3. Description of the Potentially Affected Environment

This chapter is divided into four different sections which describe different components of the baseline or existing environmental conditions. The first section describes the river characteristics which will influence the development of alternatives. This information has been separated from the remaining description of the natural environment such that some emphasis can be given to those aspects of the existing environment that are driving the development of alternatives for the DMNP. The second section describes the remaining components of the natural environment: fish and fish habitat, terrestrial vegetation, and wildlife. The third section addresses components related to soils and groundwater contamination. The final section describes socio-economic components: land use, air quality and noise, archaeology, aboriginal interests, and built heritage.

3.1 River Characteristics in the Project and Impact Assessment Study Areas

The Don Watershed possesses a dendretic drainage pattern that flows southward for 38 kilometres (as the crow flies) from the Oak Ridges Moraine (ORM) to the Inner Harbour of Toronto. The Don possesses two major branches (the East and West Don), each consisting of many smaller sub-watershed systems, such as but not limited to Taylor Massey Creek, Wilket Creek, Patterson Creek and Pomona Creek. The confluence of the East and West Branches occurs approximately 6 kilometres upstream of the Impact Assessment Study Area. Downstream from the confluence, the sub-watershed is known as the Lower Don and includes all of the Don Narrows until reaching the Keating Channel.

The entire watershed area or drainage basin of the Don River is approximately 360 square kilometres (**Figure 3−1**). It is the most heavily urbanized major watershed in the TRCA jurisdiction. Although the headwaters of the Don arise from the ground water rich Oak Ridges Moraine, the majority of the river drains through the Peel Plain (**Figure 3−2**). Owing to the relatively impervious till comprising this feature discharge contributions through this zone are almost entirely from surface run-off. The river also crosses the Iroquois Beach, the former shoreline of glacial Lake Iroquois, which is dominated by sandy material that enables both recharge and discharge of groundwater through this section.

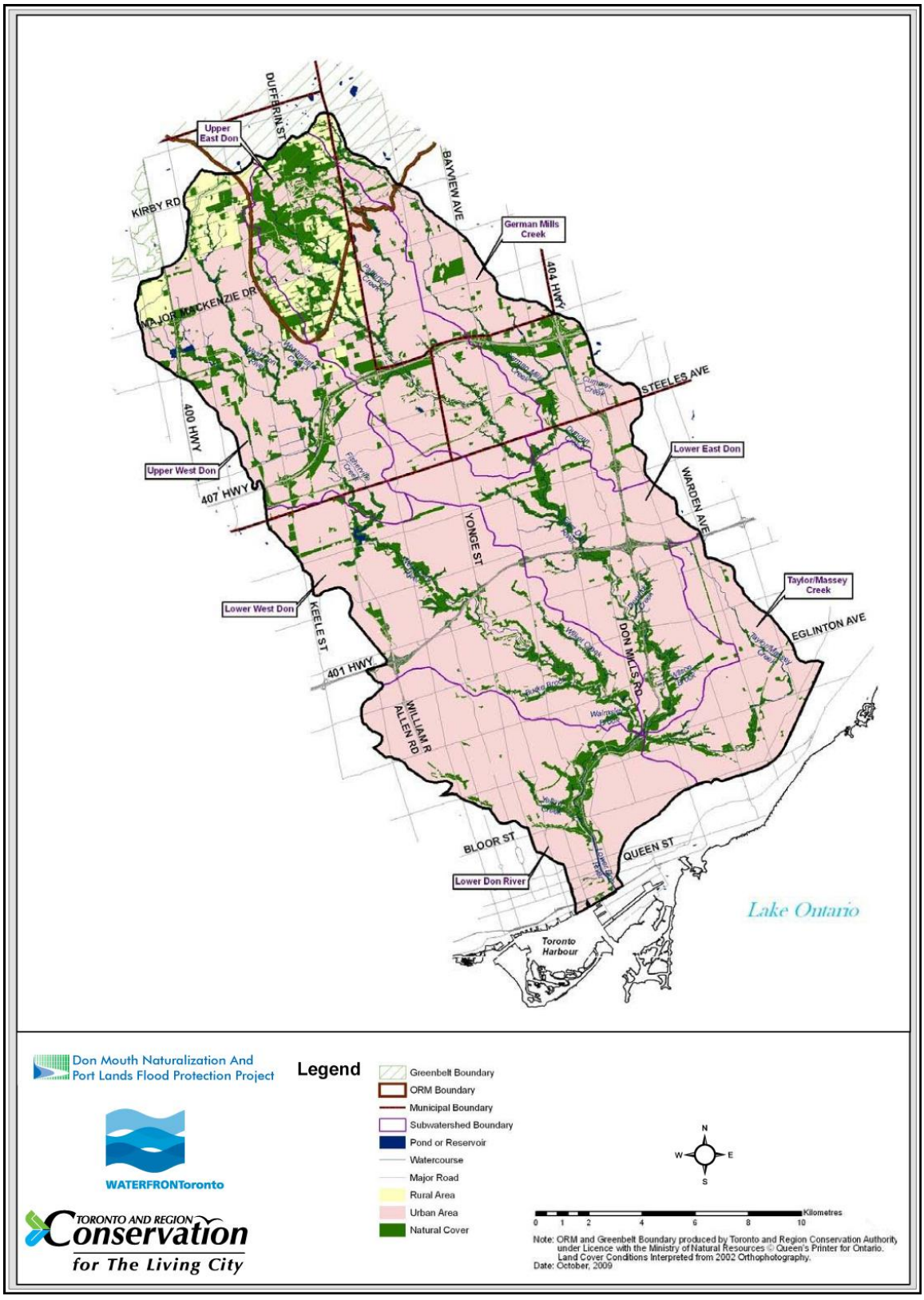

Figure 3-1 Don River Watershed

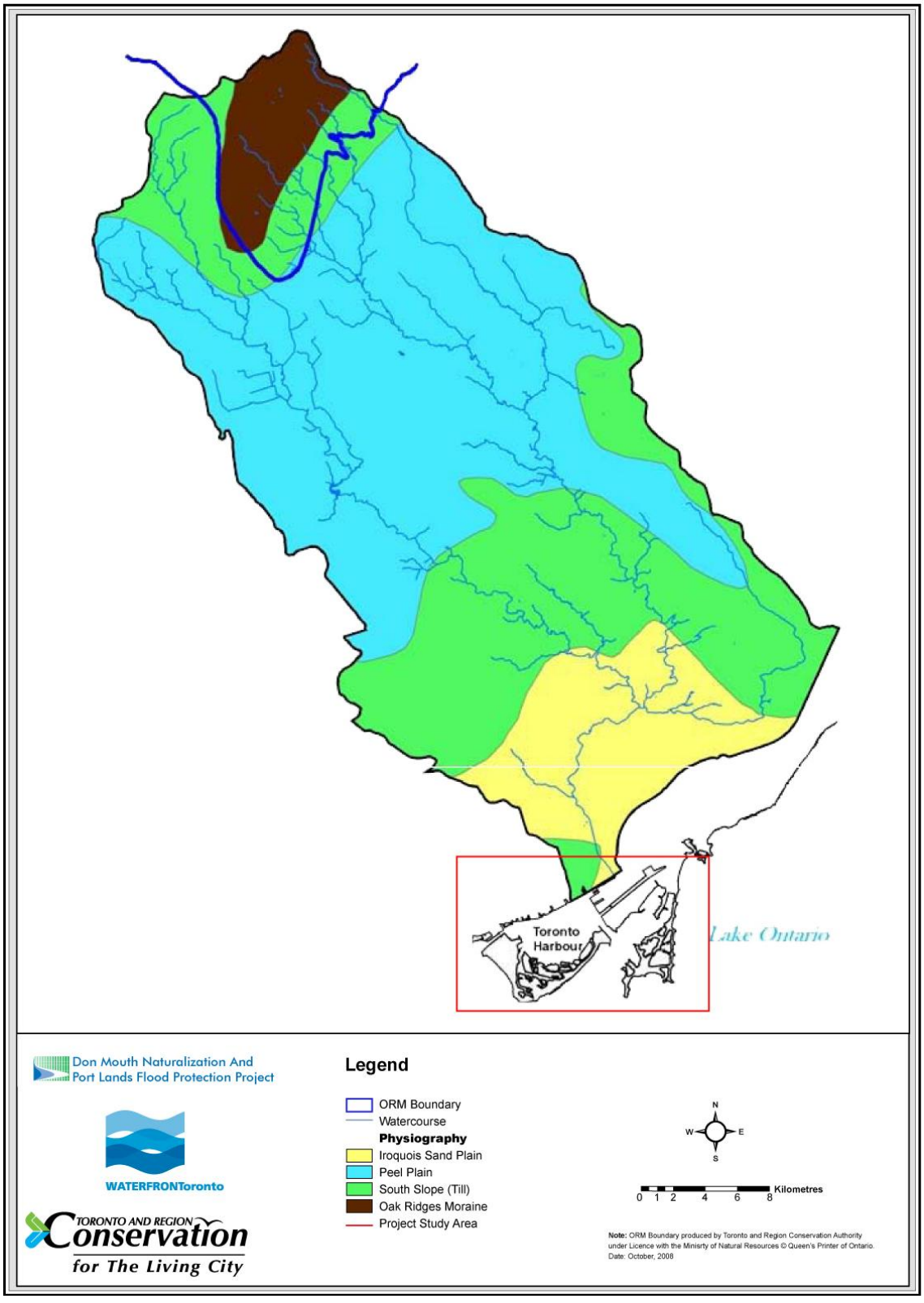

Figure 3-2 Surficial Geology of the Don River Watershed

The final 4 kilometres of the river (south of Bloor Street) lies within the Impact Assessment Study Area (**Figure 2-4**), and ends at Lake Shore Boulevard as it enters the Keating Channel, the Inner Harbour (also known as Toronto Bay), and Lake Ontario. Within the Project Study Area (**Figure 2-3**), the Don River from Riverdale Park downstream to the Keating Channel has been significantly altered as a result of adjacent land uses. Along this lower 4 kilometres section, the river is relatively straight (the channel banks largely consist of vertical steel sheet pile walls), lacks discernable grade, and has little natural connectivity to the floodplain.

The river in this lower area averages 40 metres in width and, depending upon lake levels, exhibits an approximate depth of 1 to 2 metres. South of Lake Shore Boulevard, the Don enters into the Keating Channel. The Keating Channel extends approximately 0.7 kilometres in length, varies between 37 and 60 metres in width and has depths between 2 metres and 5 metres, depending upon lake levels and the degree of sediment accumulation in the channel. During a period of approximately 5 years from the mid 1970s to early 1980s when dredging activities were halted in the Keating Channel, sediment deposition had resulted in the bed of the Keating Channel being higher than water levels in many locations during baseflow conditions.

In the context of a naturalization program for the mouth of the Don River, the form (morphology) and functions of the current river mouth differ dramatically from that of the river mouth that existed at the time of European settlement. Historic perspectives of the Lower Don River and its mouth at Lake Ontario are numerous (see **Figure 3-3**). For this reason, the following is a brief synopsis of the Lower Don River's evolution over the past 200 years. It is provided here as context for where the River has been and to set direction towards its future improvement and rehabilitation.

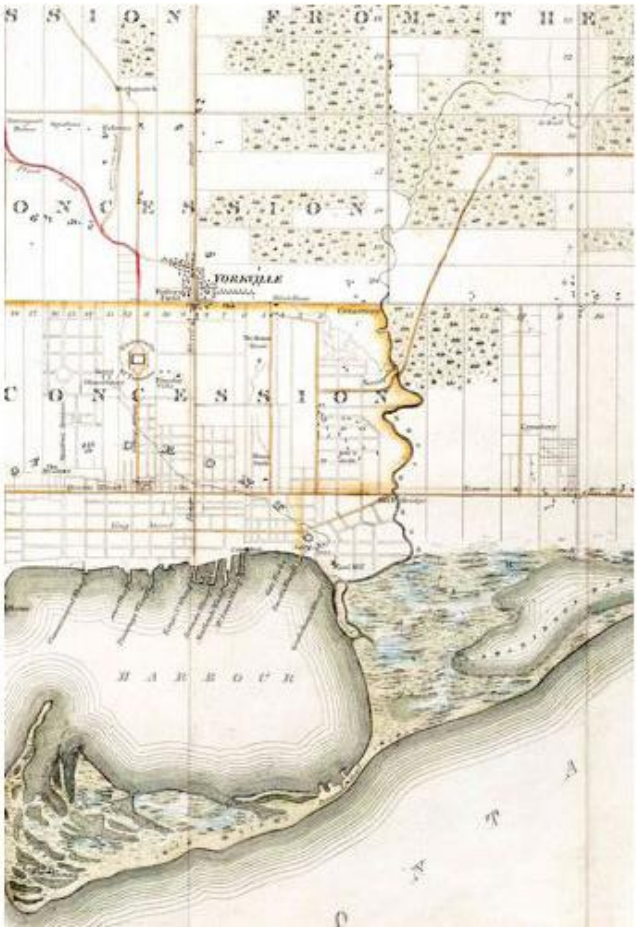

Figure 3-3 **Historical Detail from J.O. Browne and J. Ellis, *Map of the Township of York in the County of York, Upper Canada, 1851*, Toronto Public Library 912.71354 B68, courtesy of Derek Hayes (Bonnell, 2010)**

Prior to settlement and development of the City of Toronto, the lands along the lakefront were composed of forest and marsh habitats. The river was sustained by underground aquifers in its headwaters, as well as by rainfall and snowmelt that infiltrated the soils of the region's vast forests. Sheltered stretches of shoreline were lined with stands of emergent vegetation and much of the near shore was comprised of sand, gravel and stone (AHT, 2009). Of particular interest was the Ashbridges Bay Marsh complex. Named after the first settlers east of the Don River, Ashbridges Bay Marsh was in the late 1700s a 4 kilometres long marsh extending from present day Woodbine Avenue to the Toronto Harbour, covering an area of 560 hectares. It formed at the mouth of the Don River and was bounded to the south by a sandy peninsula that extended from the east to west and was formed from depositional materials eroded from the Scarborough Bluffs. The marshes were also bounded to the west by another sandy peninsula that extended south along the current Cherry Street alignment. The Ashbridges Bay marsh was one of the largest coastal marshes in the Great Lakes basin and offered extremely rich coastal habitat for hundreds of species of birds, mammals, reptiles and fish. Remnants of the east-west peninsula from the Scarborough Bluffs still exist today as a prominent feature of the Toronto Harbour, the Toronto Islands.

The channel and watershed of the Don River underwent profound changes, beginning around the late 1700s with extensive clearing of forest cover and grading of land contours. As settlement continued sawmills and gristmills were built along the river banks resulting in physical barriers to fish movement and migration, trapped sediments, siltation of fish spawning grounds and altered flow and water temperature regimes as a result of mill ponds. The native salmon populations that were once plentiful in this area declined rapidly, with the last recorded catch in Toronto Bay occurring in 1874 (Whillans, 1999).

Ashbridges Bay and the Lower Don River also became polluted by wastes from the growing Town of York, the Gooderham and Worts Distillery and cattle production. In addition to chemical pollutants other additions to the aquatic environment include non-native and invasive species. Since the 1800s, more than 140 exotic aquatic organisms have become established in the Great lakes (AHT, 2009). Some of these including Zebra mussels and common carp have been responsible for major alterations in aquatic communities.

Physical habitat alterations that have also occurred along the nearshore areas within the Impact Assessment Study Area include stone hooking, shoreline alteration (removal and filling) and hardening of shorelines. Stone hooking was a practice employed to remove aggregate materials from the lake bottom to support construction of buildings. This activity occurred from 1850 to 1910, during which significant changes to shoreline processes and its physical condition and loss of valuable aquatic habitat resulted (AHT 2009). Other early shoreline alterations included aquatic plant removal to improve navigation as early as the 1790s. Between 1900 and 1960, during the industrial period, extensive lake filling transformed the 560 hectares of Ashbridges Bay wetland complex.

The Ashbridges Bay Marsh, the recipient of decades of neglect between the 1880s to 1912, was largely lost by 1930 through active filling with garbage, building rubble and sediment dredge materials. Today the Lower Don Lands and former Ashbridges Bay, once home to a complex and rich wildlife community, are occupied by Toronto's main sewage treatment plant, salt and coal storage, oil tanks, industrial buildings, shipping docks and vacant lots (Royal Commission on the Future of the Toronto Waterfront, 1992). The river mouth of today consists of a highly altered, hardened, artificial channel, sheltered from the lake, continuously dredged, and cut off from the sediments of the Scarborough Bluffs.

Fortunately, in recent decades attention has moved towards improving and rehabilitating the Toronto Waterfront and in particular the Don River mouth. These efforts are summarized in **Chapter 2** of this document. As described in this early section, the naturalization of the Don River Mouth will provide many opportunities to improve and enhance the natural and physical components of the Lower Don River environment, while other issues such as water quality (bacteria, nutrients and contaminants) are being addressed through complementary studies such as the City of Toronto's Wet Weather Flow Management Master Plan.

The following sections describe the physical characteristics of the Lower Don and Don River Mouth for both the Impact Assessment and Project Study Areas.

3.1.1 Channel Origins

3.1.1.1 Geology of the Project and Impact Assessment Study Areas

The Georgian Bay Formation underlies the Project and Impact Assessment Study Areas. The formation consists of blue-grey shale with minor siltstone, sandstone and limestone interbeds. Upward in section, pale grey to cream, fossiliferous limestone and dolostone interbeds become more common. The Georgian Bay Formation is interpreted to represent a shallowing upward, storm-dominated shelf succession.

Outcrops of the Georgian Bay Formation are common along watercourses west of the Project and Impact Assessment Study Areas, notably the Humber River, Mimico Creek, Etobicoke Creek and the Credit River. Construction excavations in downtown Toronto commonly intersect and expose this formation. The Georgian Bay Formation is part of a Palaeozoic sequence of Late Ordovician age. The Georgian Bay Formation is underlain by the Blue Mountain Formation. This entire sequence dips (slopes) gently to the south at 5 metres per kilometre.

3.1.1.2 Soils of the Project and Impact Assessment Study Areas

The potential effects of the DMNP on soils will only occur within the Port Lands area, and thus the existing soil conditions are only relevant for this area in the context of the EA. The following discussion thus only focuses on soils within the Project Study Area.

The majority of the lands that make up the Port Lands were reclaimed during the 1800s and mid 1900s by filling Ashbridges Bay between the Don Mouth on the mainland and Fisherman's Island to the south. Reclamation reportedly proceeded with the use of hydraulically and mechanically moved harbour floor dredge spoils. Numerous different sources of fill, including dredge spoils, excavated native soils from borrow pits and construction sites, construction debris, residual stockpiled materials and so forth were used in the reclamation of the Port Lands. The composition of the fill overburden within the Port Lands may vary considerably over short distances. The use of excavated materials from urban construction sites and reported instances of municipal solid and other waste dumping in some sectors of the Port Lands indicates that non-soil inclusions including metal fragments, fireplace ash, clinker, coal, timber, brick, asphalt and concrete rubble and glass, as well as soil affected by environmental contaminants from off-site sources, may be present.

The overburden consists of layers of sand and silt and extensive areas of peat. The typical depth to bedrock within the Project Study Area ranges between 15 and 67 metres deep. The variability in the depth of layered sand and silt in the Project Study Area represents late-and post-glacial deposition of deltaic sediments on the underlying bedrock surface, which underwent differential weathering and erosion during pre-glacial time.

The land created by the reclamation scheme under the Toronto Harbour Commission (THC) Waterfront Development Eastern Section Plan in 1912 for the construction of what was then known as the Toronto Harbour Industrial District called for public and commercial wharfage and marketable land for promoting and servicing industrial development; however, heavy industrial usage commenced during the First World War and has predominated to date. The THC continued to construct and operate port facilities including the Keating Channel, extensions to the Ship Channel, quays on the East Bayfront including the Queen Elizabeth Docks and ultimately the container terminal at the Eastern Gap. The THC also continued to fill land initially for mixed purposes, but ultimately for heavy industrial/commercial uses due to the strategic requirements for industrialization during the First and Second World Wars.

A more fulsome discussion of the contaminants found in the soils and groundwater within the Project Study Area is found in **Section 3.3.**

3.1.1.3 Geomorphology of the Project and Impact Assessment Study Areas

The position and form of the mouth of the Don River have changed continuously and dramatically over the 13,000 years since the last glaciers retreated from the Toronto region. The Don River is a "drowned river mouth", which had formed as a result of changing volumes of glacial melt-waters, isostatic rebound of the landscape in response to release from the massive weight of the glaciers, and successive changes in lake levels. The current water level of Lake Ontario lies between the two extremes of the last 13,000 years: extremes that have left their mark as two parallel lines of beach bluffs.

The extent and composition of the wetland communities at the new mouths of the rivers in the Toronto region depended upon how far up the valleys the lake waters flooded. Where the Iroquois Plain was wide and the lake levels did not reach the old Iroquois shoreline, the wide, shallow river mouths allowed the formation of large fertile marshes and lagoons. Where the plain was narrow and the lake levels extended as far as the old Iroquois Shoreline, the narrow, deep river mouths allowed only the formation of small, peripheral wetlands. The historical mouth of the Don River, on Ashbridges Bay, was of the former type. The current mouth of the Don River, redirected, artificially narrowed, hardened and dredged, functions more as the latter type.

The current mouth of the Don River lies further south than the pre-disturbance river mouth, having been relocated during the construction of the Port Lands and filling along the lakeshore. The resulting very low grades in the lower Don River provides an additional complication, since even minor wind-driven (seche) or seasonal changes in lake levels can have influences hundreds of metres upstream.

The Lower Don River and Keating Channel are best characterized as lacustrine in nature, with hardened concrete channel banks. The lake effect can dominate riparian functions as far north as Gerrard Street. The current geomorphology of the mouth of the Don River differs so dramatically from the historical form of the river mouth, that the restoration of the pre-disturbance ecosystem is not possible.

3.1.2 Hydrology

The hydrology of the Don River has been dramatically affected by the highly urban nature of the watershed. Unlike less developed watersheds, the Don River watershed demonstrates a rapid response to storm events, with flows moving quickly through the river and into Lake Ontario.

A summary of the calculated flows for a range of storm events at the existing mouth of the Don River watershed is presented in **Table 3-1**. The flow values shown reflect the anticipated future land uses within the watershed.

Table 3-1 Peak Flow (m^3/s) Associated with Storm Events at the Mouth of the Don River

2-year	5-year	10-year	50-year	100-year	Regulatory Flood
164.0	240.0	295.0	430	496.0	1,694.0

The urban nature of the watershed has led to a river system with no well defined annual hydrograph (i.e., no well-defined spring freshet peak), but instead a series of peaky storm events throughout the spring, summer and fall seasons (**Figure 3- 4**).

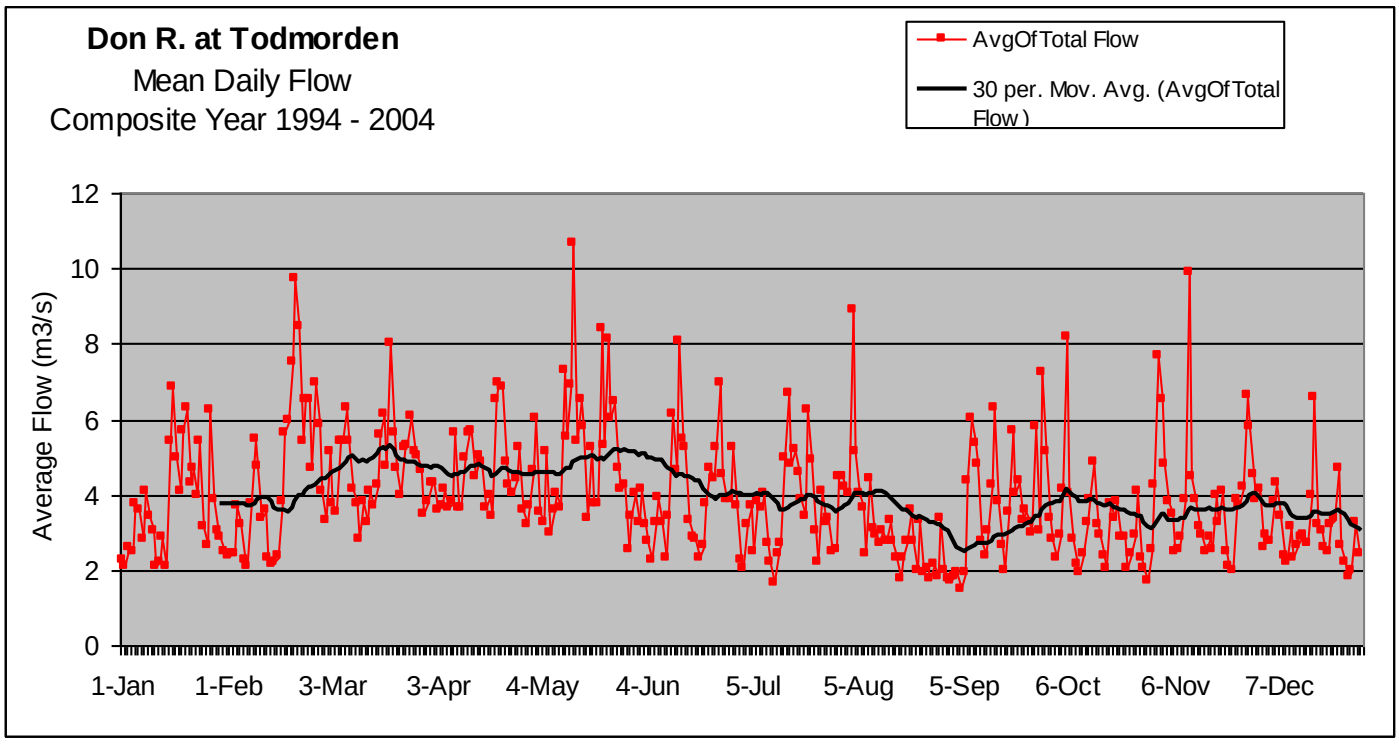

Figure 3-4 Annual Timing of Flows in the Don River at Todmorden (1994-2004)

The hydrology of the river has also been influenced greatly by industrial activity in the late 19th and early 20th centuries at the shoreline. As described in **Section 3.1.1,** the Don River lacks a defined valley feature south of Queen Street as a result of the artificial extension of the shoreline into Lake Ontario that accompanied the industrialization of the lakefront. As a result, there is little gradient at the south end of the Don River, which in turn means that water levels under normal, or low flow, conditions, are influenced more by the lake than by the river. The average water elevation of Lake Ontario at the Inner Harbour (i.e., Cherry Street) is 74.7 metres above sea level (mASL), and thus under low flow conditions the average water level of the Don River is equal to 74.7 mASL. This level can fluctuate by approximately 1 metre in either direction due to annual changes in lake levels (**Figure 3-5**).

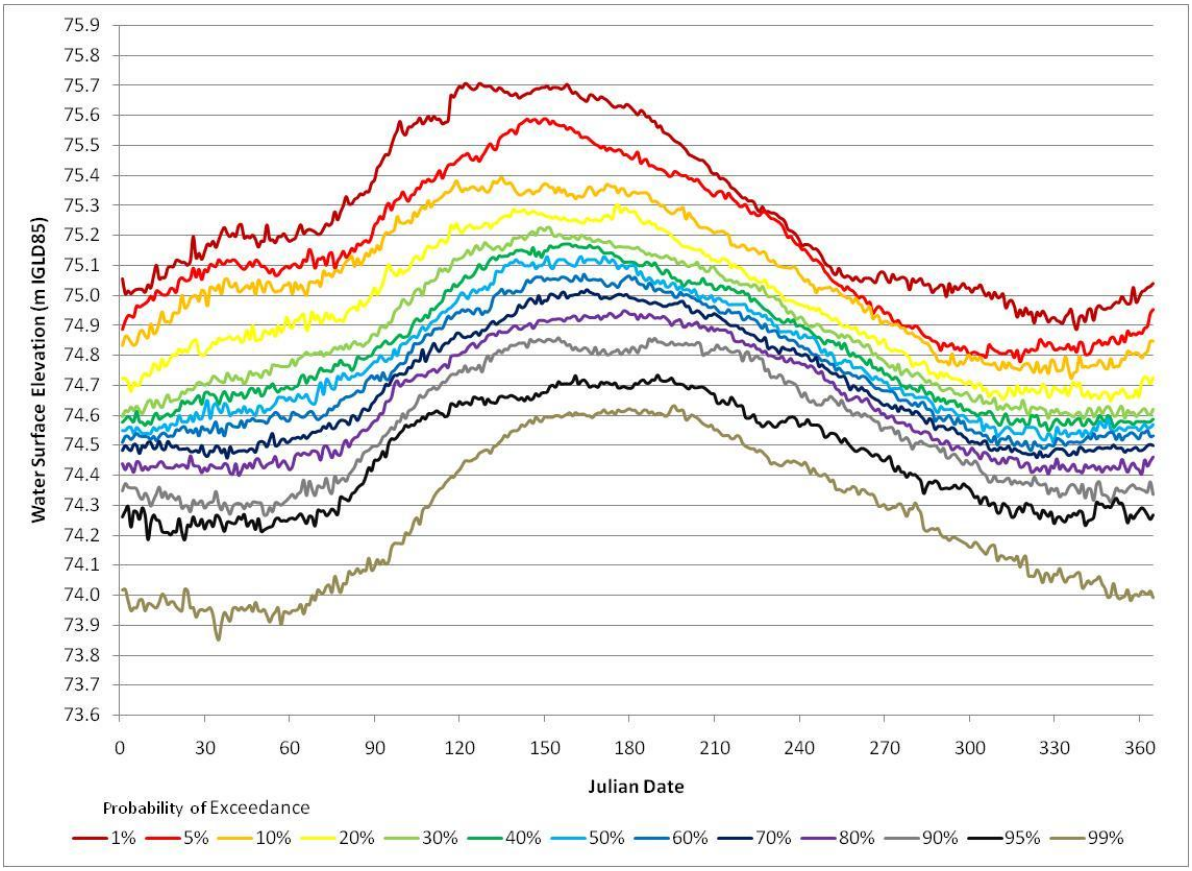

Figure 3-5 Daily Toronto Harbour Water Surface Elevation (WSE), Probability of a WSE at or Above an Elevation as a Function of Julian Date[1] (Limnotech, 2008)

Flows in the Don River have changed significantly since pre-settlement times. The watershed is now over 80% urbanized, and approximately 70% of this area was developed before stormwater management controls were a requirement of development. Discharge in the Don River increases rapidly due to precipitation resulting in turbid, sediment-laden water, erosion of the stream banks, and scouring and deposition, smothering in-stream habitat features.

