



Scarborough Shoreline

**Terrestrial Biological Inventory
and Assessment**

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 **TORONTO AND REGION**
Conservation
for The Living City

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1.0 Introduction

In 2011 the Toronto Region Conservation Authority (TRCA) conducted flora and fauna inventories of a stretch of Lake Ontario shoreline extending from East Point Park west to Bluffer's Park in preparation for an upcoming management plan. Sections of this 10 km stretch had been previously inventoried, particularly for flora, but this is the first time that the entire area has been inventoried as one piece: the Scarborough Shoreline study area. As shown in Maps 1 and 2, the study area incorporates almost all the natural cover below Kingston Road, from the mouth of the Highland Creek in the east (but not including any part of the Highland Creek watershed) to approximately Midland Avenue in the west).

The purpose of the work conducted by the TRCA during the 2011 field season was to *provide site-specific advice on management decisions* in the upcoming plan. In order to provide this advice, detailed field work was undertaken to *characterize the terrestrial natural heritage features* of the Scarborough Shoreline. Once characterized, the site features can then be understood within the larger regional context of the Terrestrial Natural Heritage Program of the TRCA. The question that the inventory addresses is "*How does the area surveyed at the Scarborough Shoreline fit within the regional and watershed natural system, and how should its contribution to this system be protected and maximized?*" The important underlying message offered by this question is that the health of the natural system is measured at the regional scale and specific sites must be considered together for their benefits at all scales, from the site to the larger system.

1.1 TRCA's Terrestrial Natural Heritage Program

Rapid urban expansion in the TRCA jurisdiction has led to continuous and incremental loss of natural cover and species. In a landscape that probably supported 95% forest cover prior to European settlement, current mapping shows that only 17% forest and wetland cover remains. Agricultural and natural lands are increasingly being urbanized while species continue to disappear from a landscape that is less able to support them. This represents a substantial loss of ecological integrity and ecosystem function that will be exacerbated in the future according to current urbanization trends. With the loss of natural cover, diminishing proportions of various natural vegetation communities and reduced populations of native species remain. Unforeseen stresses are then exerted on the remaining flora and fauna in the natural heritage system. They become even rarer and may eventually be lost. This trend lowers the ability of the land to support biodiversity and to maintain or enhance human society (e.g. through increased pollution and decreased space for recreation). **The important issue is the cumulative loss of natural cover in the TRCA region that has resulted from innumerable site-specific decisions.**

In the late 1990s the TRCA initiated the Terrestrial Natural Heritage Program to address the loss of terrestrial biodiversity within the jurisdiction's nine watersheds. This work is based on two landscape-level indicators: the quality distribution of natural cover and the quantity of natural cover. The aim of the program is to create a conservation strategy that both protects elements of the natural system (vegetation communities, flora and fauna species) *before* they become rare



and promotes greater ecological function of the natural system as a whole. This preventive approach is needed because by the time a community or species has become rare, irreversible damage has often already occurred. A healthy natural system capable of supporting regional biodiversity in the long term is the goal of the Terrestrial Natural Heritage Systems Strategy by setting targets – both short- and long-term (100 years) – for the two landscape indicators in order to provide direction in planning at all scales (TRCA 2007a, TRCA 2007b).

A target system that identifies a land-base where natural cover should be restored is a key component of the Strategy. Although the objectives of the Strategy are based on making positive changes at all scales, the evaluation models were developed at the landscape scale using a combination of digital land cover mapping and field-collected data. Field-collected data also provides ground-level information in the application of the landscape models at the site scale. The two indicators and the targets that have been set for them are explained in Section 3.1. It is important to understand that habitat quality and distribution are interdependent. For example, neither well-distributed poor-quality natural cover nor poorly-distributed good-quality natural cover achieves the desired condition of sustainable biodiversity and social benefits across the watershed.

2.0 Study Area Description

The study area is located on the Lake Ontario shoreline, between the mouths of the Highland Creek and Bluffer's Park. As such it is not considered part of any particular watershed, all surface water tending instead to drain directly towards Lake Ontario. This shoreline is situated within the City of Toronto. The study area starts on the western bank of the mouth of the Highland Creek and extends west along the shoreline through East Point Park, Guild Inn, Sylvan Park, Bellamy Ravine, Cudia Park and finally to the western boundary of Bluffer's Park (Map 2). The inland or northern boundary of the study area is indicated by the first encounter with residential roads or residential properties; therefore at one point the site boundary extends 1000 m as far inland as Kingston Road (the top of Bellamy Ravine), or just 50 m, as far as the backyard fence-lines of properties along Sylvan Avenue (Sylvan Park).

Based on GIS analysis of survey data, the Scarborough Shoreline terrestrial biological study area covers 260 hectares and lies entirely within the Carolinian floristic region, composed primarily of deciduous forest.

