmed as breeding.	<ul> <li>Ontario Breeding Bird Atlas (OBBA)</li> <li>Natural Heritage Information Centre (NHIC)</li> </ul>
Avifauna	Grasshopper Sparrow	Ammodramus savannarum	SC	SC	<ul> <li>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.</li> <li>A short-distance migrant that leaves Ontario in the fall to migrate to the southeastern United States and Central America for the winter.</li> </ul>	This species was <b>confirmed</b> on site during spring migration.  This species was <b>confirmed</b> on site during spring migration.	N/A; observed on site
Avifauna	Horned Grebe	Podiceps auritus	SC	SC	<ul> <li>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.</li> <li>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.</li> </ul>	This species was <b>confirmed</b> on site during spring migration.  This species was <b>confirmed</b> on site during spring migration.	N/A; observed on site

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	<ul> <li>Found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels.</li> <li>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.</li> </ul>	There is no suitable habitat on site for this species.  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 <b>observed</b> 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	<ul> <li>Breeding habitat includes moist, deciduous hardwood or mixed stands, which usually have thick deciduous undergrowth and tall trees used as singing perches.</li> <li>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.</li> </ul>	There is no suitable habitat on site for this species.	Ontario Breeding Bird Atlas (OBBA)
Herpetofauna	Blanding's Turtle	Emydoidea blandingii	THR	END	<ul> <li>Live in shallow water, usually in large wetlands and shallow lakes with an abundance of aquatic plants.</li> <li>May be found hundreds of metres from the nearest water body, especially while searching for mates or traveling to nesting sites.</li> <li>Hibernate in the mud at the bottom of permanent water bodies.</li> </ul>	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	<ul> <li>Specializes in hunting and eating toads, and usually only occurs where toads can be found.</li> <li>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.</li> </ul>	There is no suitable habitat on site for this species and they were not detected during targeted surveys.  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	<ul> <li>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.</li> <li>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.</li> </ul>	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 Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
					<ul> <li>shallow water, especially if it is fleeing from a potential predator.</li> <li>Congregate in underground burrows or rock crevices to hibernate in groups.</li> </ul>		
Herpetofauna	Northern Map Turtle	Graptemys geographica	SC	SC	<ul> <li>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.</li> <li>In winter, hibernates on the bottom of deep, slow-moving sections of river.</li> </ul>	This species has been <b>observed</b> 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.	<ul> <li>Ontario Reptile and Amphibian Atlas (ORAA)</li> <li>Natural Heritage Information Centre (NHIC)</li> </ul>
Herpetofauna	Queensnake	Regina septemvittata	END	END	<ul> <li>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).</li> <li>Often hibernating in groups with other snakes, amphibians and even crayfish, suitable hibernation sites include abutments of old bridges and crevices in bedrock.</li> </ul>	There is no suitable habitat on site for this species and they were not detected during targeted surveys.  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	<ul> <li>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.</li> <li>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.</li> <li>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.</li> </ul>	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 NS	<ul> <li>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.</li> <li>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.</li> <li>Hibernation sites include humid areas that are cold but do not freeze such as in caves, mines, rock crevices, and unheated basements.</li> </ul>	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	<ul> <li>This species has been confirmed on site, within Lake Ontario.</li> </ul>	<ul> <li>Toronto and Region Conservation Authority (TRCA)</li> </ul>

Species Grouping	Species Common Name	Species Scientific Name	*ESA Status	*SARA Status	Habitat Requirements	Suitable Habitat for Species within the Project Area	Background Source
					<ul> <li>Eel to have the broadest diversity of habitats of any fish species in the world.</li> <li>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.</li> </ul>		

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





W.F. Baird & Associates Coastal Engineers Ltd.

## Memorandum

Office | 1267 Cornwall Road, Suite 100, Oakville, Ontario L6J 7T5, Canada Phone | +1 905 845 5385 Email | oakville@baird.com

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 hardedge treatments will be replaced with a naturalized, green wetland edge.

www.baird.com

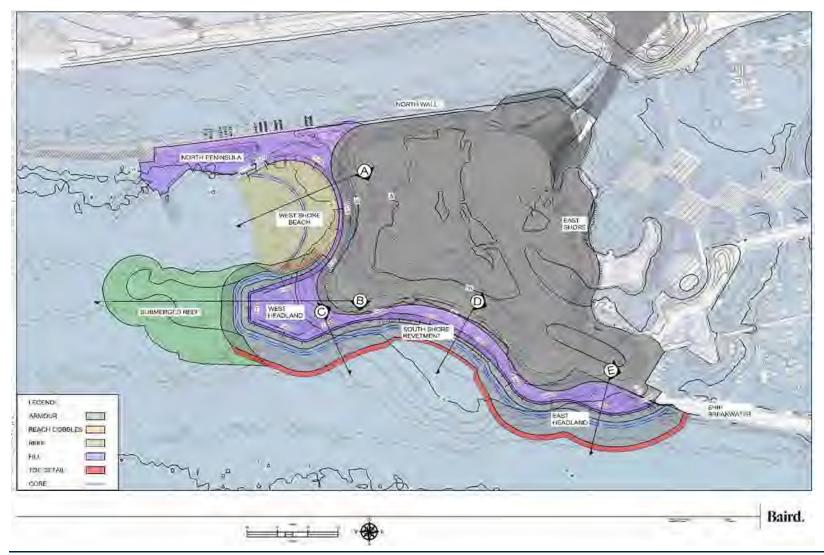
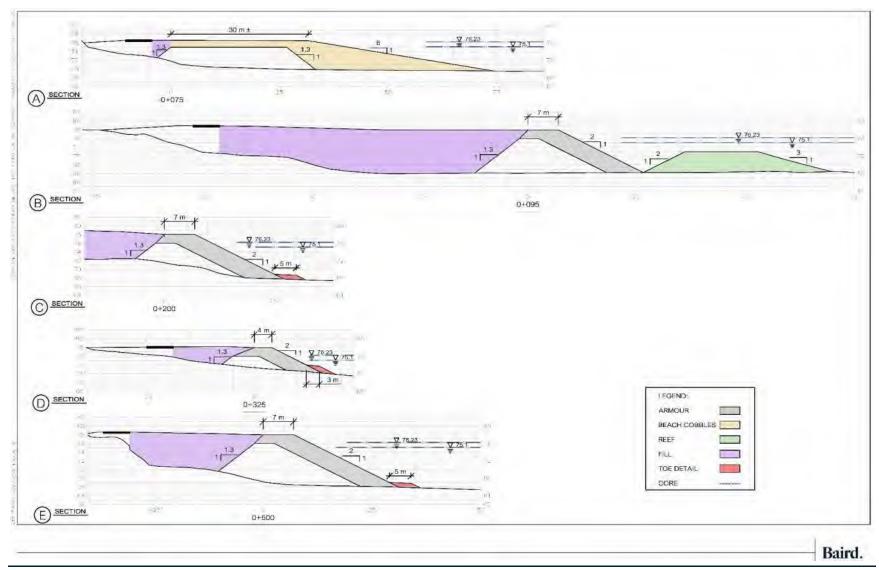


Figure 1: Concept plan of primary elements of proposed shoreline, West Island Ontario Place

Commercial in Confidence Baird.

www.baird.com



Commercial in Confidence

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

Baird.

www.baird.com

13471.201.M1.R3\_West Island Shoreline Brief

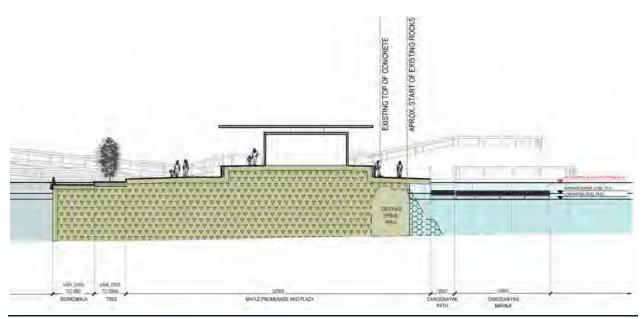


Figure 3: Concept section at north peninsula (south side on left side of figure; north side with canoe/kayak area on right hand side of figure)

#### 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 m², 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 m², including the shore works (Area C) and the submerged reef (Area D). At the east shore of the West Island, about 1100 m² 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	<ul> <li>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.</li> </ul>	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.
	<ul> <li>Higher design water levels due to the Lake Ontario regulation plan and climate change impacts increases the risk of future erosion and flooding damage.</li> </ul>	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	<ul> <li>Public space along the water's edge at the perimeter of the lakefill is narrow with only limited connection to the water's edge.</li> </ul>	<ul> <li>Increase the width of the perimeter public realm for pedestrians, cyclists, and emergency vehicles; provide waterfront park amenities and canoe/kayak docking.</li> </ul>
and - Connectivity to the Water	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.	<ul> <li>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.</li> </ul>
Aquatic Habitat	<ul> <li>Lack of aquatic habitat features along the shoreline.</li> </ul>	Enhance aquatic habitat features consistent with Toronto Waterfront Aquatic Habitat Restoration Strategy (TWARS), including submerged reef and surcharged open coast revetments.
	<ul> <li>East shore lagoon has hard, vertical edges (e.g., timber pilings, steel sheet piles); water is stagnant.</li> </ul>	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)	
Α	New Lakefill Above Water	31,700 m <sup>2</sup>	
В	New Lakefill Above Water (East Shore)	4,300 m <sup>2</sup>	
Total Surface Area of New Lakefill Above Water			36,000 m²
С	New Lakefill Below Water	15,700 m <sup>2</sup>	
D	New Submerged Reef (Lakefill Below Water)	9,500 m <sup>2</sup>	
Total Surface Area of New Lakefill Below Water			25,200 m²
Е	New Water Area Created from Existing Lake	fill 1100 m <sup>2</sup>	

#### 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 m³; 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 (m³)	Beach Material (m³)	Clean Fill (m³)	Reef Stone (m³)
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 <sup>3</sup>	24,000 m <sup>3</sup>	108,000 m <sup>3</sup>	30,000 m <sup>3</sup>
	Total Lakefill Volume			279,000 m <sup>3</sup>



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

www.baird.com Commercial in Confidence

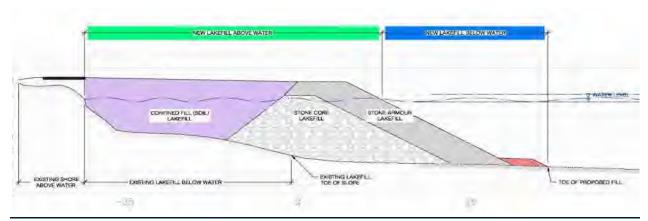


Figure 5: Definition sketch of new lakefill areas above water and new lakefill areas below water

#### **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<sup>1</sup>; Jacobs, 2020<sup>2</sup>) 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., EurOtop³).

Baird.

www.baird.com

<sup>&</sup>lt;sup>1</sup> Shoreplan Engineering Limited, 2012. Ontario Place Preliminary Coastal Assessment, Technical Memorandum, November 30.

<sup>&</sup>lt;sup>2</sup> Jacobs, 2020. Ontario Place Coastal Assessment, Technical Memorandum No. 1, December 18.

<sup>&</sup>lt;sup>3</sup> 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<sup>4</sup>; 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

<sup>\* (100-</sup>year Flood Level Used)

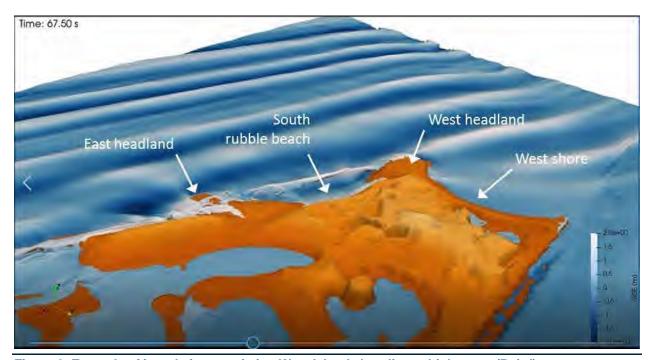


Figure 6: Example of inundation at existing West Island shoreline at high water (Baird)

Baird.

www.baird.com

<sup>&</sup>lt;sup>4</sup> Shoreplan Engineering Limited, 2013. Ontario Place Preliminary Coastal Assessment, Wave Uprush, April 24.