3.1.3 Flooding

Flooding within the area of the Lower Don River has a written history dating back to the mid-1870s, beginning first with ice jams and late fall flooding. However with rapid development of the headwaters over the last few decades and the corresponding increase in stormwater responsiveness, floods can occur at any time during the year. As recently as August of 2005, extensive flooding occurred within the Impact Assessment and Project Study Areas resulting from a series of severe thunderstorms. The flooding that has occurred over the last few decades has resulted in mainly nuisance type flooding. However, the area would be subject to extensive flooding under a tropical storm similar to Hurricane Hazel, which occurred on October 15 and 16, 1954.

1. *In astronomy, the Julian year is a unit of time defined as 365 days long. For the purposes of Figure 3-5, Julian Day value of 0 is January 1, and Julian Day value 364 is December 31.*

The Province of Ontario currently uses the rainfall from Hurricane Hazel centered over the Don Watershed to define the limits of flooding, known as the Regulatory Flood. Upstream of Queen Street within the Project Study Area, the valley feature is narrow but is sufficiently deep to be able to contain the extremely high discharge rates estimated to be in the range of 1,700 cubic metres per second.

South of Queen Street within the Project Study Area, there is no valley, but rather a broad, wide, low-lying area comprised of lakefill, possessing no valley containment of the Regulatory Flood. Flooding within this area is further influenced by the elevated embankment of CN Rail's Kingston Subdivision, forcing floodwaters further west and restricting flows under the embankment through existing north-south road underpasses (e.g., Spill Zone 3 (**Figure 2-1**)). Water from the Regulatory Flood would spill west into the downtown core of the city, and south and eastward through the Port Lands and South Riverdale community (**Figure 2-1**).

Flood protection works are currently being implemented upstream in the Lower West Don Lands (as per the LDRW Class EA) in order to stop flood waters from spilling west through Spill Zone 3. The elevated railway crossing at the Don River has already been lengthened to accommodate the additional flood flows that would be prevented from flowing through the West Don Lands.

On the north side of the Kingston Subdivision, floodwaters would also exit east of the Don River and flow under the Eastern Avenue underpass of the Kingston Subdivision before flowing east through the South Riverdale community towards Ashbridges Bay.

South of the Kingston Subdivision, floodwaters under the Regulatory Flood continue to exceed channel capacity, spilling south of the Keating Channel and east of the Don River. These waters combine with flows originating through the Eastern Avenue underpass of the Kingston Subdivision, and merge to form Spill Zones 1 and 2 (**Figure 2-1**). Spill Zone 1 is mainly comprised of industrial and vacant lands whereas the vast majority of Spill Zone 2 is comprised of residential and commercial land uses.

Immediately north of the Kingston Subdivision, floodwater depths are calculated to be in excess of 3 metres at the peak flood depth. Given the relatively uniform topography and the widespread extent of flooding south of the Kingston Subdivision, depths are for the most part less than 1 metre, with some areas exceeding 1 metre, primarily associated with the Unilever site and along Lake Shore Boulevard East.

In addition to the influences of a highly urbanized watershed and an artificially extended shoreline, the mouth of the Don River contains a number of other human-made impediments to flood conveyance (**Figure 3-6**). The known impediments to flood flow downstream from the CN rail bridge are:

- Utility bridge;
- Gardiner Expressway piers;
- Lake Shore Boulevard road and rail crossing; and
- 90-degree bend at the top of the Keating Channel.

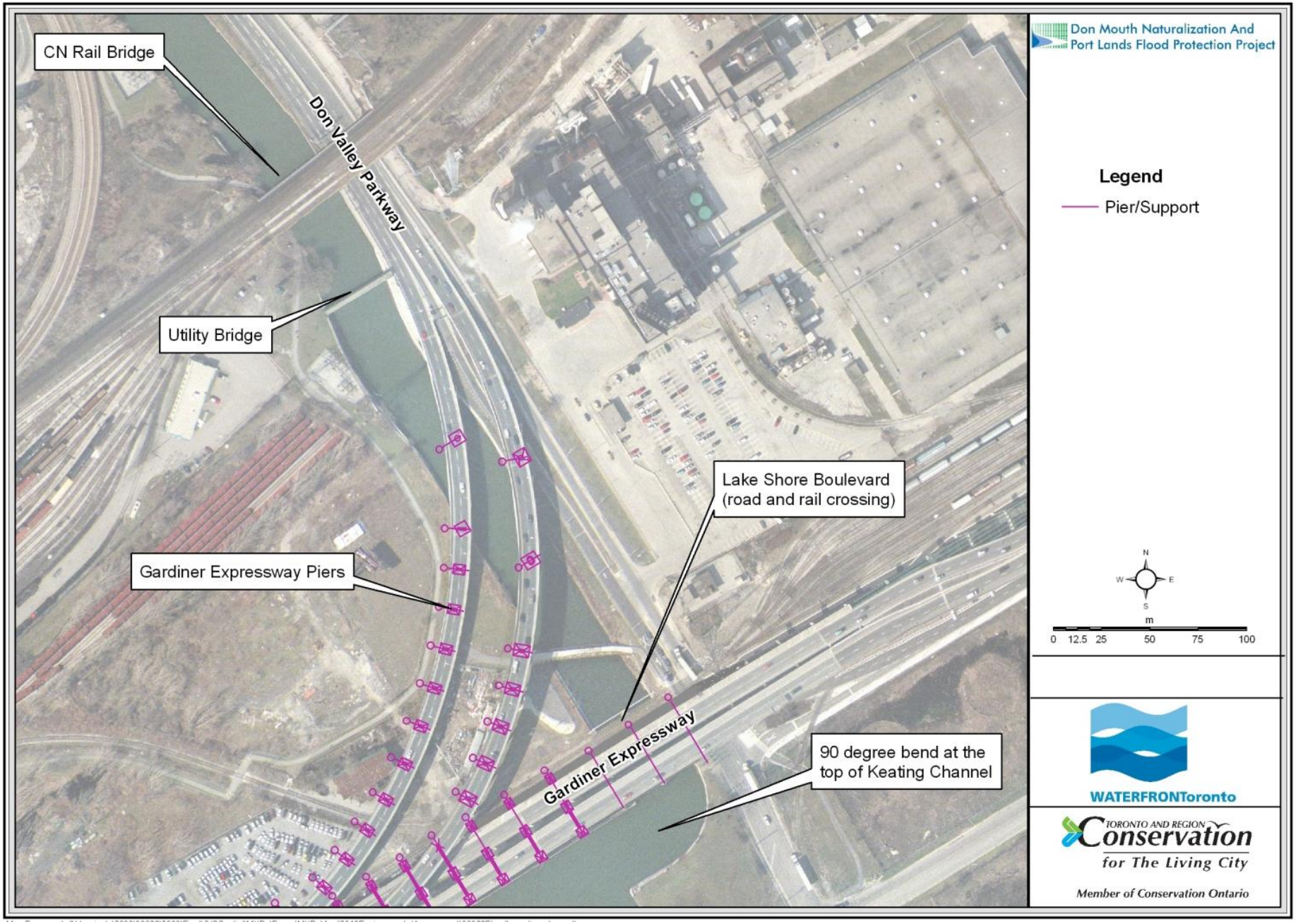

Figure 3-6 Impediments to Flood Conveyance

Past studies in the area, such as the Lower Don River West Remedial Flood Protection Project, have examined the hydraulics of the Don River at its mouth through the use of computer modelling. These models have been used to predict the expected response of the river, in terms of flows, velocities, and water levels, to flood events including the Regulatory Flood. The results of past hydraulic analyses lead to the following conclusions:

- The flooding depth within the Don River channel at Lake Shore Boulevard is approximately 5.5 metres, and almost 1.5 metres deeper north of Project Study Area at Queen Street;
- Flood depths greater than 1 metre would be expected within the area immediately adjacent to the river, and immediately north of the CN Rail line;
- The lands within the Impact Assessment Study Area approximately bounded by the Don River to the east, Cherry Street to the west, the CN Rail line to the north, and Lake Shore Boulevard to the south (i.e., 480 Lake Shore Boulevard) remain generally unaffected by the Regulatory Flood levels; and
- Under existing conditions, none of the roadway crossings are overtopped, with the exception of Lake Shore Boulevard.

Past analyses and the conclusions listed above have been updated as part of the DMNP EA through the use of a three-dimensional hydraulic and sediment transport model, known as Delft3D. The Delft3D model was used to evaluate hydraulic conditions and flood flows under existing conditions. The results of this analysis are summarized in **Table 3-2**.

Table 3-2 Delft3D Modelling of Hydraulic Conditions and Flood Flows under Existing Conditions

Return Period (approximate)	Flow Rate (m^3/s)	Velocities (m/s)		Effects
		Upstream of Lake Shore Boulevard	Keating Channel	
5-year	250	2.0 - 2.5	1.0 – 1.5	Flooding upstream of the CN Rail bridge on the west side of the Don Narrows north of Queen Street, as well as minor inundation on lower Don Valley Parkway.
25-year	350	3.0 - 3.5	1.5 – 2.5	Flooding continues on lower Don Valley Parkway and parts of Bayview Avenue. Flow begins entering the Unilever site downstream of the CN bridge.
100-year	> 500	4.0 - 5.0	2.0 (3.0 – 3.5 in the narrow section of the Channel)	Flow crosses Lake Shore Boulevard to the east of the Channel; begins flooding the Port Lands south of Lake Shore Boulevard.
>100-year	600	4.0 - 5.0	2.5 – 4.0	Flow around Unilever building. Overbank flow out of the 90-degree bend at the top of the Keating Channel continues. Flow along Villiers Street, Don Roadway, and Commissioners Street south of Keating Channel.
Between 100-year and Regulatory Flood	> 1000	> 5.0	3.0 – > 5.0	Flow through the Eastern Avenue underpass; flooding is conspicuous throughout the entire Project Study Area.

3.1.4 Water Quality

The water quality of the Lower Don River has been characterized in studies such as the Don River Watershed Plan (TRCA, 2009a), the City of Toronto's Wet Weather Flow Management Master Plan (City of Toronto, 2003c) and the Toronto Area Watershed Management Study (Pitt and McLean, 1986).

Three types of water pollution affect health and activities on the Toronto Waterfront and in the Don River: bacterial, nutrient enrichment and contaminants. These pollutants come from four main sources: local point sources such as combined sewer overflows (CSOs) (30 from which the Don River receives effluent), storm sewer outlets (approximately 872 on the Don River) and water pollution control plant discharges (North Toronto Wastewater Treatment Plant); watershed non-point sources; lake wide sources; and historic sources such as sediments contaminated by past activities (TRCA, 2007a).

3.1.4.1 Impact Assessment Study Area

The water quality issues along the Toronto Waterfront (Impact Assessment Study Area) are similar to those associated with the Don River. The highly-urbanized Don River is the dominant source of flow and contaminant and nutrient loading to the harbour as it accounts for over 90% of land-based flow to the harbour (MOE, 2001). Since contaminant loads are positively correlated with flow, the river also accounts for a majority of the suspended sediment, phosphorus, copper, lead and zinc loading.

3.1.4.2 Project Study Area

The Don River often exceeds the Provincial Water Quality Objectives (PWQOs) for many substances, especially during wet weather. Contaminants routinely found in wet weather samples include *E. coli* bacteria, heavy metals (e.g., zinc, copper), suspended sediment, nutrients, and seasonally, chlorides and pesticides. The major sources of these pollutants are runoff from roads and residential, industrial and commercial land uses through the storm sewers, the effluent of the North Toronto Wastewater Treatment Plant, combined sewer overflows along Taylor/Massey Creek and the Lower Don, and spills.

Elevated levels of conventional pollutants that exceed water quality guidelines even in dry weather or low flow conditions are also found in the Lower Don waters. Water quality data collected on the Lower Don under TRCA's Regional Watershed Monitoring Network ambient water sampling program show that for a number of conventional pollutants, less than 70% of water samples met the guidelines for those contaminants (**Table 3-3**).

Table 3-3 Median Concentrations and the Percent of Samples that Meet Guidelines at the Pottery Road Monitoring Station (January 2002 – July 2005)

Water Quality Variable	Median Concentration	Percent Meet Guideline (%)	PWQO or Other Guideline
Total Suspended Solids	12 mg/L	79	30 mg/L
Total Phosphorus	0.15 mg/L	10	0.03 mg/L
Nitrate	1.5 mg/L	13	1.0 mg/L
Un-ionized Ammonia	0.023 mg/L	46	0.02 mg/L
Chloride	220 mg/L	76	250 mg/L
E. coli	615 CFU/100 mL	18	100 CFU/100 mL
Copper	4.84 µg/L	52	5 µg/L
Lead	5.0 µg/L	68	5 µg/L
Zinc	13 µg/L	67	20 µg/L

Note: Values in the table represent predominantly dry weather or low flow conditions in the Don River because samples were collected monthly on set dates and low flow conditions prevail roughly 75% of the time.
Source: TRCA, 2008

The Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 1999) recognize the following guidelines as the lowest acceptable concentrations of dissolved oxygen (see **Table 3-4**).

Table 3-4 Federal Dissolved Oxygen Guidelines (TRCA, 2004b)

Ecosystem	Guideline value (mg/L)	
	Early Life Stages	*Other Life Stages*
Warm Water	**6**	5.5
Cold Water	**9.5**	6.5

Dissolved oxygen (DO) concentrations in the Keating Channel obtained by TRCA in 2003 indicate that DO is too low to support even warm water fish at any life stage for the majority of the time in July. There was a decreasing trend in DO concentrations in July, 2003 which may be the result of an increasing biological oxygen demand (BOD). High BOD is known to be caused by the decomposition of organic material in industrial and municipal effluents (sewage treatment facilities) and can result in fish kills. Without remedy, low DO concentrations during the summer months will likely limit the type of resident fish assemblage that can be established in the mouth of the Don River at the Keating Channel (TRCA, 2004b).

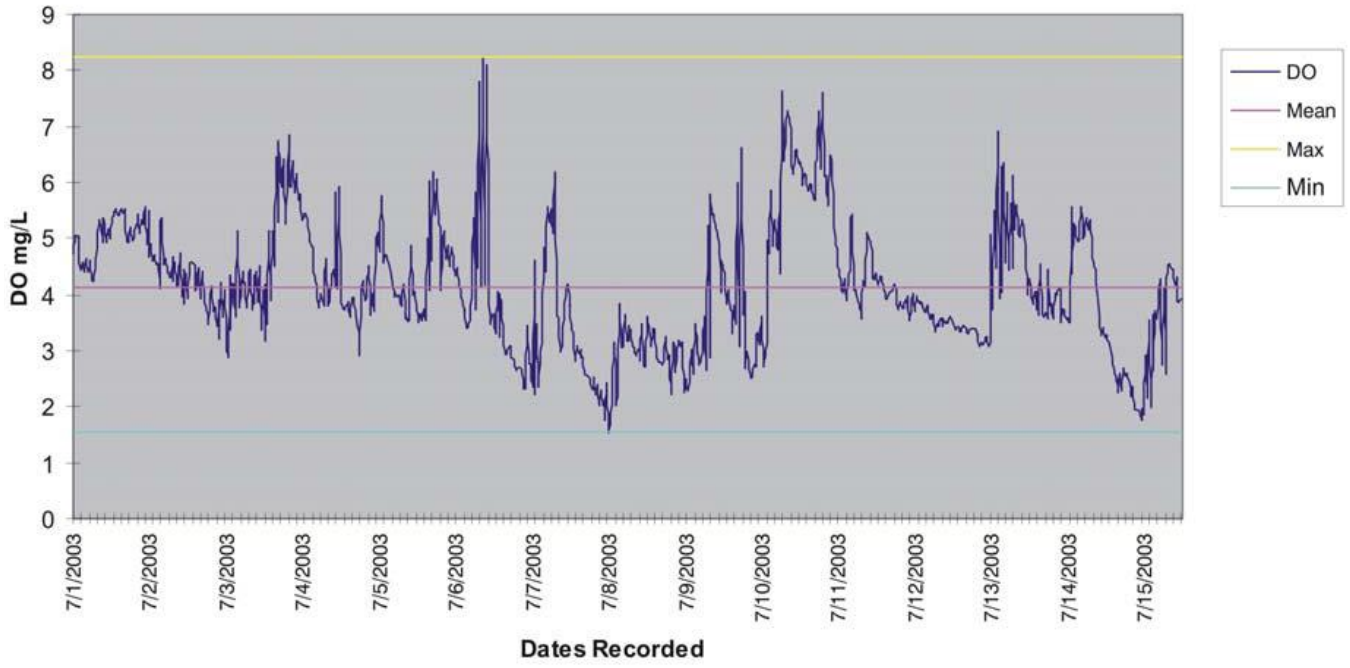

Figure 3-7 Keating Channel Dissolved Oxygen, July 2003

Suspended solids (including inorganic material like silt and clay, and particulate organic matter such as algae) are a principal factor in the determination of water clarity, although discolouration associated with dissolved solids is also a factor. Suspended sediment may be derived from watershed sources carried to the river, such as from construction sites, winter de-icing and instream erosion. When the sediment carried in suspension arrives at the lower Don River, the velocity changes result in it being dropped out of suspension and deposited on the bed of the river or in the Keating Channel. Typical concentrations of suspended solids, throughout much of the year, do not

cause direct stress to aquatic life or impose undue restrictions on beneficial uses such as recreation. They are, however, strongly associated with contaminants such as metals and trace organics which have low solubility and tend to preferentially bind to suspended solids (MOE, 2001).

Turbidity of the water in the Don River is generally elevated (median of 24.3 NTU) due to sediment loading upstream, instream erosion and, when occurring, regular dredging that is undertaken to maintain depths within the channel and to prevent upstream flooding. Based on TRCA data collected during 2008 (**Figure 3-8**), increased turbidity often correlates well to rainfall events and dredging activities.

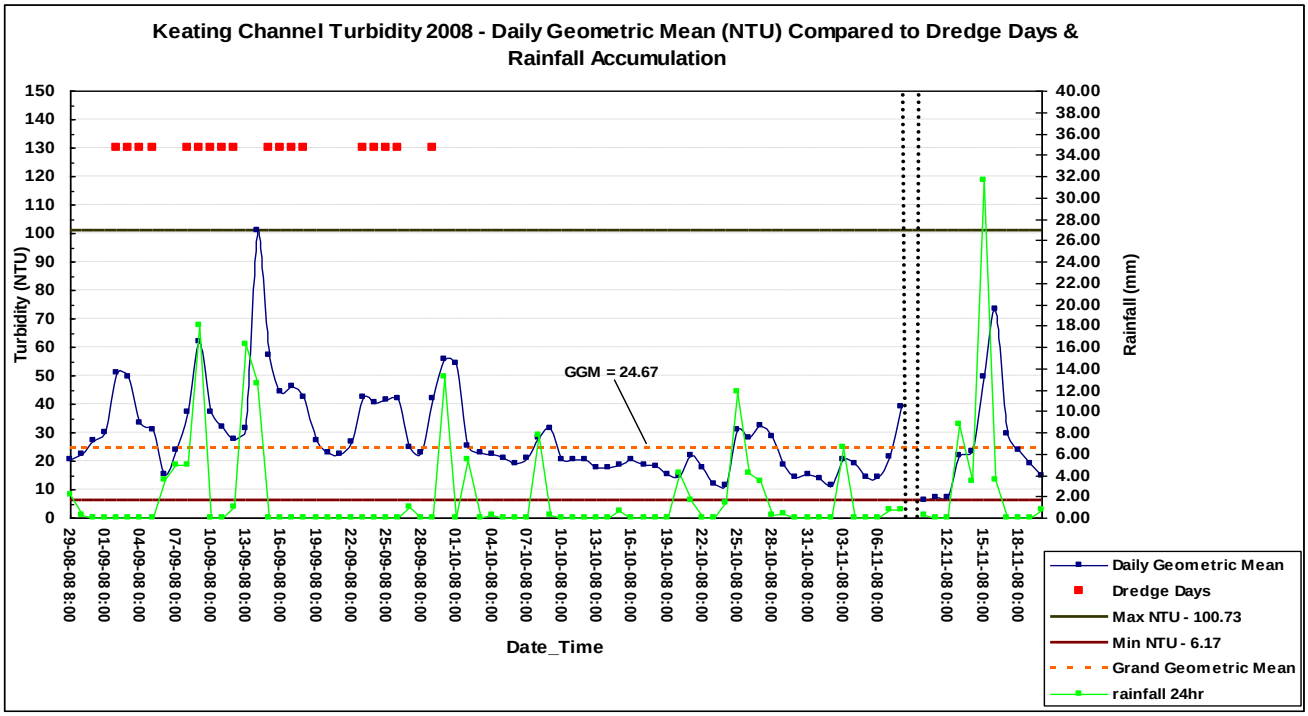

Figure 3-8 Keating Channel Turbidity (TRCA, 2008)

The Keating Channel and the Lower Don generally have similar water temperatures between the months of September to May; however, during the summer months (June to August), the Lower Don experiences warmer water conditions than the Keating Channel largely because of the influence of Lake Ontario on moderating the water in the Keating Channel (TRCA, 2004b).

Overall, the studies reviewed suggest that aquatic organisms in the mouth of the Don River and Keating Channel are subject to water quality stressors. In the Keating Channel, high chloride concentrations and low dissolved oxygen concentrations will likely limit the presence or usage of these areas by native fish and benthic invertebrates for certain life-stages.

While not focussed directly on improving water quality, the DMNP will likely improve some aspects of water quality both in the Don River Mouth and the Inner Harbour through enhanced management of transported sediment and improved water turn over during the summer months through the naturalized portion of the Don River. It is anticipated that implementation of the City of Toronto's Wet Weather Flow Management Master Plan will have a positive effect on water quality in the Project and Impact Assessment Study Areas. More information on sediment quality and quantity is provided in the next section.

For a more in-depth overview of water quality in the Don River, the TRCA's Don River Watershed Plan (2009) should be consulted. This recently released Plan explores the sources, levels of impairment and solutions of key water quality issues affecting the Don River and the Keating Channel.

3.1.5 Sediment Quality and Quantity

The harbour provides a sheltered environment for sediment deposition and accumulation. Examination of dredging records for the Keating Channel, sediment trap accumulation rates, flow patterns, wave climate and sediment type indicates that the Inner Harbour and the Keating Channel act as a sediment trap for a large proportion of the total suspended sediment that is delivered to it (MOE, 2001).

Work completed during the baseline study shows that most trapping of sediment occurs in the upstream section of the Project Study Area, particularly in the first 100 metres below the Lake Shore Boulevard crossing at the inside corner where the Don enters the Keating Channel. Furthermore, trapping of sediment also occurs under the railway bridge constructed in 2007 on the west side of the Don River, and may require periodic dredging in order to retain conveyance and habitat function. The concentration of suspended sediment in the Lower Don River is highly dependent on flow conditions in the river. The concentration is generally low during the dry periods (no rainfall) but increases greatly during rainstorm events. Concentrations of 12 to 50 milligrams per litre associated with lower flows are most common and occur for approximately 200 days per year with a suspended sediment load composed mostly of clay.

The majority of sediment deposited in the lower Don River and Keating Channel is sand with a gradation to silty sand as one moves westward along the Keating Channel, suggesting that most of the silts and clays continue on into the Inner Harbour (Acres, 1983; Golder, 2002; Baird 2008 surveys; TRCA, 2008). A sedimentation analysis was completed in order to collect data on baseline conditions. The historical sediment data were collected at an Environment Canada (EC) gauge at Todmorden Mills (Pottery Road at Bayview Avenue), which is approximately 6 kilometres upstream of the Project Study Area. In order to evaluate the quantity of sediment entering and moving through the Impact Assessment and Project Study Areas, sedimentation modelling was carried out and two key criteria were evaluated: the suspended sediment concentration (SSC) under different flow conditions in the river, and the mean annual sediment loads.

3.1.5.1 Sedimentation Modelling

A model was created to simulate sedimentation in the Project Study Area (Keating Channel and upstream vicinity) under a variety of different channel morphologic conditions. It evaluated expected velocities and shear stresses associated with various flood events under different channel configurations. These were then used to calculate critical discharges for deposition of different particle size classes (or sizes of sediment) in a given area. Field samples were used to generate relationships for particle size distribution characteristics under different flow conditions.

The following data were available for calibration of the model:

- 41 years of daily flow data at the Todmorden Gage;
- 15 years of sediment sampling data (SSC); and
- Suspended sediment samples for grain size distribution.

The flow and suspended sediment concentration data were used to generate a sediment rating curve for the Lower Don, and to determine average annual sedimentation rates in the channel and in an individual storm event. Results of the modelling are discussed below.

Analysis of the suspended sediment rating curve generated from data at the Todmorden gauge shows an average annual suspended sediment load of 38,600 tonnes per year, with much of the suspended sediment sampled (often over 50%, depending on discharge) being in the medium to coarse silt and sand size range. For the purposes of evaluating sediment delivered to the Keating Channel, 20% was added to this figure to represent near-bed sediment transport not captured by the sampling strategy. This gave a total of an estimated 46,300 tonnes per year of sediment supplied to the river mouth. The reasons for this difference are that bedload and near-bed suspended sediment were not measured at Todmorden, there are unmeasured tributary inputs of sediment downstream from Todmorden, and there may be changes in channel sediment storage in the lower Don.

The amount of sediment supplied may be much higher than 46,300 tonnes per year if the 20% value is too low. Remedial Action Plan (RAP) for the Toronto and Area Region of Concern suggests that suspended solids may be as little as 1 to 15% of total solids. In addition, the 46,300 tonnes per year value may be an underestimate because of sediment inflows from storm sewers and combined sewers between Todmorden and the Keating Channel. These issues are currently undergoing further investigation.

The records and targets for dredging in the Keating Channel indicate that an average of 30,600 cubic metres of dredged sediment is removed each year from the channel. The vast majority of this material is composed of silt (~20,000 tonnes) and sand (~17,000 tonnes), while the remainder is clay (~3,000 tonnes). This means that approximately 5,000 tonnes per year of clay and 1,000 tonnes per year of fine silt are not trapped in the channel and remain in suspension. The 30,600 cubic metres of dredged sediment represents the average volume of sediment removed from the channel, in contrast to the total volume of material (sediment plus water) of 36,800 cubic metres removed from the channel. The dredged sediment compares well with the first-order estimates of sediment inflow above, given an estimated trapping efficiency of 64 to 87% for the current Keating Channel.

3.1.5.2 Sediment Characterization

The Golder Associates report from 2002 examines sediment conditions in the lower Don River and Keating Channel. The report summarizes available suspended sediment and bed sediment data in the Don River and Inner Harbour. The report includes reference to several studies, such as Wilkins (1974) that states “sediments at the juncture of the Don River and Keating Channel were primarily sand, but graded to silts along the channel”. The Golder report details of sediment quality studies undertaken in the Project Study Area, but no further discussion of grain size characteristics is presented. However, the appendices of the Golder report include some grain size data from other reports (cited in Golder, 2002; MOE, 1977; MOE, 1980; TRCA-MOE, 1995; TRCA 2001). The results show that the material in the Keating Channel is dominantly sandy, although there is a high degree of variation between samples in different locations and at different times, with some, dominantly silt particles.

Baird undertook sediment sampling of the lower Don River in August 2008. Twenty sediment cores in ten pairs were collected between Riverdale Park and the downstream side of the CN rail bridge. Sediment cores were up to 86 cm deep, and the cores were sub-sampled depending on layering present within each core. Each subsample was then analyzed for grain size distribution. The grain size characteristics of each sample were variable, depending on location and depth, but in general most samples were dominantly very coarse to fine sands. Some thin silt and clay layers were present between the larger sandy deposits.

3.1.5.3 Sediment Quality

Sediment quality assessments within the Keating Channel and the Inner Harbour have been undertaken since the mid-1970s by MOE, Environment Canada and the TRCA. The assessments have examined the presence of a variety of contaminants including PCBs and organochlorines, PAHs, trace metals, nutrients and a variety of physical parameters such as grain size and loss on ignition (MOE, 2001).

Sediment quality in the Keating Channel, although contaminated to varying degrees, has been shown to be among the least contaminated areas along the Inner Harbour as much of the finer sediments (which typically carry a greater contaminant load) pass though the channel. In addition, frequent dredging activities prevent the accumulation of finer sediments.

Recent reports by AHT (TRCA, 2007a) and previous RAP reports have concluded that sediment quality in the Inner Harbour are degraded with concentrations of metals above PSQG Lowest Effects Levels (LEL) at most locations. Highly contaminated sediment (above Severe Effect Levels (SEL) is localized and attributable primarily to the locations of CSOs. The majority of the harbour sediment, while degraded, is not toxic and does not have chemical concentrations above PSQG SELs (TRCA, 2007a). This observation is further corroborated from the results of sediment bioassays conducted on behalf of TRCA. The results indicate that none of the nine sediment samples had a significant effect on the organisms tested (TRCA, 2007s).

The Inner Harbour has experienced significant improvements in sediment quality, particularly for lead, but also for copper and zinc, since the late 1970s. This trend suggests that the elimination of sources such as leaded gasoline, as well as a range of other activities to reduce contaminant loads related to urban non-point sources, have directly and positively influenced water quality in the Don River and sediment quality in the harbour. These activities could include the increased use of buffer strips to act as pollutant traps, sewer use and spills control programs, and improved sediment and erosion control practices, but apart from lead it is difficult to identify the specific management practices that can account for the improving trends.

Overall, heavy metal concentrations in the sediments are not acutely toxic to aquatic organisms in the Keating Channel and lower Don River (TRCA, 2004c).