The surface geology and soils of the Scarborough Shoreline are complex and interesting, being overwhelmingly dominated by the Scarborough Bluffs. Much of the tableland above the Bluffs falls within the Iroquois Sand Plain, with the west half of the Bluffer's section situated on the South Slope physiographic zone as it extends through the sand plain to meet Lake Ontario. Surface geology consists primarily of glacial lake deposits of sand and clay in various layers exposed on the Bluffs. The most prominent deposits are those of a prehistoric river delta entering into an enlarged periglacial Lake Ontario (Scarborough Formation) (Eyles 2004). This phase of the lake



was actually earlier than Lake Iroquois in that it occurred *prior* to the greatest extent of the Wisconsin glaciation that covered the Toronto area. In places, especially at Bluffers Park, there are high pinnacles of laminated clay deposited within the periglacial lake itself (Sunnybrook Till). The last phase of the periglacial lake is the best-known – Lake Iroquois. Lake Iroquois existed during the time of the final retreat of the Wisconsin glaciation. The Lake Iroquois shoreline forms a hillside that is usually a few hundred metres back from the present-day Bluffs, but actually intersects them at Cathedral Bluffs Park (east of Bluffers Park). The result is that the Scarborough Bluffs at Cathedral Bluffs Park attain their greatest elevation: about 100 m above Lake Ontario.

Recreational activity, primarily hiking and dog-walking, occurs throughout the site, largely along designated trails, but the different sections also have various degrees of informal trail creation. East Point Park, for example, as the most open habitat within the study area, has a particularly extensive network of narrow trails criss-crossing the entire meadow and shrub complex. The use of these trails, both formal and informal, varies considerably through the year, with the majority of intensive use occurring through the summer and early fall.

3.0 Inventory Methodology

A biological inventory of the Scarborough Shoreline study area was conducted at the levels of habitat patch (landscape analysis), vegetation community, and species (flora and fauna) according to the TRCA methodologies for landscape evaluation (TRCA 2007c) and field data collection (TRCA 2007d). Habitat patch mapping was excerpted from the regional 2007/08 mapping of broadly-defined patch categories (forest, wetland, meadow and coastal) and digitized using ArcView GIS software.

A key component of the field data collection is the scoring and ranking of vegetation communities and flora and fauna species to generate local “L” ranks (L1 to L5); this process was undertaken in 1996-2000 and ranks are reviewed regularly (TRCA 2010). Vegetation community scores and ranks are based on two criteria: *local occurrence* and the number of *geophysical requirements* or factors on which they depend. Flora species are scored using four criteria: *local occurrence*, *population trend*, *habitat dependence*, and *sensitivity to impacts associated with development*. Fauna species are scored based on seven criteria: *local occurrence*, *local population trend*, *continent-wide population trend*, *habitat dependence*, *sensitivity to development*, *area-sensitivity*, and *patch isolation sensitivity*. With the use of this ranking system, communities or species of *regional concern*, ranked L1 to L3, now replace the idea of *rare* communities or species. Rarity (*local occurrence*) is still considered but is now one of many criteria that make up the L-ranks, making it possible to recognize communities or species of regional concern before they have become rare.

In addition to the L1 to L3 ranked species, a large number of currently common or secure species at the regional level are considered of concern in the urban context. These are the species identified with an L-rank of L4. Although L4 species are widespread and frequently occur in relatively intact urban sites, they are vulnerable to long-term declines.



3.1 Landscape Analysis

The quality, distribution and quantity of natural cover in a region are important determinants of the species distribution, vegetation community health and the provision of “ecosystem services” (e.g. air and water quality, recreation, aesthetics) in that region.

Base Mapping

The first step in evaluating a natural system or an individual *habitat patch* is to interpret and map land cover using aerial photographs. The basic unit for the evaluation at all scales is the habitat patch in the region, which are then combined and evaluated as a system at any scale. A *habitat patch* is a continuous piece of habitat, as determined from aerial photo interpretation. The TRCA maps habitat according to four broad categories: *forest*, *wetland*, *meadow*, and *coastal* (beach, dune, or bluff). At the regional level, the TRCA jurisdiction is made up of thousands of habitat patches. This mapping of habitat patches in broad categories is conducted through remote-sensing and is used in the evaluation of quality, distribution and quantity of natural cover. It should not be confused with the more detailed mapping of vegetation communities obtained through field surveys and that is used to ground-truth the evaluation (see Section 3.2).

Quality Distribution of Natural Cover

The quality of each habitat patch is evaluated according to three criteria: *size* (the number of hectares occupied by the patch), *shape* (edge-to-area ratio), and *matrix influence* (measure of the positive and negative impacts from surrounding land use) (TRCA 2007c). A total score for each patch is obtained through a weighted average of the scores for the three criteria. This total score is used as a measure of the ‘quality’ of a habitat patch and is translated into a local rank (L-rank) ranging from L1 to L5 based on the range of possible total scores from 3 to 15 points. Of these L-ranks, L1 represents the highest quality habitat and L5 the poorest.