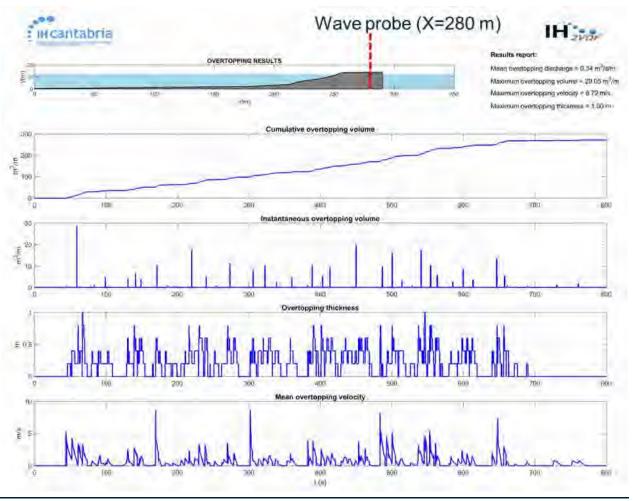


Figure 7: Example of numerical modelling of wave overtopping of existing shoreline, West Island Ontario Place (Baird)

#### 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

Baird.

www.baird.com

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.

Baird.

www.baird.com

#### **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)

Baird.

www.baird.com Commercial in Confidence



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.

Baird.

www.baird.com

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).

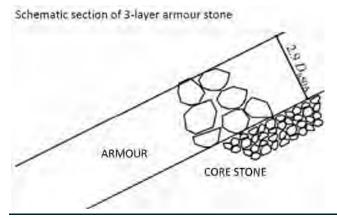


Figure 13: Schematic of multiple layer armour protection

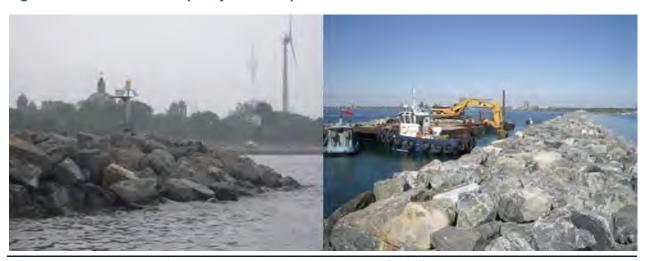


Figure 14: Armour protection at Western Beaches breakwater (Baird)

Baird.

www.baird.com



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

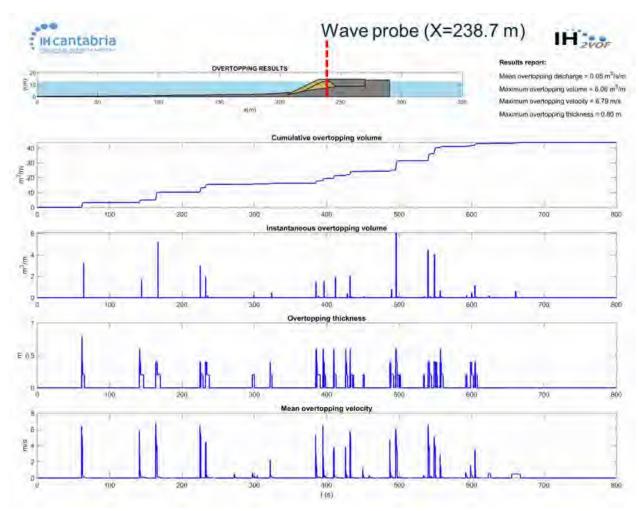


Figure 16: Example of numerical modelling of wave overtopping of proposed shoreline protection concept, West Island Ontario Place (Baird)

Baird.

www.baird.com Commercial in Confidence



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.



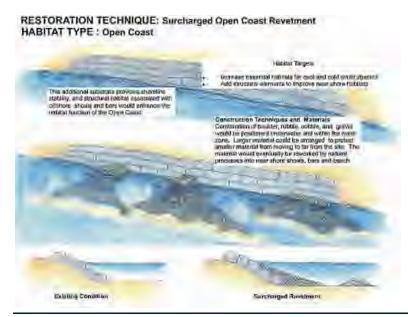


Figure 18: Surcharged open coast revetment (TWARS)

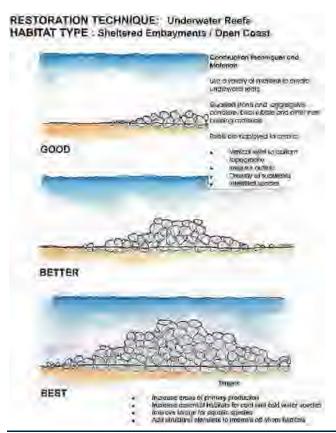


Figure 19: Underwater reefs (TWARS)

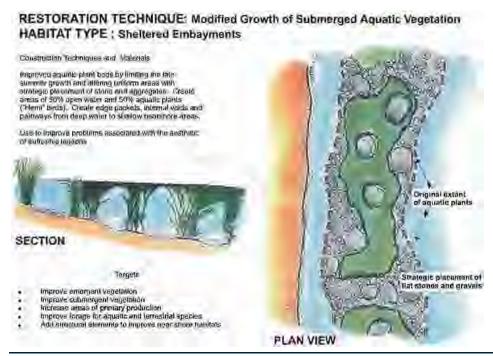


Figure 20: Modified growth of submerged aquatic vegetation (TWARS)

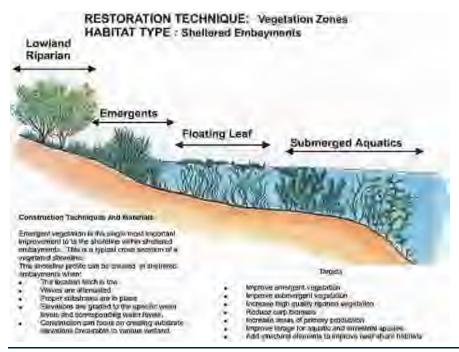


Figure 21: Vegetation zones (TWARS)

Baird.

www.baird.com Commercial in Confidence





# **Natural Heritage Impact Study**

## **Redevelopment of Ontario Place**

## **Infrastructure Ontario**

44-1 Dundas St W, Toronto, ON M5G 1Z3

Prepared by:

SLR Consulting (Canada) Ltd.

100 Stone Road West, Suite 201, Guelph, ON N1G 5L3

SLR Project No.: 241.030861.00000

September 13, 2023

Revision: 00

## **Revision Record**

Revision	Date	Prepared By	Checked By	Authorized By
0	September 13, 2023	Phil Anderson, Megan Olson,	Kim Logan	Gord Wichert
		Matthew Ross, Diane Francis,		
		Nicole Charlton		



#### September 13, 2023 SLR Project No.: 241.030861.00000

## **Statement of Limitations**

This report has been prepared by SLR Consulting (Canada) Ltd. (SLR) for Infrastructure Ontario (Client) in accordance with the scope of work and all other terms and conditions of the agreement between such parties. SLR acknowledges and agrees that the Client may provide this report to government agencies, stakeholders and/or Indigenous communities as part of project planning or regulatory approval processes. Copying or distribution of this report, in whole or in part, for any other purpose other than as aforementioned is not permitted without the prior written consent of SLR.

Any findings, conclusions, or recommendations in this report are based on conditions that existed at the time work was completed, and the assumptions, conditions, and qualifications set forth herein.

This report may contain data or information provided by third party sources on which SLR is entitled to rely without verification and SLR does not warranty the accuracy of any such data or information.

Nothing in this report constitutes a legal opinion or compliance determination with environmental laws, rules, regulations, or policies established by federal, provincial, or local government bodies, other than as specifically set forth in this report. Revisions to the regulatory standards referred to in this report may be expected over time and, as a result, modifications to the findings, conclusions and recommendations may be necessary.



# **Executive Summary**

SLR Consulting (Canada) Ltd. was retained by Infrastructure Ontario to prepare this Natural Heritage Impact Statement for the proposed redevelopment of Ontario Place, located at 955 Lake Shore Boulevard West in Toronto, Ontario. This NHIS is in support of the Official Plan Amendment and Zoning By-law Amendment applications for the project. This NHIS can be read in tandem with the Existing Conditions report prepared by Morrison Hershfield (2023).

Ontario Place is a human-built site that cannot be restored to historical ecological conditions. There is opportunity 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. The revitalization includes a comprehensive investment in publicly accessible parks 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 shoreline – with a new beach and improved opportunities for swimming, fishing, and water recreation.

The redevelopment of Ontario Place is a phased approach, with the first phase including the site-wide Ontario Place Public Realm (OPPR) and Therme facility and parking, loading, and drop-off structure for all Ontario Place users. The second phase includes expansions to the Live Nation concert venue and Ontario Science Centre. Details on the proposed redevelopment of the Live Nation concert venue and Ontario Science Centre will be provided once available.

Therme was selected through a competitive bid process by the Government of Ontario to deliver 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. 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.

Fish and fish habitat at Ontario Place will experience both positive and negative impacts because of the final design. The most prominent aquatic impact to Ontario Place will involve infilling of Lake Ontario and will cause permanent impacts that will require mitigation and monitoring. The Therme Development will redesign the West Island resulting in better protection from waves and flood waters and incorporate intentional and improved habitat design. Construction efforts at Ontario Place shall consider the potential impacts to the aquatic ecosystem due to the proximity to Lake Ontario. Erosion and sedimentation, isolation of fish, and noise generated during construction activities cause temporary negative influence on fish and fish habitat in the area but will generally be minimized through design and mitigation.

Terrestrial ecosystems at Ontario Place may experience both positive and negative permanent impacts because of the final design while temporary negative impacts are likely to result from construction activities only. The redevelopment will result in the loss of existing vegetation and habitat to accommodate construction; however, the long-term outcome of the proposed plans will improve ecosystem function and create a living landscape across Ontario Place. The completed redevelopment will include permanent footprint impacts associated with new buildings, infrastructure, hardscapes, and shoreline protections as well as green roofs and green space.



Naturalization plans identify several strategies related to natural features and habitat enhancement including: increasing tree canopy cover; promoting biodiversity and rich wildlife habitat through the use of native and resilient planting; increasing habitat types and diversity 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.

Potential improvement in the productivity, resiliency and carrying capacity of this habitat, are anticipated with intentional compensation and habitat restoration efforts outlined in this report. Portions of the aquatic habitat at Ontario Place will be displaced by the developments presented above, but efforts to rebuild new habitat and improve existing habitat will offset these losses. The existing terrestrial condition provides an urban based habitat that was created with little forethought for long-term resiliency. Creation of a new and improved Ontario Place allows the opportunity to integrate a more balanced approach for human use within a natural state to emphasize education and innovation for future generations.



# **Table of Contents**

State	ement of Limitations	!
Exec	utive Summary	iii
Tabl	e of Contents	1
1.0	Introduction	3
1.1	Project Location	3
1.2	Natural Heritage Existing Conditions Report	6
1.3	Natural Heritage Impact Study Purpose	8
2.0	Proposed Redevelopment	8
2.1	Therme	8
2.2	Ontario Place Public Realm	.11
3.0	Impact Assessment and Mitigation	.17
3.1	Fish and Fish Habitat	.17
3.1.1	Potential Permanent Impacts and Mitigation	.18
3.1.2	Potential Temporary Impacts and Mitigation	.24
3.2	Terrestrial Ecosystems	.27
3.2.1	Potential Permanent Impacts and Mitigation	.27
3.2.2	Potential Temporary Impacts and Mitigation	.36
4.0	Naturalization Plan	.43
4.1	Parks and Open Spaces	.43
4.2	Natural Features and Habitat Enhancement	.44
5.0	Permitting and Approvals	.51
5.1	Fish and Fish Habitat	.51
5.1.1	Fisheries Act	.51
5.1.2	Endangered Species Act	.53
5.1.3	Applicable Timing Restrictions for Work	.54
5.2	Terrestrial	.54
5.2.1	City By-laws	.54
5.2.2	Applicable Timing Restrictions for Work	.54
6.0	Conclusions	.54
6.1	Fish and Fish Habitat	.54
6.2	Terrestrial	.55
7.0	Closure	56



8.0 References	.57
Tables in Text	
Table 1: Potential Permanent Effects to the Aquatic Environmental Components of the West Island of Ontario Place	.20
Table 2: Potential Permanent Effects to the Aquatic Environmental Components of the East Island of Ontario Place	.23
Table 3: Potential Temporary Effects to the Aquatic Environmental Components of Ontario Place	.25
Table 4: Potential Permanent Effects, Terrestrial Environment	.28
Table 5: Summary of Anticipated Vegetation Removal within ELC Communities	.31
Table 6: Summary of Anticipated Vegetation Removal within other Vegetated Areas	
Table 7: Summary of Trees Potentially Impacted and Protected by Area	.32
Table 8: Potential Temporary Effects, Terrestrial Environment	.36
Table 9: Lakefill and Aquatic Habitat Alteration Summary	.52
Table 10: Summary of Estimated Quantity Aquatic Habitat Area Losses and Gains	.55
Table 11: Summary of Estimated Terrestrial Habitat Area Losses and Gains	.55
Photos in Text	
Image 1: Example of existing manicured open space	.13
Image 2: Algae bloom in Brigantine Cove	.14
Image 3: A series of planted bosques and planting beds are seen as enhancement strategies improve the waterfront edge of the mainland	to .17
Image 4: Painted Turtles observed in existing TRCA enhanced habitat south of Live Nation	.46
Figures in Text	
Figure 1: Ontario Place Site Location	5
Figure 2: Proposed Site Plan for Ontario Place West Island, Therme (Figure to be provided when updated plans received)	9
Figure 3: Proposed Site Plan for Ontario Place East Island, Ontario Place Public Realm (Figure 5) to be provide upon receipt of updated plans)	
Figure 4: Potential Fish Habitat Impacts and Proposed Restoration	.19
Figure 5: Vegetated Areas and Site Plan Overlay	.29
Figure 6: Proposed Post-Redevelopment Green Spaces and Green Roofs	30



### 1.0 Introduction

SLR Consulting (Canada) Ltd. (SLR) was retained by Infrastructure Ontario (IO) to prepare this Natural Heritage Impact Statement (NHIS) for the proposed redevelopment of Ontario Place, located at 955 Lake Shore Boulevard West in Toronto, Ontario ("Site"). This NHIS is in support of the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications for the Site.