3.1.6 Sediment Quantity and Sediment Management

The Keating Channel is dredged annually to reduce the risk of flooding and to maintain navigation. Historic volumes of dredged material are presented in **Table 3-5.**

Table 3-5 Keating Channel Dredging Volumes, 2002 to 2008

Year	Volume Dredged (Scow Measure)[1], m^3	Volume Dredged (In-situ Measure)[2], m^3
2002	35,812	29,843
2003	35,861	29,884
2004	38,009	31,674
2005	36,290	30,242
2006	38,391	31,993
2007	36,290	30,242
Average	**36,776**	**30,646**

Note: 1. Total volume of material (sediment plus water) removed from the channel
2. Volume of sediment removed from the channel

Dredging of the Keating Channel is undertaken by the TPA. On average, approximately 36,800 m^3 of material (sediment plus water) is removed annually from the channel.

In 2007, the total operating Keating Channel dredging costs were approximately $423,200, including approximately $360,700 for dredging, $20,100 for channel surveying and sounding and $42,400 for environmental monitoring and the Cherry Street Lift Bridge maintenance. Two-thirds of the total costs were paid by the City of Toronto through TRCA and the remaining one-third by the TPA.

3.1.7 Debris Management

Debris is regularly removed from the Keating Channel using two control booms, a floating skimmer and a dockside crane. The amount of debris is directly related to stormy weather, flash floods and other similar events. About 450 metric tonnes of debris are removed from the Keating Channel annually by the TPA. Most of this debris is currently trucked away for disposal; however, larger pieces of woody debris are periodically used by TRCA for naturalization projects throughout their jurisdiction.

The associated cost varies from year to year and is the biggest variable in the Harbour Maintenance Expenses. Historic data on the amount of removed debris and associated cost are presented in **Table 3-6.**

Table 3-6 Keating Channel Debris Tonnage and Removal Costs, 2005 to 2007

Year	Amount Removed (Tonnes)	Associated Cost
2005	705	$213,727
2006	378	$176,629
2007	276	$146,036
Average	**453**	**$178,793**

3.1.8 Ice Management

The TPA is responsible for ice breaking within the Inner Harbour. At present, the Keating Channel provides sufficient depth to allow water to flow under ice layers that form within the Channel and into the Inner Harbour. In addition, thermal influences from the North Toronto Treatment Plant and road salt applications have reduced the magnitude and frequency of ice jams in the Lower Don River, as compared to past flooding events that have been recorded due to ice jams.

3.2 Natural Environment

Within a hundred years of the foundation of the City of Toronto, the quality of the water and habitat within the Ashbridges Bay Marsh had become degraded due to inputs of raw human waste from the Don River and manure from the huge cattle feed lot that was part of Gooderham and Worts Distillery just west of the Don River. Although hunters and birders strongly valued the marsh for the large populations of bird species, planning officials for the City saw the natural marsh habitat as wasted space and a source of contagion and believed that they felt that the area should be filled and used for industry. The Toronto Harbour Commission (now the TPA) was created in 1911 to oversee the 'reclamation' of the marsh. Filling of Ashbridges Bay commenced in 1912, and by 1960 the marsh was completely gone.

When the St. Lawrence Seaway opened in 1959, the TPA anticipated that the Port of Toronto would experience an increase in shipping traffic. To accommodate this increase they began another lake filling project to construct the Leslie Street Spit (also known as Tommy Thompson Park) in the area of Leslie Street and Unwin Avenue, an extension of the filled area that was formerly Ashbridges Bay Marsh. This land base was zoned to provide port related infrastructure such as warehouses and was designed to provide shelter for the Outer Harbour.

In the early 1970s, it was evident that Toronto was not going to experience the increase in shipping volume as predicted in the 1950s due to a decline in the shipping industry caused by replacement by more economical transport methods including trucks and rail. Coincidentally, over the decade of construction, vegetation communities had naturally become established on the Port Lands from seed that was in the fill, windblown to the Spit, washed onto the land from the water and deposited by birds. Many species of wildlife were living in the forests and meadows of the Spit, but most dramatically, huge nesting colonies of gulls and terns occupied the raw fill. Tommy Thompson Park had evolved into a significant feature along the shoreline of Lake Ontario, supporting an unusually high diversity of biological communities, including one provincially rare, seven regionally rare, and six locally rare plant species. Migratory birds had also started to use the land as a stopover location along their migration route between South American winter grounds and Boreal Forest breeding grounds. Additionally, members of the public were accessing the site on the weekends when lake filling activities were not occurring, to benefit from the car-free environment to walk, cycle and enjoy nature.

The following sections focus on the significance of existing terrestrial and aquatic environment within the context of the DMNP and other related redevelopment initiatives. Generally, natural areas in the vicinity of the DMNP are concentrated along the banks of the Don River, with very little naturally-occurring vegetation in the Project Study Area.

3.2.1 Designated Natural Areas

Within the Impact Assessment Area there is an array of natural areas that include created, regenerating and historically naturally occurring sites (**Figure 3-9**). Within a landscape with so little natural space, these communities have become the refugia that harbour the genetic sources of plants and animals that may colonize the naturalization along with native species plantings anticipated to occur in the Project Study Area as a result of the DMNP.

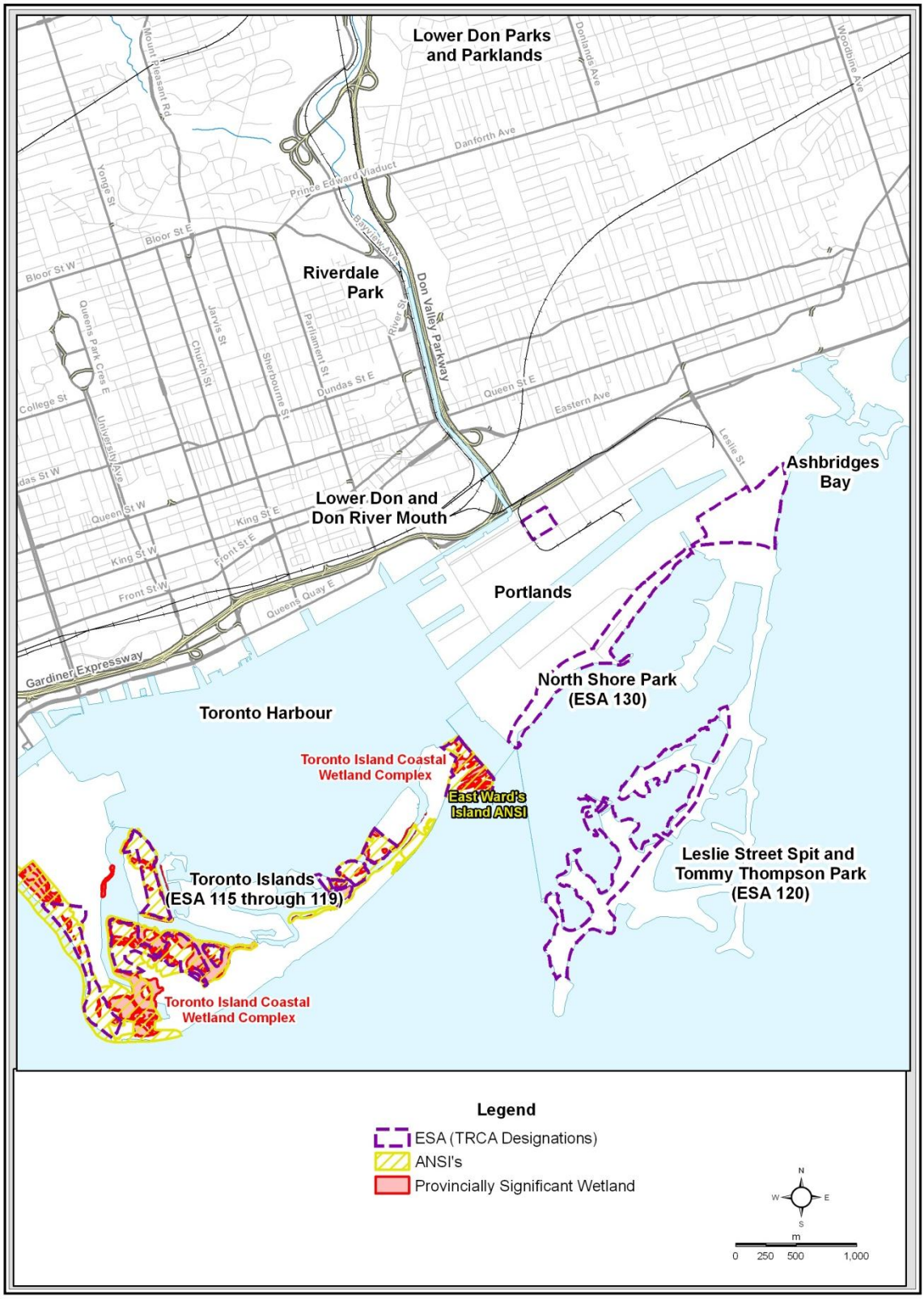

Figure 3-9 Natural Areas in the Impact Assessment Study Area

3.2.1.1 Wetlands

Impact Assessment Study Area

Located within the DMNP Impact Assessment Study Area is the Toronto Island Wetland Complex. This 22 ha Provincially Significant Wetland (Natural Heritage Information Centre – NHIC) complex includes 11 wetland units, composed of 27% swamp and 73% marsh (NHIC, 2006). The Toronto Island Wetland Complex has important functions for the integrity of the lake ecosystems, including the provision of fish spawning habitat and migratory bird habitat.

Other smaller patches of wetland vegetation occur within the Impact Assessment Study Area, especially in the vicinity of Tommy Thompson Park / Leslie Street Spit and Ashbridges Bay (**Figure 3-9**). These include past and ongoing wetland creation efforts by TRCA and Waterfront Toronto in Cell 1, Triangle Pond, and a number of the embayments in Tommy Thompson Park.

Project Study Area

Of the stretch of the Don River running south of Bloor St. and into the Project Study Area, TRCA classified 0.7% of the vegetation as wetland (TRCA, 2004c). There are no Provincially Significant Wetlands located within the Project Study Area.

3.2.1.2 Areas of Natural and Scientific Interest (ANSI)

Impact Assessment Study Area

Two ANSIs lie within the Impact Assessment Study Area: the Leslie Street Spit and Tommy Thompson Park Important Bird Area; and the East Ward's Island ANSI (**Figure 3-9**).

The OMNR classifies the Leslie Street Spit (officially known as the Tommy Thompson Park) as a Life Science ANSI. The NHIC records the area of the Leslie Street Spit as 57 hectares, but it but it actually has a much larger footprint that is closer to 10 square kilometres (1,000 ha) when all of the wetland and shallow aquatic areas are included (Wilson and Cheskey, 2001). The spit, which is really a man-made peninsula, extends southwest for 5 kilometres from Tommy Thompson Park to a point approximately 4 kilometres due south of the mouth of the Don River (**Figure 3-7**). A variety of vegetation communities have developed on the peninsula, including open Cottonwood (*Populus deltoides*) woodlands, willow scrub, wet meadows and dry fields (NHIC, 2006).

Tommy Thompson Park has provided one of only two active Caspian Tern (*Sterna caspia*) colonies in Ontario (with Hamilton Harbour containing the other) and has become an important site for migrating birds and wintering waterfowl (Wilson and Cheskey, 2001; NHIC, 2006). Tommy Thompson Park has been designated as an Environmentally Sensitive Area and was selected as a globally Important Bird Area (IBA) by Birdlife International in 2001 (Bird Studies Canada, 2006). It provides a nationally-significant nesting area for Black-crowned Night-herons and Ring-billed Gulls, as well as a regionally significant nesting area for Common Terns (Wilson and Cheskey, 2001).

The East Ward's Island Life Science ANSI lies at the east end of the Toronto Islands, approximately 2 kilometres south of the Don River Mouth (**Figure 3-9**). Ecological communities on the 7 ha site include an open woodland of Cottonwood and European Crack Willow (*Salix fragilis*) that have colonized into disturbed lands and a small remnant dune ridge community of Marram Grass (*Ammophilia breviligulata*) (NHIC, 2006). The dune ridge community is regionally significant, with the other nearest known communities lying approximately 160 kilometres to the east in Northumberland and Prince Edward Counties (NHIC, 2006).

Project Study Area

No ANSIs lie within the DMNP Project Study Area.

3.2.1.3 Environmentally Sensitive Areas (ESAs)

Environmental Significant Areas (ESA) are natural areas where, based on inventories of the biological and physical attributes of natural areas within a given geographic area (e.g. municipality, watershed), are evaluated against established criteria which often include social values. These criteria may include sensitivity, but also reflect the values of the agency that generates the evaluation system. They can be compared to Environmentally Sensitive Areas which have been evaluated with respect to the *sensitivity* of the attributes and functions, as opposed to the *significance*.

TRCA undertook an ESA assessment published in 1982 that designated a comprehensive set of important natural areas throughout their jurisdiction. While recognition of the ESAs remain an important consideration, the current approach is focussed on connecting these areas through natural heritage system planning into an interrelated, higher functioning and much more significant feature on the landscape.

Impact Assessment Study Area

In total, seven ESAs lie within the larger Impact Assessment Study Area: five small ones on the Toronto Islands, one on the Leslie Street Spit overlapping with the ANSI and one on the south shore of the Port Lands with an outlier just east of the Don Roadway (**Figure 3-9**).

Toronto Islands: ESAs 115 through 119

These ESAs have the beach and dune complexes mixed with wetlands typical of the sandy islands and barrier beaches that form at the mouth of the drowned river mouths along the north shore of Lake Ontario. They include the Hanlan area south of the Toronto Airport (ESA 115), Mugg's Island (ESA 116), the Wildlife Sanctuary including Forestry Island (ESA 117), Snake Island (ESA 118), and East Ward's Island (ESA 119). Together they provide habitat for an array of rare plants, habitat for the colonial black-crowned night-heron (*Nycticorax nycticorax*), winter roosts for sawhet owls (*Aegolius acadius*), and rare dune formations (MTRCA, 1982).

Tommy Thompson Park: ESA 120 (overlaps with Leslie Street Spit ANSI)

See the detailed description in **Section 3.2.1.2.**

North Shore Park: ESA 130

The core of this ESA is located on the Cherry Beach shoreline between the Eastern Gap and the base of Leslie Street. Like the Spit, this is a created site that has succeeded into native communities that includes open beach, old field and 40-550 year old eastern cottonwood (*Populus deltoides*) woodland. In addition to the shoreline, a small lot at the northeast corner of Commissioners Street and the Don Roadway also features two locally rare plants (as of 1991): river bulrush (*Scrirpus fluviatilis)* and Richardson's rush (*Juncus alpinoarticulatus* formerly *J. alpinus* var. *insignis).*

Project Study Area

No ESAs lie within the DMNP Project Study Area.

3.2.2 Vegetation

The DMNP Project and Impact Assessment Study Areas lie within the eastern extension of the Carolinian floristic region (7E), which is concentrated in southwestern Ontario, but which also extends along the north shore of Lake Ontario.

3.2.2.1 Vegetation Communities

Impact Assessment Study Area

The most important vegetation communities in the Impact Assessment Study Area occur on the Toronto Islands and at the Leslie Street Spit. The Toronto Island vegetation is naturally occurring, while the Leslie Street Spit is entirely constructed for objectives that did not include natural heritage. The vegetation communities on the Leslie Street Spit were established through natural succession processes.

Much of the Impact Assessment Study Area consists of aquatic environments. Aquatic vegetation mapping was conducted in 2000 by TRCA staff, and shows aquatic plant species along the northern shores of the Toronto Islands, the northern and eastern sides of the Outer Harbour, and parts of the Leslie Street Spit. A detailed survey of the aquatic plant community in the inner harbour was conducted in the summer of 2007 (**Table 3-7**).

Table 3-7 Aquatic Plant Species Found in 2007 Survey of Toronto Harbour

Slip	Common Name	Scientific Name
Portland	Canada Waterweed	*Elodea canadensis*
Spadina	Canada Waterweed	*Elodea canadensis*
	Coontail	*Ceratophyllum demersum*
	Richardsons Pondweed	*Potamogeton richardsonii*
	Eurasian Water Milfoil	*Myriophyllum spicatum*
	Muskgrass	*Chara sp.*
Peter	Canada Waterweed	*Elodea canadensis*
	Coontail	*Ceratophyllum demersum*
	Muskgrass	*Chara sp.*
	Eurasian Water Milfoil	*Myriophyllum spicatum*
Rees	Canada Waterweed	*Elodea canadensis*
	Coontail	*Ceratophyllum demersum*
	Richardsons Pondweed	*Potamogeton richardsonii*
	Eurasian Water Milfoil	*Myriophyllum spicatum*
	Muskgrass	*Chara sp.*
Simcoe	Canada Waterweed	*Elodea canadensis*

Aquatic plants are useful indicators of water quality conditions and they provide valuable habitat for fish and aquatic invertebrates and other aquatic like. Depth and turbidity of the water in the slips in the Inner Harbour is a limiting factor in the establishment of aquatic plants. Many of the slips are dredged to maintain adequate depth for commercial marine traffic, and this uniform depth prevents the colonization of the majority of the aquatic plants.

The area within the Inner Harbour with the highest species diversity and vegetation density was the Rees Slip, with roughly 45% of the total area vegetated. The depths within the Rees slip are shallower than other slips, which may explain the great coverage and species diversity within the slip (TRCA, 2007a).

The aquatic plant species found within the Inner Harbour such as Eurasian Milfoil (*Myriophyllum spicatum*), Coontail (*Ceratophyllum demersum*), and Canada Waterweed (*Elodea canadensis*) are tolerant of high nutrients and turbidity (Croft and Chow-Fraser, 2007). All three can be found growing in dense mats, in areas with elevated nutrient levels and sediment deposits.

Project Study Area

In a biological inventory of the Lower Don Valley (TRCA, 2004c), the TRCA summarized plant communities in the area that extends from the Keating Channel north to Bloor Street (i.e., an area that includes, but is much larger than, the Project Study Area). Within this larger area, TRCA identified and mapped 42 plant community types along the Don Valley using the Ontario Ecological Land Classification system (ELC; Lee *et al*., 1998). The Ecological Land Classification system is a nested classification that groups vegetation types into ecosites and vegetation types with common soil and generalized vegetation characteristics. Community Series are differentiated by plant form or landform (e.g., SWD – **SW**amp, **D**eciduous or RBT **R**ock **B**arren, **T**reed) which are broken down into Ecosites (e.g., SWD3 Maple Mineral Deciduous Swamp) and in turn into Vegetation Types (e.g., SWD3-4 Manitoba Maple Mineral Deciduous Swamp).

The vegetation communities in the Project Study Area (**Figure 3-10** includes 14 forest and woodland/savannah communities, 13 successional and thicket communities, 10 wetland and aquatic communities, and 5 meadow and open communities.

Proportionally, 19% of the land in this area is young early successional wooded areas and contains documented invasive plant species, 1% is successional thickets, 0.7% is wetland, 11% is meadow and the remaining 68% is manicured or developed (TRCA, 2004c), with very little natural habitat in the Project Study Area. According to TRCA's local ranking system, five plant communities are of regional concern, nine are of urban concern and nine are classified as exotic. All of the nine communities of urban concern and four out of the five communities of regional concern were found to the north of Gerrard Street and outside of the Project Study Area. Most of the forested communities lie outside the Project Study Area, north of Gerrard Street, while disturbed ruderal (i.e., vegetation that colonizes disturbed lands) and cultural plant communities and marshes predominate south of Eastern Avenue.

For the biological inventory, TRCA mapped 29 vegetation communities, consisting of seven distinct ecosites or types, with three communities remaining unclassified **(Table 3-8)**. Twenty additional communities were mapped (Cultural Marsh / Shallow Water and Cultural Hedgerow), which are not part of the standard Ecological Communities Classification.

Table 3-8 Ecological Communities in the Vicinity of the DMNP Project Study Area

ELC Classification	Community Description	Number of Communities
OAO	Open Aquatic Ecosite	9
CUM1	Dry-Moist Old Field Meadow Ecosite	7
CUT1	Mineral Cultural Thicket Ecosite	1
CUT1-1	Sumac Cultural Thicket Type	2
CUS1	Mineral Cultural Savannah Ecosite	4
FOD8-1	Fresh-Moist Poplar Deciduous Forest Type	2
SBO1	Open Sand Barren Ecosite	1
M	Unclassified	3
CU MA/SA[2]	Cultural Marsh / Shallow Water	16
CUH	Cultural Hedgerow	4

Source: TRCA, 2004c

2. CU MA/SA, CUH are not standard ELC codes

The TRCA survey determined that at least 15 of these communities suffer from severe disturbance or invasion by exotic species. Only one of the communities (open sand barren ecosite (SBO1)) is classified by TRCA as having any particular significance, and was located to the northeast of the Cherry Street – Lake Shore Boulevard intersection. This community is considered regionally significant (TRCA L-rank 2) on the basis of a very restricted distribution and moderate geophysical requirements.

The area between the Keating Channel and the Ship Channel is dominated by industrial development. Some of the buildings have been removed and the sites of former tank farms and factories are being reclaimed by an array of non-native species. Cottonwood is common; however, many of the trees are invasive alien species such as Manitoba Maple (*Acer negundo*), Black Locust (*Robinia pseudosacacia*), and Norway maple (*Acer platanoides*).

The Keating Channel was not surveyed for aquatic vegetation in the 2007 survey, and there was no mention of aquatic vegetation in the channel in the 2000 survey (TRCA, 2007a). Dredging occurs frequently in the channel, which would have a negative impact on colonization of aquatic plants. Although there is little aquatic vegetation in the Keating Channel, there is adequate vegetation in quays and slips of the Inner Harbour as well as the embayments of the Toronto Islands to provide habitat for the fish species found in both the Inner Harbour and Keating Channel.

3.2.2.2 Flora

Impact Assessment Study Area

TRCA identified 395 species of vascular plants in the area of the Lower Don River (including the Impact Assessment Study Area), of which 71 (18%) occur only as specimens planted for restoration purposes. There are 324 naturally-occurring species, none of which are at risk either nationally or provincially. The Ontario Natural Heritage Information Centre records one provincially vulnerable species, Bushy Cinquefoil (*Potentilla paradoxa*, S-rank 3), that may occur on sandy beaches within the lower Don River. It is adapted to periodic episodes of burial and exposure by the shifting sand in back-beach swales. This habitat may occur on the beaches south of the Ship Channel however it was not recorded in the TRCA surveys. Within the region (MNR Central Region), the Aurora District Office of the OMNR considers 14 species to be rare and another 23 species to be uncommon (Varga *et al.,* 2000). Similarly, TRCA has ranked 13 species as having regional significance, and 43 species as having significance within an urban context (TRCA, 2004c).

Project Study Area

Within the vicinity of DMNP Project Study Area, TRCA mapped four plant species of regional concern and ten species of concern in an urban context (**Table 3-9**; **Figure 3-10**; (TRCA, 2004c)). Of the regionally significant plants, three of the four species are planted in the area and have not demonstrated natural regeneration (TRCA, 2004c).

Table 3-9 Regionally Significant Plant Species in the DMNP Project Study Area

Species	Common Name	Number of Locations	TRCA Rank
Quercus marcrocarpa	Bur Oak	2	L3 – Regional Significance (planted)
Salix nigra	Black Willow	2	L3 – Regional Significance (planted)
Calystegia sepium	Hedge Bindweed	4	L4 – Urban Significance
Thuja occidentalis	White Cedar	1	L4 – Urban Significance (planted)
Salix amaygdaloides	Peach-leaved Willow	1	L4 – Urban Significance
Platanus occidentalis	Sycamore	1	L1 Regional Significance (planted)

Table 3-9 Regionally Significant Plant Species in the DMNP Project Study Area

Species	Common Name	Number of Locations	TRCA Rank
Acer sacharinum	Silver Maple	4	L4 – Urban Significance
Fraxinus nigra	Black Ash	1	L4 – Urban Significance (planted)
Acer rubrum	Red Maple	1	L4 – Urban Significance
Panicum virgatum	Switch Grass	1	L3 – Regionally Significant
Rosa blanda	Smooth Wild Rose	2	L4 – Urban Significance
Cornus foemina	Grey Dogwood	1	L4 – Urban Significance (planted)
Schoenoplectus validus	Soft-stemmed Bulrush	1	L4 – Urban Significance
Schoenoplectus americanus	Three-square Rush	1	L4 – Urban Significance

Source: (TRCA, 2004c)

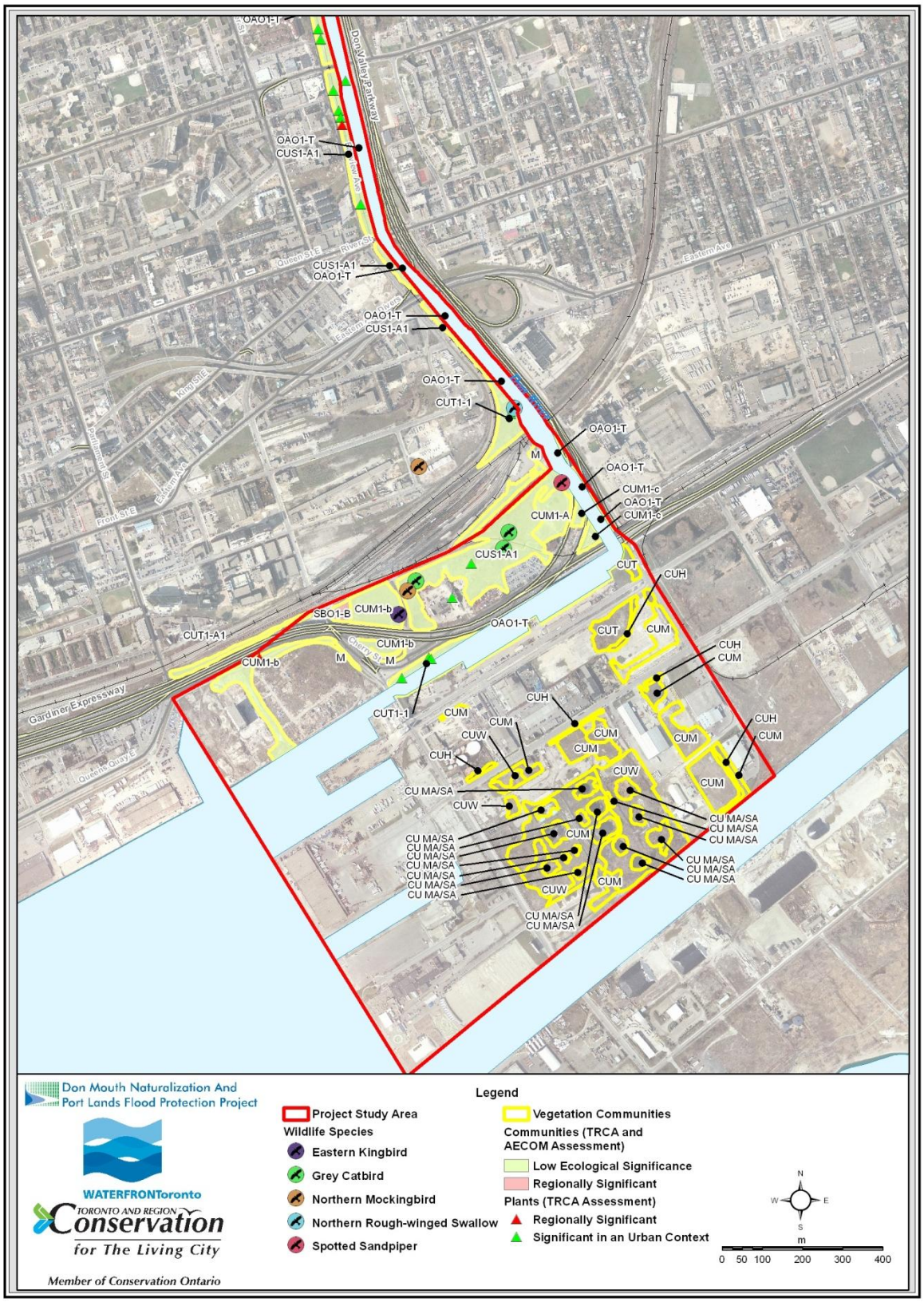

Figure 3-10 Natural Features of Interest in the Project Study Area

3.2.3 Terrestrial Wildlife

3.2.3.1 Impact Assessment Study Area

TRCA has identified 49 fauna species breeding in the area of the Lower Don River (Impact Assessment Study Area) (**Table 3-10**). Of the 37 breeding bird species listed, three are exotic and none are considered to be area-sensitive. The red-eared slider (*Trachemys scripta*) is the only exotic species of the five herpetofauna identified. All seven mammal species are native to Ontario.

Table 3-10 Mammals, Birds and Herpetofauna Reported from the Lower Don River (TRCA 2004)

	Common Name	*Species*	TRCA Locally Significant	TRCA L-Rank
Mammals	Beaver	*Castor canadensis*	Yes	L3
	Eastern Chipmunk	*Tamias striatus*	Yes	L4
	Grey Squirrel	*Sciurus carolinensis*	Yes	L5
	Raccoon	*Procyon lotor*	Yes	L5
	Striped Skunk	*Mephitis mephitis*	Yes	L5
	White-tailed Deer	*Odocoileus virginianus*	Yes	L5
	Coyote	*Canis latrans*	Yes	L5
Birds	Spotted Sandpiper	*Actitis macularia*	Yes	L4
	Belted Kingfisher	*Megaceryle alcyon*	Yes	L4
	Northern Flicker	*Colaptes auratus*	Yes	L4
	Eastern Wood-pewee	*Contopus virens*	Yes	L4
	Willow Flycatcher	*Empidonax trailii*	Yes	L4
	Great Crested Flycatcher	*Myiarchus crinitus*	Yes	L4
	Red-eyed Vireo	*Vireo olivaceus*	Yes	L4
	Northern Rough-winged Swallow	*Stelgidopteryx ruficollis*	Yes	L4
	Grey Catbird	*Dumetella carolinensis*	Yes	L4
	Northern Mockingbird	*Mimus polyglottos*	Yes	L4
	Canada Goose	*Branta canadensis*	Yes	L5
	Mallard	*Anas platyrhynchos*	Yes	L5
	Killdeer	*Charadrius vociferous*	Yes	L5
	Mourning Dove	*Zenaida macroura*	Yes	L5
	Chimney Swift	*Chaetura pelagica*	Yes	L5
	Downy Woodpecker	*Picoides pubescens*	Yes	L5
	Eastern Kingbird	*Tyrannus tyrannus*	Yes	L5
	Warbling Vireo	*Vireo gilvus*	Yes	L5
	Cliff Swallow	*Petrochiledon pyrrhonota*	Yes	L5
	Barn Swallow	*Hirundo rustica*	Yes	L5
	American Crow	*Corvus brachyrhnchos*	Yes	L5
	Black-capped Chickadee	*Parus atricapillus*	Yes	L5
	American Robin	*Turdus migratorius*	Yes	L5
	Cedar Waxwing	*Bombycilla cedrorum*	Yes	L5
	Yellow Warbler	*Dendroica petechia*	Yes	L5
	Northern Cardinal	*Cardinalis cardinalis*	Yes	L5
	Song Sparrow	*Melospiza melodia*	Yes	L5
	Red-winged Blackbird	*Agelaius phoeniceus*	Yes	L5
	Common Grackle	*Quiscalus quiscula*	Yes	L5
	Brown-headed Cowbird	*Molothrus ater*	Yes	L5
	Baltimore Oriole	*Icterus balbula*	Yes	L5
	Orchard Oriole	*Icterus spurious*	Yes	L5
	House Finch	*Carpodacus mexicanus*	Yes	L5

Table 3-10 Mammals, Birds and Herpetofauna Reported from the Lower Don River (TRCA 2004)

	Common Name	*Species*	TRCA Locally Significant	TRCA L-Rank
Birds	American Goldfinch	*Carduelis tristis*	Yes	L5
	Rock Dove	*Colombia livia*	No	
	European Starling	*Sturnus vulgaris*	No	
	House Sparrow	*Passer domesticus*	No	
Herpetofauna	American Toad	*Bufo americanus*	Yes	L4
	Green Frog	*Rana clamitans*	Yes	L4
	Midland Painted Turtle	*Chrysemys picta*	Yes	L4
	Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	Yes	L4
	Red-eared Slider	*Trachemys scripta*	No	

The number of bird species utilizing the Lower Don area annually is likely much higher than breeding bird surveys would indicate. During the 2006 spring migration, 177 bird species for a total of 2,549 individuals were banded at Tommy Thompson Park (Bird Studies Canada, 2006). The close proximity of the park to the study area makes it probable that some of these bird species may also be found in the Lower Don area during spring and fall migration.

Chimney Swift has been identified by the Committee on Status of Endangered Wildlife in Canada (COSEWIC) Committee on the Status of Species at Risk in Ontario (COSSARO) as threatened due to recent precipitous declines in the population. Although urban tolerant and historically nesting in old chimneys, many chimneys have been improved or capped and now exclude the species. This is the only species reported for the Impact Assessment Area that has a national and/or provincial ranking.

According to TRCA regional rankings, the Beaver (*Castor canadensis*) is of regional concern and an additional 11 birds and four herptiles are of concern in an urban context. Most of the species of concern are more common further north in the Don Valley (outside of the Impact Assessment Study Area) where natural cover is higher and urbanization not as extreme (TRCA, 2004c). **Figure 3-11** reflects the scarcity of these species at the river mouth.

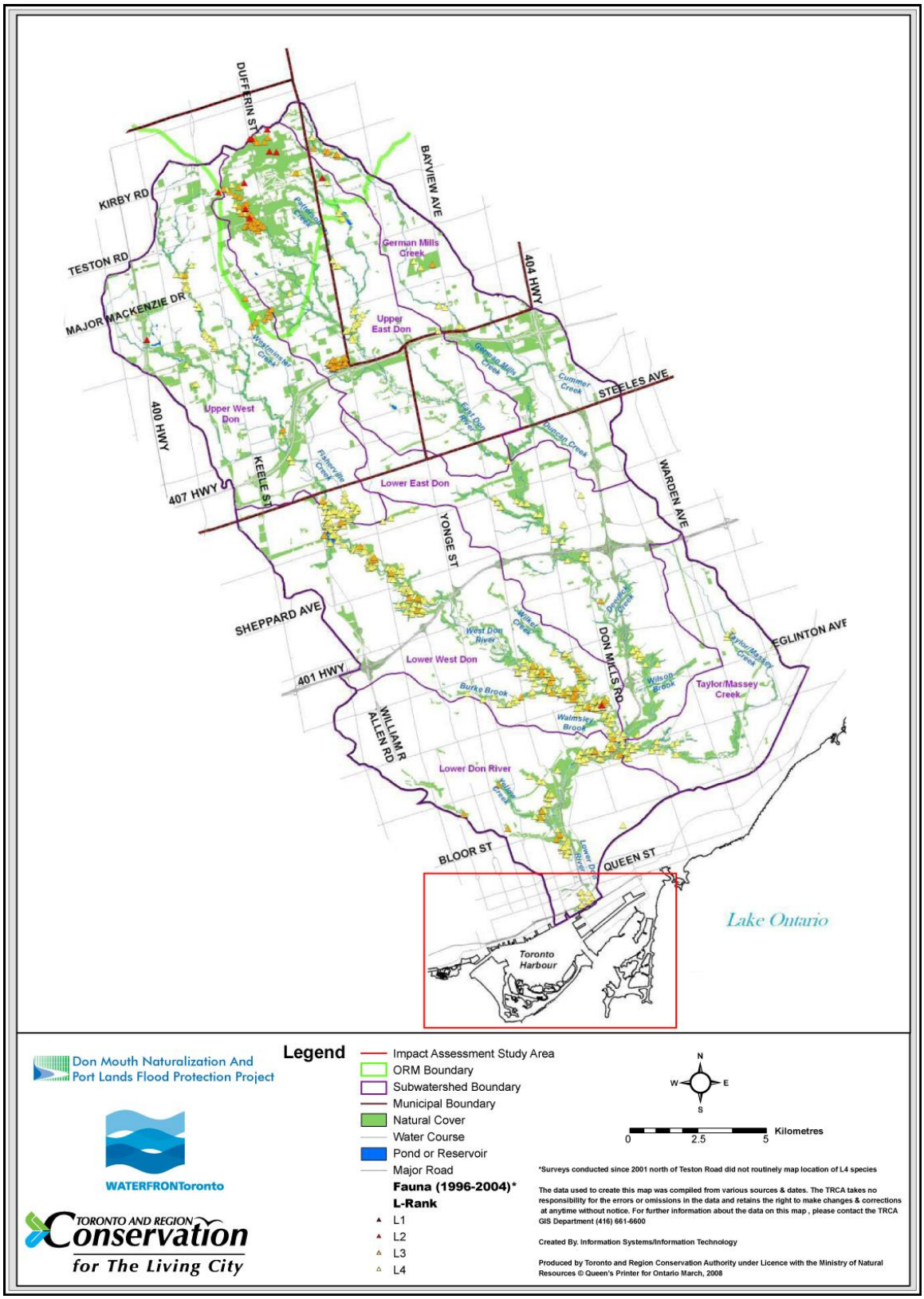

Figure 3-11 Fauna Species of Concern

3.2.3.2 Project Study Area

Only five of the breeding fauna species were recorded within the Project Study Area – all birds (**Table 3-11)**, (TRCA, 2004c), though TRCA site observations in 1994/95 confirmed the presence of a coyote den (TRCA, 2009b). TRCA has assessed four of the five species as having significance in an urban context. Two of the species, Grey Catbird and Northern Mockingbird, depend greatly on early and mid-successional scrub or thicket vegetation. The close proximity of Tommy Thompson Park to the Project Study Area makes it probable that some of the bird species banded in the 2006 survey may also be found in the Project Study Area during spring and fall migration.

Table 3-11 Regionally Significant Animal Species in the DNMP Project Study Area

Species	Common Name	Number of Locations	TRCA Rank
Stelgidopteryx ruficollis	Northern Rough-winged Swallow	1	L4 – Urban Significance
Actitis macularia	Spotted Sandpiper	1	L4 – Urban Significance
Tyrannus tyrannus	Eastern Kingbird	1	L5
Dumetella carolinensis	Grey Catbird	3	L4 – Urban Significance
Mimus polyglottos	Northern Mockingbird	1	L4 – Urban Significance

Source: (TRCA, 2004c)

3.2.4 Fisheries and Aquatic Habitat

Fish communities respond to the quality of the environment in which the live, providing indicators of ecosystem health (Christie et.al., 1988). Stress responses within fish communities are manifested in several ways including species abundances, population dynamics, biomass representation, reproductive capability and contaminant levels. The transformation of the fish community in the Toronto Harbour and the Don River over the past 200 years can be described in terms of many of these responses.

3.2.4.1 Impact Assessment Study Area

Urban development coupled with the continued settlement of the headwater streams in York Region since 1980 have caused many of the Don River watershed's historical fish species to be displaced and extirpated due to uninhabitable conditions (Dillon, 2006). Urbanization of the watershed in the form of land use change and habitat fragmentation has lead to significant degradation of the aquatic habitat and fish communities historically inhabiting the watershed. The Don River Watershed Plan (TRCA, 2009a) seeks to restore natural flow and balance to the waterways of the Don River, reducing the destructive flows that accompany every storm and maintaining baseflows that support productive aquatic habitats.

Fish Habitat

Habitat conditions play an important role in fisheries management and in the determination of future habitat restoration efforts. Using knowledge of the life histories of local species and the habitat conditions present or desired, fish habitat can be improved or created to achieve several outcomes. Recent reports by AHT (2007) and on-going sampling by TRCA indicate that substrates within the Toronto Harbour consist of mud and muddy sand throughout much of the harbour with coarser sediments occurring along the inner shore slope of the island shoreline (TRCA, 2007a). Overall, however, the habitat that is present contains sparse to no submergent vegetation, a lack of substrate diversity and in water structures and relatively uniform depth contours (TRCA, 2007a).

In summary, shown below are the major substrates along the Toronto waterfront: shale bedrock, sand, muds and clay, and boulder, cobble and gravel.

Fish Community

Throughout Lake Ontario, recent non-native species introduction and invasion has increased total species diversity. However, the abundance of native species has declined significantly over the past 200 years. Pre-settlement, the Toronto Harbour was comprised of approximately 30 major fish species (those most conspicuous) and an additional 30 lesser encountered fish species (Whillans, 1979). According to Whillans (1979) seven distinct transformations have occurred over the past 200 years in the Toronto Harbour. Through these transformations the decline and sometimes extirpation of several species occurred in Lake Ontario.

As early as 1840, Lake Sturgeon, Atlantic Salmon (*Salmo salar)*,and Muskellunge (*Esox masquinongy*) were all in decline. Following this trend, other species such as Northern Pike *(Esox lucius*), Pumpkinseed *(Lepomis gibbosus*), Largemouth Bass (*Micropterus salmoides)* and Yellow Perch (*Perca flavescens*) were noted as in decline in the Toronto Harbour by 1854. The reasons for these declines have been attributed to deforestation, the construction of mill dams and physical changes in water levels. Over the remaining 150 years decreased abundance of Lake Trout (*Salvelinus namaycush*), Lake Herring (*Coregonus artedi*), Walleye (*Sander vitreum*) and small mouth bass (*Micropterus salmoides*) and other species has been attributed to habitat alterations and loss of littoral habitat (stone hooking), lake and wetland filling and over exploitation or a combination of these activities.

In recent years (1997 – 2007) 24 fish species have been captured along the Toronto Waterfront. Many of these fish such as White Sucker (*Catostomus commersoni*), alewife (*Alosa pseudoharengus*) and common carp (*Cyprinus carpio*) are routinely captured where as some species are only encountered on occasionally years and / or in low numbers. Results from 2007 show that when fish data are analyzed for biomass, two species, Common Carp (40.5%) and Northern Pike (37.5%) contribute to nearly 78% of the total biomass of fish processed within the Inner and Outer Harbour (TRCA, 2007a). Interestingly, Chinook Salmon (*Oncorhynchus tshawytscha*) and Brown Trout (*Salmo trutta*) together account for approximately 10% of the biomass. Their presence indicates a seasonal movement in the fall toward near shore habitats for feeding and spawning migrations, although spawning is likely of limited to negligible success in this area.

The presence of Northern Pike is a positive sign of a top predator utilizing the Toronto Inner Harbour area as habitat. Many of the fish captured were larger adult fish. Dominant predators such as pike and bass are termed “keystone predators” as they structure the community by the effects of predation. It has been shown when predation increases, so too does community diversity (MTRCA, 1994). The sites where Northern Pike were caught tended to have several habitat features in common including a relatively higher abundance of submerged aquatic vegetation, gradual depth gradients and evidence of overhead cover. Complementary studies performed by TRCA by radio tagging 27 Northern Pike in 2000-01 showed that 95% of the detections in the Toronto Harbour were associated with submerged vegetation. This study concluded that rehabilitation efforts to encourage the presence of Northern Pike should include increasing aquatic macrophyte areas and developing connections between existing submerged macrophyte areas rather than focussing on shallow-water spawning and nursery habitats. Other studies suggest that improving the abundance of underwater structure for these ambush predators will also improve their attraction and use of the area.

3.2.4.2 Project Study Area

Over the past two decades several studies have described the fish and fish habitat conditions in the Don River (Acres Consulting, 1983; Martin-Downs, 1988; Paul Theil Associates, 1989; Task Force to Bring Back the Don, 1991; TRCA, 1992; TRCA, 2004c; TRCA, 2004b; Dietrich for TRCA, 2006; AHT, 2009). Based on the presence of these studies and other strategies and planning documents produced about the Don River, the purpose of the following sections is to provide a brief overview of the existing fish community and fish habitat conditions of the main aquatic areas of the Project Study Area, which include the Lower Don and Keating Channel.

Lower Don River

Fish Habitat

Fish habitat features within the Lower Don are generally characterized as degraded, highly disturbed conditions that are uniform in nature and lack habitat diversity and complexity. There is a general lack of instream cover in terms of aquatic vegetation and substrates such as boulders and crevasse habitat. The river is best characterized as lacustrine in nature with hardened concrete channel banks and very little riparian cover. The morphology of the stream is generally low velocity, run habitat with very few riffles, pools and depth variability. The substrates consist primarily of silt and fine sediments and the turbidity of the water is generally high, which is typical of warm, surface water systems. Short-term water temperature "spikes" (fluctuations) were observed in 2003 by TRCA but were not considered long enough in duration to have adverse effects on fish species inhabiting the Lower Don (TRCA 2004b). Relatively low flow velocity in the Lower Don coupled with a lack of riparian cover may have added to warm water conditions observed in 2003.

The productivity, water quality and overall health of an aquatic environment are generally depicted in the health of the benthic community. Golder Associates (2005) determined that despite the presence of varying degrees of contaminated sediments, the most profound influence on the benthic community was suspended sediments and organic enrichment from storm sewer discharge and combined sewer outfalls (CSO). The benthic community present within the Lower Don exhibits a relatively low diversity. The benthic community is comprised largely of oligochaetes (79%), which are aquatic worms that are highly tolerant to environmental change and have the ability to recolonize rapidly after environmental disturbances (TRCA 2004b). Chironomidae and Insecta combined to account for the remaining 21% of the benthic community composition. Chironomidae were in higher abundance in the Lower Don than in the Keating Channel (TRCA 2004b). The composition of benthic species and dominance of oligochaetes depicts a highly disturbed and degraded benthic community typical of an organic enriched environment. This condition has persisted since the late 1960s showing little change through to today.

Fish Community

Comprehensive fish sampling (bi-weekly electrofishing along three transects) conducted by TRCA from 1991 to 2005 revealed a total of 24 fish species inhabiting the Lower Don between May and November (TRCA, 2004b; Dietrich for TRCA 2006). All of the fish captured were typically warmwater and coolwater species; however, Chinook Salmon (*Oncorhynchus tshawytscha*) and alewife (*Alosa pseudoharengus*) which are typically coldwater species were also captured (**Table 3-12**).

Table 3-12 Species Present in the Lower Don River Electrofishing Database from 1989 to 2005 (Dietrich, 2006)

Origin	Thermal guild	Species	Common name	Trophic Group
Native	Cool	*Anguilla rostrata*	American eel	Piscivore
		Rhinichthys atratulus	blacknose dace	Generalist
		Notropis atherinoides	emerald shiner	Specialist
		Etheostoma nigrum	johnny darter	Specialist
		Etheostoma caeruleum	rainbow darter	Specialist
		Lepisosteus osseus	longnose gar	Piscivore
		Esox lucius	northern pike	Piscivore
		Notropis hudsonius	spottail shiner	Specialist
		Notropis spilopterus	spotfin shiner	Specialist
		Gasterosteus aculeatus	threespine stickleback	Generalist
		Sander vitreum	walleye	Piscivore
		Catostomus commersoni	white sucker	Specialist
	Warm	*Pimephales notatus*	bluntnose minnow	Generalist
		Ameiurus nebulosus	brown bullhead	Generalist
		Aplodinotus grunniens	freshwater drum	Specialist
		Dorosoma cepedianum	gizzard shad	Specialist
		Lepomis gibossus	pumpkinseed	Specialist
		Ambloplites rupestris	rock bass	Specialist
		Morone chrysops	white bass	Specialist
Non-native	Cold	*Salmo trutta*	brown trout	Piscivore
		Oncorhynchus tshawytscha	chinook salmon	Piscivore
	Cool	*Alosa pseudoharengus*	alewife	Specialist
		Osmerus mordax	rainbow smelt	Specialist
	Warm	*Cyprinus carpio*	common carp	Generalist
		Ctenopharyngodon idella	grass carp	Generalist
		Morone americana	white perch	Specialist

The species assemblage and richness captured in the Lower Don in a given year was significantly lower than other Lake Ontario north shore rivers which typically contain between 25 and 27 species (TRCA 2004b). The most common species captured during TRCA sampling of every year were White Sucker (*Catostomus commersoni*), Emerald Shiner (*Notropis atherinoides*) and Spottail Shiner (*Notropis hudsonius*). These three species accounted for 88% of the fish community in spring, summer and fall. Other high order piscivorous species such as Northern Pike (*Esox lucius*) and Walleye (*Sander vitreum*) were also captured during the survey period, albeit in low numbers, but indicate that trophic interactions between predator and prey within the degraded system may be occurring.

Since 2005, the fish capture program has continued with data becoming available at the time of this document preparation. Key findings of these most recent assessments reveal that walleye may be attempting to spawn in the Project Study Area and that recent habitat improvements within the Lower Don associated with the CN Bridge replacement have attracted and are being utilized by fish.

In 2002, the first Walleye was caught in the Lower Don River/Keating Channel. Between 2002 and 2005 the low number of walleye captured grew, followed by a general decline in 2006. In 2006 a ripe (pre-spawn) male Walleye

was captured, indicating that Walleye may be attempting to spawn in the Lower Don River. Following two seasons (2007 and 2008) without any walleye being recovered a healthy Walleye was caught under the Old Eastern Avenue crossing north of the existing CN Rail bridge in 2009.

In 2008, TRCA observed a higher fish diversity and abundance adjacent to and within the recently placed boulders than anywhere else within the Lower Don. This habitat structure was constructed as part of the Lower Don River West Remedial Flood Protection Project in 2007. This recent increase in fish diversity and abundance along this reach is a positive indicator that despite water and sediment issues in the Lower Don, the limiting habitat structure plays a key role in affecting the low numbers of fish and species diversity.

In 2009, another fish species worthy of note was captured in the Lower Don. While conducting routine monitoring in the Lower Don River the TRCA captured a Quillback (*Carpiodes cyprinus*). Although the Quillback is native to Ontario, it is considered uncommon. This is the first record of a Quillback within TRCA's jurisdiction and a new species for the Don River and the Toronto Waterfront. The Quillback is a coolwater species and is considered to have an "intermediate" tolerance.

Finally, in analyzing the fish TRCA fish data Dietrich (2006) suggested that observed changes in community structure may signal positive trends occurring in the Lower Don. Based on his analysis, Dietrich cites no significant changes to species richness, no net increase in non-native species, a recent increase in native species biomass and the increased abundance of walleye as all being indicators of positive community health trends.

Table 3-13 Fish Species Assemblage in the Lower Don, 1991-2005

Species	1991	1998	2003	2004	2005
Walleye (*Sander vitreum*)			X	X	X
Chinook salmon (*Oncorhynchus tshawytscha*)			X	X	X
Brown Trout (*Salmo trutta*)				X	
Northern pike (*Esox lucius*)			X	X	
Emerald shiner (*Notropis atherinoides*)		X	X	X	X
Gizzard shad (*Dorosoma cepedianum*)		X	X	X	X
Spottail shiner (*Notropis hudsonius*)			X	X	X
Spotfin shiner (*Notropis spilopterus)*				X	
Johnny darter (*Etheostoma nigrum*)		X	X		
Rainbow darter (*Etheostoma caeruleum)*					X
White bass (*Morone chrysops*)			X	X	
Rock Bass (*Ambloplites rupestris)*				X	
Freshwater Drum (*Aplodinotus grunniens)*				X	
Pumpkinseed (*Lepomis gibbosus*)	X		X	X	X
Yellow perch (*Perca flavescens*)	X				
Fathead minnow (*Pipmephales promelas*)	X	X			
Blacknose dace (*Rhinichthys cataractae*)	X	X			X
Bluntnose minnow (*Pimephales notatus*)	X		X		
Common carp (*Cyprinidae carpio*)	X	X	X	X	X
Grass carp (*Ctenopharyngodon idella*)			X		
White sucker (*Catostomus commersoni*)	X	X	X	X	X
Brown Bullhead (*Ameiurus nebulosus)*				X	
Alewife (*Alosa pseudoharengus*)		X	X	X	
Creek chub (*Semotilus atromaculatus*)	X	X			
Total	**8**	**9**	**14**	**16**	**10**

Keating Channel

Fish Habitat

Fish habitat within the Keating Channel is generally characterized as degraded or highly disturbed and is uniform in nature. The Keating Channel has an average width of approximately 37 metres. The channel lacks habitat diversity and complexity with limited in-stream cover in terms of aquatic vegetation and substrates such as boulders and crevasse habitat. The morphology of the Keating Channel is generally low velocity, pool habitat with no riffles and uniform depths. Regular dredging creates clearly defined pools (depths of 5 to 6 metres) with over-steepened sides which fill in throughout the year.

As discussed in **Section 3.1.4.2**, turbidity of the water is generally elevated (median of 24.6 NTU) due to sediment loading upstream, instream erosion and, when occurring, mechanical dredging that is undertaken to maintain depths within the channel. Deposition of sand combined with a lack of habitat diversity and riparian cover create a very uniform and degraded system that limits the diversity of species that are able to survive there. The hardened shoreline, depth, and lack of aquatic vegetation make the Keating Channel more of a lacustrine habitat than a riverine habitat.

Overall, the deep vertical concrete, wooden and steel sheet pile walls, the lack of riparian/instream vegetation or cover, the regularity of dredging, and the general uniform sandy substrates provide poor fish habitat conditions for most estuarine fish and wildlife species.

Benthic Community

The benthic community in the Keating Channel is relatively low in terms of diversity. This may largely be due to the regular dredging that occurs to keep the channel from filling in with sediment. The benthic community is comprised almost exclusively of oligochaetes (97%), which are a species highly tolerant to environmental change and which have the ability to recolonize rapidly after environmental disturbances (TRCA, 2004b). Chironomids, which are true insects, represent only 1% of the benthic community (TRCA, 2004b). The composition of benthic species depicts a highly disturbed and degraded benthic community that is influenced primarily by organic enrichment and suspended sediments entering the watercourse through storm sewer outfalls and combined sewer outflows (CSOs) and dredging that regularly occurs within the Keating Channel (Golder Associates, 2002).

Fish Community

Comprehensive fish sampling conducted by TRCA from 1989 to 2003 (which was expanded to include data from 2004 and 2005) revealed a total of 17 fish species inhabiting the Keating Channel between May and November (TRCA, 2004b). In any particular year, no greater than 10 species were recovered with an average of only six per year throughout the course of the sampling period. Many of the fish species captured were not considered typical warmwater species; rather they were generally cool and coldwater lake species such as alewife and emerald shiner (**Table 3-14**). The species assemblage and richness captured in the Keating Channel was lower in diversity than the Lower Don and was also dominated in percent composition by fewer species (TRCA, 2004b). The most common species captured during TRCA sampling were alewife and emerald shiner in the spring/summer and gizzard shad in the fall (TRCA, 2004b). Similar to the Lower Don, other high order piscivorous species such as northern pike and Chinook salmon were also captured in the Keating Channel indicating that some trophic interactions between predator and prey within the degraded system may be occurring.

Table 3-14 Fish Species Assemblage in the Keating Channel, 1989-2005

Species	1989	1990	1991	1992	1993	1998	2000	2002	2003	2004	2005
Three-spine stickleback (*Gasterosteus aculeatus*)									X		
White perch (*Morone americana*)		X			X		X				
Longnose gar (*Lepisosteus osseus*)							X				
American eel (*Anguilla bostoniensis*)		X									
Walleye (*Sander vitreum*)										X	
Chinook salmon (*Onchohynchus tshawytscha*)								X	X	X	
Northern pike (*Esox lucius*)	X								X	X	X
Emerald shiner (*Notropis atherinoides*)	X	X	X	X	X	X		X	X	X	X
Gizzard shad (*Dorosoma cepedianum*)	X	X	X	X		X	X	X	X	X	X
Spottail shiner (*Notropis hudsonius*)		X					X		X	X	
Johnny darter (*Etheostoma nigrum*)									X		
Common carp (*Cyprinidae carpio*)	X	X		X	X	X	X		X	X	
Freshwater drum (*Aplodinotus grunniens)*										X	
White sucker (*Catostomus commersoni*)		X				X					
Brown bullhead (*Ameiurus nebulosus)*										X	X
Alewife (*Alosa pseudoharengus*)	X	X	X	X	X	X	X	X	X	X	X
Rainbow smelt (*Osmerus mordax*)	X	X						X	X		
TOTAL	**6**	**9**	**3**	**4**	**4**	**5**	**6**	**5**	**10**	**10**	**5**

3.2.5 Landscape Connectivity and Cover

3.2.5.1 Impact Assessment Study Area

Natural cover in the TRCA region is scarce due to agriculture and development. Urban natural areas contribute to the conservation of wildlife habitat and biological diversity (Federation of Ontario Naturalists, 2006). In order to maintain area-sensitive breeding species and enhance water, air and soil quality, Environment Canada (2004) recommends that woodland or natural cover in a watershed exceed 30%. The Don Watershed has an estimated 15.6% natural cover remaining, 1% (50.6 ha) of which is found south of Gerrard Street (TRCA, 1997).

The riparian habitat of the Lower Don River provides an important potential corridor for maintaining north-south connectivity between the Toronto Waterfront and the ravine system to the north of the Impact Assessment Study Area (and ultimately the Oak Ridges Moraine). For most species, connectivity along this corridor is presently limited by its narrowness and by the presence of substantial barriers to movement (TRCA, 2004c). These barriers consist of residential and commercial developments, roadways such as Lake Shore Boulevard and the Gardiner Expressway, and other obstacles such as the CN Rail line.

The Lower Don River West Remedial Flood Protection Project will improve connectivity somewhat on the west side of the river, through the construction of additional parkland in the form of a naturalized flood protection landform north of the CN Rail line. However, for most of its length, the lower Don River remains a narrow, unnaturally straight and hardened channel, with little aquatic habitat and just a thin line of terrestrial vegetation along the trail on its west side. In its present form, therefore, the lower Don provides minimal connectivity for songbirds, but provides little or no connectivity for wildlife other than fish.

3.2.5.2 Project Study Area

The Don River Mouth has good potential as a core habitat area because of its overall size and position on the landscape. At present, however, it suffers from too much disturbance, fragmentation and environmental

degradation to form an effective part of a natural environment network. Although most of the area supports natural cover, the vegetation consists of early-successional and exotic species adapted to a stressful, highly disturbed environment.

3.3 Soil and Groundwater Contamination

As described earlier in this chapter, the Port Lands were reclaimed using numerous different sources of industrial fill. The lands, reclaimed in the early 1990s, were created primarily with the intent of developing space for heavy industrialized uses dating back to the early 1900s. These uses on and in the immediate vicinity of the Project Study Area included:

- bulk storage and handling (coal, salt, cement, aggregates, grain);
- petroleum refining, hydrocarbon products manufacturing, petroleum products storage, handling and distribution;
- equipment manufacturing (refrigeration, furniture, etc.);
- paper and paper board production;
- steel foundry, forging, fabricating;
- liquid and solid waste management, rendering and scrap metals operations;
- transportation terminal operations and vehicle maintenance and repair operations;
- petroleum product, containerized, break/bulk and bulk marine shipping operations, ship building and repair; and
- municipal services (works yard activities).

The combination of the placement of industrial fill and subsequent long-term commercial and industrial use of the lands has resulted in a range of identified or anticipated contamination issues in groundwater and soils that is represented by light and heavier fraction petroleum hydrocarbons, chlorinated and non-chlorinated organic compounds, heavy metals, polycyclic aromatic hydrocarbons, polycyclic biphenyls and general chemistry parameters.

However, the distribution of the above-noted contamination is closely associated with the nature of fill materials deposited (commercial fill versus dredged sediments) as well as site use in certain areas of the Project Study Area, such that the type and distribution of contamination encountered is found to be relatively localized rather than a broadly-based issue.

The lands constituting the Project Study Area have been the subject of environmental investigations, of varying scope, going back to at least the mid-1980s with more than 130 environmental investigations completed providing at least a preliminary assessment of the contamination occurring within a majority of the Project Study Area footprint. The most recent investigation carried out south of the Keating Channel was completed by SLR Consulting Canada Ltd. in 2008-09 which comprised most of the lands south of the Keating Channel within the Project Study Area (SLR, 2009). The SLR 2009 investigation consisted of a utility location survey, the drilling of sixty-eight (68) boreholes with forty-six (46) completed as monitoring wells, the collection of soil and groundwater samples for environmental laboratory analysis, and the collection of geotechnical data. The SLR investigation confirmed varying frequencies of MOE Table 1 and Table 3 exceedances for heavy metals and inorganics, PAH, PHC and VOC in the soil and groundwater. LNAPL impacts were also observed in 4 borehole locations. Hazardous material was observed in the study area. Soils and groundwater impacts were identified across the area possibly as a result of impacted fill being placed at the site or from the various historical industrial uses of the site. The most significant cause for impacted soils and groundwater was likely the result of historical use of the area for petroleum refining, storage and distribution.