The proposed OPA applies to the full extent of Ontario Place and will provide a long-term framework for redevelopment, including for planned near-term *Ontario Place Public Realm (OPPR): Investments in biodiversity and habitat health* and infrastructure improvements, as well as policy and design direction for future uses. The proposed ZBA has been scoped to align with the proposed water recreation 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 proposed redevelopment as well as the planning approvals for the Site will be phased.

The Study Area consists of a portion of the mainland south of Lake Shore Boulevard West, the West Island and the East Island. Proposed development is expected to exclude Trillium Park, located along the east side of the East Island. The entire Site falls under the jurisdiction of the Toronto Region Conservation Authority (TRCA).

Reports previously prepared for the Site were referenced in the Draft Natural Heritage Existing Conditions Report (NHECR) prepared by Morrison Hershfield (MH, 2023). These supporting reports have been reviewed by SLR in the completion of this report.

# 1.1 Project Location

The Site comprises Ontario Place, located at 955 Lakeshore Boulevard West within the City of Toronto, Ontario and is bound by Lake Shore Boulevard West to the north and by Lake Ontario on all other sides. The East and West Islands of Ontario Place were built into the landscape of Lake Ontario as artificial islands beginning in 1969. Components of Ontario Place include the concert venues (Echo Beach and Budweiser Stage), Trillium Park and the Cinesphere (repurposed as an IMAX theatre). Previous components that are no longer in use include a water park and amusement rides.

The entire Site includes a portion of the mainland shoreline along the south of Lakeshore Boulevard West, the West Island, the East Island excluding Trillium Park, and all associated shoreline and aquatic habitat (Figure 1).

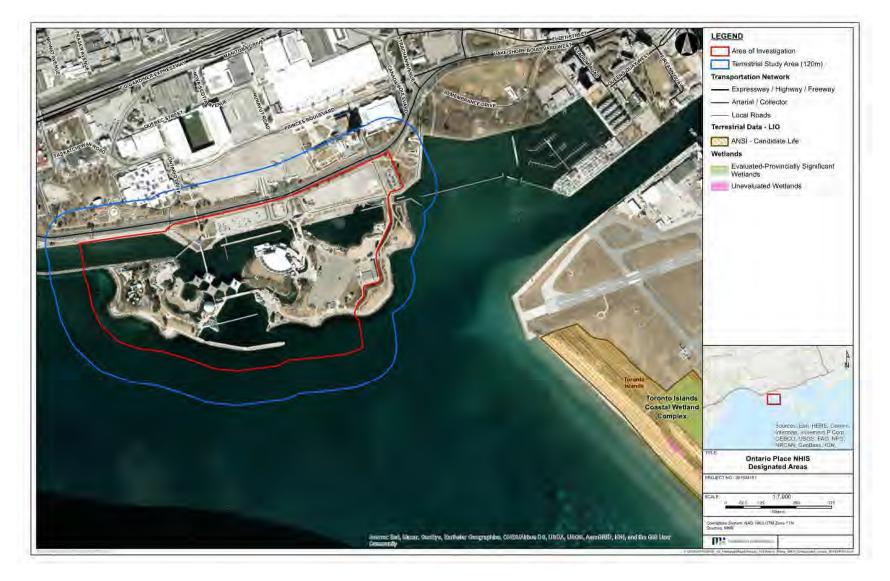
The Study Area includes a 120 m buffer applied to the perimeter of the Site. The 120 m width is the Provincially recommended distance to assess sensitivities and potential negative impacts to adjacent lands (Ontario Ministry of Natural Resources, 2010). Figure 1 illustrates the Site (area contained within the red line), the 120 m adjacent lands boundary (i.e., the Study Area



September 13, 2023 SLR Project No.: 241.030861.00000 Natural Heritage Impact Study

contained within the blue line) and any natural heritage features mapped by Land Information Ontario (LIO).





**Figure 1: Ontario Place Site Location** 



# 1.2 Natural Heritage Existing Conditions Report

The NHECR prepared by MH details the baseline conditions of the Site and surrounding natural heritage features. Relevant policy listed by MH includes:

- Provincial Policy Statement, 2020 (PPS)
- Endangered Species Act, 2007 (ESA)
- Migratory Birds Convention Act, 1994 (MBCA)
- Species at Risk Act, 2002 (SARA)
- TRCA Ontario Regulation (O. Reg.) 166/06
- Fish and Wildlife Conservation Act, 1997 (FWCA)
- Environmental Protection Act, 1990
- Fisheries Act, 2019
- City of Toronto (2022a) Official Plan
- City of Toronto Natural Heritage Guidelines

MH performed field investigations for the Study Area in 2022, including:

- Species at Risk Bat Surveys
- Landbird Migratory Stopover Surveys
- Waterfowl and Shorebird Stopover and Staging Surveys
- Breeding Bird Surveys
- Nest Searches of Buildings, Bridges, and other Structures
- Amphibian Breeding Surveys
- Reptile Hibernaculum and Turtle Wintering Area Surveys
- Turtle Nesting Area Surveys
- Mammalian Surveys
- Invertebrate Surveys
- Vegetation Surveys and Ecological Land Classification (ELC)

MH assessed the significance and sensitivity of the Site based on the 2022 field investigations. The results of this assessment determined that:

- Chimney Swifts (Chaetura pelagica), listed as Threatened under the SARA, were identified on site. 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.
  - Lake Ontario within the Study Area directly supports fish and fish habitat, including potentially sensitive habitat for the Endangered American Eel (*Anguilla rostrata*) 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



September 13, 2023

SLR Project No.: 241.030861.00000

Ontario Place Pavilions. 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.

- Small eels (<150–250 mm prefer coarse substrate (cobble, gravel, boulder) while larger eels (351-450 mm) prefer silt substrates with moderate macrophyte cover located in water 0.7-> 1 m) deep. American eel substrate preferences appear to change as eels grow and their preferences do not vary with season (Lloyst et al. 2015).
- Suitable habitat for American 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 coincides with proposed alteration of existing shoreline conditions at each of the Therme and OPPR proposed development sites and activities may trigger the provincial ESA.
- During field assessment, large coarse rock habitat suitable for American Eel was identified to occur in habitat monitoring locations which identified banks comprising boulder, riprap, 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 American 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.
- There are no Provincially Significant Wetlands or coastal wetlands on or within 120 m of Ontario Place.
- There are no significant woodlands on or within 120 m of Ontario Place.
- There are no significant valleylands on or within 120 m of Ontario Place.
- The following types of Significant Wildlife Habitat (SWH) 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.
- There are no Areas of Natural and Scientific Interest (ANSI) at or within 120 m of Ontario Place.



## 1.3 Natural Heritage Impact Study Purpose

The rezoning approach for this project involves:

- OPA for all of Ontario Place, proposing new facilities for Therme, Live Nation (plans are pending), Ontario Science Centre (plans are pending) and OPPR improvements
- ZBA for all of Ontario Place but only proposing new facility for Therme and OPPR improvements

The redevelopment is at an early design stage, particularly regarding potential opportunities for habitat enhancement or required compensation, the information presented in this NHIS regarding potential impacts, mitigation, and naturalization will continue to adapt throughout the design process. 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 Report is intended to cover impact assessment and mitigation for the Site and will build on the identification of key natural heritage features and functions described in the Draft NHECR (MH, 2022).

# 2.0 Proposed Redevelopment

The redevelopment of Ontario Place is a phased approach, with the first phase including the site wide OPPR and Therme facility with associated parking, loading, and drop-off structure. The second phase includes expansions to the Live Nation concert venue and Ontario Science Centre. This section provides a summary of the current proposed plans for the OPPR and Therme facility. Details on the proposed redevelopment of the Live Nation concert venue and Ontario Science Centre will be provided when available.

#### 2.1 Therme

Therme was selected through a competitive bid process by the Government of Ontario to deliver 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. 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. Therme Canada's 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. Figure 2 shows an overview of the proposed plans for the West Island.



September 13, 2023

SLR Project No.: 241.030861.00000



To support these ideas, the following overarching principles have been implemented by Therme:

- To honour 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 human-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, armouring 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 innovative 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 (access 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 (the Therme Building, on the West Island) featuring a waterpark, pools, wellness and sauna facilities, sports recreation, gardens, and thermal baths with indoor and outdoor spaces.
- 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 docking 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, moderated wave action, gradual slope for wading toddlers/those less capable swimmers) at Ontario Place. The west side provides an opportunity for reducing wave action at the beach by both the west headland and the artificial 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.
- Installation of new shoreline protections around the West Island including armour stone and stepped terraces and 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, including an allowance for future increases due to climate change.
- 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 roofs 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 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.

#### 2.2 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 incorporate bio-diverse landscape typologies including woodlots, wetlands, meadows, and recreational areas to satisfy both natural and cultural uses. Woodlots have been chosen as part of this bio-diverse range not just because of Trillium park's success but also because Ontario Place is located within a significant bird migration zone. This 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,



and around the area that will become the future 'Forum' and event spaces. 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 in contrast to the existing manicured lawns (Image 1).

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 wooded 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 (Image 2). 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 through vertical layers (canopy, subcanopy, ground cover, etc.). 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.





Image 1: Example of existing manicured open space

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.



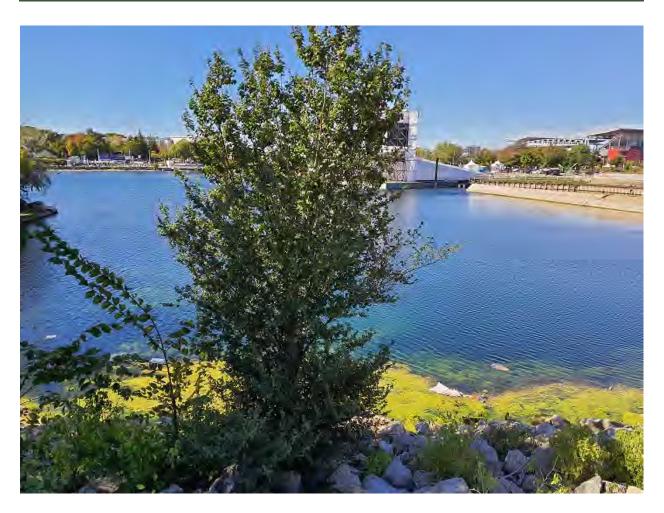


Image 2: Algae bloom in Brigantine Cove

The OPPR team proposes replacing the existing lawn areas with grasslands, meadow, and shrub planting to enhance biodiversity and create an immersive landscape that unifies the East Island with Trillium Park (Image 3). 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. Figure 3 shows an overview of the proposed plans.