3.3.1 Overburden Conditions

The lands north of the Keating Channel comprise silt and sand fill containing varying amounts of intermixed gravel, clay and miscellaneous debris including wood chips, metal and brick. The fill layer extended to depths of approximately 8 metres below ground surface.

Silty sand to sand underlies the fill layer. A discontinuous peat layer was reported that occurs at depths below 4.5 metres that demarcates the fill horizon and underlying native strata. A light non-aqueous phase liquid (LNAPL) layer was reported in the central portion of the 480 Lake Shore Boulevard property, consistent with its historical use as a petroleum refining and bulk storage facility.

South of the Keating Channel, similar general overburden conditions were reported. Silt and sand fill was encountered that contained varying amounts of gravel, clay and miscellaneous debris including glass, metal, concrete, brick, coal and clinker materials. South of the Keating Channel the fill layer extended to depths of approximately 5 metres below ground surface, underlain by a discontinuous peat layer and silty sand, sand and sand and gravel. Moderate to strong petroleum hydrocarbon-like odours as well as moderate to significant oil-like staining were observed in a number of locations reported within the fill layer and to a lesser extent in the native soil.

LNAPL was reported in areas that historically supported a petroleum refining and bulk storage/distribution facility and truck maintenance activities as well as within the lands currently occupied by a waste oil recycler. A dense non-aqueous phase liquid (DNAPL) layer has been inferred to occur infrequently based on the reported presence of strong odours and oil staining.

3.3.2 Groundwater Conditions

Groundwater occurs at depths of less than 1 metre to approximately 3.0 metres below ground surface. Groundwater elevation information shows that groundwater discharges west and southwesterly towards the Inner Harbour and Ship Channel. The groundwater table is strongly influenced by lake level fluctuations and thus the shallow groundwater flow directions fluctuate between monitoring events, making it difficult to establish a dominant groundwater flow direction within the Project Study Area.

3.3.3 Overburden Quality

The lands within the Project Study Area north of Keating Channel and east of Cherry Street have supported a variety of historical industrial and commercial facilities, including petroleum refinery operations, recycling facilities and automobile wrecker activities. These activities have resulted in environmental contamination represented by petroleum hydrocarbons (PHCs), metals and polycyclic aromatic hydrocarbons (PAHs) to reported depths of at least 5.0 metres below ground surface. West of Cherry Street (and north of the Keating Channel), the lands supported foundry works. These lands are characterized by the presence of metal and PAH-related contamination to reported depths of at least 4.0 metres below ground surface.

Localized areas of the metal-impacted fill have been characterized as a hazardous waste.

South of the Keating Channel and west of Cherry Street, historical coal storage activities, bulk fuel storage, paperboard manufacturing, foundry, scrap metal recycling operations, auto repair and concrete aggregate mixing plants existed. Environmental contamination represented by metals, PAHs and PHCs has been reported in the overburden to depths of at least 6.0 metres below ground surface.

East of Cherry Street, the lands have historically supported petroleum refining, bulk fuel storage and distribution activities, waste oil recycling, steel manufacturing and scrap metal yards. A large transport truck maintenance facility also operated in this portion of the Project Study Area. Relatively more significant environmental contamination (represented by metals, PAHs, PHCs as well as volatile organic compounds (VOCs)) was reported in the overburden soils to depths of approximately 9 metres below ground surface in areas in this portion of the Project Study Area.

Non-aqueous phase liquids (NAPLs) in the form of light (LNAPLs) as well as dense (DNAPLs) have also been reported, particularly in the areas formerly utilized for bulk fuel storage and distribution activities, waste oil recycling operations and truck maintenance facility.

3.3.4 Groundwater Quality

The distribution of groundwater contamination within the Project Study Area is best described as localized. Metal, PAH, PHC and VOC contaminant impacts have been reported on a localized basis within the Project Study Area.

3.4 Socio-economic Environment

This section describes the socio-economic conditions within the DMNP Project Study Area and Impact Assessment Study Area.

The socio-economic baseline study examines the existing and future socio-economic conditions in the Project Study Area and Impact Assessment Study Area. The objectives of the socio-economic study are to identify existing and future land use and socio-economic patterns to gain an understanding of the community likely to be affected and how this community and others uses the DMNP Project and Impact Assessment Study Areas.

The Impact Assessment Study Area reflects a broader area outside the actual Project Study Area that may be affected directly or indirectly by the DMNP. For ease of data collection, the City Wards 28, 30, and 32 have been considered part of the Impact Assessment Study Area for the purpose of the socio-economic baseline and assessment (**Figure 3-12**).

- Ward 28 includes the Inner Harbour, and the Moss Park, Toronto Islands, and Regent Park neighbourhoods.
- Ward 30 includes Lake Ontario Park, Tommy Thompson Park, the Leslie Street Spit, the Toronto Port and the Port Lands area. Part of South Riverdale, Greenwood and Coxwell neighbourhoods are also found within this ward.
- Ward 32 includes part of Ashbridges Bay, the Beach area, the Woodbine Corridor, as well as part of the Greenwood and Coxwell neighbourhoods.

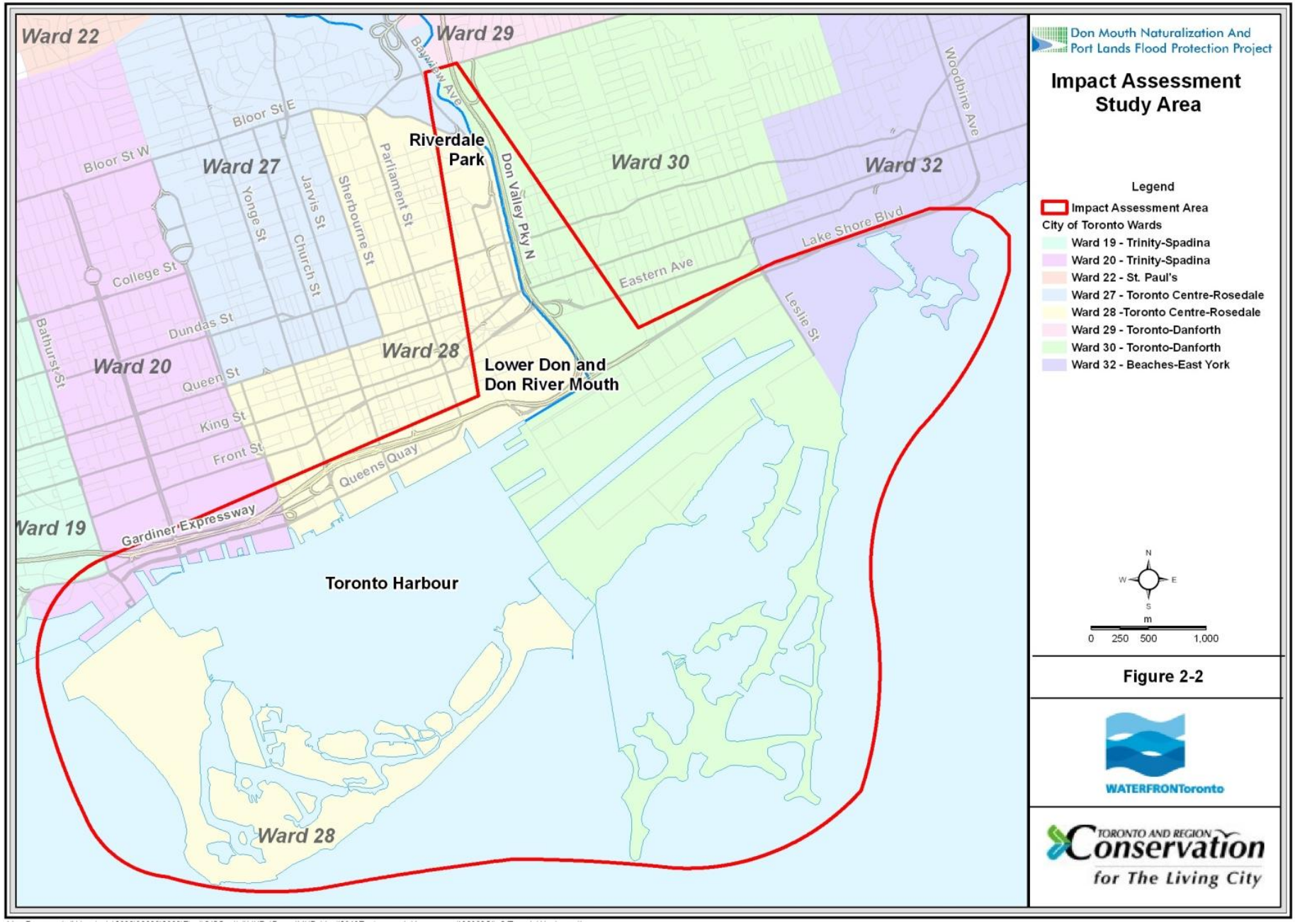

Figure 3-12 City of Toronto Wards in the Impact Assessment Study Area

3.4.1 Population and Demographics

The total population of the Impact Assessment Study Area in 2006 was 165,000 compared to approximately 2.5 million people in the City of Toronto. There is currently no population residing within the Project Study Area.

Upon completion of the waterfront revitalization the estimated population of the Impact Assessment Study Area as a result of tabulating future development in the East Bayfront, West Don Lands and Port Lands neighbourhoods is expected to increase by approximately 79,000 bringing the total population up to approximately 249,000 by 2023 (Urban Design Associates and DTAH, 2005). A comparison of the population characteristics between the Study Areas and the City of Toronto between 1996 and 2006 is presented in **Table 3-15**.

Table 3-15 Population of Toronto and the Study Areas in 2006

	City of Toronto	Impact Assessment Study Area[3]	Project Study Area
Total Population (2006)	2,503,281	165,565	There is currently no population in the Project Study Area
Total Population (1991)	2,481,510	170,085	
Population Change (2001-2006)	0.9%	-2.7%	
Largest Age Groups in 2006 (percentage)	1- 35-44 years (16.6%) 2- 25-34 years (15.4%) 3- 45-55 years (14.5%)	1- 35-44 years (20.0%) 2- 25-34 years (17.3%) 3- 45-54 years (16.0%)	

Table 3-16 compares the use of transit, auto and other transportation uses in the City of Toronto to the Impact Assessment Study Area. This table indicates that public transit plays an important role in transporting the residents who reside in the Impact Assessment Study Area. In the Impact Assessment Study Area, 37% of people used transit for work related trips and 28.0% used transit for non-work related trips compared to 30 % for work related and 19.0% for non-work related trips in Toronto in 2006.

Table 3-16 Transportation in Toronto and the Impact Assessment Study Area in 2006

	Transportation Means	City of Toronto	Impact Assessment Study Area[b]
Work Trips	**Transit**	30%	37%
	Auto	62%	46%
	Other[a]	8%	17%
Non-work Trips	**Transit**	19%	28%
	Auto	71%	55%
	Other[a]	10%	17%

Note: a Includes walking, cycling, rollerblading, etc.
b. Wards 28, 30 and 32

Transit's important role is also indicated by the TTC-TWRC Waterfront Transit Environmental Assessments Terms of Reference (approved in January, 2007 and recently incorporated into the Lower Don Lands Class EA Master Plan) which was produced to identify the transit improvements required to support planned development in the East Bayfront, West Don Lands and Port Lands areas. The transit improvements in these areas must abide by a number of policies which include:

3. Wards 28, 30 and 32

- A "Transit First" approach which provides for the early construction and operation of planned higher-order transit services at an early stage in the development process so that the transit-oriented objectives of the plan are achieved from the outset;
- The rights-of-way are to accommodate travel lanes, transit, pedestrian and cycling requirements;
- The existing bus and streetcar network will be extended into the waterfront area providing numerous connections north-south to connect the waterfront with existing nearby communities;
- New streetcar routes will operate in exclusive rights-of-way on existing and proposed streets to ensure efficient transit movement; and
- Waterfront streets will be renamed as "places" with distinct identities; Streets will act as lively urban connections as well as traffic arteries. The needs of motorists will be balanced with efficient transit service and high-quality amenities for pedestrians and cyclists (TTC-Waterfront Toronto, 2007).

3.4.2 Economic Activities

3.4.2.1 Impact Assessment Study Area

The economic activities in the Impact Assessment Study Area are financial services, telecommunication, software development, graphic design, Internet technology, film and media companies, and the retail sector – including specialty retail, market, food, restaurants and entertainment. Some of the neighbourhoods in the Impact Assessment Study Area which provide these services include the St. Lawrence, St. Jamestown, the Town of York, Corktown, the Distillery District, the Riverdale District, the Beach, Old Cabbagetown, the Queens Quay Harbourfront and the West Don Lands.

Many waterfront industries taking advantage of the port facilities are also located in the Impact Assessment Study Area. These industries provide storage, processing, and shipment facilities for various products such as sugar, salt, cement, steel, and lumber. It should be noted that activities associated with steel and lumber products have declined considerably since the 1990s. In 1999 an economic impact study indicated that the Toronto Port employs an equivalent of approximately 1,300 full time jobs in cargo, tourism, and recreation, which represents an estimated regional economic impact of $422 million annually (The Mariport Group Ltd., 1999).

3.4.2.2 Project Study Area

The Project Study Area is primarily industrial. Within this area there are a variety of industrial uses such as food processing, transportation, entertainment, internet technology, heavy machine rental, automobile and financial services. As development gets underway existing heavy industries and businesses will be replaced with light industry, commercial, residential, and institutional uses. This transition will occur over a number of years.

3.4.3 Existing Land Use

3.4.3.1 Impact Assessment Study Area

Current land use in the Impact Assessment Study Area is predominantly commercial/industrial, with some recreational and residential land use along the waterfront (**Figure 3-13**). The area houses a number of important municipal and private facilities including the Toronto Port, the Portlands Energy Centre, Filmport, the Toronto City Centre Airport, Ashbridges Bay Sewage Treatment Plant, businesses related to the film industry, City of Toronto recycling facilities, and the St. Lawrence Market. Recreational and residential land uses include a number of marinas and recreational boating clubs, as well as a system of cycling/pedestrian trails.

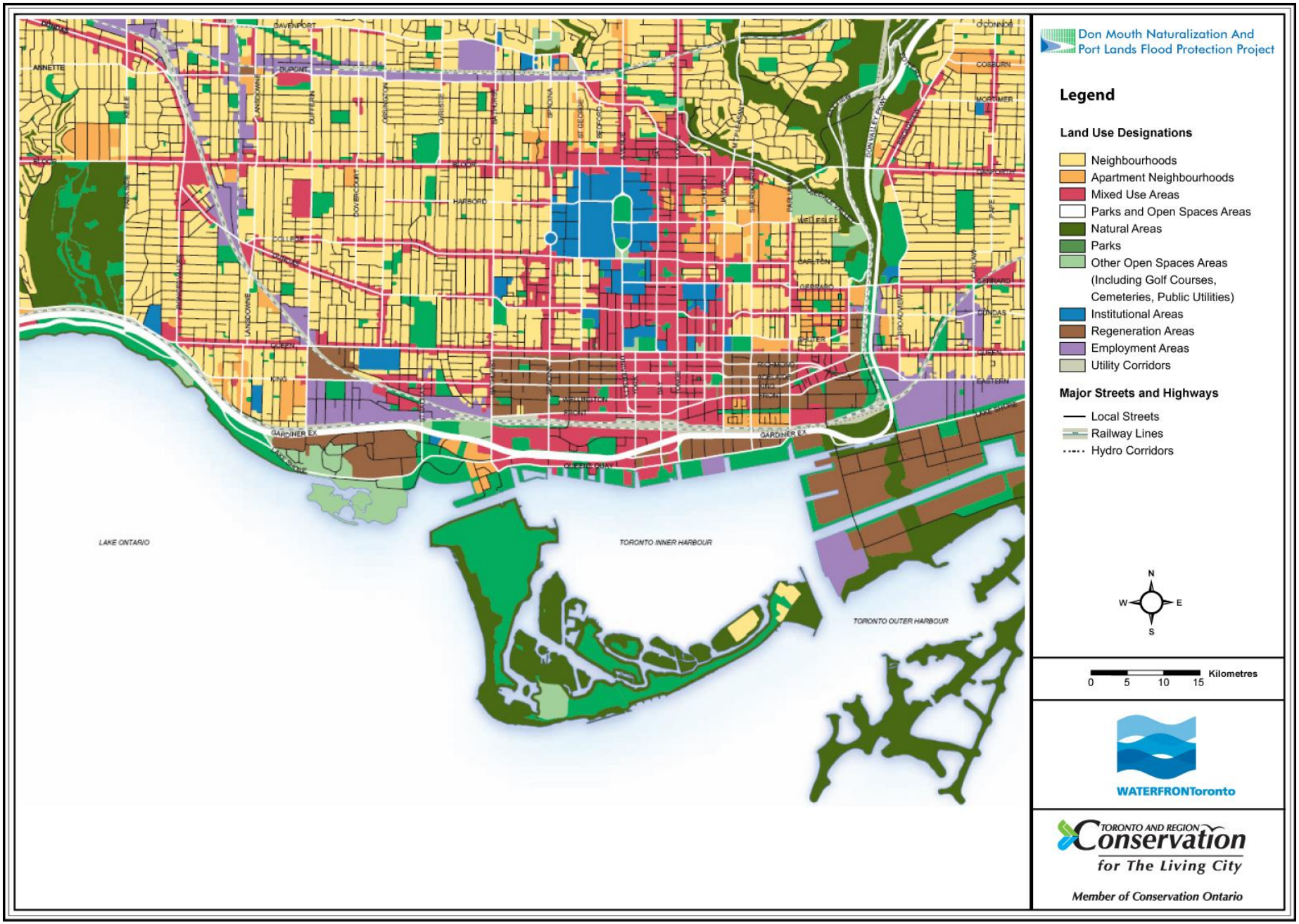

Figure 3-13 Land Use in the Impact Assessment Study Area

The Impact Assessment Study Area is currently bisected by transport and utilities infrastructure, including rail links, the Don Rail Yard, water and sewer utilities, gas pipelines, hydro transmission lines, and roads within the area.

Existing neighbourhoods that lie within the Impact Assessment Study Area are Cabbagetown, Regent Park, Corktown, Central Waterfront, Toronto Islands, Riverdale and the Beach. Planned neighbourhoods include East Bayfront, West Don Lands and Lower Don Lands.

3.4.3.2 Project Study Area

The current land use in the Project Study Area is primarily industrial, with some recreational, entertainment, food, transportation, telecommunications, financial and internet technology services also located in the area (**Figure 3-14**).

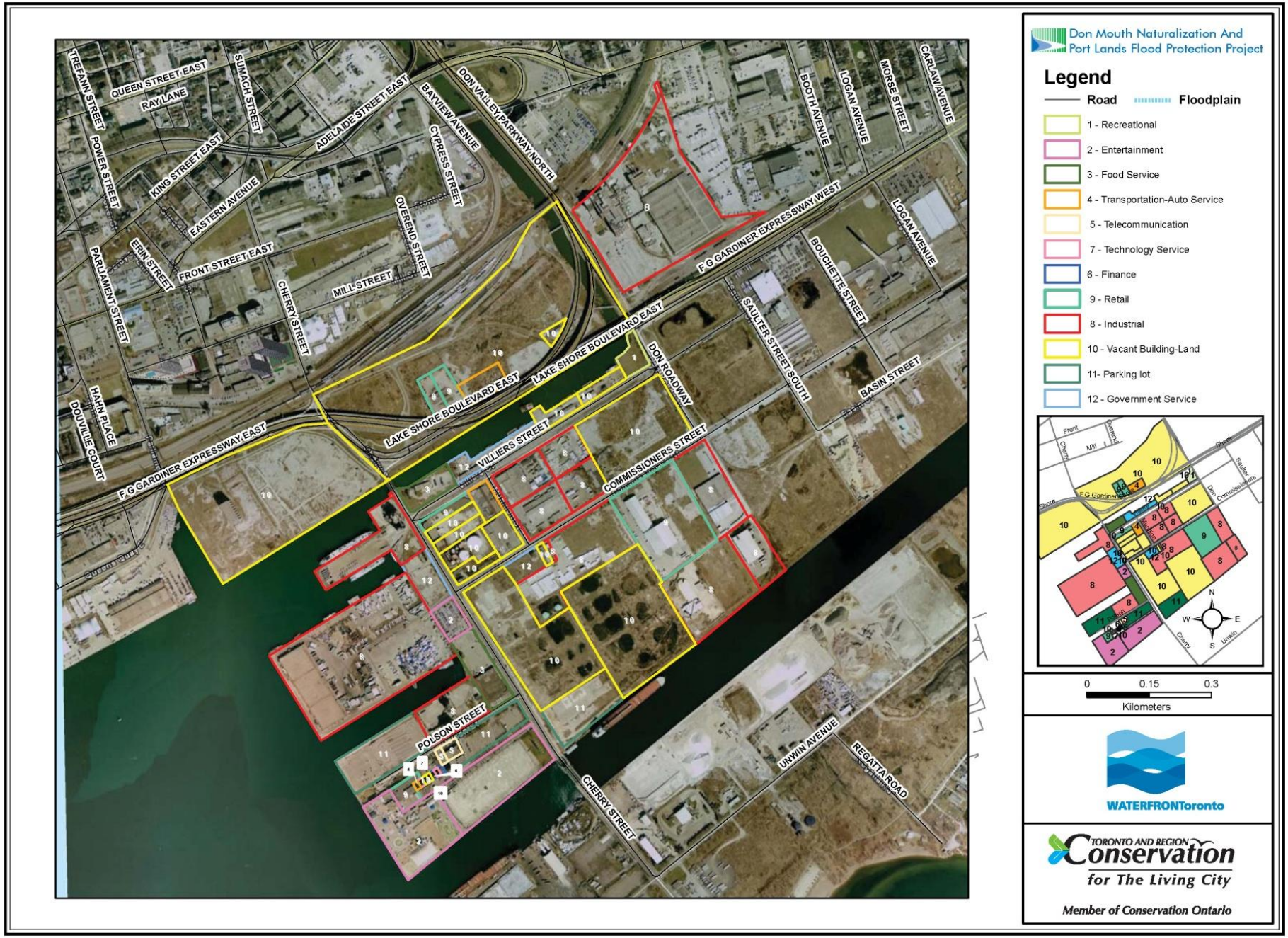

Figure 3-14 Land Use in the Project Study Area

Industrial sector businesses located within the area include Lafarge Canada Incorporated, Essroc Italcementi Group, Korex, Coopers Iron and Metal, and NR Industries. The Sound Academy (formerly known as the Docks Entertainment Complex) and Enterprise 2005 Cruise Lines are the primary recreational and entertainment businesses in the area, and the Keating Channel Pub & Grill and T&T Supermarket provide food services. The TPA also operates a works yard in the area (see **Section 3.4.5.1** for more detail).

Transportation services within the Project Study Area are located along its northern boundaries and include Star Coach Services and the Magic Bus Company. The telecommunications, finance and Internet technology services are located in a cluster on Polson Street and include Tower's Production Inc., Club Finance Corporation, Live Wire, and Great White North Communications Inc.

In addition, many vacant lands and buildings exist in the area, owing to the Port Lands' long history of past industrial, shipping, and railway uses.

Properties within the Project Study Area are predominantly owned by the City of Toronto and the TPLC (formerly known as TEDCO), including the dock walls, with some small holdings held by the Provincial government (**Figure 3-15**). There are some private property holdings in the northwest portion of the Project Study Area, along Commissioners Street and at the south end of Cherry Street, such as Lafarge and the Docks. The waterlots within the Project Study Area are owned and/or managed by the Federal government through the TPA.

Figure 3-15 Property Ownership in the Project Study Area[4]

4. *Since this figure was published by TPLC (formerly TEDCO), some ownership changes have occurred. Waterlots within the Project Study Area are owned and/or managed by the Federal government,*

3.4.4 Recreation Uses

3.4.4.1 Project and Impact Assessment Study Areas

Table 3-17 provides a description of existing and proposed land based recreational uses in both the Project and Impact Assessment Study Areas. The locations of these recreational areas are illustrated in **Figure 3-16** below.

Table 3-17 Recreation Uses in the DMNP Project and Impact Assessment Study Areas

Recreational Area	Description	Location
Don River Bikeway	• The Don River Bikeway traverses the Project and Impact Assessment Study Areas, extending northward from Lake Shore Boulevard along the west side of the Don River and connecting to the Don and Taylor Massey Creek valleyland corridors. The bikeway is a regional recreational and utilitarian trail that is surfaced in asphalt. An underpass of the CN Railway was completed by TRCA in 2007, as was an underpass under GO Transit's Bala Subdivision, north of the CN Railway. These will enhance the Don River Trail with the future West Don Lands. The Bala Underpass remains closed until the Don River Park is complete.	Project Study Area & Impact Assessment Study Area
Martin Goodman Trail	• The Martin Goodman Trail is one of the most heavily-used recreational and commuter trails in Toronto. Extending across the length of the Port Lands, the Martin Goodman Trail is used for walking, cycling, rollerblading and nature appreciation. It provides linkages to the waterfront trail and other recreational areas such as Tommy Thompson Park. Through the Lower Don Lands study area, the existing trail takes a zigzag route, with no relationship to the water's edge in this area. The revitalization of the Lower Don Lands area aims to improve the trail's continuity and to provide an improved and continuous riverfront and water's edge experience as well as improved connections to the east and west.	Project Study Area & Impact Assessment Study Area
Don River Park	• Construction of Don River Park has not yet begun, and will occur on a parcel of land on the west side of the Don River as a component of the West Don Lands community. The park will provide a range of active and passive recreational amenities as well as forming the primary trail connection between the proposed community and the Don River Trail. A flood protection landform (FPL) is a key element of the park. Construction of the landform is led by the Ontario Realty Corporation, with Waterfront Toronto leading the construction of the Park following completion of the FPL. TRCA provides oversight to ensure that the landform and park are completed according to Class EA approvals.	Impact Assessment Study Area
Sherbourne Park	• Sherbourne Park is proposed as a small urban waterfront park to be developed in association with the East Bayfront Community. The site is located west of the mouth of the Keating Channel on the waterfront, at the foot of Sherbourne Street.	Impact Assessment Study Area
Cherry Beach	• Cherry Beach is being redeveloped to allow more people to access it. It will become the western arm of the proposed Lake Ontario Park. Phase one of construction for Cherry Beach has been completed which included landscaping and the development of a trail to Cherry Point. Additionally, Waterfront Toronto opened the Cherry Beach Sports Fields in 2008.	Impact Assessment Study Area
Lake Ontario Park (Proposed)	• The site of the proposed Lake Ontario Park encompasses approximately 375 ha extending along the waterfront from Cherry Beach in the west to the R C Harris Filtration Plant in the east. Some sections of it are currently under construction. Lake Ontario Park is comprised of a number of existing parks including Cherry Beach/Clarke Beach Park, Tommy Thompson Park, Ashbridges Bay Park, Woodbine Park, Pantry Park, Kew Gardens and the Eastern Beaches as well as the interstitial lands along the perimeter of the Ashbridges Bay Treatment Plant site and the north shore of the Outer Harbour Water Park.	Project Study Area & Impact Assessment Study Area

Table 3-17 Recreation Uses in the DMNP Project and Impact Assessment Study Areas

Recreational Area	Description	Location
	• Lake Ontario Park will offer both passive and active recreational opportunities. In general, programmed recreational facilities will be located along the south side of Unwin Avenue, and the landscape will transition to a more passive and natural dune-like character in the vicinity of the shoreline of the Outer Harbour Water Park. Specific activities proposed include soccer, baseball, tennis, basketball, cycling, hiking, cross country skiing, skating and a myriad of water sports ranging from sailing to kite boarding. The connection between Lake Ontario Park and the proposed Lower Don Greenway is important for connectivity for habitat between Tommy Thompson Park and the Don River Valley.	
Toronto Islands	• The Toronto Islands are a chain of small islands located within the Impact Assessment Study Area in Lake Ontario just offshore from the city centre that provide shelter for the Toronto Harbour. The islands are a popular recreation destination and contain a small residential community and the Toronto City Centre Airport. The islands host Centerville, a children's amusement park, several swimming beaches and recreational boating.	Impact Assessment Study Area
Water's Edge Promenade	• Water's Edge Promenade is a Harbourfront Centre and Waterfront Toronto initiative to create continuous and easily accessible water's edge. The first phase along York Quay was completed in 2005 and provides a double row of trees down the centre of the east promenade, a raised promenade adjacent to the water's edge, a continuous 5 m boardwalk on the lake adjacent to the promenade, a continuous 12 m wide water' edge promenade, seating, trees planted on the north side of the promenade that provide shade to pedestrians, two finger piers extending perpendicularly from the boardwalk into the lake and lighting along the water's edge.	Impact Assessment Study Area
Tommy Thompson Park	• Tommy Thompson Park is a unique urban wilderness minutes from downtown. The park is located on a man-made peninsula, known as the Leslie Street Spit, which extends 5 km into Lake Ontario and is over 500 ha in size. The park represents some of the largest existing natural habitat on the Toronto waterfront. Wildflower meadows, cottonwood forests, coastal marshes, cobble beaches and sand dunes are just some of the habitats at Tommy Thompson Park. Wildlife, especially birds, flourish at the park, which provides one of the best nature watching areas in the GTA. Other recreational opportunities include hiking, cycling, rollerblading and fishing.	Impact Assessment Study Area

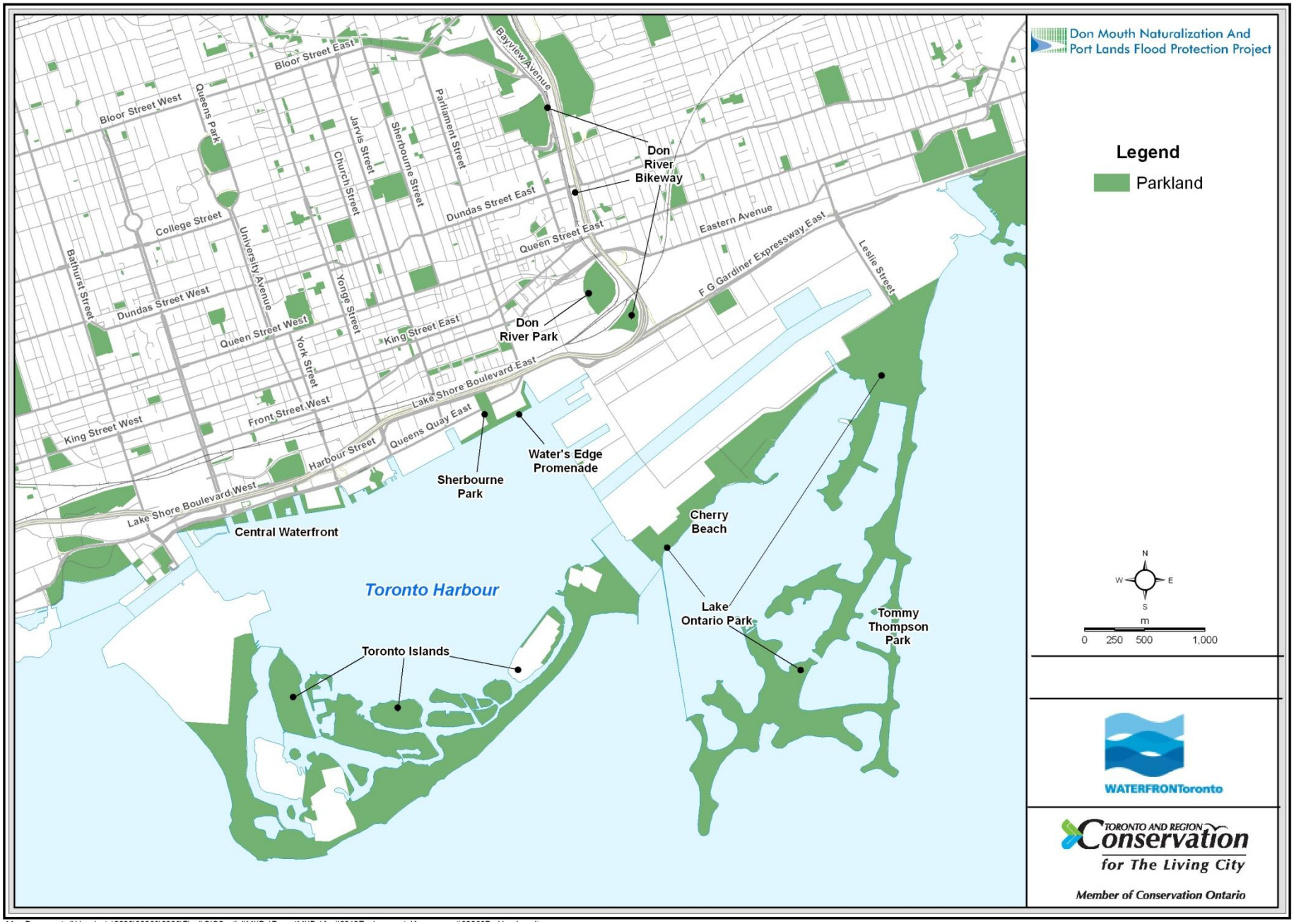

Figure 3-16 Recreational Areas in the DMNP Project and Impact Assessment Study Areas

3.4.5 Existing Marine Uses

The following sections focus on marine uses in the Impact Assessment Study Area, which is home to the majority of the marine activity.