Together these strategies look to increase the biodiversity, 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 four 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 spp.*), Poplars (*Populus spp.*), and other native species can become invasive and dominate the plantings unless closely monitored. New species such as Chinese Elm (*Ulmus parvifolia*), White Mulberry (*Morus alba*), and Northern Catalpa (*Catalpa speciosa*) have become established in other waterfront parks like Tommy Thompson Park. Some of these plants require controlled thinning or elimination.





Image 3: A series of planted bosques and planting beds are seen as enhancement strategies to improve the waterfront edge of the mainland.

# 3.0 Impact Assessment and Mitigation

The following sections describe the anticipated impacts to existing conditions on Site related to the proposed development plans and early design details.

#### 3.1 Fish and Fish Habitat

Fish and fish habitat at Ontario Place will experience both positive and negative impacts because of the final design. Impacts have been assessed and outlined below based on the project specific aspects and mitigation and compensation recommendations have been provided in Sections 3.1 and 3.2. Figure 4 shows areas of fish habitat that will be removed, altered, and created and provides details on shoreline restoration locations.



### 3.1.1 Potential Permanent Impacts and Mitigation

### 3.1.1.1 Therme Development

The most prominent aquatic impact to Ontario Place will be associated with the Therme Development and the redevelopment of the West Island. This will involve infilling of Lake Ontario surrounding the island and will have permanent impacts that will require mitigation and monitoring (Table 1). The Therme Development will reconfigure the West Island for better protection from waves and flood waters and incorporate the goals and objectives established by the Fish Community Objectives for Lake Ontario, Urban Recreational Fisheries Strategy, and Toronto Waterfront Aquatic Habitat Restoration Strategy (TWAHRS) documents in the habitat development on site (Stewart et al. 2017, TRCA 2016, TRCA 2020).







NOTES:
AQUATIC HABITAT IMPACTS AND RESTORATION AREAS ARE STILL
BEING DEVELOPED FOR THE EAST ISLAND.

SOURCE: WEST ISLAND LAKEFILL AREA; BAIRD DRAWING: 12471.101-A-PLAN.DWG 7/14/2023

THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY AND SHOULD NOT BE USED FOR NAVIGATION

INFRASTRUCTURE ONTARIO ONTARIO PLACE TORONTO, ONTARIO, CANADA

ONTARIO PLACE REDEVELOPMENT NATURAL HERITAGE IMPACT STUDY

#### POTENTIAL FISH HABITAT IMPACTS AND PROPOSED RESTORATION

FIGURE NO:

DATE: September 13, 2023

PROJECT NO: 241.030861.00001

Table 1: Potential Permanent Effects to the Aquatic Environmental Components of the West Island of Ontario Place

<b>Environmental Component</b>	Potential Effects	Mitigation Measures / Compensation	Net Effects
Water Quality	<ul> <li>Contamination due to spills<sup>1</sup></li> <li>Increased surface water runoff<sup>1,2,3</sup></li> </ul>	<ul> <li>Incorporate permeable walkway surfaces into the design to manage surface run off<sup>1,2,3</sup></li> <li>Utilize bioswales to improve surface water runoff quality<sup>1,2,3</sup></li> </ul>	<ul> <li>Minimal effects if turbidity managed appropriately<sup>1</sup></li> <li>Minimal effects if no lasting contaminants enter the waterbody<sup>1,3</sup></li> <li>Improved surface water runoff management<sup>1,2,3</sup></li> </ul>
Aquatic Habitat	<ul> <li>Shading of underwater habitat can produce offsetting effects, i.e., reduce primary and secondary productivity as well as moderate water temperatures<sup>1</sup></li> <li>Loss of existing channel and associated aquatic habitat<sup>2,3</sup></li> </ul>	<ul> <li>Clean rock fill¹</li> <li>Removal or regrading of structure following completion, re-establishing connectivity from inner areas to sheltered break wall¹</li> <li>Dock design and incorporation of appropriate materials to allow natural light penetration to the bottom¹</li> <li>Supplemental stone of various sizes to provide habitat heterogeneity adjacent to docks¹</li> <li>Creation of habitat with excavations of lakefill areas²,³</li> <li>Shoreline protection²,³</li> <li>Installation of large wood debris and wooden structures²</li> </ul>	<ul> <li>Mid-channel reef that remains after partial berm removal restores fish movements and provides additional in water structure and habitat for feeding, reproduction, and cover<sup>1</sup></li> <li>Materials deposited along the shoreline and lakebed provides additional in water structure and habitat<sup>1</sup></li> <li>Minimal extent (spatial and temporal) of shading under docks allows growth of aquatic vegetation and benthic invertebrates<sup>1</sup></li> <li>Shade will moderate nearshore water temperatures supporting an association of fishes with a broader range of temperature preferences<sup>1</sup></li> <li>Permanent placement of rock creates increased diversity of habitat functions with a diverse range of coarse rock to fine sediments providing reproductive, rearing young and adult growth functions to a broader range of fish species<sup>1,3</sup></li> <li>Increased overall habitat quality and productivity<sup>2,3</sup></li> <li>Increased habitat heterogeneity<sup>2</sup></li> <li>Improved resilience of habitat<sup>2,3</sup></li> </ul>
Fish Community	<ul> <li>Reduced opportunities for reproduction, feeding and growth<sup>2,3</sup></li> <li>Exposure to loud or very loud noise for extended periods may result in permanent reductions in sensitivity or physical injury.<sup>1,7</sup></li> </ul>	<ul> <li>Collect and transfer fish from areas where they may be trapped and isolated during construction to areas where they can move among diverse, connected habitats <sup>1</sup></li> <li>Introduce submergent and emergent aquatic vegetation and variety of substrates increases habitat diversity<sup>2,3</sup></li> <li>Create a range of habitat opportunities along depth gradients<sup>2</sup></li> <li>Department of Fisheries and Oceans (DFO) recommends that when conducting a project near water, proponents identify time windows to protect fish (in all life stages) and the organisms on which they feed. In addition to time windows, other mitigation measures (such as bubble curtains) are sometimes required to minimize fish mortality as much as possible.<sup>1,7</sup></li> <li>For activities generating impulsive noise (i.e., impact pile driving), DFO provides guidance on the peak underwater sound pressure levels that may affect fish adversely. <sup>1,7</sup></li> </ul>	Novel wetland niches, increasing habitat features and functions <sup>2</sup>

<sup>&</sup>lt;sup>1</sup>North Wall of West Island; <sup>2</sup>East Shore of West Island; <sup>3</sup>East Headland of West Island; <sup>4</sup>South Shore of West Island; <sup>5</sup>West Headland of the West Island; <sup>6</sup>West Shore and Offshore Reef of West Island; <sup>7</sup>North Peninsula of West Island.



Several docks, piers, and walkways will need to be constructed for long term access by pedestrians. Walking surfaces will encircle the West Island and allow for pedestrians to view and access the various riparian habitats on the inner and outer shores. Installing infrastructure directly adjacent to or in contact with the lake water poses its own potential impacts, including shading habitat and increased surface runoff. Some fishes such as Smallmouth Bass (*Micropterus dolomieu*), Northern Pike (*Esox lucius*), and other ambush predators may benefit from moderate shade cover. Proper storm run-off management (including nature-based treatment train wetlands), planning and installation should prevent long term impacts and the need for most mitigation or compensation measures. During construction, measures to control erosion and sediment releases into the water will help mitigate impacts to the nearshore fish community and associated habitat. Minimal shoreline vegetation, and limited aquatic habitat exist under current conditions. Currently steel sheet pile walls, rock cribs, and armored riprap make up most of the West Island shoreline. These features provide few areas for spawning and reproduction, feeding and growth resulting in low habitat value to the aquatic ecosystem.

One of the key features of the proposed West Island will be the Wetland Innovation Zone, which should increase the near shore and littoral habitat available for the aquatic community when constructed. TWAHRS identified self-sustaining native fish communities as one of their primary objectives along the Toronto Waterfront (TRCA, 2003). The introduction of shallow habitats, including submergent and emergent vegetation along the littoral zones of Ontario Place, is designed to support the reproduction and growth of the fish species found here. The Wetland Innovation Zone is designed to incorporate natural wetland processes to improve habitat and water quality through multi use pathways along the East Shoreline. The Wetland Innovation Zone is located where there are shallow, sheltered waters conducive to wetland habitats and isolated from most marina traffic.

The Wetland Innovation Zone creates 2.1 acres of ecologically flourishing environment that only receives treated stormwater from the public realm and functions as a final polishing step in a nature-based system. The Wetland Innovation Zone receives overflows of stormwater runoff from the upstream site area by way of permeable pavement, underdrains, and catch basins, which are then treated before final release to the wetland. A closed-loop water recycling system helps minimize the amount of municipally supplied potable water used for park maintenance by promoting passive irrigation and providing additional storage for an active irrigation system. The park's stormwater management system manages its stormwater on-site, promoting nature-based solutions through managing water where it lands, which results in a significant reduction of discharge volumes and outperforms the required stormwater criteria.

Functionally the Wetland Innovation Zone is designed to incorporate natural wetland processes to improve habitat and water quality, with multi-use pathways running along the East Shoreline. Short term losses of habitat will occur during the isolation of the construction areas. Long term habitat gains will be achieved with increased complexity of the habitat which will provide additional spawning and growth opportunities for warm water fish such as Rock Bass (*Ambloplites rupestris*), Pumpkinseeds (*Lepomis gibbosus*), and Bluegills (Lepomis macrochirus) already found in these locales. Appropriately selected aquatic and terrestrial



plants will be placed along the in-water wetland to upland gradient. The quiet, sheltered wetland area will be assessed for suitability to develop over winter habitat comprising silt-gravel substrates.

The proposed redesign of the southern shoreline of the West Island will incorporate additional lake filling to protect the area from flooding and develop a resilient shoreline. This shoreline will provide intentional aquatic habitat as well as safe and reliable access to the water for pedestrians. Although the existing rock protection at Ontario Place will be removed for the rehabilitation of shoreline stabilization and changes to the West Island, installation of new appropriately sized rock for shore protection has been incorporated to include niche and void spaces into the preliminary design for shoreline rehabilitation efforts which benefit American Eel. Small eels (<150–250 mm prefer coarse substrate (cobble, gravel, boulder) while larger eels (351-450 mm) prefer silt substrates with moderate macrophyte cover located in water 0.7-> 1 m) deep. American eel substrate preferences appear to change as eels grow and their preferences do not vary with season (Lloyst et al. 2015).

Cobble and gravel substrates will be placed at the toe of the proposed southern shoreline. The range of substrate sizes will be selected to provide spawning and refuge habitat for species including American Eel, Alewife (Alosa pseudoharengus), and Lake Trout (Salvelinus namaycush), consistent with Lake Ontario fish community objectives for promoting healthy and diverse communities. During the construction period, entrapment of fish may occur in isolated work areas. Fish will be removed from proposed work areas in the event of entrapment and relocated back into the open areas of Lake Ontario. Other construction best practices will be used to allow fish maintain access to appropriate habitats in the short-term during construction. A temporary ring road will be established on the island for the construction phase increasing the potential risk of spills and contamination from vehicles.

The proposed west beach will replace the existing stacked armour stone seawall and be protected by the elongation of the north peninsula and west headland to reduce the long-term effects of wave action and longshore erosion.

### 3.1.1.2 Ontario Place Public Realm Development

The East Island will see redevelopment of the Ontario Place Public Realm, including Brigantine Cove, The Forum, and William G. Davis Trail. In addition, a proposed span bridge will replace the existing causeway connecting the east island to mainland. Using the established strategies of Trillium Park, the Ontario Place Public Realm Development intends to preserve and enhance the natural landscape of Ontario Place by creating a multi-use forest park along the lake shore of Toronto. The primary vectors of impact to the aquatic environment on and around the East Island will be the redevelopment of Brigantine Cove, the development of a wetland habitat area in the existing channel, construction of the span bridge to replace the causeway, and regrading, filling, and armouring of the shoreline and upland areas along the lakefront.

Table 2 provides a breakdown of potential permanent effects to environmental components of the East Island of Ontario Place.



Table 2: Potential Permanent Effects to the Aquatic Environmental Components of the East Island of Ontario Place

Environmental Component	Potential Effects	Mitigation Measures / Compensation	Net Effects
Water Quality	<ul> <li>Contamination due to spills<sup>1,2,3,4</sup></li> <li>Increased surface water runoff<sup>1,2,3</sup></li> <li>Sediment release associated with causeway modification<sup>4</sup></li> </ul>	<ul> <li>Incorporate permeable walkway surfaces into the design to manage surface run off<sup>1,2,3</sup></li> <li>Silt curtains and monitoring of water quality to minimize negative effects associate with causeway modification<sup>4</sup></li> <li>Utilize bioswales to improve surface water runoff quality<sup>1,2,3</sup></li> </ul>	<ul> <li>Minimal effects if turbidity managed appropriately<sup>1,4</sup></li> <li>Minimal effects if no lasting contaminants enter the waterbody<sup>1,3,4</sup></li> <li>Improved surface water runoff management<sup>1,2,3</sup></li> </ul>
Aquatic Habitat	<ul> <li>Shading of underwater habitat can produce offsetting effects, i.e., reduce primary and secondary productivity as well as moderate water temperatures<sup>1, 4</sup></li> <li>Increase in aquatic vegetation and associated habitat<sup>1,2</sup></li> <li>Increased in aquatic habitat associated with causeway modification and removal<sup>4</sup></li> </ul>	<ul> <li>Clean rock fill¹</li> <li>Dock design and incorporation of appropriate materials to allow natural light penetration to the bottom¹</li> <li>Supplemental stone of various sizes to provide habitat heterogeneity adjacent to docks¹</li> <li>Shoreline protection¹.².³</li> <li>Installation of large wood debris and wooden structures²</li> <li>Vegetation planted along in water to upland gradients².³</li> <li>Range of substrates used during causeway modifications to create diverse aquatic habitat⁴</li> </ul>	<ul> <li>Materials deposited along the shoreline and lakebed provide additional in water structure and habitat<sup>1,2,3</sup></li> <li>Minimal extent (spatial and temporal) of shading under docks allows growth of aquatic vegetation and benthic invertebrates<sup>1</sup></li> <li>Shade will moderate nearshore water temperatures<sup>1</sup></li> <li>Permanent placement of rock and wooden features creates increased diversity of habitat functions with a diverse range of coarse rock to fine sediments providing reproductive, rearing young and adult growth functions to a broader range of fish species<sup>1,2</sup></li> <li>Increased overall habitat quality and productivity<sup>1,2,3</sup></li> <li>Increased habitat heterogeneity<sup>1,2,3</sup></li> <li>Improved resilience of habitat<sup>1,2,3</sup></li> </ul>
Fish Community	<ul> <li>Improved long term opportunities for reproduction, feeding and growth<sup>1,2,3,4</sup></li> </ul>	<ul> <li>Collect and transfer fish from areas where they may be trapped and isolated during construction to areas where they can move among diverse, connected habitats<sup>1,2,3,4</sup></li> <li>Introduce submergent and emergent aquatic vegetation and variety of substrates to increase habitat diversity<sup>1,2</sup></li> <li>Create a range of habitat opportunities along depth gradients<sup>1,3</sup></li> </ul>	<ul> <li>Novel wetland niches, increasing habitat features and functions<sup>2</sup></li> <li>Depth gradients favour species suited to a range of feeding and reproduction modes<sup>1,3</sup></li> <li>Habitat function and opportunities currently not available at this location are provided<sup>1,2</sup></li> <li>Alternate route for fish moving between Brigantine Cove and open waters of Lake Ontario<sup>4</sup></li> </ul>

<sup>&</sup>lt;sup>1</sup>Brigantine Cove; <sup>2</sup>Wetland Habitat Channel; <sup>3</sup>Lakefront Shoreline, <sup>4</sup>Causeway Modifications.



September 13, 2023 Pact Study SLR Project No.: 241,030861,00000

Much like the West Island, there will be an increase in the number of public walkways, floating docks, and piers to improve the long-term access by pedestrians to the East Island. Permeable walking surfaces will allow for access to the newly developed amenities such as the wetland habitat channel, the floating wetlands, and shoreline access. Installing infrastructure directly adjacent to or in contact with the lake water poses potential impacts, including shading habitat and increased surface runoff. Shading is a potential concern where a lack of penetrating light may reduce the vegetation growth in the water column and along the lakebed. Shallower water depths in the wetland habitat channel and floating wetlands will help mitigate this risk and provide an overall benefit. The floating wetlands have the potential to create a wider variety of habitats than exist presently, benefiting both forage and predatory fish species. Shade and vegetation will provide additional habitat heterogeneity, increasing the overall productivity of the aquatic ecosystem. Increased aquatic and riparian vegetation can also provide benefits to water quality and help manage run off. Incorporating storm water and runoff management tools should prevent long term impacts and reduce the need for most mitigation or compensation measures. During construction, measures to control erosion and sediment releases into the water will help mitigate impacts to the nearshore fish community and associated habitat.

The East Island of Ontario Place lacks intentional aquatic habitat. Minimal shoreline vegetation occurs in both Brigantine Cove and along the lakefront. Vertical surfaces and damaged armored riprap make up most of the shoreline of the East Island. Armouring and terraced access to the lakefront will help to reincorporate natural vegetation communities to an area impacted by wave and wind action. Brigantine Cove and the wetland habitat channel have the opportunity for greater diversity of aquatic vegetation due to their finer substrate size and sheltered location. Opportunities to develop over-winter habitat for American Eels in the soft sediments will be explored. The introduction of shallow habitats, including submergent and emergent vegetation along the littoral zones of the East Island will support fish and aquatic biota at all life history stages. Short term losses of habitat will be required during the isolation of the construction areas. Long term habitat gains will be made with the increase in the complexity of the habitat, providing additional spawning and growth opportunities for fishes such as darters, and sunfishes and catfishes that prefer warm water.

The proposed redesign of the southern shoreline of the East Island will incorporate additional infilling and grading of the shoreline and upland areas to provide additional resiliency from flooding and other wave damage. Cobble and gravel substrates will be incorporated into the armour stone and riprap features to provide additional cover to the fish community of the area. The range of substrate sizes will be selected to provide spawning and refuge habitat for species including American Eel, Alewife, and Lake Trout, consistent with Lake Ontario fish community objectives for promoting healthy and diverse communities.

### 3.1.2 Potential Temporary Impacts and Mitigation

Construction efforts at Ontario Place shall consider the potential impacts to the aquatic ecosystem due to the proximity to Lake Ontario. Erosion and sedimentation, isolation of fish, and noise generated during construction activities cause unintended and detrimental influence on fish and fish habitat in the area. Active mitigation is required to manage the higher levels of



disturbance during the construction periods. Construction best practices will be employed across the site to help reduce the risk of lasting detrimental impacts. If unmitigated, the proposed work may lead to temporary construction impacts that include risks to water quality, aquatic habitat, and fish community (Table 3).

Table 3: Potential Temporary Effects to the Aquatic Environmental Components of Ontario Place

Environmental Component	Potential Effects	Mitigation Measures / Compensation	Net Effects
Water Quality	<ul> <li>Increased sedimentation events leading to elevated total suspended solids and turbidity during construction</li> <li>Contamination due to spills from construction equipment</li> </ul>	<ul> <li>Erosion and sediment control (ESC) methods to minimize sedimentation</li> <li>Implement best practices when working around water</li> <li>Utilize bioswales to improve surface water runoff quality</li> </ul>	<ul> <li>Minimal effects if turbidity managed appropriately during construction</li> <li>Minimal effects if no lasting contaminants enter the waterbodies during construction</li> </ul>
Aquatic Habitat	<ul> <li>Loss of access to existing aquatic habitat</li> <li>Temporary sedimentation during construction</li> </ul>	<ul> <li>Use clean rock fill for all in water applications</li> <li>Divert sediment and construction contact water away from fish habitat</li> <li>Implement best practices when working around water</li> </ul>	<ul> <li>Access to suitable habitat in the West Island East Shore locale will minimize potential effects associated with temporary restrictions of movement</li> <li>Minimized potential harmful effects to habitat</li> </ul>
Fish Community	<ul> <li>Entrapment in work area</li> <li>Most fish will avoid the area of disturbance during construction</li> <li>Temporary noise-induced behaviour changes</li> </ul>	<ul> <li>Salvage operation in isolated areas and release captured fish in appropriate areas</li> <li>Identify timing windows to protect fish and their prey from noise. Other mitigation measures (i.e., bubble curtains)</li> </ul>	<ul> <li>Minimized loss of aquatic life</li> <li>Minimal loss of life stage opportunities for fish because key habitat functions largely absent in existing conditions</li> <li>Fish will move to adjacent areas with similar habitat function as</li> </ul>



ure Ontario	September 13, 2023
eritage Impact Study	SLR Project No.: 241.030861.00000

Environmental Potential Effects Component		Mitigation Measures / Compensation	Net Effects	
		can also be deployed.	the construction area	

A comprehensive ESC plan will be developed in subsequent design phases and implemented to prevent migration of sediment laden runoff (or other contaminants) from the construction areas on Ontario Place into the Lake Ontario. This plan will include inspection and maintenance of the measures until final cover is established. Specific aspects include:

- Silt fence to be properly installed, regularly inspected, and maintained. Sediment control will be left in place and maintained until all surfaces contributing drainage to these waterbodies are fully stabilized.
- All exposed and newly constructed surfaces will be stabilized in accordance with appropriate means and the characteristics of the soil material. These surfaces will be revegetated as quickly as possible following completion of the proposed works.
- Emergency response plan including contingency procedures, materials and notification procedures will be readily available for use in the event of a silt release and for general application in regular maintenance and repair.

During the construction period, fish relocation and construction best practices will be used to maintain access to appropriate habitats where short-term entrapment of fish is a possibility in isolated work areas. Removing fish from a work area will help manage impacts to the aquatic community during temporary periods of poor water quality. Lake infilling, grading, or planting along shorelines have the potential to introduce sediment or deleterious substances into the waterbody, and minimizing the number of fish in direct contact with these areas reduces the risk of loss of life.

Underwater noise can be a serious issue to fish and fish habitat if unmanaged. Underwater noise can be generated from various construction processes such as sheet piling or post driving. When an object vibrates in water, it causes the fluid particles around it to move. These particles collide with nearby particles, continuing until they run out of energy. In underwater acoustics, the word sound is used to describe all the pressure waves that are generated in an underwater medium.

Sound that is significantly above underwater ambient sound levels (natural background) is considered noise and can trigger responses in fish. Noise is defined as unwanted sound. It is standard practice within the acoustical industry to use these two terms, sound, and noise, interchangeably.

The Ontario Place redevelopment project and associated in-water construction efforts are expected to temporarily increase underwater noise levels near the project area.

A high-level assessment of projected sources and corresponding impacts of underwater noise on aquatic fauna has been performed. Noise impact criteria have been established via a review



of the most relevant guidelines and peer-reviewed literature and reports. These criteria include physiological and behavioural impacts on acoustic species.

The specific outcomes of this high-level underwater noise assessment are summarized as follows:

- Recognition of potential noise sources (pertaining to lake fill and in-water construction), such as impact and vibratory pile driving, drilling, and dredging.
- Fish are likely the aquatic species to be potentially impacted by the in-water construction noise emissions.
- Impulsive noise, due to impact piling, is the sole in-water construction method projected to potentially cause physical injury to some fish species at very close ranges.
- Non-impulsive noise activities such as vibratory piling, drilling, and dredging may cause non-harmful behavioural responses in some fish species throughout the project area.

Where the potential for physical injury to fish exists, the application of mitigation methods or exclusion zones will prevent harmful impacts beyond temporary changes in behaviours from occurring (in general, temporary changes refer to minor variations in typical movement/swimming behaviour during exposure to elevated levels of underwater noise).

The confined nature of the combined bathymetry that makes up Lake Ontario in the vicinity of Ontario Place and the existing infrastructure in the proposed project area does not allow sound to travel freely through the water. Therefore, shallow waters and the proximity of the project to the shoreline, combined with lakebed sediments comprised primarily of sand, mud and clay, can significantly reduce underwater noise levels and, in some cases, present a physical barrier to sound propagation.

# 3.2 Terrestrial Ecosystems

Terrestrial ecosystems at Ontario Place may experience both positive and negative permanent impacts because of the final design while temporary negative impacts are likely to result from construction activities only. The potential impacts to existing vegetation associated with the proposed Therme, OPPR, and Live Nation areas can be quantified separately (by tenant), where possible; however, the potential impacts to wildlife and wildlife habitat have largely been assessed in consideration of the site, rather than in isolation, given the mobility of wildlife.