3.4.5.1 Impact Assessment Study Area

The Port of Toronto

The Port of Toronto is an important land use within the Impact Assessment Study Area, covering approximately 20 acres with over 3 kilometres of deep water wharfage. The Port is one of the largest city and inland ports in Canada with a single harbour entrance that facilitates the movement of traffic and saves shipping lines distances and time[5]. The Port provides immediate access to marine routes, major highways and rails facilities. Total port tonnage in 2007 was 2,068,665 tonnes with the top 3 bulk cargoes being sugar, salt and cement (TPA, 2009). In 1999, an economic impact study indicated that the Port employed the equivalent of 1,500 full time jobs in cargo, tourism and recreation, representing an estimated regional economic impact of $422 million annually (The Mariport Group, 1999). This figure does not include the value brought to the area by Porter Airlines, which uses the Toronto City Centre Airport.

The TPA was established for the purpose of operating the Port and has legislated responsibility for all of its port activities related to shipping, navigation, transportation of passengers and goods, and the handling and storage of cargo. In addition to the Port of Toronto (consisting of Marine Terminal 51 and Warehouse 52), it owns and operates the Toronto City Centre Airport, the Outer Harbour Marina and the Works Department. The TPA currently has a staff of 110 full-time employees and approximately 25 seasonal and part-time workers (TPA, 2009).

The Outer Harbour Marina is located adjacent to the Leslie Street Spit in a protected channel with quick access to Lake Ontario and Toronto's Inner Harbour. The Marina offers 636 slips, 30- and 50-amp power and picnic areas and green space (TPA, 2009).

A manoeuvring circle is a common measure for the available manoeuvring space in a basin. Currently, the Inner Harbour has a manoeuvring circle with a diameter of 915 metres using the dimension of a Seawaymax (length overall (LOA): 225.6 metres, beam: 23.8 metres, draft: 7.9 metres) as a reference, since this is the largest ship to use these waters (Baird, 2009). Bounding objects for the existing configuration are the quay wall at the Queen Elizabeth Docks to the northwest and the limit of 8.2 metres maintained depths to the south and northeast. The size of the manoeuvring circle for the Inner Harbour is important as it limits the size of the ships which can enter the Inner Harbour and safely turn around.

Cruise Boats

The number of cruise ships visiting Toronto increased from zero in 1994 to 7 cruise ship landings in the Port of Toronto in 2009, all from one ship. Each cruise visit brought approximately 700 people to the City. In addition, there are 7 cruise ship landings planned for 2010 (also from the same ship). The international cruise vessels bring visitors to Toronto from France, Germany, the U.K. and the U.S. The increased cruise operations in the Great Lakes mean more cruising to the Port of Toronto and more tourists to the City.

5. *The other entrance, the Western Gap, is not dredged for shipping activities and only provides access for shallow draft recreational craft.*

Commercial Tour Boats

Seventeen companies operate approximately 34 charter/tour boats in the Inner Harbour. The concentration of the charter boats is along the dockwall and marine slips of the Central Waterfront area from Bathurst Quay in the west to the Parliament Street Slip in the east. The charter boats operate between April and October of each year.

Ferries

The city provides ferry services to the Toronto Islands. The Toronto Ferry Terminal is located at the Bay Street and Queens Quay intersection. The city's island ferries operate year round, with more frequent service from April to October than during the winter months. In 2006, it was estimated that the city's ferries transport between 1.1 and 1.3 million people across the Harbour each year (TWRC, 2006b).

The TPA provides a ferry service to the City Centre Airport. The Royal Canadian Yacht Club, the Island Yacht Club, the Queen's City Yacht Club and the Island Marina also operate ferry services to the islands for club members, recreational boaters and program participants.

Recreational Boating

The Impact Assessment Study Area is home to over 50 boat clubs and marinas with over 5,258 boat moorings and over 15,000 members and users. Some of the boating activities that take place along the waterfront are yachting, sailing, power boating, rowing, canoeing, kayaking, dragon boating and windsurfing.

The Marine Strategy Resource Guide (TWRC, 2006b) indicated that there are 29 yacht and boating clubs, 5 marinas, and 7 boating/teaching organizations on the Waterfront. The Inner Harbour from the western gap to the eastern gap has the second highest concentration of boaters. It has four yachting and sailing clubs, three marinas, three canoe club/facilities, the Blind Sailing Association of Canada, Queens Quay Disabled Sailing Program, one rowing club and Queens Quay Sailing and Power Boating. The Outer Harbour extends from the eastern gap to the Leslie Street Spit. It is home to seven sailing clubs, one wind surfing club, one rowing club, one dragon club, and one marina. The Ashbridges Bay area extends east of Leslie Street Spit and is home to two yachting and sailing clubs and one canoe club. **Table 3-18** provides a list of the recreational boating clubs, marinas and organizations along the waterfront.

Table 3-18 Recreational Boating Clubs, Marinas and Organizations in the Impact Assessment Study Area

	Name	Location
Boating/Teaching Organizations	Toronto Brigantine	249 Queens Quay West
	Navy League of Canada	659 Lake Shore Boulevard West
	Blind Sailing Association of Canada	235 Queens Quay West
	Queens Quay Sailing & Power Boating	275 Queens Quay West
	Queens Quay Disabled Sailing Program	275 Queens Quay West
	Harbourfront Canoe & Kayaking School	283A Queens Quay West
Marinas	Ontario Place Marina	955 Lake Shore Boulevard West
	Marina Quay West	539 Queen Quay West
	Marina 4	235 Queens Quay West
	Outer Harbour Marina	475 Unwin St.

Table 3-18 Recreational Boating Clubs, Marinas and Organizations in the Impact Assessment Study Area

	Name	Location
Yacht and Boating Clubs	Ashbridges Bay Yacht Club	30 Ashbridges Bay Park Road
	Toronto Hydroplane Sailing Club	20 Ashbridges Bay Park Road
	Balmy Beach Canoe Club	10 Ashbridges Bay Park Road
	Water Rats Sailing Club	Regatta Road
	Hanlan Boat Club	Regatta Road
	Mooredale Sailing Club	Regatta Road
	St. Jamestown Sailing Club	Regatta Road
	Westwood Sailing Club	Regatta Road
	Outer Harbour Centreboard Club	Regatta Road
	Toronto Multihull Sailing Club	Regatta Road
	Great White North Dragon Boat Club	Unwin Avenue
	Aquatic Park Sailing Club	Tommy Thompson Park
	Toronto Island Canoe Club	Wards Island
	Sunfish Cut Boat Club	Algonquin Island
	Queen City Yacht Club	Algonquin Island
	Bayside Rowing Club	600 Unwin Street
	Toronto Windsurfing Club	Regatta Road
	Island Yacht Club	400 Queens Quay West
	Toronto Island Sailing Club	Centre Island
	Royal Canadian Yacht Club	South Island
	Greater Toronto Dragon Boat Club	Lake Shore Boulevard West (east of Sunnyside Pool)
	Boulevard Club	1491 Lake Shore Boulevard West
	Toronto Sailing and Canoe Club	1391 Lake Shore Boulevard West
	Argonaut Rowing Club	1225 Lake Shore Boulevard West
	Alexandra Yacht Club	2 Stadium Road
	National Yacht Club	1 Stadium Road

Source: TWRC, 2006

The members and users of recreational boating facilities are active on the Toronto waterfront from 5:00 to 5:30 am until 8:30 to 9:00 pm or last light at night, seven days a week. On weekdays, rowers normally use the water from 5:00 to 7:00 am and to a lesser extent from 5:30 to 8:30 pm. Sailors, power boaters and dragon boaters normally use the water from 6:00 to 9:00 pm. On weekends, 9:00 am to 4:00 pm are prime times for sailors and power boaters. Additionally, more than 40 regattas occur every year, and tend to take place on weekends (10 am to 12 noon, 2:00 to 4:00 pm) and mid-week (6:00 to 8:00 pm).

Other

Some of the other marine uses in the area include industrial shipping for Tate and Lyle (formerly Redpath Sugar), emergency service, tugboat operations, water taxis for passenger embarking and disembarking, and leisure activities such as sport fishing and radio controlled model boating. Maintenance activities by the Port Authority within the Inner Harbour include clearing debris. There are also salt companies located in the Impact Assessment Study Area that use the areas south of the Ship Channel for storage, including Akzo Nobel Salt. Additionally, dockwalls are used for overwintering to undertake repairs and maintenance of lakers.

3.4.5.2 Project Study Area

Within the Project Study Area, marine use is largely limited to industrial cargo shipping associated with the Port of Toronto, Lafarge, Essroc and others. The Port Works Yard is located on the southern side of the Keating Channel, and the dockwall, including Polson and Cousins Quays, offers docking facilities for cargo shipping boats. An Atlas crane is located at Cousins Quay for loading/unloading of cargo.

Maintenance activities by the Port Authority within the Project Study Area include dredging and debris management associated with the mouth of the Don River, and the harbour operations yard.

3.4.6 Land Use Planning

3.4.6.1 Impact Assessment Study Area

The following is an overview of the planning and development initiatives in the Impact Assessment Study Area. While the Project Study Area is also subject to all of the initiatives described below, the Keating Channel Precinct Plan is the most specific to this area and is discussed in **Section 3.4.6.2** (Project Study Area).

City of Toronto Official Plan

On July 6, 2006, the Ontario Municipal Board (OMB) issued an order, bringing the majority of the City of Toronto's new Official Plan into effect and repealing most of the seven municipal Official Plans that the new City of Toronto inherited. The new Official Plan is the City's road map for successful city-building over the next 25 years. It sets out where and how growth will occur, and all of the necessary services and infrastructure that will accompany new development.

The Official Plan includes policies for development along the water's edge. The Plan states, "increased public enjoyment and use of lands along the water's edge will be promoted…" and "Private development and public works on lands along the water's edge or in its vicinity will improve public spaces in the waterfront; and maintain and increase opportunities for public views of the water, and support a sense of belonging to the community" (City of Toronto, 2007b, p. 2-25). Additionally, the Official Plan sets in place a mixed use community for the waterfront including residential and economic development.

Central Waterfront Secondary Plan

The City of Toronto prepared the Central Waterfront Secondary Plan called "Making Waves" (City of Toronto, 2001b) which sets out planning policies for the Central Waterfront area. It outlines the development philosophy and high-level framework for Waterfront Revitalization from Etobicoke Creek in the west to the Rouge River in the east and identifies the Central Waterfront as the focus of planning framework changes and priorities that would benefit the city as a whole. The Central Waterfront Secondary Plan encompasses the Port Lands, the West Don Lands, East Bayfront, Central Bayfront, Fort York and Exhibition Place.

Making Waves established four "Core Principles" and 23 "Big Moves". Starting with these central concepts, detailed precinct plans are being prepared to provide block-by-block details for roads, schools, parks, and residential and commercial developments. The four key principles for waterfront revitalization are:

- Removing barriers/making connections;
- Building a network of spectacular waterfront parks and public spaces;
- Promoting a clean and green environment; and
- Creating dynamic and diverse new communities.

The implementation of 23 “Big Moves” is aimed at establishing new areas to live, work, and play. New housing for approximately 68,000 people in 40,000 units is projected. An estimated 925,000 square metres of commercial space providing opportunity for 35,000 new jobs is anticipated (City of Toronto, 2001b).

The City of Toronto approved “Making Waves: A Secondary Plan for the Central Waterfront” in 2003. The Secondary Plan has been guiding the planning for the waterfront revitalization, and is currently under appeal. The city is implementing the plan through the development of Precinct Plans for key revitalization areas and the development of the Port Lands Implementation Strategy. **Figure 3-17** illustrates the areas covered by the Precinct Plans. The Secondary Plan creates a long-term planning framework for the Central Waterfront, recognizing that the implementation of this Plan will take place for years to come.

It should be noted that some sections of the Central Waterfront Secondary Plan are under appeal to the Ontario Municipal Board; thus not all policies of the Secondary Plan are fully in force and effect.

An amendment to the former City of Toronto Official Plan and Central Waterfront Secondary Plan (OPA 388) was approved by City Council on August 17, 2010 to address changes in the Lower Don Lands area, including the need for the reconfiguration of the Don River mouth and associated parks, adjacent open spaces, infrastructure, and developable land.

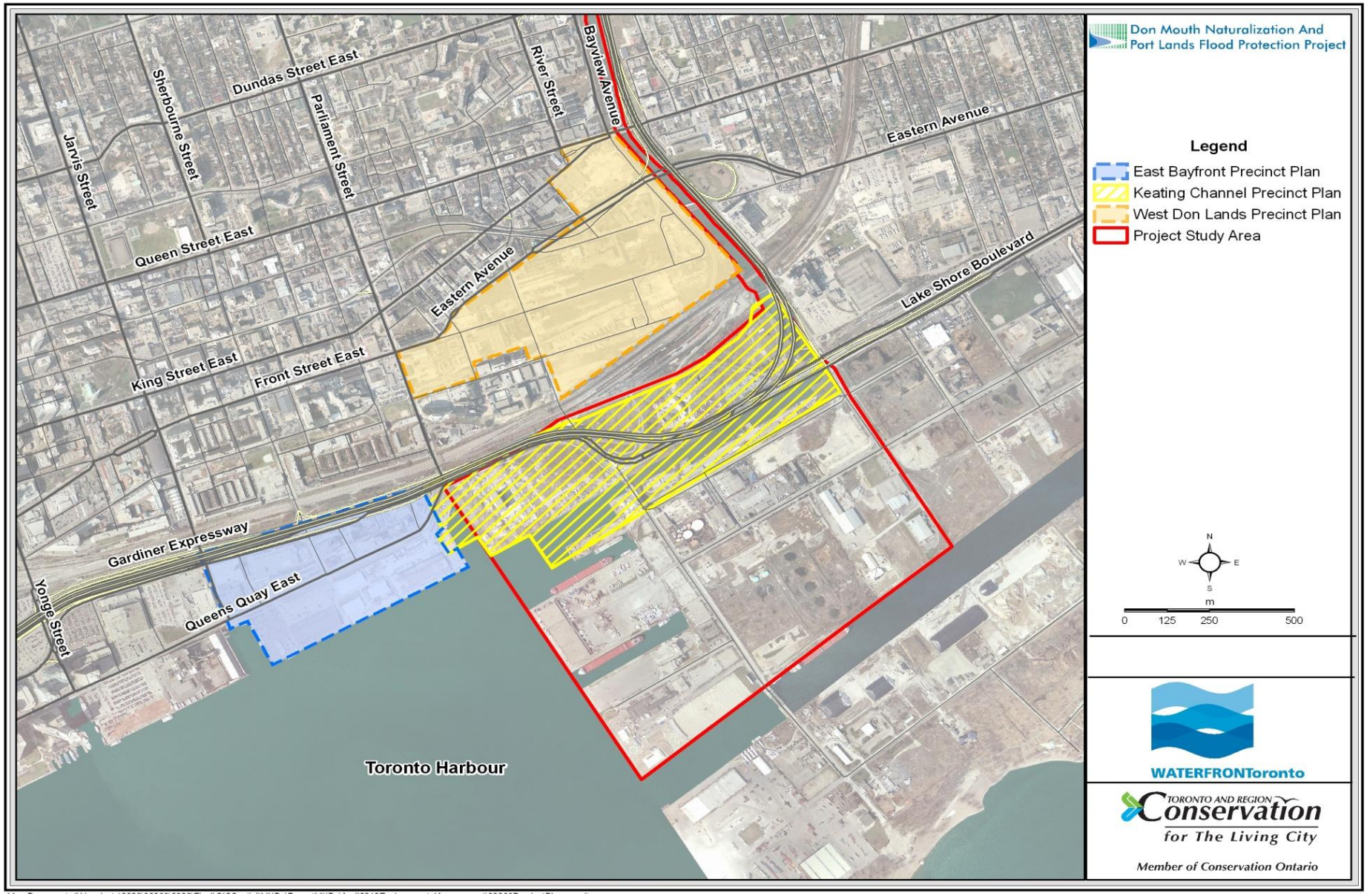

Figure 3-17 Locations of the Precinct Plans

Special Policy Area (SPA)

Portions of the Lower Don Lands located both north and south of the Keating Channel are located within a provincially approved Special Policy Area (SPA) in the former City of Toronto Official Plan. The Provincial Policy Statement (PPS), 2005 (MMAH, 2005) recognizes the importance of protecting the public's health and safety, and to that end generally does not permit development and site alteration within areas where flooding from rivers, streams or small inland lakes would cause a danger to the public or damage to property. The PPS, 2005 also recognizes that, in exceptional circumstances, the social and economic viability of some communities that have historically existed in floodplains requires the reduction in the provincial floodplain standards.

In accordance with provincial standards, flooding hazards may be managed through a One Zone Concept, Two Zone Concept or a SPA approach. In general, the One Zone Concept is the primary provincial approach to managing flood risk through the planning process, which essentially requires that no new development be permitted within the flood plain. In exceptional situations, the Province may permit limited development and site alteration to occur in areas prone to flooding by approving an SPA, as it has done for portions of the Lower Don Lands. In the past, the designation of an area as a SPA has been applied to historic communities, such as downtowns, that are within flood susceptible areas.

Approval of a SPA designation and any proposed changes to the boundaries, policies and land uses of an existing SPA may only be granted by the Ministers of Municipal Affairs and Housing (MMAH) and Natural Resources (MNR). The criteria and procedures for approval of a SPA are established by the Province with the document entitled *Procedures for Approval of New Special Policy Areas (SPAs) and Modifications to Existing SPAs*. As noted above, the City of Toronto, in cooperation with Waterfront Toronto and with support from the Ministry of Municipal Affairs and Housing and the Ministry of Natural Resources, has approved an amendment (OPA 388) to the Central Waterfront Secondary Plan to address changes in the Lower Don Lands area due to the proposed new river.

OPA 388 removes the SPA designation from a portion of the lands located in the Lower Don Lands precinct of the Central Waterfront Secondary Plan and replaces it with a Two Zone concept for floodplain management. The amendment also designates certain lands comprising the new valley system as Parks and Open Space Areas, Natural Areas wherein development is not permitted. The purpose of this amendment is to facilitate future works related to the DMNP and, once the flood protection works are completed, to realize development in this area in accordance with the vision expressed in the amended Secondary Plan.

Precinct Plans

Waterfront Toronto and the City of Toronto are planning for new communities in the East Bayfront, West Don Lands and Lower Don Lands areas (Keating Precinct and future Precinct(s)). The Precinct Plans are intended to outline development principles and guidelines at a level of detail not possible within the broader Secondary Plan. The intent is that these principles and guidelines form the bridge that allows the city to move from Official Plan policies to Zoning By-law provisions and provide the necessary urban design, planning and development guidance to permit the actual revitalization of individual precincts of the Toronto waterfront. The precinct plans will establish the location, scale, character and function of all public spaces, streets, buildings and facilities to be provided and developed within the precinct and will specify the process for their realization through the planning approval and development process.

East Bayfront Precinct Plan

The East Bayfront precinct is the most central waterfront revitalization area to the downtown core and is considered a regeneration area. The Precinct extends from Cherry Street in the east to Parliament Street in the west.

Zoning by-law number 1049-2006 which was based on the Precinct Plan was passed by the City on the 27th of September 2006. The by-law implements the City proposal to amend the general zoning by-law 438-86 for the East-Bayfront-West area; from industrial uses to mixed development and open space including the water edge's promenade.

The Plan intends for the area to become a "new downtown neighbourhood and a destination for city residents and visitors alike." Furthermore, the Plan intends to create the following:

- 3 kilometres of continuous publicly accessible waterfront
- 1,400 units of affordable rental housing
- 5,700 units of market housing
- Low scale development along the water's edge – four stories
- One million square feet of commercial space
- 3.7 acre waterside, Sherbourne Park
- Community recreation/meeting facilities (Waterfront Toronto, 2009a)

Development of the East Bayfront precinct started in the fall of 2007, with construction of the first building at the foot of Jarvis Street. Phase One of East Bayfront development will take approximately four years to complete and includes:

- Sherbourne Park, including water's edge promenade
- Public transit on Queens Quay East
- 700 residential units, including 140 units of affordable rental housing
- 50,000 sq. metres of employment space
- 15,000 sq. metres of ground floor cultural, retail, service and entertainment uses (Waterfront Toronto, 2009a)

In July 2008, George Brown College announced its plans to join Waterfront Toronto's revitalization efforts and build its new campus at the foot of Jarvis Street. The campus is expected to open in 2011.

West Don Lands Precinct Plan

The West Don Lands area lies to the south east of the City's Downtown. The Plan intends for the West Don Lands to be connected to the downtown core and the Don River Valley corridor. The Plan designates the land usage in the precinct as mixed-use with an emphasis on urban living. Front Street is a major east/west street, linking the West Don Lands to the city centre. The Plan states that, because of its critical location, the West Don Lands will be the gateway neighbourhood from the Downtown to the Port Lands." The Plan intends for the area to have:

- Over 9 hectares of parks and public spaces including 7 hectare Don River Park
- Public transit within a five-minute walk of all residences
- 5,800 residential units, including 1,200 units of affordable rental housing
- 93,000 square metres of employment space
- Pedestrian & cycling connections within neighbourhood and to city
- Elementary school
- Recreation centre
- Two childcare centres (Waterfront Toronto, 2009d)

The Precinct Plan was approved by the City in May of 2005. In May 2006, work started to achieve the goals of the Plan. Phase One of West Don Lands revitalization will include 850 market housing units and 130 units of

affordable housing. Residential construction is scheduled to begin in 2010, with the first residents moving into the West Don Lands starting in 2011.

The West Don Lands has also been named as the location for the temporary athletes village for the 2015 Pan American Games. The proposed village would accommodate 8,500 athletes and team officials and would include approximately 2,100 housing units in buildings that will be designed and developed in such a way that they can be easily converted for residential uses following the Games.

Keating Channel Precinct Plan

The Keating Channel Precinct Plan falls within the Project Study Area, and is discussed in detail in **Section 3.4.6.2**.

Future Precinct(s) Plan

The future Precinct(s) Plan also falls within the Project Study Area. As of the date of this document, preparation of the future Precinct(s) Plan had not yet begun.

3.4.6.2 Project Study Area

Keating Channel Precinct Plan

The Keating Channel Precinct area is located primarily on the north side of the Keating Channel and south of the GO transit yards, from Parliament Street in the west, to the Don Valley Parkway in the east. It also includes land on the south side of the channel, north of Villiers Street. The Keating Channel Precinct will be the first community developed in the Lower Don Lands.

The Plan envisions the area as an integration of neighbourhoods, infrastructure, and parks and open spaces that will frame the new river systems. The area is also seen as a gateway to a revitalized Port Lands providing connections to the existing communities to the north and east and the emerging communities of East Bayfront and the West Don Lands. The Plan intends for the area to have:

- Approximately 10 hectares (ha) of park, which is largely centred around the Keating Channel;
- Four new bridges over the Keating Channel for vehicles, transit, cyclists, and pedestrians;
- Extension of streets and trails into and through the precinct including Queens Quay, a realigned Lake Shore Boulevard, Cherry Street, Villiers Street, Munitions Street, the Martin Goodman Trail, the Don River Trail and the water's edge Waterfront Promenade;
- 4,700 residential units, including 940 units of affordable housing and an additional 235 units of "low end of market" housing;
- A mix of mid-rise and higher tower buildings, with lower building closer to the water's edge to ensure solar access to the public realm and preserve skyline views;
- Higher buildings and higher density closer to the Gardiner and rail corridor to shield the neighbourhood from noise generated by nearby transportation corridors;
- 168,000 – 197,000 square metres of employment space, including office, commercial, professional office and retail uses;
- One school located just east of the Parliament Street Slip; and,
- Two daycare centres, one located at the school facility, the other in the vicinity of the area east of Cherry Street.

3.4.7 Cultural Resources

Cultural resources include cultural heritage landscapes (cemeteries, 19th century roadways, town squares, etc.), built heritage resources (churches, houses, bridges, etc.), and archaeological remains (tools, pottery, coins, human remains, etc.) Since the Impact Assessment Study Area covers an extensive area along Toronto's waterfront and the effects of the DMNP will be focused in the Project Study Area, the focus of this section will be on the Project Study Area.

3.4.7.1 Project Study Area

Cultural Heritage Landscapes and Built Heritage Resources

The Lower Don Valley has a long history, which dates from the time of the Aboriginal Mississauga peoples and continued through the French and British regimes with extensive documentation and maps dating from the 18th century onwards. Human use and intervention of the Don River began almost immediately once the lands in the Township were taken up, with infilling, tree removal, farming, and the establishment of mills and industry significantly altering the flow of the Don early in the 19th century. By the second quarter of the 19th century, the Don River was being used as an open sewer, a practice which continued into the early 20th century. The late 19th century saw the land use become almost entirely industrial, and after the extensive flooding which occurred in the second half of the 19th century that destroyed businesses and bridges, lobbying began for improvements to the Don Valley.

Prior to 2004, there were over 61 individual built heritage features located within an area that stretches north from the existing edge of Toronto's Inner Harbour to the Queen Street bridge on the west side of the Don River; the north side of Eastern Avenue on the east side of the river; and from the York Street Slip on the west end, to Ashbridges Bay on the east end (an area that extends beyond the Project Study Area). In the intervening time some demolition of structures has occurred. The City of Toronto's current Inventory of Heritage Properties identified a total of 31 designated properties and 21 listed structures or landscapes within this area (**Figure 3-18** and **Appendix B**).