# 3.2.1 Potential Permanent Impacts and Mitigation

The following assessment describes 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; however, the long-term outcome of the plans will improve ecosystem function and create a living landscape across Ontario Place. The completed redevelopment, as proposed, will include permanent footprint impacts associated with new buildings, infrastructure, hardscapes, and shoreline protections as shown in Figure 6, as well the installation of approximately 5,200 m² of green roofs and 80,300 m² of green space (Figure 6), including 53,000 m² within OPPR areas and 27,300 m² within



Therme areas. We acknowledge 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 a maximum of 63,000 m², while the proposed green roofs and green space total an area of 85,500 m², for a minimum net gain (in area) of ~22,500 m². The proposed green roofs and green spaces are intended to restore and improve upon the existing terrestrial features and functions on site. Wetland habitat creation details are being finalized but new wetland habitat will also provide a net gain at the terrestrial-aquatic interface and these amounts have not been included in the above totals. Potential permanent effects of the proposed development are summarized in Table 4.

**Table 4: Potential Permanent Effects, Terrestrial Environment** 

Environmental Component	Potential Effects	Mitigation Measures / Compensation	Net Effects
Terrestrial Habitat	Non-native species removals	Provides a better opportunity area for biodiversity and	<ul> <li>Reduction of non- native species in the area</li> </ul>
		additional habitat	<ul> <li>Increased biodiversity and variability in increased habitat</li> </ul>
	Wetland creation		Wetlands can help mitigate potential impacts for stormwater management from the new buildings and hard surfaces
Terrestrial Wildlife	New nesting/habitat structures	Installation prior to mass tree removals	Provides an opportunity for additional/alternate habitat creation



28

LEGEND:

VEGETATION SURVEY AREA (MORRISON HERSHFIELD)

ELC COMMUNITY (MORRISON HERSHFIELD)

FODM4-11: DRY - FRESH BLACK LOCUST DECIDUOUS FOREST

OAO: OPEN AQUATIC

WOM: MIXED WOODLAND

NOTES:
ONTARIO PLACE MASTERPLAN: LAND INC.; MSP;
THERME - WEST ISLAND STUDIO; TLA; INFRASTRUCTURE ONTARIO;
SEPTEMBER 2023
OVERALL LANDSCAPE PLAN; STUDIO TLA
SHEET NUMBER: LS.100.T
2022.09.13
VEGETATION MAPPING: MORRISON HERSHFIELD; SEPTEMBER 2023

100

SCALE 1:4,250 PAGE SIZE 11 x 17 NAD 1983 UTM Zone 17N THIS MAP IS FOR CONCEPTUAL PURPOSES ONLY AND SHOULD NOT BE USED FOR NAVIGATION

INFRASTRUCTURE ONTARIO ONTARIO PLACE TORONTO, ONTARIO, CANADA

ONTARIO PLACE REDEVELOPMENT NATURAL HERITAGE IMPACT STUDY

**VEGETATED AREAS AND** SITE PLAN OVERLAY

FIGURE NO:

DATE: September 13, 2023

PROJECT NO: 241.030861.00001





#### Vegetation

Since most of the property is landscaped and maintained, and of anthropogenic origin, most of the vegetated areas do not meet the criteria for ecological communities established under the ELC system. Table 5 provides a summary of impacted areas within ELC communities and Table 6 provides a summary of impacts within vegetated areas that do not meet ELC criteria. Overall, the proposed redevelopment is anticipated to require the removal or disturbance of 63,000 m² or ~6.3 hectares (ha) of fully or partially vegetated areas within the site. Areas impacted by the proposed site designs are shown in Figure 5.

Secondary 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.
- Short-term 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. Based on the plan to increase vertical habitat structure (canopy layers, etc.) there is an opportunity to create a decrease in negative microclimate changes across Ontario Place.
- Loss of riparian vegetation and root masses, encouraging erosion and soil loss at the site.
- Loss of habitat for wildlife.

All anticipated negative impacts can be mitigated to create long-term improved conditions for the Ontario Place ecosystem. The following sections describe the anticipated impacts and proposed mitigation to result in overall positive gains for Ontario Place.

Table 5: Summary of Anticipated Vegetation Removal within ELC Communities

Area ID <sup>1</sup>	ELC Code	ELC Community	Total Size (m²)	Total Impacted Area (m²)	Project Location
F	OAO	Open Aquatic	4,800	600	East Island
G	FODM 4-11	Dry-Fresh Black Locust Deciduous Forest	7,100	5,100	East Island
J	WOM	Mixed Woodland	25,700	25,700	West Island
Р	OAO	Open Aquatic	5,200	5,200	West Island
TOTAL				36,600	

兴

<sup>&</sup>lt;sup>1</sup> Figure 5

Table 6: Summary of Anticipated Vegetation Removal within other Vegetated Areas

Area ID	Total Size (m²)	Total Impacted Area (m²)	Project Location
С	1,200	1,200	East Island
D	5,800	5,800	East Island
Е	4,300	4,300	East Island
Н	3,800	3,800	West Island
I	2,800	2,800	West Island
K	1,500	1,500	East Island
М	2,500	2,500	West Island and Mainland
N	3,200	3,200	West Island and Mainland
0	1,400	1,400	West Island
TOTAL		26,500	

Table 7 presents the total tree impacts and retained trees based on the MH (April 26, 2023) Arborist Report by area. Full details are presented in the Arborist Report (MH 2023). The final tree impact analysis is ongoing through detailed design/site plan design.

Table 7: 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	25	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%



32

#### Avifauna

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. Vegetation removal is required to raise the site to remediate soil contamination and alleviate flood risk. Many of the existing buildings and structures within the Study Area, the majority of which provide nesting habitat for birds will also be subject to demolition, renovation, or redevelopment, resulting in further loss of nesting areas for avifauna in some instances. 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. The proposed work could negatively influence migratory landbird and breeding bird populations on site temporarily after the project is complete as it will take time for plantings to be established following construction. Opportunities to plant larger caliper trees and more robust shrubs and herbaceous plants wherever possible should reduce the time to regenerate habitat on site. Many migrating and/or breeding birds that are displaced from the Study Area in the interim are likely to find nesting and foraging opportunities at nearby alternative locations, 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; locations already recognized as Important Bird Areas (IBA) by IBA Canada. Long-term impacts to Avifauna as they relate specifically to rare, Species at Risk (SAR), and Species of Conservation Concern (SoCC) birds are assessed below under SWH and SAR. Most of the resident and migratory birds at Ontario Place are typical for urban settings and any birds looking for specialized habitats are unlikely to settle or stay on the islands for breeding, nesting and rearing young. The project provides an opportunity to increase habitat quality and quantity to encourage use by a larger diversity of avifauna species in the area. Short term solutions to offset negative impacts include placement of nesting structures.

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.
- 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. To ensure impacts to the birds are minimized from additional glass and structures on site to the greatest extent feasible, the City of Toronto's (2007) Bird Friendly Development Guidelines must be incorporated into the design plans, wherever they are applicable. Compliance with City of Toronto Light Pollution by-laws must also be considered.

### Herpetofauna

The site does not provide habitat for most species 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. Work with the potential to permanently disrupt or alter the thermal regimes, flows, or substrates within confirmed Turtle Wintering Areas is not recommended. These impacts will be countered by proposed plans to create and 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**

Most mammals identified on site (e.g., Striped Skunk [Mephitis mephitis], Red Fox [Vulpes vulpes], American Mink [Neovison vison], Raccoon [Procyon lotor], Eastern Cottontail [Sylvilagus floridanus], Eastern Grey Squirrel [Sciurus carolinensis]) 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 structure redevelopments, most of these species should persist in the area during construction in nearby undisturbed locations such as Trillium Park and Coronation Park. Typically, these species will reinhabit the Study Area 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 require abundances of insects; 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, the proposed work could negatively influence bat populations on site until suitable habitat is available.

#### **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 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 SWH 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 proposed design plans will remove all (33 of 33) of the potential maternity roost trees for bats on site. Feeding opportunities for bats are also likely to be reduced. 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. To minimize disruption to bat habitat we recommend that bat houses be installed on site as soon as conditions allow. 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 Study Area used as Landbird Migratory Stopover areas will be reduced following vegetation removals. Although 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 superior habitat for Landbird Migratory birds in the long-term 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. Currently, only minor impacts are proposed within Turtle Wintering Areas. Improvement to wetland habitat proposed for Ontario Place are expected to improve habitat conditions for turtles within the Study Area 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 [Somateria spectabilis], Pied-billed Grebe [Podilymbus podiceps] Horned Grebe [Podiceps auritus), within shoreline habitats that are not proposed to be altered at Ontario Place (e.g., Northern Map Turtle [Graptemys geographica]) or that will remain available at Trillium Park or Live Nation (e.g., Great Egret [Ardea alba]), or they are only occasional (e.g., Grasshopper Sparrow [Ammodramus savannarum]) or aerial visitors (e.g., Peregrine Falcon [Falco peregrinus]) within the Study Area for foraging and feeding. Of all Special Concern and Rare animals noted on site, only Eastern Wood-pewee (Contopus virens) may potentially be impacted by the proposed work, particularly through the loss of woodland within the Site 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 for breeding. In addition to animals, several provincially rare plants were also recorded in the Study Area, including Kentucky Coffee-tree (Gymnocladus dioicus; S3), Honey Locust (Gleditsia triacanthos; S2?), and Ohio Buckeye (Aesculus glabra; S1). 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).



## 3.2.2 Potential Temporary Impacts and Mitigation

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, damage or injury to non-target trees intended for retention may occur.
- 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 (*Phragmites australis australis*), Japanese Knotweed (*Reynoutria japonica*), and Pale Swallowwort (*Vincetoxicum rossicum*), 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.
- <u>Disturbance to Wildlife</u>: 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. With implementation of the mitigation measures outlined in Table 8, potential temporary impacts can be mitigated during the construction phase.

**Table 8: Potential Temporary Effects, Terrestrial Environment** 

Environmental Component	Potential Effects	Mitigation Measures / Compensation	Net Effects
Terrestrial Habitat	Tree removals with moderate quality trees for bats and trees with DBH >30 cm	Compensation plantings and nesting and bat structures to decrease the amount of time the habitat is unavailable	<ul> <li>Removal of non-native species</li> <li>Provides an opportunity for additional/alternate habitat creation</li> </ul>
Terrestrial Wildlife	Removal of migratory bird and bat habitat	<ul> <li>Avoid breeding bird and bat roosting timing windows</li> <li>Provide alternate habitat opportunities (i.e. large</li> </ul>	Minimal effects to nesting opportunities based on limited number of tree removals



Environmental Component	Potential Effects	Mitigation Measures / Compensation	Net Effects
		calliper sized native trees, migratory bird boxes/houses)	
	Barn Swallow (Hirundo rustica) nests potentially impacted	Installation of Barn Swallow nesting structures	Provides a better opportunity area for habitat creation
	Removal of food source for pollinator species	Provide alternate habitat opportunities (i.e. vegetation plantings/pollinator gardens, bat boxes, migratory bird boxes/houses)	Minimal effects to nesting and roosting opportunities based on limited number of tree removals

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 designs. 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 Study Area prior to and/or during construction:

- All vegetation removals will be completed in accordance with applicable guidelines and permits.
- Surplus material resulting from removals operations will be handled as per applicable guidelines and permits.
- 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 (2016) 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 by a certified arborist.
- Equipment and vehicles shall not be operated or re-fueled within the dripline of trees not designated for removal.
- Vegetation removals beyond the project limits will not be completed 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 applicable guidelines.

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*, (Ontario Invasive Plant Council [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 Ministry of Natural Resources and Forestry (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 contaminated soil. Though considered a non-hazardous material, many landfill locations do not accept invasive species containing soil.
- Disturbed areas requiring cover shall be revegetated as per the landscape architecture plans. Areas requiring seeding or sodding shall be covered in accordance with applicable quidelines.



## **Soils**

Mitigation measures shall be implemented 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 applicable guidelines.
- 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 always remain effective, including during shut down periods, as per applicable guidelines.
- Excess earth resulting from construction operations should be handled as per applicable policies and guidelines.
- 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 always be kept on site. 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, Conservation and Parks (MECP) 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 quantity 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 by-laws unless an exemption is obtained.
- As per applicable guidelines, 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 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 because 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 Study Area due to other exclusion and/or construction activities.
  - 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 Environment and Climate Change Canada.



## **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. If 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 because of the proposed project activities, including Northern Map Turtle and Snapping Turtle (*Chelydra serpentina*), 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 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 of Conservation Concern**

Although the majority of SoCC 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 SoCC 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 the 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.

#### Bank Swallow

Bank Swallow (*Riparia riparia*) is listed as a Threatened species in Ontario. Although Bank Swallow nesting habitat was not observed within the Study Area, this species has been recorded previously surrounding the Study Area, 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.

# 4.0 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 using 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 a human-built site that cannot be restored to historical ecological conditions. There is opportunity 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 and create a more cohesive, diverse, and functional ecosystem. 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.

# 4.1 Parks and Open Spaces

As noted in the introduction, this revitalization includes a comprehensive investment in publicly accessible parks 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



shoreline – with a new beach and improved opportunities for swimming, fishing, and water recreation.

Prepared 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. Project plans also identify an increase in tree canopy cover for the site intended to, in part, reduce summer peak temperatures and air pollution, increase biodiversity and ecological function, and add living beauty to the spaces. Preliminary plans propose to increase 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 within downtown Toronto along 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. There are 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 intends to open the causeway 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. This would allow for increased connectivity between the internal embayments at Ontario Place and Lake Ontario for aquatic animals, increasing linkages between open water areas.

## 4.2 Natural Features and Habitat Enhancement

Plans for the OPPR identify an increase in tree canopy cover for the site intended to, in part, provide increased and improved wildlife habitat. The proposed master plan for the OPPR includes wetlands and waterfront woods. 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 a preliminary 9,300 square metres of innovative wetland habitat, which features habitat creation, as well as areas within the East Island (e.g., Brigantine Cove)<sup>2</sup>. Aquatic habitat value will also be increased with shoreline improvements in the protected shore zone.

Plans identify several strategies related to natural features and habitat enhancement including: increasing tree canopy cover; promoting biodiversity and rich wildlife habitat through the use of native and resilient planting; increasing habitat types and diversity of spaces on the islands through landscape planting and microclimate creation; keeping all developments out of flood hazard zones;



<sup>&</sup>lt;sup>2</sup> Amounts of wetland habitat have not been finalized and are not quantified for this report.

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, plans for the redevelopment identifies several strategies related to naturalizing development including stormwater management, pervious surfaces, and inclusion of renewable energy and materials. As the OPPR and Therme plans continue to develop, it is recommended that further consideration be given to naturalizing development and achieving a net habitat gain for the site.

As a human-built site, Ontario Place cannot be restored to historical ecological conditions, but proposed habitat creation 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.

## 4.2.1.1 Vegetation, Wildlife, and Wildlife Habitat

Landscaping plans for the OPPR and Therme facility are being developed according to best scientific practices. 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. Ongoing maintenance, monitoring, and adaptive management are recommended to support the growth and success of all habitat works.

The site is known to provide candidate Bat Maternity Colony SWH. Per MNRF (2015) SWH Criteria Schedules for Ecoregion 7E, maternity colonies can be found in tree cavities and vegetation with more than 10 large-diameter (>25 cm DBH) maternity roost trees per hectare. By increasing tree abundance 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 (*Pinus strobus*), Maples (*Acer spp.*), Ashes (*Fraxinus spp.*), Aspens (*Populus spp.*), and Oaks (*Quercus spp.*) (MNRF 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 (*Tachycineta bicolor*) are also known to nest in cavity trees throughout the site, as well as in artificial nesting structures. Addition Tree Swallow nesting structures can also be considered for installation at suitable locations on the site to act as habitat for this species in the near-term, until suitably mature trees are available. Other avian species observed onsite that could benefit from the inclusion of artificial nesting areas customized to the species include Terns and Gulls (family Laridae), 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. 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 Northern Map Turtle was observed in early spring after ice-out, and in early fall approaching ice-on, this area is considered a confirmed Turtle Wintering Area. The TRCA has undertaken restoration work within turtle habitat, which appears to have included installation of habitat features including vegetated islands and logs for basking. 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, provision of suitable additional turtle basking habitat in these areas should be considered. In addition, created wetlands should include a variety of submerged, emergent, and floating-leaved aquatic vegetation 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 nesting areas. Installation of artificial turtle nesting areas would be likely to result in successful nesting at this site given the prevalence of breeding-sized turtles observed in some areas.



Image 4: Painted Turtles observed in existing TRCA enhanced habitat south of Live Nation

The entire Site 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 day, more than 35 species in total, and at least ten species on at least five 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 and provincially rare wildlife species were detected over the course of the field surveys. Provincially rare species observed include Great Egret, King Eider, and Pied-billed Grebe. Special Concern species observed include Northern Map Turtle, Barn Swallow, Horned Grebe, Eastern Wood-pewee, Peregrine Falcon, Grasshopper Sparrow, and Monarch (Danaus plexippus). Therefore, the Study Area 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 turtles and waterbirds, 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. Monarch requires different habitat types depending on their life stage. Adult butterflies require feeding areas containing nectar producing plants and require Milkweed (Asclepias spp.) on which to lay their eggs. Upon hatching from eggs, larval Monarchs require Milkweed exclusively to feed on. Habitat creation for this species can be accomplished through including combinations of Milkweed 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 Migratory Butterfly Stopover Area SWH by including combinations of field/meadow and woodland habitats and including an abundance of Milkweed and preferred nectar plants within planting plans. In addition to wildlife, several provincially rare plants were also recorded in the Study Area, 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, Chimney Swift is the only terrestrial SAR confirmed on site. Although creation of nesting habitat for Chimney Swift is not required based on the anticipated project impacts and proposed mitigation and avoidance measures, the species responds positively to nesting on human-made roost structures. Therefore, incorporation of artificial roosting structures for Chimney Swift could be completed to enhance and improve habitat for the species if that objective is desired.

Although no snakes 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 is hibernation habitat, which will remain unavailable following the redevelopment. 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 most 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 (*Castor canadensis*) would benefit from creation of wetlands with increased aquatic vegetation, as well as from accessible plantings in riparian areas and shorelines.

Based on the current designs, approximately 80,300 m<sup>2</sup> green space and 5,200 m<sup>2</sup> green roofs will be established within the Study Area following completion of the project to act as habitat for various wildlife species, to varying degrees; refer to Figure 6. Although planting plans and restoration plans are in varying stages of development between the different stakeholders, at this time it is understood that proposed green spaces will consist of the following:

- Seven 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.
- Trees to be planted within the seven Therme Public Landscape areas as well as other spaces include numerous mast, seed/achene, and berry producing species for wildlife such as Oaks, Serviceberries, Nannyberry, and Elderberry (Sambucus sp.).
- Total trees to be planted are estimated in the range of 2,500 to 3,000 (+/- 15%)
- Currently, the anticipated area of green space within the OPPR is approximately 53,000 m<sup>2</sup>.
- The current Therme concept plans include an estimated 5,200 m² of green roof and 27,300 m² of greenspace.
- 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 roofs 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 roofs 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 will be approximately 5,200 m², green space proposed will include approximately 27,300 m² and approximately 53,000 m² within the Therme and Public Realm landscaped areas, respectively, and green space will include an estimated 2,500 to 3,000 planted trees. These proposed planted trees will result in a net gain of approximately 1,500 trees, or roughly a 50 - 60% overall increase in the number of trees on site, when compared with the current conditions and when required tree removals are considered.

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.

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.

#### 4.2.1.2 Fish and Fish Habitat

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 DFO, TRCA, AHT, and others. Habitat restoration, enhancements and offsetting shall be completed to meet agency requirements.

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 (TRCA 2020). Restoration and enhancement 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 migratory 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.



To benefit American Eel specifically, general improvements to the availability and abundance of foraging and refuge habitat is recommended. 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 American Eel was identified 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. The top layer of substrate for the shoreline protection and submerged reef areas will be selected to ensure the size provides suitable habitat for the American Eel. American Eel typically over winter in relatively shallow water with soft, unconsolidated substrates. Suitable locations to enhance or develop over wintering will be investigated.

#### **Therme**

The proposed design is anticipated to result in the loss of some existing fish habitat, and the permanent creation of new fish habitat resulting from the excavation of existing lakefill along the eastern wetlands on the West Island, and the construction and installation of the swimming pier and new public bridge, called the Gateway Bridge (refer to Table 9). There will also be the installation of restorative fish habitat features, which have the potential to result in permanent positive alteration to fish habitat in the amount of approximately 28,800 m<sup>2</sup>.

The restoration opportunities that are recommended will result in permanent net effects that are positive to the local fish and fish habitat. They include a diversity of features such as a submerged reef, wetland planting area, a cobble beach, and the open shoreline with surcharged revetments. These enhancements will be designed in detail through collaboration with all regulatory agencies and partnerships with organizations such as AHT. Best practices have been considered and will continue to be incorporated into the designs. All habitat compensation will be consistent with research and best management decisions for Toronto's Lake Ontario shoreline. Inclusions such as softened green shoreline edges on the eastern wetland areas on West Island are also anticipated to enhance fish habitat locally.

#### **Ontario Place Public Realm**

The OPPR plans propose the permanent creation of approximately 755 m² of fish habitat resulting from the removal of the existing fill/berm located at the eastern extent of the development site. The berm acts as a causeway and access between the mainland and the East Island. It will be replaced with a bridge to maintain access to the island. Brigantine Cove is located immediately west of this area and is a prime opportunity to improve aquatic habitat and create a naturalized shoreline edge. The aquatic habitat conditions in Brigantine Cove will improve through the increased connectivity provided by the proposed new bridge crossing. This linkage will assist in decreasing the stagnant water conditions and is anticipated to improve circulation throughout Brigantine Cove and beyond. The strategy for Brigantine Cove is to create a network of wetland spaces with riparian habitat to improve water circulation, manage occasional flooding and create an immersive landscape experience for visitors. 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.



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 26,600 m² of habitat will be enhanced, indirectly, within Brigantine Cove. Considerations for inclusion of the aquatic and riparian planting 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, floating wetlands, and water's edge planting zones here are intended to increase habitat and soften the edge of the island.

# 5.0 Permitting and Approvals

There are multiple permits and approvals that are required to initiate and complete the proposed plans. The following sections describe the current applicable regulations and legislation in place to obtain permits and approvals for the project.

## 5.1 Fish and Fish Habitat

For the project and potential impacts to fish and fish habitat there are several permits and/or authorizations that will be required.

#### 5.1.1 Fisheries Act

The federal *Fisheries Act* applies to developments that are anticipated to impact fish habitat. The Act prohibits serious harm to fish, and by extension within the Act, fish habitat. In cases where unavoidable impacts are anticipated (after avoidance and mitigation measures are used), the Act's policies require that protection of fish habitat be achieved. Where serious harm of fish is unavoidable, protection is most often achieved by way of employing habitat off-setting or compensation measures.

The creation and improvement of aquatic habitat surrounding Ontario Place's East and West Islands will be the permanent habitat compensation required to satisfy the anticipated Fisheries Act Authorization. Currently, more detailed plans for the footprint of the West Island are available, while the East Island is still developing specific volumes and footprints of fill. The removal of the east access causeway is included in this table, as development plans are further progressed. As the plans and footprints for the East Island develop, they will be compared and considered with the overall fish and fish habitat naturalization plan. Habitat lost to lake filling will require compensation and will be achieved through the proposed habitat gains or improvements listed in Table 9. Lake fills above the water level will be considered habitat loss (Table 9) as the existing lake and shoreline habitat will be overprinted by fill and other materials. Lakefill below water and the submerged reef will be considered habitat gains (Table 9) owing to habitat enhancement or creation incorporated into the proposed shoreline design. Lakefill below water along the south shore will employ specifically sized stone substrate to provide greater resources for the fish community. The reef will overprint the existing lakebed habitat but will provide additional rocky substrate for reproduction and complex cover. Habitat resources such as cover, forage, spawning substrate, and nursery habitat are limited in this area. The additional large rocky substrate, and habitat improvement measures will help supplement the limited resources and bolster productivity.