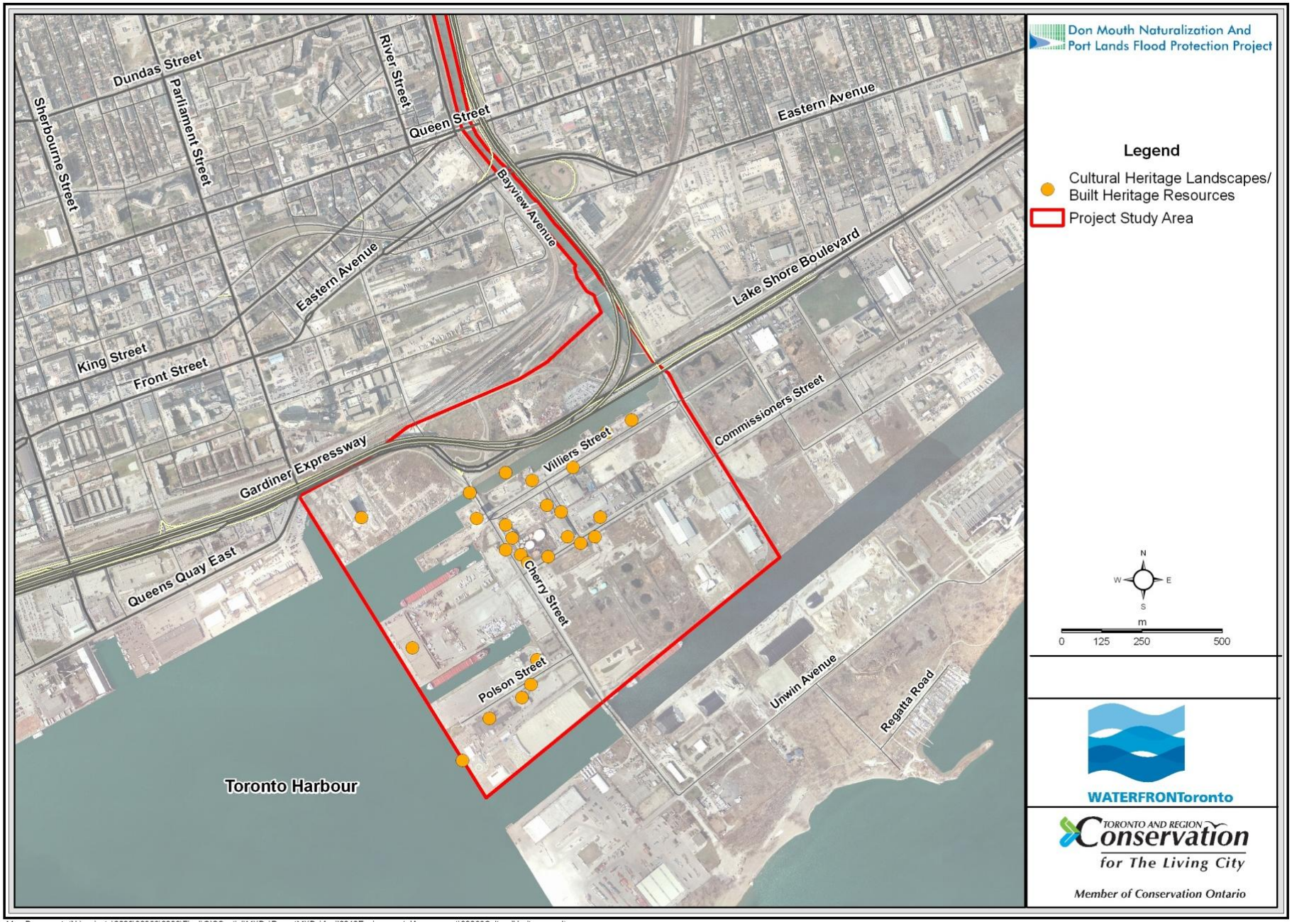

Figure 3-18 Cultural Heritage Landscapes and Built Heritage Resources in the Project Study Area (City of Toronto's Inventory of Heritage Properties)

Additionally, other properties in the area were considered by the City in 2005 for inclusion in the Inventory. However, our findings conclude that twelve built heritage resources exist within the Project Study Area. They include:

- 242 Cherry Street - Marine Terminal 35, 1962 & Atlas Crane, 1961
- 275 Cherry Street – Dominion Bank, 1920
- 281 Cherry Street – Toronto Hydro Substation, c.1930
- 309 Cherry Street – William McGill and Company Building, c. 1935
- 309 Cherry Street – Former Bank of Montreal by Darling & Pearson Architects, 1920
- 312 Cherry Street – Century Coal Company (ESSROC Silos), 1920
- 39 Commissioners Street – Fire Hall No. 30 by City Architect J.J. Woolnough, 1928
- 16 Munition Street – Queen's City Foundry, c.1917
- 15 Polson Street – Dominion Boxboards Building, 1931
- 54 Polson Street – Canada Cement Company: silos, c.1900 and office building, 1931
- 62 Villiers Street – Toronto Harbour Commissioners Storage Buildings, 1916
- 351-369 Lake Shore Boulevard East – Victory Soya Mills, 1944-48

Furthermore, the cultural heritage landscape of the Project Study Area is best identified by the development of the Keating Channel, which is part of the City of Toronto's marine and industrial heritage.

Archaeological Resources

The following is a summary of a Stage 1 Archaeological Assessment of the DMNP (ASI, 2007a). This assessment was prepared to help distinguish whether archaeological remains are thought to be within or near the Project Study Area.

Registered Archaeological Sites

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the Ministry of Culture. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden Block is approximately 13 kilometres east to west, and approximately 18.5 kilometres north to south. A four-letter designator references each Borden Block, and sites within a block are numbered sequentially as they are found. The Project Study Area under review is located within the AjGu Borden Block.

While no archaeological sites have been registered directly within the Project Study Area boundary, four sites have been documented within a 2 kilometres radius. Particulars concerning these sites are summarized in **Table 3-19**.

Table 3-19 Registered Archaeological Sites within ~2 km of the Project Study Area

Borden No.	Site Name	Cultural Affiliation	Site Type
AjGu-16	Thornton-Blackburn	Historic Afro-Canadian	Urban Residence
AjGu-35	Gooderham & Worts Windmill	Historic Euro-Canadian	Commercial Building
AjGu-41	First Parliament	Historic Euro-Canadian	Public Building
AkGu-1	Withrow	Precontact Aboriginal	Village and Cemetery

Previous Archaeological Assessments

The Project Study Area incorporates lands examined during the "Archaeological Master Plan of the Central Waterfront" (ASI, 2003); the "Stage 1 Archaeological Assessment of the East Bayfront, West Don Lands and Port Lands Areas" (ASI and HRL, 2004); and the TRCA's Cultural Heritage Study of the area (TRCA, 2004a). As well, these lands are currently being considered within Waterfront Toronto's Archaeological Conservation and Management Strategy initiative. One component of this latter project is the compilation of an archaeological inventory for those portions of Toronto's waterfront between Bathurst Street and the Don River, from Lake Shore Boulevard south to the water's edge. Another component is to develop a framework for the evaluation of the significance of these archaeological resources. The ultimate objective of this work is the establishment of protocols and planning measures for the short- and long-term management of the physical remnants of these features, and exploration of the opportunities for their interpretation and commemoration.

Inventory of Archaeological Resources within the Project Study Area

The inventory of the Project Study Area (**Figure 3-19**) has been compiled using selected cartographic sources from the mid-nineteenth through mid-twentieth century, as well as other reconstructions of site locations prepared for previous historical/archaeological studies. These have been overlaid on the modern base map for the DMNP.

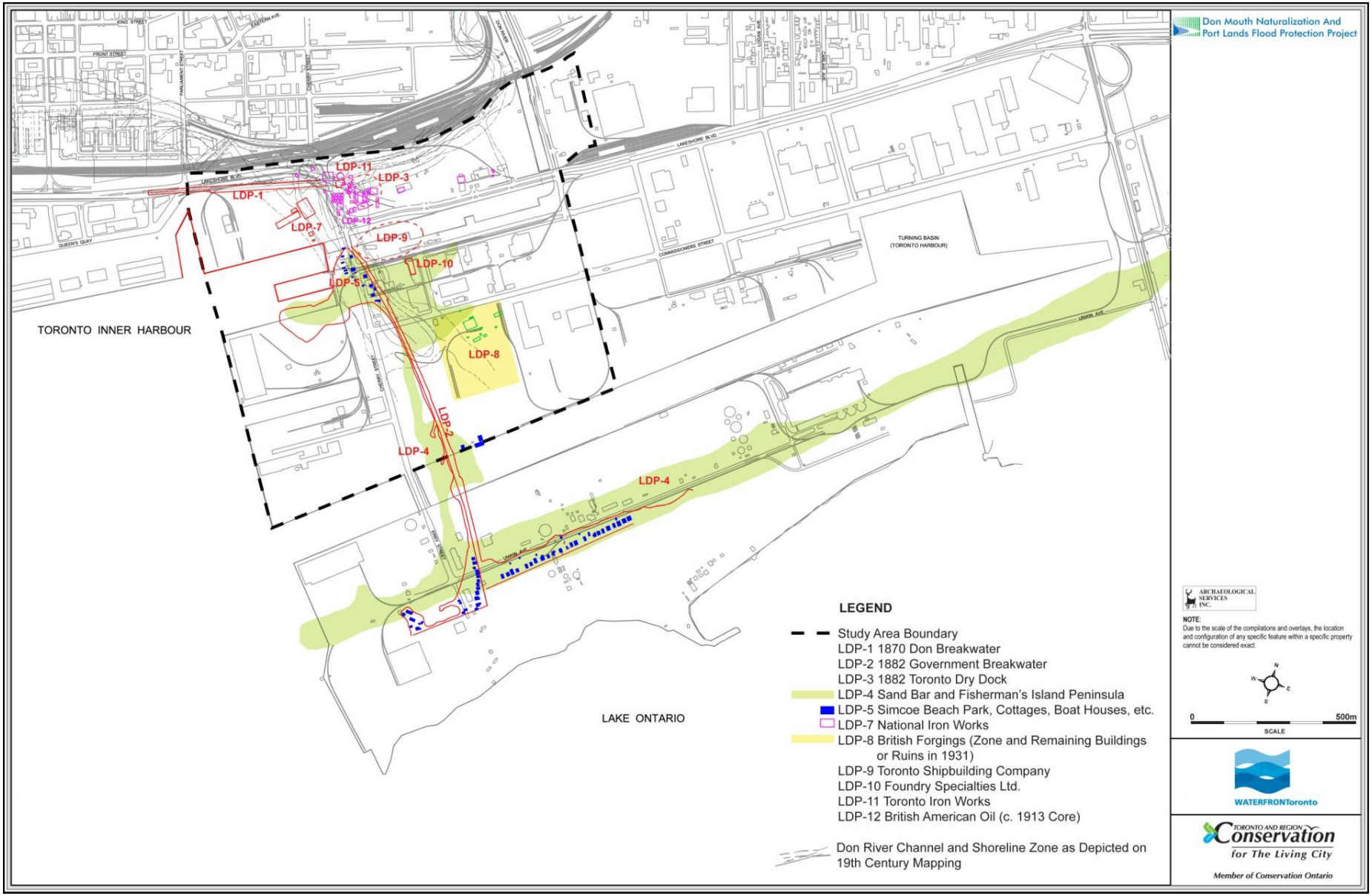

Figure 3-19 Archaeological Inventory of the Project Study Area

Aboriginal Archaeological Potential

Despite the overall significance of the mouth of the Don River in terms of pre-contact and early contact period Aboriginal subsistence, settlement and communication systems, the vast majority of the Project Study Area consists of 20th- century made land. Those portions of the Project Study Area that constitute the original landforms have been extensively altered through both natural processes and large-scale engineering works.

The location of the sandbar that ran roughly parallel to the alignment of Cherry Street defined the boundary between Toronto Harbour and Ashbridges Bay. The location of this feature can be reconstructed at a general level, but is not expected to survive as an integral feature, or at the very least, not as one for which any surfaces on which pre-contact period occupations occurred will have remained intact. Not only did the form of the bar fluctuate according to changes in water levels and storm action, but it was subsumed by massive amounts of fill; a process which entailed importation of materials and dredging, as well as the grading and reworking of these fills to create a stable block of made land.

The scale of such impacts has been noted nearby on a portion of the Fisherman's Island sand bar, which was destroyed during the same period of landmaking that resulted in the disappearance of the Cherry Street spit. Investigation of 5 metres wide, 1.5 metres deep stratigraphic profiles through the Transitional Sports Fields on the south side of Unwin Avenue (ASI, 2007) revealed a variably deep layer of fill (imported demolition rubble, municipal waste in the form of trash and cinders, etc.) that overlay a discontinuous horizon of homogeneous sterile sand that was also of variable thickness, but in general was 30 to 40 centimetres thick.

This in turn rested directly on lakebottom silts and clays. It was concluded that the sand horizon represented the basal portion of the sandbar that would have been submerged below the waters of the lake. Nevertheless the stratum was examined for visual evidence for the formation of any stable ground surfaces. None were noted. Given the substantial downcutting of the feature by modern activities, and the extensive deposition and reworking of imported fills and original soils that had clearly taken place throughout the Transitional Playing Fields property, it was concluded that there was no remaining integrity or potential for the presence of pre-contact Aboriginal archaeological resources. The magnitude of the modern engineering works carried out throughout the Port Lands as a whole suggests that a similar conclusion may be reached for the balance of the area.

Thus, there is little to no potential for the survival of significant pre-contact or early contact period Aboriginal archaeological resources.

Identified Euro-Canadian Resource Evaluation

The inventory of potential Euro-Canadian resources consists of a total of 11 features, or complexes of features (**Figure 3-19**). These include such things as built features (e.g., Don Breakwater, Toronto Dry Dock); natural features (e.g., Sand Bar and Fisherman's Island Peninsula); and remnants of industry (e.g., Toronto Shipbuilding Company, Foundry Specialties Ltd.). In order to assess the archaeological potential significance of any material remains associated with these developments, it was necessary to evaluate their character and the potential contribution that any detailed archaeological investigations of these sites may be expected to provide.

A comprehensive archaeological evaluation system developed in the 1980s was adapted for the Toronto Historical Board's evaluation process for built heritage features and used on various waterfront projects over the past few decades. These projects have included both large-scale, broad-brush reviews and detailed, property-specific studies (e.g., ASI, 1992; ASI and HRL, 2004; HHI, 1994; HRL, 1989). The criteria are currently being refined for the Waterfront Toronto Archaeological Conservation and Management Strategy and were used to assess the

relative significance of the Euro-Canadian resources within the DMNP Project Study Area. Based on these criteria, resources were assigned a ranking (Grade 1, 2, 3 or 4), with Grade 4 being lakefill and Grade 1 being a historically significant feature for which archaeological field work is recommended. A full description of the methodology and rankings of Euro-Canadian resources, including modifications to the original evaluation system and full descriptions of each feature, is provided in **Appendix B**.

The results of the assessment are presented in **Table 3-20**.

Table 3-20 Archaeological Inventory: Summary of Features and Significance Evaluations

Inventory No.	Feature/Resource	Grade	Recommendation	Comments
LDP-1	Don Breakwater	2	Documentation during construction monitoring.	Deeply buried remains may survive, although it is highly unlikely that the cribbing forms a continuous feature.
LDP-2	Government Breakwater	2	Documentation during construction monitoring.	Deeply buried remains may survive, although not as a continuous feature.
LDP-3	Toronto Dry Dock	2	Documentation during construction monitoring.	Deeply buried remains may survive, however the area was heavily redeveloped by British American Oil.
LDP-4	Sand Bar and Fisherman's Island Peninsula	2	Documentation during construction monitoring.	The one section of the former landform that has been investigated revealed that no original soils had survived twentieth century filling and development within the area.
LDP-5	Simcoe Beach Park Cottages, Boat Houses, etc.	3	No archaeological action required.	Few traces may be expected to have survived subsequent development of the area.
LDP-7	National Iron Works	3	No archaeological action required.	Foundations may remain. Previous studies have recommended that these be exposed for interpretation. Such work need not be accompanied by archaeological investigation.
LDP-8	British Forgings	3	No archaeological action required.	Foundations may remain. Previous studies have recommended that these be exposed for interpretation. Such work need not be accompanied by archaeological investigation.
LDP-9	Toronto Shipbuilding Company	3	No archaeological action required.	Deeply buried remains may survive on the lands south of the Keating Channel. These might be exposed for interpretation. Such work need not be accompanied by archaeological investigation.
LDP-10	Foundry Specialties Ltd.	3	No archaeological action required.	The site has been continuously occupied, therefore there is little potential for the survival of any early features or deposits with any degree of integrity.
LDP-11	Toronto Iron Works Ltd.	3	No archaeological action required.	Few traces may be expected to have survived subsequent development of the area.
LDP-12	British American Oil	3	No archaeological action required.	Foundations may remain. Previous studies have recommended that these be exposed for interpretation. Such work need not be accompanied by archaeological investigation.

As shown in **Table 3-20**, four features (the Don Breakwater; the Government Breakwater, the Toronto Dry Docks; and the Sandbar and Fisherman's Island Peninsula) were assigned a Grade 2 ranking, for which limited archaeological fieldwork (monitoring) is recommended. No feature within the Project Study Area was considered a Grade 1 resource, where archaeological test excavations and possible mitigation efforts would be necessary.

3.4.8 First Nation/Aboriginal Peoples' Interests

The Don River and original mouth of the Don was significant to Aboriginal subsistence, settlement and communication. The vast majority of the study area consists of twentieth century land created by infilling and therefore the original landforms have been extensively altered both through natural processes and large-scale engineering works.

- *The Mississaugas of New Credit First Nation*

  In the 1730s, it was estimated that the Mississaugas of New Credit of southern Ontario numbered between 1,000 and 1,500 people. Semi-nomadic, they spent the summers in villages near the mouths of rivers and creeks emptying into Lake Ontario, including Bronte Creek, Sixteen Mile Creek, the Credit River, Etobicoke Creek, and the Humber River. East of the Humber was a long peninsula (known today as the Toronto Islands) which, with the mainland, formed a deep harbour. To this place "the Mississauga brought their sick to recover in its healthy-living atmosphere." The DMNP is located within the area of the Toronto Purchase Specific Claim, which has recently been settled between the Government of Canada and the Mississaugas of the New Credit First Nation.

- *Five Other Mississauga First Nations and the Ogemawahj Tribal Council*

  The Williams 1923 Treaties were among the last Treaties signed between the Government of Canada and First Nations. The Williams Treaties involved seven separate Treaties that were signed between October 31 and November 21, 1923. These Treaties involved three Chippewa Nations (Georgina Island, Christian Island (or Beausoleil), and Mnjikaning (or Rama)), and four Mississauga Nations (Curve Lake, Hiawatha, Alderville, and Scugog), and resulted in the cessation of their Right to hunt and fish in their territorial lands. These Treaties covered over 4.7 million ha of southern Ontario, with the southwestern limit ending just upstream of the Project Study Area near Bloor Street in the Don Watershed.

  A number of the Williams Treaty First Nations are also member First Nations of the Ogemawahj Tribal Council. The most recent incarnation of the Tribal Council was established in 1990 and represents a cooperative between six First Nations including the Scugog and Alderville First Nations (Mississaugas), the Beausoleil, Georgina Island, and Mnjikaning First Nations (Chippewas), and the Moose Deer Point First Nation (Pottawatomis). Evidence of this alliance between the Mississauga, Chippewa and Pottawatomi First Nations has been documented as early as the 1690s. The Tribal Council allows these six First Nations to combine their resources to provide superior professional and technical services to its member First Nations.

- *Conseil de la Huronne-Wendat / Huron-Wendat First Nation*

  The Conseil de la Huronne-Wendat or Huron-Wendat First Nation occupied much of southern and eastern Ontario, including the DMNP Study Areas, prior to the Mississauga First Nations. During the 1600s, disease and warfare resulted in dramatic reductions in their populations and ultimately, the Huron-Wendat First Nations migrated north and east into Quebec. However, the Huron-Wendat First Nation continues to have strong cultural heritage ties to the Toronto Area given their long history of occupation in southern Ontario.

- *The Métis Nation*

  The Métis are a distinct Aboriginal people with a unique history, culture, language and territory. The Métis Nation is comprised of descendants of people born of relations between Indian women and European men. The initial offspring of these unions were of mixed ancestry. The genesis of a new Aboriginal people called the Métis resulted from the subsequent intermarriage of these mixed ancestry individuals.

  Distinct Métis settlements emerged as an outgrowth of the fur trade, along freighting waterways and watersheds. In Ontario, these settlements were part of larger regional communities, interconnected by the highly mobile lifestyle of the Métis, the fur trade network, seasonal rounds, extensive kinship connections and a shared collective history and identity.

  The Toronto and York Region Métis Council represent the collective rights of the Métis Nation of Ontario within the DMNP Project Study Area.

- *Miziwe Biik*

  Miziwe Biik Aboriginal Employment and Training was created in 1991 to meet the unique training and employment needs of aboriginal peoples. Miziwe Biik provides the Greater Toronto Area's Aboriginal community with training initiatives and employment services. Miziwe Biik is one of about 20 agencies in Toronto that provides services for the aboriginal community in the GTA, and had expressed interest in opportunities for the local Aboriginal community as it relates to the Lower Don Lands area.

Archaeological evidence indicates that many other Aboriginal communities have occupied the DMNP Project Study Area over the centuries. The DMNP team contacted and provided project updates to the following First Nations/Aboriginal communities to discuss the DMNP:

- Mississaugas of the New Credit First Nation
- Mississaugas of Scugog
- Conseil de la Nation Huronne-Wendat
- Alderville First Nation
- Hiawatha First Nation
- Kawartha Nishnawbe First Nation
- Curve Lake First Nation
- Anishnabek Nation
- Ogemawhj Nation
- Chiefs of Ontario
- Métis Nation of Ontario
- Toronto and York Region Métis Council
- Association of Iroquois and Allied First Nations
- Miziwe Biik

The First Nation/Aboriginal consultation undertaken by the DMNP team is described in detail in **Chapter 10**.

3.4.9 Infrastructure

The following section describes the existing transportation system and utilities located within the Project and Impact Assessment Study Areas. This includes a description of existing roadways, railway tracks, bicycle lanes and trails,

public transit and utility corridors. Existing infrastructure in the Project Study Area is described at a detailed level. For the remaining area within the Impact Assessment Study Area, more general information on existing infrastructure is provided.

3.4.9.1 Roadways

Impact Assessment Study Area

The Impact Assessment Study Area is intersected by two major expressways (the Frederick Gardiner Expressway and the Don Valley Parkway) connecting to arterial, collector and local roads. These roadways are summarized in **Table 3-21** below.

Table 3-21 Roadways within the Impact Assessment Study Area

Roadway		Description
East-West	*Frederick Gardiner Expressway*	• An expressway with on / off ramps at Spadina Road, Yonge Street, York Street, and Sherbourne Street.
	Lake Shore Boulevard West	• A major arterial road.
	Queens Quay West	• A minor arterial road east of Bathurst Street and a collector road west of Bathurst Street
	Unwin Avenue	• A local road.
	Front Street	• A minor arterial road.
	Eastern Avenue Diversion / Richmond Street East	• Major arterial roads connected by a ramp to the Don Valley Parkway that crosses the Don River. Two piers support the ramp within the Don River (Don Narrows section) with additional piers located on each top of bank. Eastern Avenue Diversion crosses the Don River (Don Narrows) well above the Regulatory Flood level. During a Regulatory Flood event, it is anticipated that flood waters would flow through the South Riverdale community, via the Eastern Avenue underpass of CN's Kingston Subdivision, east of the Don River.
	Eastern Avenue	• A minor arterial road from Queen Street to Carlaw Avenue, a major arterial from Carlaw Avenue to Sumach Street, a minor arterial from Sumach Street to Parliament Street where it continues west as Front Street, which is a minor arterial road. An old, out-of-commission bailey bridge crosses the Don River (Don Narrows) along the original Eastern Avenue right-of-way and would be largely submerged during a Regulatory Flood event.
	Adelaide Street East	• A major arterial road.
	King Street East	• A major arterial road.
	Queen Street East	• A major arterial road. Queen Street East crosses the Don River (Don Narrows) well above the Regulatory Flood level.
	Dundas Street East	• A major arterial road, which becomes a minor arterial road east of Broadview Avenue. Dundas Street East crosses the Don River (Don Narrows) well above the Regulatory Flood level.
	Gerrard Street East	• A minor arterial road. Gerrard Street East crosses the Don River (Don Narrows) well above the Regulatory Flood level.
	Basin Street	• A local road east of the Don Roadway, south of Commissioners Street.
North-South	*Don Valley Parkway*	• An expressway with on / off Ramps at Eastern Avenue Diversion.
	Bayview Avenue	• A major arterial road north of Queen Street East and a collector road south of Queen Street E.
	Sherbourne Street	• A minor arterial road.
	Lower Jarvis Street	• A major arterial road north of Lake Shore Boulevard East and a collector road south of Lake Shore Boulevard East.

Table 3-21 Roadways within the Impact Assessment Study Area

Roadway		Description
	Yonge Street	• A major arterial road between Front Street and Harbour Street and a minor arterial road south of Harbour Street and north of Front Street.
	York Street	• A major arterial road north of Harbour Street and a major arterial road south of Harbour Street.
	Spadina / Lower Spadina Avenue	• A major arterial road north of Lake Shore Boulevard West and a collector road south of Lake Shore Boulevard West.
	Bathurst Street	• A major arterial road.
	Broadview Avenue	• A minor arterial road.
	Leslie Street	• A collector road between Lake Shore Boulevard East and Commissioners Street and a local road south of Commissioners Street.

Note: All roads are under the jurisdiction of the City of Toronto. Road classification is based on the City of Toronto Road Classification System (published August 2008)

Project Study Area

The Gardiner Expressway and Lake Shore Boulevard converge with the Don Valley Parkway near the base of the Don Narrows within the Project Study Area, contributing the bulk of the traffic in the area. Lake Shore Boulevard intersects with minor north-south collector roads (Cherry Street, the Don Roadway), providing access to the Port Lands Area. The Port Lands Area is accessed from the east along Villiers Street (a local street) and Commissioners Street (a collector road)[6]. **Table 3-22** provides a description of east-west and north-south roadways within the Project Study Area. **Figure 3-20** shows the location of roadways within the Project Study Area.

Table 3-22 Roadways within the Project Study Area

Roadway		Description
East-West	*Frederick Gardiner Expressway*	• An expressway under the jurisdiction of City of Toronto, basic six-lane elevated roadway (+34 m width) with on / off Ramps at Don Valley Parkway. It has a posted speed of 90 km/h and an eight-lane urban cross-section that connects Downtown and west Toronto to the provincial freeway system. The Gardiner Expressway is one of the principal roadways providing regional access to central Toronto and links to the Queen Elizabeth Way (QEW) west of the City, as well as the Don Valley Parkway and Lake Shore Boulevard East, east of the Don River. It carries high traffic volumes and operates as a controlled access, free-flow facility. Other than the connection with Don Valley Parkway, there are no access ramps within the boundaries of the study area; however, access is provided to the east and west of the project limits. West of the study area, an eastbound on-ramp is provided just east of Jarvis Street and a westbound off-ramp touches down at Sherbourne Street. The Gardiner terminates east of the study area where an westbound on-ramp and an eastbound off ramp to/from Lake Shore Boulevard East are provided between Don Roadway and Carlaw Avenue (terminal ramps). • The Gardiner crosses over the Don River along the same alignment as Lake Shore Boulevard East. Each of the two on/off ramps connecting the Gardiner to the Don Valley Parkway north of Lake Shore Boulevard East are supported by one pier in the middle of the Don River. Around 20 piers support the two ramps before they connect to the main section of the Gardiner west of the Don River crossing.

6. *There are no direct access points from the west, since the Port Lands is bordered by the Inner Harbour.*

Table 3-22 Roadways within the Project Study Area

Roadway		Description
	Don Valley Parkway North and South Ramps	• A two-lane elevated facility (+9 m width) under the jurisdiction of The City of Toronto connecting Don Valley Parkway to Gardiner Expressway.
	Lake Shore Boulevard East	• A major arterial road under the jurisdiction of the City of Toronto, basic six-lane divided roadway (+28.5 m width) located generally beneath and south of the Gardiner Expressway. It has high volumes of traffic with posted speed limits of 60 km/hr. Lake Shore Boulevard, which also brings thousands of workers downtown, has the sprawling character of a suburban arterial, particularly around the Cherry Street intersection. • Lake Shore Boulevard East connects with each of the main north-south streets serving the Project Study Area (i.e., Parliament Street, Don Road, DVP and Cherry Street) at a series of signalized intersections. The posted speed limit is 60 km/h. Lake Shore Boulevard East has one low-lying crossing over the Don River broken into three separate cells. The cells are supported by piers which coincide with the location of the piers for the Gardiner Expressway immediately overhead. Currently, the bridge soffit is set at an elevation of 77.6 to 77.7 m above sea level.
	Queens Quay East	• A four-lane minor arterial road under the jurisdiction of the City of Toronto with basic 4-lane cross section. Presently it terminates at Parliament Street. East of Yonge Street to Parliament Street, Queens Quay has bike lanes in both directions. On the south side of Queens Quay, the Martin Goodman multi-use trail runs from Richardson Street to Parliament Street, where it continues along the south side of Lake Shore Boulevard and along the east side of Cherry Street. At Unwin Avenue it connects to an on-street route to Cherry Beach and Tommy Thompson Park. It is a major thoroughfare that feeds traffic to Lake Shore Boulevard and will be impacted during the construction period (approximate pavement width of 19.0 m) that runs parallel to Lake Shore Boulevard across central Toronto.
	Commissioners Street	• A collector road under the jurisdiction of the City of Toronto with a basic four-lane divided cross section (+16.5 m width). Speed limit is 50 km/hr. Commissioners Street extends from Cherry Street to Leslie Street and is the main east-west collector road within the Port Lands.
	Villiers Street	• A local street under the jurisdiction of the City of Toronto with a basic four-lane divided cross section (+34 m width). Speed limit is 50 km/hr.
	Polson Street	• A local road under the jurisdiction of the City of Toronto with a basic two-lane cross section. Speed limit is 50 km/hr.
North-South	*Don Valley Parkway*	• An expressway under the jurisdiction of City of Toronto, basic six-lane roadway with on / off Ramps at Gardiner Expressway. High traffic volumes and free flow operations with posted speed limit of 90 km/hr. Within the study area it connects Downtown and East Toronto to the Provincial 400 series freeway system, which connects to York Region, Durham Region and Peel Region. Within the study area there are a northbound on-ramp and a southbound off-ramp to/from the DVP via Don Roadway. Also in the study area, the F.G. Gardiner Expressway and Don Valley Parkway are connected via two high speed elevated ramps: southbound to westbound and eastbound to northbound. The DVP is typically six lanes wide but changes to four lanes south of Eastern Avenue.
	Cherry Street	• A two-lane collector road (+18 m width) under the jurisdiction of the City of Toronto passing beneath rail-line with speed limits of 50 km/hr. Cherry Street crosses the western end of the Keating Channel with a lift bridge operated by the TPA and owned by the City of Toronto. This bridge provides access to the western Port Lands from Cherry Street and Lake Shore Boulevard East. This bridge was closed for approximately six months in 2007 as it underwent major maintenance repairs.

Table 3-22 Roadways within the Project Study Area

Roadway		Description
	Don Roadway	• A four-lane collector road under the jurisdiction of the City of Toronto with speed limits of 50 km/hr. Don Roadway extends from the base of the Don Valley Parkway to Commissioners Street and provides access from the site to the Don Valley Parkway. At its intersection with Lake Shore Boulevard, eastbound and westbound left turns are prohibited to and from Don Roadway.
	Munition Street	• A local road under the jurisdiction of the City of Toronto with a basic two-lane cross section and on street parking on both sides. Speed limit is 50 km/hr.
	Parliament Street	• A minor arterial road which connects with Queens Quay East at Small Street and extends to Lake Shore Boulevard East as a four-lane facility with on-street bicycle lanes. It then extends northwards from Lake Shore Boulevard East as a basic two-lane roadway to Bloor Street East.
	GO Transit Access Road – off Lake Shore Boulevard East.	• A minor local road providing access north of Lake Shore Boulevard East (immediately east of Cherry Street) to GO Transit's Don Yard and ' Wilson Yard.
	Unilever Access Road under CN's Kingston Subdivision	• A minor local road that used to provide access to Unilever staff north and south of CN's Kingston Subdivision, located immediately east of the Don Roadway/Don Valley Parkway. This road has since been taken out of commission, though it does provide for the conveyance of flood waters under the elevated railway crossing.