**Table 9: Lakefill and Aquatic Habitat Alteration Summary** 

Lakefill Description	Lakefill Area (m²)	Gain / Loss	Habitat Condition
New Lakefill Above Water (West Island South Shore)	35,200	Loss	Existing armour stone on shoreline. Lakebed substrate comprised of sands, glacial till, and gravel with outcrops of bedrock. Little habitat function providing opportunities for reproduction, shelter, or refuge.
New Lakefill Above Water (West Island)	4,300	Loss	Vertical walls of either concrete, steel pilings, or wood pilings on shoreline. Sheltered, depositional habitat with fine sediments and undisturbed vegetation growth. Vertical walls provide little depth gradients and limited surfaces for aquatic vegetation. While species such as Pumpkinseed and Rock Bass that prefer relatively warm water in sheltered areas have been collected along the east shore, opportunities for spawning and rearing young are limited in this locale.
New Lakefill Below Water (West Island)	15,700	Gain	Proposed armouring will provide depth gradients instead of vertical walls in some locations. Parts of armored areas and toe of slopes will be surcharged with substrates ranging from gravel to cobbles. These substrates will provide increased surface area for vegetation (where sufficiently sheltered) and benthic invertebrate production. Substrates will be sized appropriately to provide opportunities for open water species of Lake Ontario.
New Submerged Reef	12,000	Gain	A submerged stone reef structure constructed with rip rap to small armour. Substrate sizing will be dependent on fish community requirements for species such as Lake Trout, which spawned on nearshore reefs historically.
New Water Area Created from Existing Lakefill (West Island)	1,100	Gain	A naturalized, green wetland, incorporating a tiered shoreline to allow natural water level fluctuations and vegetation communities. The design of the wetland area is ongoing in consultation with stakeholders. Habitat features would be designed to support submergent and emergent aquatic vegetation with opportunities for spawning and reproduction, rearing young and adult refuge and growth for species such as Rock Bass, Pumpkinseed, Northern Pike, and Yellow Perch ( <i>Perca flavescens</i> ) and other suitable forage species, thus supporting habitat and fisheries objectives of TWAHRS and the Fish Community Objectives for Lake Ontario.



Lakefill Description	Lakefill Area (m²)	Gain / Loss	Habitat Condition
New Water Area Created from Existing Lakefill (East Island)	755	Gain	Removal of the existing causeway along the eastern edge of the East Island, improving connectivity, access to habitat, and water flow throughout Brigantine Cove. Vegetated and softened shorelines will replace existing sheet pile walls and timber cribs to improve riparian habitat integrity.

The following provide some examples of the proposed habitat enhancements associated with shoreline protection. A submerged stone reef structure will be installed off the southwesterly end of the newly expanded west headland. The proposed nearshore reef is a key innovative component of the project in the design of the West Beach, as it will help protect the beach from wave action and provide complex offshore habitat for a wide variety of aquatic organisms. Historically Lake Trout spawned on nearshore reefs along the Toronto Waterfront, but these have been lost or degraded over time due to dredging, aggregate extraction, and increased sedimentation. Suitable substrate will be placed at appropriate depths to promote Lake Trout spawning. This will support the Fish Community Objectives for Lake Ontario by providing critical spawning habitat for native species of sport fish (Stewart et al. 2017). Offshore habitat is limited around Ontario Place. New access to a wide range of offshore depth gradients provide habitat that was once scarce to these species. Complex, diverse habitats support feeding and reproduction modes of many important fish species.

Additional information will be provided for the associated gains and losses of fish and fish habitat for the east island when more detailed plans are available.

## 5.1.2 Endangered Species Act

The ESA is a provincial statute administered by the MNRF. The ESA defines mandatory species and habitat protection with a science-based approach to species designated by the Committee on the Status of Species at Risk in Ontario listed on Schedules 2 (Endangered) and Schedules 3 (Threatened) of O. Reg. 230/08. Species and their habitats are protected and any person who has an interest in activities which may harm, harass, kill a species or destroy/remove habitats of species regulated under the ESA (e.g., the development of a property) must adhere to the policies and regulations under the ESA, as failure to do so can result in fines.

The only aquatic species at risk known to inhabit the waters surrounding Ontario Place is the American Eel. Habitat for American Eel has been identified along the south shores of both islands in Ontario Place. They have been captured by fish community surveys previously but in low abundance and infrequently. They preferentially use rocky substrate adjacent to open water for foraging and shelter. The design of the habitat compensation features along the open lake shoreline will be tailored to ensure the appropriate substrate size to benefit American Eel. Enhancement or creation of over winter habitat will be explored. Consultation with provincial and



federal regulators will occur to ensure overall benefits to not just the American Eel population of Lake Ontario, but the greater fish community.

## 5.1.3 Applicable Timing Restrictions for Work

The following standard timing restrictions for work apply to aquatic habitat:

- July 16 to September 30 (for in water work affecting fish species present at Ontario Place)
- Project timing windows will be discussed with regulatory agencies

## 5.2 Terrestrial

Permitting or registration under the ESA is not anticipated to be required for terrestrial SAR.

Tree protection will be undertaken in a manner that is consistent with the industry standard in the City of Toronto as presented in City By-laws listed in section 5.2.1. Similarly, for aspects of the project applicable to TRCA jurisdiction, a voluntary review process will be undertaken. Trees in Trillium Park and Coronation Park are outside of the Study Area and are not anticipated to be impacted. The exact number of trees requiring permits for injury or removal is unknown as design plans have not been finalized. The MH (2023) Arborist Report estimates that 372 of 471 trees greater than or equal to 30 cm DBH (79%) and 1,343 of 1,782 trees less than 30 cm DBH (75%) will be impacted. Of the 1,343 trees less than 30 cm DBH, only those that are considered street trees (number unknown) require permitting.

## 5.2.1 City By-laws

The City of Toronto (2022b) Tree Protection By-laws applicable to trees subject to impacts from the proposed redevelopment include:

- City of Toronto Municipal Code Chapter 813, Article II, protects all trees situated on City streets.
- Article III, Chapter 813 of the City of Toronto Municipal Code protects trees on private property with diameter of 30 cm or more and trees of any diameter that were planted as a condition of a permit issued under this bylaw or a site plan agreement.

# 5.2.2 Applicable Timing Restrictions for Work

The following timing restrictions for work apply to terrestrial habitat:

- April 1 to August 31 (Breeding and Migratory Birds)
- April 1 to September 30 (Bats)

# 6.0 Conclusions

The following sections summarize the overall gains and losses of the project.

#### 6.1 Fish and Fish Habitat

The existing fish community reflects the habitat available in the waters surrounding Ontario Place, marginal and not functioning optimally. There is the potential to improve the productivity, resiliency and carrying capacity of this habitat, with intentional compensation and habitat restoration efforts



outlined in this report. Portions of the aquatic habitat at Ontario Place will be displaced by the developments presented above, but efforts to rebuild new habitat and improve existing habitat will offset these losses (Table 10). A deliberate and integrated plan to minimize the lasting impacts of this development will help promote a healthy and productive aquatic ecosystem.

Table 10: Summary of Estimated Quantity Aquatic Habitat Area Losses and Gains

Location	Loss of Existing Habitat	Proposed Habitat Restoration	Net Gain/Loss
West Island	39,500 m <sup>2</sup>	28,800 m <sup>2</sup>	-10,700 m <sup>2</sup>
East Island	NA <sup>3</sup>	755 m <sup>2</sup>	+755 m²
	Total		-9,945 m²

## 6.2 Terrestrial

The current terrestrial ecosystem at Ontario Place is limited in function across most of the Site. Areas such as Trillium Park and Tommy Thompson Park are ideal examples of how diversity and function of the natural features on the island can be improved and enhanced. The existing terrestrial condition provides an urban based habitat that was created with little forethought for long-term resiliency. Creation of a new and improved Ontario Place allows the opportunity to integrate a more balanced approach for human use within a natural state to emphasize education and innovation for future generations (Table 11).

Table 11: Summary of Estimated Terrestrial Habitat Area Losses and Gains

Loss of Existing Habitat	Proposed Habitat Restoration <sup>4</sup>	Net Gain/Loss
63,000 m <sup>2</sup>	85,500 m <sup>2</sup>	+22,500 m <sup>2</sup>

55

<sup>&</sup>lt;sup>3</sup> Not all area values are available; updates will be completed as the design progresses.

<sup>&</sup>lt;sup>4</sup> Does not include the wetland creation area (currently in the design stage).

# 7.0 Closure

Regards,

SLR Consulting (Canada) Ltd.

<Original signed by>

<Original signed by>

Gord Wichert, Ph.D., R.P.Bio., P.Biol. Technical Director, Aquatic Ecology

<Original signed by>

Kim Logan, B.Sc., P.Biol., P.Geo. (Limited)
Senior Ecologist

<Original signed by>

Nicole Charlton Senior Ecologist, ISA ON-2111A Matthew Ross, B.Sc. Terrestrial Ecologist



# 8.0 References

- Aquatic Habitat Toronto. 2004. Toronto Waterfront Aquatic Habitat Restoration Strategy. Available online at: <a href="http://www.glfc.org/pubs/FisheryMgmtDocs/Fmd17-01.pdf">http://www.glfc.org/pubs/FisheryMgmtDocs/Fmd17-01.pdf</a> [accessed 01 August 2023].
- City of Toronto. 2007. Bird-Friendly Development Guidelines. Available online at: <a href="https://www.toronto.ca/city-government/planning-development/official-plan-quidelines/design-quidelines/bird-friendly-quidelines/">https://www.toronto.ca/city-government/planning-development/official-plan-quidelines/design-quidelines/bird-friendly-quidelines/</a>.
- City of Toronto. 2016. Tree Protection Policy and Specifications for Construction Near Trees.

  Available online at: https://www.toronto.ca/data/parks/pdf/trees/tree-protection-specs.pdf.
- City of Toronto. 2022a. Official Plan. Available online at: https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/official-plan/.
- City of Toronto. 2022b. Toronto Municipal Code: Chapter 813, Trees. Available online at: https://www.toronto.ca/legdocs/municode/1184\_813.pdf.
- Evergreen. 2001. Urban naturalization in Canada: a policy and program guidebook. Available online at: <a href="https://www.evergreen.ca/downloads/pdfs/Urban-Naturalization-in-Canada-1.pdf">https://www.evergreen.ca/downloads/pdfs/Urban-Naturalization-in-Canada-1.pdf</a>.
- Halloran et. al. 2013. Best Management Practices set forth in the Clean Equipment Protocol for Industry. Accessed from <a href="https://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/Clean-Equipment-Protocol\_June2016\_D3\_WEB-1.pdf">https://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/Clean-Equipment-Protocol\_June2016\_D3\_WEB-1.pdf</a>
- Lloyst, M.H.M., T.C. Pratt, S., M., Reid, and M., G., Fox. 2015. Nearshore habitat associations of stocked American eel, *Anguilla rostrata*, in Lake Ontario and the upper St. Lawrence River. Journal of Great Lakes Research 41 (2015) 881-889.
- Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. 41 pp.
- Ministry of Natural Resources and Forestry. 2017. Best Management Practices for Excluding Barn Swallows and Chimney Swifts from Buildings and Structures. Queen's Printer for Ontario. 22p
- Ministry of Natural Resources and Forestry. 2017. Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-colored Bat. April 2017. 13 pp.
- Morrison Hershfield. 2022a. Natural Heritage Existing Conditions Report for the Redevelopment of Ontario Place. Presented to Infrastructure Ontario. Revised August 4, 2023. 234 pp.
- Morrison Hershfield. 2022. Arborist Report for the Redevelopment of Ontario Place. Presented to Infrastructure Ontario. Revised April 26, 2023. 131 pp.
- Ontario Invasive Plant Council. 2011 and 2012. Invasive Phragmites Best Management Practices in Ontario, Invasive Dog-strangling Vine Best Management Practices in Ontario, and Invasive Japanese Knotweed Best Management Practices in Ontario. Accessed from <a href="https://www.ontarioinvasiveplants.ca/resources/best-management-practices/">https://www.ontarioinvasiveplants.ca/resources/best-management-practices/</a>
- Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.



- September 13, 2023 SLR Project No.: 241.030861.00000
- Stewart, T.J., Todd, A., and LaPan, S. 2017. Fish community objectives for Lake Ontario [online]. Available from: <a href="www.glfc.org/pubs/FisheryMgmtDocs/Fmd17-01.pdf">www.glfc.org/pubs/FisheryMgmtDocs/Fmd17-01.pdf</a> [accessed 01 August 2023].
- Toronto and Region Conservation Authority. 2020. Toronto Water Aquatic Habitat Restoration Strategy. Available online at: https://torontorap.ca/app/uploads/2020/06/TWAHRS\_STRATEGY11.pdf.
- Toronto and Region Conservation Authority. 2016. Fishing in your Backyard: An Urban Recreational Fisheries Strategy for the Lake Ontario Northwest Waterfront. Available online at: <a href="https://trca.ca/app/uploads/2017/09/URFS\_June-20-2016.pdf">https://trca.ca/app/uploads/2017/09/URFS\_June-20-2016.pdf</a> [accessed 01 August 2023].