Note: Road classification is based on the City of Toronto Road Classification System (published August 2008)

Figure 3-20 Roadways within the Project Study Area

Further, a traffic assessment of the key intersections within the Project Study Area was conducted by AECOM in March 2010, in order to determine existing Levels of Service (LOS). The data used to establish the current traffic conditions for the AM and PM peak periods included the most recent (2004, 2005, 2007, 2008 and 2009) 8-hour turning movement counts (TMC) along with the AM and PM peak hour traffic for the Project Study Area intersections.

The assessment focused on the typical AM and PM peak hour periods for the following intersections:

- Cherry Street at Lake Shoe Boulevard East
- Cherry Street at Villiers Street
- Cherry Street at Commissioners Street
- Don Roadway at Villiers Street
- Don Roadway at Commissioners Street
- Don Roadway at Lake Shore Boulevard East
- Lake Shore Boulevard East at Parliament Street/Queens Quay Street

The traffic assessment of the existing conditions identified that the traffic performance at the key intersection with the Project Study Area is at an acceptable Level of Service. **Table 3-23** summarizes the traffic performance within the Project Study Area.

Table 3-23 Existing (2010) AM and PM Peak Hour Traffic Operations

Intersection Description	Traffic Control	Approach Movement		AM Peak Hour				PM Peak Hour			
				Delay (Sec)	*LOS*	*V/C Ratio*	*Queue Length (m)*	*Delay (Sec)*	*LOS*	*V/C Ratio*	*Queue Length (m)*
Commissioner Street and Cherry Street	**Signalized**	EB	LTR	20	B	0.30	10.1	20	C	0.33	11.5
		WB	LT&TR	19	B	0.33	11.4	19	B	0.36	11.7
		NB	LTR	6	A	0.15	10.9	8	A	0.39	30
		SB	LTR	6	A	0.25	17.6	8	A	0.43	30.9
		OVERALL		**12**	**B**	**0.27**		**11**	**B**	**0.38**	
Commissioner Street and Don Roadway	**Signalized**	EB	L	10	B	0.12	7.7	11	B	0.18	11
		EB	T&TR	10	A	0.08	7	10	B	0.17	13
		WB	L	9	A	-	1.1	9	A	-	0.8
		WB	T &TR	10	B	0.16	11	10	B	0.22	14.7
		NB	LTR	13	B	0.01	2.5	13	B	-	1.3
		SB	TL	14	B	0.14	10.6	15	B	0.19	13.6
		SB	R	13	B	0.04	6	13	B	0.03	5.4
		OVERALL		**11**	**B**	**0.15**		**11**	**B**	**0.20**	
Lake Shore Boulevard and Cherry Street	**Signalized**	EB	TT&TR	3	**A**	**0.12**	2.8	8	**A**	**0.33**	20.6
		WB	TTT	1	A	0.14	0.2	6	A	0.21	1.4
		NB	L	8	**A**	**0.34**	27	6	**A**	0.10	6.6
			R	48	D	0.78	98.7	53	**D**	0.84	110.4
		OVERALL		**14**	**B**	**0.49**		**17**	**B**	**0.51**	

Table 3-23 Existing (2010) AM and PM Peak Hour Traffic Operations

Intersection Description	Traffic Control	Approach Movement		AM Peak Hour				PM Peak Hour			
				Delay (Sec)	*LOS*	*V/C Ratio*	*Queue Length (m)*	*Delay (Sec)*	*LOS*	*V/C Ratio*	*Queue Length (m)*
Lake Shore Boulevard and Don Roadway	**Signalized**	EB	TT	13	B	0.14	26.4	18	B	0.43	68.9
			R	22	C	0.02	6.9	24	C	0.05	11.8
		WB	TT	16	B	0.34	49	14	B	0.14	20.8
			R	14	B	0.12	9.9	14	B	0.13	10.1
		NB	L	29	C	0.32	18.9	27	C	0.33	25.7
			TR	24	C	0.24	31.2	29	C	0.51	65.8
		SB	L	26	C	0.33	36.5	39	D	0.69	69.5
			TR	34	C	0.67	96.2	28	C	0.49	61.9
		OVERALL		**22**	**C**	**0.48**	**22**	**23**	**C**	**0.54**	
Villiers Street and Cherry Street	**Unsignalized**	EB	LTR	14	B	0.01	0.3	15	B	0.02	0.4
		WB	LTR	12	B	0.08	1.9	12	B	0.16	4.3
		NB	LTR	1	A	-	0	0	A	-	0
		SB	LTR	1	A	0.03	0.7	2	A	0.03	0.8
		OVERALL		**2**	**A**			**3**	**A**		
Lake Shore Boulevard and Parliament Street/ Queens Quay Street	**Signalized**	EB	L	20	B	0.44	42.9	22	C	0.59	56
			T&TR	74	E	1.01	133	66	E	0.98	126
		WB	L	30	C	0.74	95.6	20	B	0.37	38.6
			T&TR	40	D	0.84	124	34	C	0.78	92
		NB	LT&TR	32	C	0.21	23	54	D	0.88	85
		SB	LT&TR	33	C	0.32	29	40	D	0.59	38
		OVERALL		**46**	**D**	**0.77**	**44**	**D**	**0.86**		

Cells highlighted in red indicate unacceptable Levels of Service

EB – Eastbound Traffic
NB – Northbound Traffic
SB – Southbound Traffic
WB – Westbound Traffic
L – Left lane at intersection
T – Through lane at intersection
R – Right lane at intersection
TT – Two through names in one direction
TR – Through right shared lane at intersection
LR – Left Right shared lane at intersection
LT – Left through shared travelling lane at intersection
TTT – Three through lanes in one direction
LTR – Left through Right (Shared travelling lane with all three movements at intersection)

3.4.9.2 Rail

Impact Assessment Study Area

The original intent of the Port Lands area was, in large part, to create an extensive and efficient cargo distribution network that allowed for the efficient transfer of goods between cargo ships and trains. For a number of reasons, these extensive distribution networks were never fully realized and over the last several decades, rail traffic in the Port Lands has been greatly reduced. However, some rail traffic in and adjacent to the Port Lands area continues.

Two major rail corridors (Subdivisions) cross through the Project Study Area. The first, the Kingston-GO Subdivisions, runs in an east-west direction connecting downtown Toronto to Montreal and represents one of the busiest rail links in Canada. An elevated rail bridge with five tracks crosses the Don River north of the Gardiner Expressway and south of Eastern Avenue. The two northern tracks are owned and operated by Canadian National Railway (CN) and are called the Kingston Subdivision. These lines are elevated on top of an embankment and

cross the Don River. They are heavily used connecting Union Station to areas to the east, such as Montreal and Ottawa, by CN freight and VIA trains. The three southern tracks are owned by GO Transit (GO Subdivision). This bridge sits approximately 6 metres above the surrounding lands and is perched on an embankment built by the Grand Trunk Railway (predecessor to CN) in 1928. This bridge was also expanded by an additional 21 metres to the west of the Don River by TRCA and Waterfront Toronto in 2007 as part of the comprehensive flood protection works identified in the LDRW Class EA (2005).

The second major rail corridor, the Bala-Belleville Subdivisions, runs in a north-south direction connecting downtown Toronto with the communities to the north. These Subdivisions are situated along the west bank of the Don River, just east of Bayview Avenue, before turning west and connecting to the Kingston Subdivision line and Union Station. The Bala Subdivision south of Queen Street is owned by GO Transit and operated by Toronto Terminals Railway (TTR). TTR also manages and operates the tracks and rail yards on behalf of the TPLC (Keating Yard, Wilson Yard and Harbour Lead Spur), and GO Transit (Don Yard). GO Transit operates regular commuter services on this line, connecting communities in the north GTA with Toronto. North of Queen Street, the Bala Subdivision is owned and operated by CN. The Belleville Subdivision is owned and operated by Canadian Pacific Railway (CPR). These two Subdivisions run adjacently up the Don Valley to Riverdale Park where they diverge; the Bala Subdivision continues along the valley bottom of the lower Don River, and the Belleville Subdivision begins to climb the west ravine wall of the lower Don River to Millwood Road. Due to their low-lying position, these lines are subject to regular flooding.

Project Study Area

GO Transit and the TPLC (formerly TEDCO) are the primary owners of rail infrastructure within the DMNP Project Study Area. GO Transit recently acquired the Don Yard from CN Rail and the TPLC owns the Wilson Yard. Both yards are located on the west bank of the Don River, immediately south of CN's Kingston Subdivision. The Toronto Terminals Railway manages the day-to-day operations and maintenance of the Don and Wilson Yards and the GO Subdivision. The two southern lines connect to GO Transit's Don Yard facility that is used to store trains during the day between the morning and afternoon rush hours. The Don Yard is located along the northern boundary of the Keating Precinct Plan.

The TPLC also owns a network of tracks and rail yards within the Port Lands area. These are connected to Union Station by the Harbour Lead which swings southeast through 480 Lake Shore Boulevard and crosses over the Don adjacent to the Lake Shore Boulevard crossing.

The Harbour Lead is a heavy industrial spur line that descends from the south side of the Kingston-GO Subdivisions through the area of 480 Lake Shore Boulevard East. The Harbour Lead provides access Wilson Yard (immediately south of the Don Yard), the Keating Yard (immediately north of Lake Shore Boulevard East and east of the Don River), and a number of spurs that provide service to the Port Lands (Ashbridges Bay Treatment Plant, the Port of Toronto, and a number of other heavy industries) and Redpath Sugar. The Harbour Lead, Wilson Yard, Keating Yard and other spur lines located throughout the Port Lands will remain in operation, with the exception of the Don Roadway and Redpath Sugar spur lines. The Harbour Lead crosses the Don River adjacent and parallel to the Lake Shore Boulevard East crossing.

The facilities in the East Bayfront area were formerly served by an industrial rail spur that runs along the south side of Queens Quay East between Redpath Sugar and the Keating rail yard located on the east side of the Don River. In July 2008, Redpath Sugar agreed to give up the use of the rail spur in an effort to support public realm improvements in the East Bayfront area.

Existing railway tracks within the DMNP Project Study Area are described in **Table 3-24** and illustrated in **Figure 3-21**.

Table 3-24 Existing Railway Tracks within the Project Study Area

Railway Track	Description
Harbour Lead Track	Connects the Kingston-GO Subdivisions from Union Station with the Wilson Yard, Keating Yard, and Spur Lines along the East Bayfront and within the Port Lands.
Lake Shore Boulevard East Spur	Exits the Keating Yard and runs east along Lake Shore Boulevard to Leslie Street providing service to the City's Ashbridges Bay Treatment Plant and the Port of Toronto.
Redpath Sugar Spur	The freight rail spur, which serves the Tate and Lyle Plant (formerly Redpath Sugar) to the west, divides the landscape into oddly-shaped and disconnected parcels. The spur line runs immediately north of Lake Shore Boulevard East on the west side of the Don River. The line then crosses Cherry Street and is then directed along the south side of Queens Quay East. The spur is used on an occasional basis for the transportation of refined sugar and liquid sugar. There is a second track running parallel to the main spur. This track serves as rail car storage and for shunting purposes.
Villiers St. Spur	Exits the Keating Yard and runs along Villiers Street serving the Multi-Tenant uses on the west side of the Cherry Street (between the Keating Channel and Ship Channel) as well as Atlas Crane and Lafarge Canada. These tracks will be eliminated.
Don Roadway Spur	Exits the Keating Yard along the Don Roadway towards Basin Street in the east and the Ship Channel in the south. TPLC recently decommissioned these tracks.

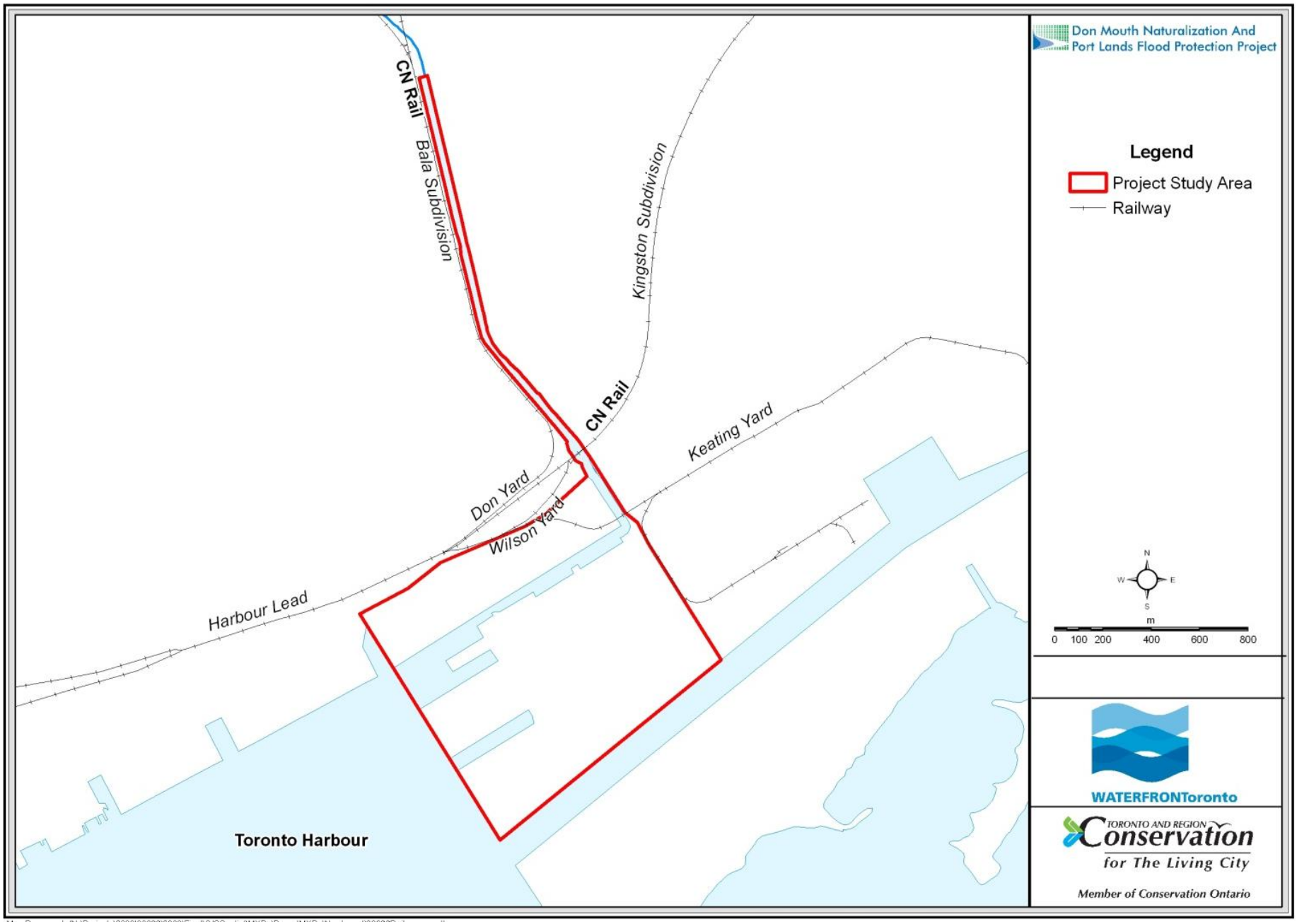

Figure 3-21 Railway Tracks within the Project Study Area

3.4.9.3 Bicycles, Pedestrians and Public Transit

Impact Assessment Study Area

Sidewalks are provided on most of the existing public streets within the Impact Assessment Study Area near the Project Study Area, except in a few instances including on the south side of Queens Quay East. Pedestrians walking on the south side of Queens Quay East are able to use the multi-use Martin Goodman Trail but are required to cross to the north side of Queens Quay East at Richardson Street in order to proceed further west.

On-street bicycle lanes are located in both directions along Queens Quay East, and are connected by suggested biking paths near Harbourfront. To the west of Harbourfront, the bike lanes become a multi-use pathway (the Martin Goodman Trail), and connect to other bike lanes on Strachan and through Fort York. In the east, the bike lanes connect to others on Lower Sherbourne.

Also within the Impact Assessment Study Area, multi-use trails criss-cross the Toronto Islands, though these are separated from the Port Lands by the Eastern Gap. Park roads that can be used for cycling are located throughout the Leslie Street Spit and Tommy Thompson Park.

Surface transit services currently provided within the Impact Assessment Study Area include:

- Streetcar Route 509 Harbourfront E/W
- Streetcar Route 510 Spadina N/S (E/W along Queens Quay West)
- Streetcar Route 501 King Street E/W
- Streetcar Route 502 Downtowner E/W
- Streetcar Route 503 Kingston Rd E/W
- Streetcar Route 504 King Street E/W (N/S along Broadview Ave.)
- Streetcar Route 505 Dundas Street E/W (N/S along Broadview Ave.)
- Streetcar Route 506 Carlton E/W
- Bus Route 6 Bay N/S (E/W along Queens Quay East)
- Bus Route 75 Sherbourne N/S
- Bus Route 83 Jones N/S
- Bus Route 143 Downtown/Beach Express (E/W)
- Bus Route 144 Downtown/Don Valley Express N/S

Figure 3-22 illustrates the current transit services within the Impact Assessment Study Area.

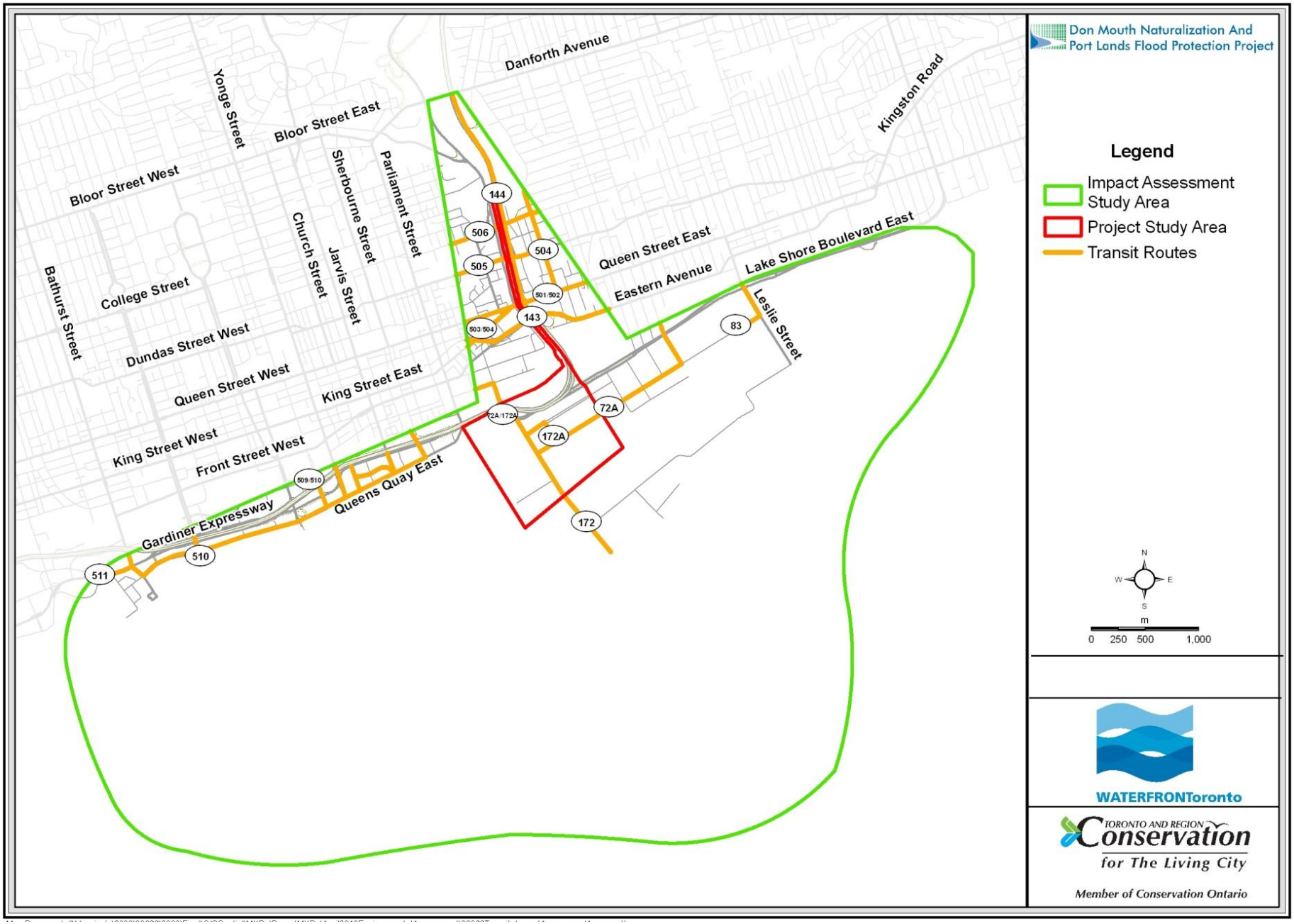

Figure 3-22 Transit Services within the Impact Assessment Study Area

Project Study Area

One of the most heavily-used recreational and commuter trails in Toronto, the Martin Goodman Trail takes a zigzag route through the Lower Don Lands with no relationship to the water's edge. Part of the Martin Goodman Trail, a major multi-use off-road pathway, runs along the south side of Queens Quay East and connects to trail systems running into the Port Lands, north along the Don Valley corridor and eastwards on the north side of Lake Shore Boulevard East. A minor multi-use off-road pathway connects along the north side of Lake Shore Boulevard East from Parliament Street to Cherry Street.

High performance cyclists regularly use the Port Lands for road bike race training, following a loop from Commissioners Street to Cherry Street to Unwin Street to Leslie Street.

There is a pedestrian bridge that crosses the Don River just north of the Harbour Lead rail bridge.

Surface transit services currently provided within the West Don Lands area including:

- Bus Route 172 Cherry Street N/S
- Bus Route 72 Pape Street N/S

As part of the future redevelopment of the area, Waterfront Toronto and the City have commitment to a "transit-first" policy for waterfront revitalization while new road access may also be required.

3.4.9.4 Utilities

The following utilities are present along the roadways within the Project Study Area:

- Water
- Sanitary
- Storm
- Oil
- Electricity
- Telecommunication Providers
- Gas

Table 3-25 documents the detail of utilities (size and length) within the Project Study Area.

Table 3-25 Detail of Utilities along the Project Study Area

	Utilities	Location	Length (m)
Water (below ground)	300 mm	Lake Shore (Don to Cherry)	690
	300 mm	Cherry Street	200
	2100 mm Tunnel	Lake Shore (Don to Cherry)	690
	150 mm	Lake Shore (Don to Cherry)	80
	400 mm	Don River (Lake Shore/Don Yard)	270
	300 mm	Villiers Street	700
Sanitary (below ground)	300/375 mm	Lake Shore (Don to Cherry)	690
	300 mm	Cherry Street	200
	300 mm	Villiers Street	520
Storm (below ground)	450/525 mm	Lake Shore (Don to Cherry)	70
	450/525 mm	Lake Shore (Don to Cherry)	100
	525/450/375/300 mm	Lake Shore (Don to Cherry)	180
	375/525/600 mm	Lake Shore (Don to Cherry)	130
	450/600 mm	Villiers Street	60
	375/450/900/1050 mm	Villiers Street	200
	1350 x 1350 mm	Cherry Street	200

Table 3-25 Detail of Utilities along the Project Study Area

	Utilities	Location	Length (m)
Gas (below ground)	500 mm	Lake Shore (Don to Cherry)	690
	500 mm	Cherry Street	200
	100 mm	Villiers Street	650
Hydro One Networks Inc. (HONI) (above ground unless otherwise noted)	Hydro Transformer Station	Don Fleet Station (west bank Don River south of Kingston – GO Subdivisions)	N/A
	Hydro Transformer Station	Basin Station (west bank Don River north of Kingston – GO Subdivisions	N/A
	Hydro Bridge	Crosses Don River from Don Fleet Station to Don Roadway	N/A
	High Voltage Overhead Hydro Tower	Beside Don Fleet Station	N/A
	High Voltage Overhead Hydro Tower	Beside Basin Station	N/A
	High Voltage Overhead Hydro Tower	Between Keating Yard and Don Roadway, north of Lake Shore Boulevard. E	N/A
	High Voltage Overhead Hydro Tower	East of Don Roadway, south side of Gardiner / Lake Shore Blvd.	N/A
	High Voltage Overhead Hydro Tower	East of Don Roadway, just north of Commissioners	N/A
	High Voltage Overhead Hydro Towers	Towers run westward from Don Fleet Station immediately south of Don Yard and Kingston-GO Subdivisions to Union Station	N/A
	High Voltage Overhead Hydro Towers	Towers run eastward from Don Roadway down middle of Commissioners Avenue	N/A
	High Voltage Underground Hydro Cables	Run north-south along Don Roadway to Hydro Bridge	N/A
	High Voltage Underground Hydro Cables	Run north from Hydro Bridge to Basin Station and areas further north along west bank of Don River	N/A
	High Voltage Underground Hydro Cables	Runs to Don Fleet Station then westward along south side of Don Yard and Kingston-GO Subdivisions	N/A
Power (T.H.E.S.) (below ground)	Conduit	Lake Shore (Don to Cherry)	690
	Conduit	Lake Shore (Don to Cherry)	690
	Conduit	Lake Shore (Don to Cherry)	760
	Conduit	Cherry Street	200
	Conduit	Villiers Street	200
Bell Canada (above & below ground)	Conduit	Cherry Street	200
	Overhead	Villiers Street	120
Oil (below ground)	3 – 200 mm	Keating Ch. to Harbour Lead	210
	2- 150 mm	Keating Ch. to Harbour Lead	210
	1 – 200 mm	Villiers Street	570

Figure 3-23 below illustrates the location of existing utilities in the Project Study Area, excluding private utility connections to individual properties in the Project Study Area.

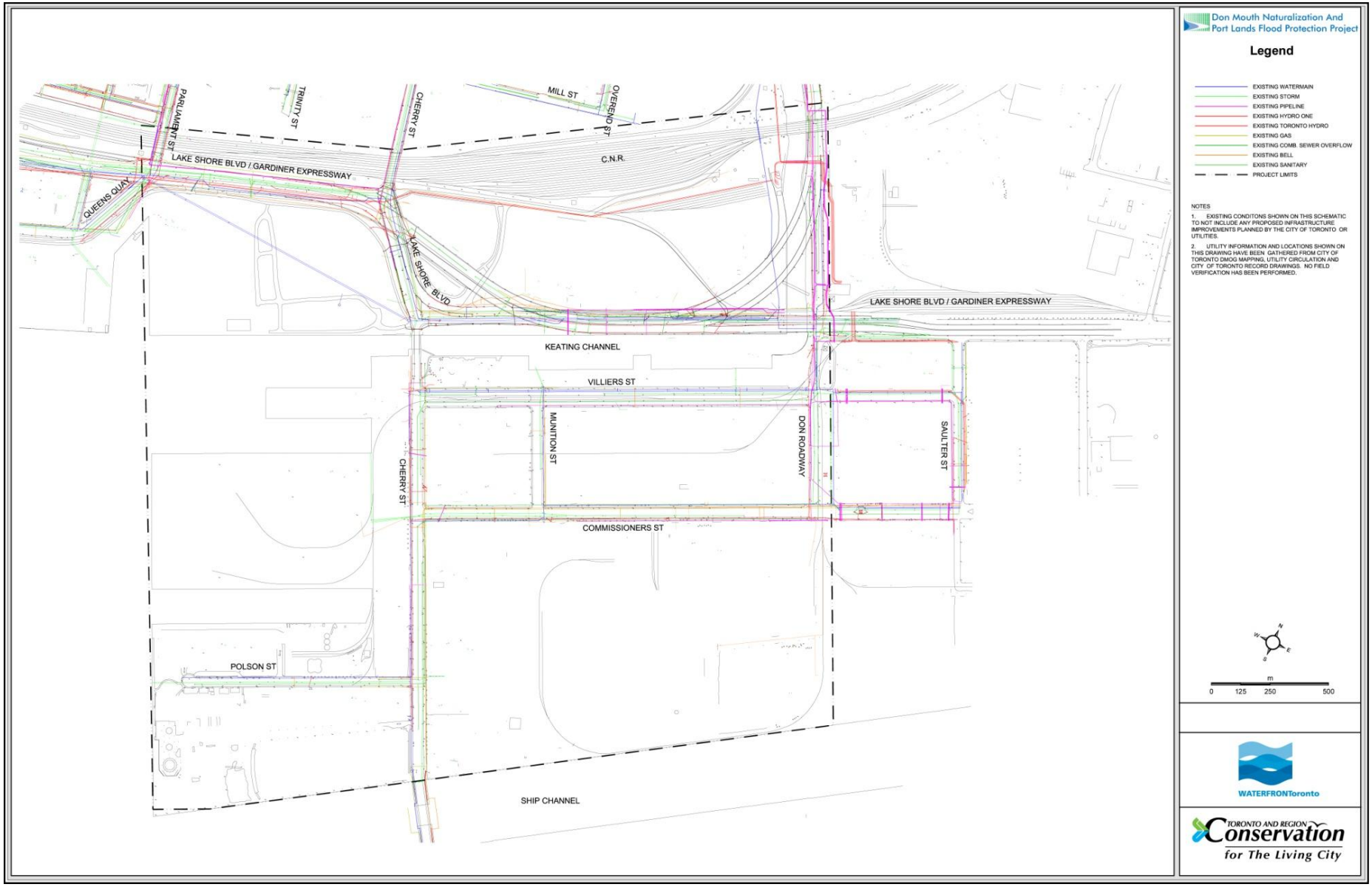

Figure 3-23 Existing Utilities within the Project Study Area