Species presence or absence correlates to habitat patch quality (size, shape and matrix influence) (Kilgour 2003). The quality target is based on attaining a quality of habitat patch throughout the natural system that would support in the very long term a broad range of biodiversity, *i.e.* a quality that would support the region’s fauna Species of Conservation Concern (Table 1).

Table 1: Habitat patch quality, rank and species response

Size, Shape and Matrix Influence	Patch Rank	Fauna Species of Conservation Concern
Excellent	L1	Generally found
Good	L2	Generally found
Fair	L3	Generally found
Poor	L4	Generally not found
Very Poor	L5	Generally not found



In addition to the three criteria that make up the total habitat patch score, another important measure to consider in assessing habitat patch quality is forest interior, i.e. the amount of forest habitat that is greater than 100 m from the edge of the forest patch, using 100 m increments. A recognized distance for deep interior conditions occurs at 400 m from the patch edge. Such conditions are a habitat requirement for several sensitive fauna species.

Quantity

The *quantity target* is the amount of natural cover which needs to exist in the landscape in order to accommodate and achieve the quality distribution targets described above. The two targets are therefore linked to each other: it will be impossible to achieve the required distribution of natural heritage quality without the appropriate quantity of natural cover. The proportion of the region that needs to be maintained as natural cover in order to achieve desired quality is identified as 30%.

3.2 Vegetation Community and Species

Vegetation community and flora and fauna species data were collected through field surveys. These surveys were done during the appropriate times of year to capture breeding status in the case of amphibians and birds, and during the optimal growing period of the various plant species and communities. Vegetation communities and flora species were surveyed concurrently. Vegetation community designations were based on the Ecological Land Classification (ELC) and determined to the level of vegetation type (Lee *et al.* 1998). Community boundaries were outlined onto printouts of 2007 digital ortho-rectified photographs (ortho-photos) to a scale of 1:2000 and then digitized in ArcView.

Flora regional and urban species of concern (species ranked L1 to L4) were mapped as point data with approximate number of individuals seen. A list of all other species observed was documented for the site.

The majority of records used for this inventory and report are drawn from the 2011 field season, augmented by flora species data collected by TRCA in fall 2000 for the City of Toronto Natural Heritage Study (City of Toronto 2001). In addition, the flora data include incidental reports submitted by TRCA staff since 1997 and from a long-term forest vegetation monitoring plot initiated in 2008 at Cudia Park. Marshall Macklin Monaghan (1997) had also collected data for East Point Park that could have been of use in assessing recent trends; however their report could not be located in time for this study.

The most complete fauna survey of the site was conducted by the TRCA in May, June and July of 2011. The 41 ha Guild Inn site was inventoried in 2002, and any additional records from this earlier survey have been incorporated into the results for this document (TRCA 2002). Other reports have also been included from the results of the annual long-term monitoring surveys, conducted since 2008 at two stations on the study area (East Point Park and Cudia Park). Surveys in 2011 were concerned primarily with the mapping of breeding bird species of regional and urban concern, i.e.



those ranked as L1 to L4. As per the TRCA data collection protocol, breeding bird surveys were carried out by visiting all parts of the site at least twice during the breeding season (last week of May to mid-July) to determine the breeding status of each mapped point. The methodology for identifying confirmed and possible breeding birds follows Cadman *et al.* (2007). All initial visits were completed by the end of the third week of June. The field-season is to be organized so that by late June only repeat visits are being conducted. It is imperative that any visit made in the first half of June is subsequently validated by a second visit later in the season. Fauna regional species of concern (species ranked L1 to L3) were mapped as point data with each point representing a possible breeding bird.

Table 2. Schedule of TRCA biological surveys at Scarborough Shoreline

Survey Item	Survey Dates	Survey Effort (hours)
Patch / Landscape	2008 ortho-photos	21 hours
Vegetation Communities and Flora Species	2000: Oct. 11 th , 12 th , 13 th , 16 th , 17 th , 18 th , 19 th , 20 th , 23 rd , 25 th	70 hours
	2011: May 5 th , 12 th , 20 th ; June 1 st , 2 nd , 13 th , 16 th , 19 th , 20 th ; July 5 th , 7 th , 19 th , 20 th , 22 nd , 28 th ; Aug. 5 th , 8 th , 11 th , 12 th , 16 th , 17 th , 18 th , 22 nd , 23 rd ; Sep. 2 nd , 6 th , 8 th , 12 th , 13 th , 19 th , 20 th	182 hours
Breeding Songbirds	2002: June 3 rd , 4 th , 25 th	29 hours
	2011: May 31 st ; June 10 th , 14 th , 16 th and 24 th ; July 4 th , 7 th and 8 th	

4.0 Results and Discussion

Information pertaining to the Scarborough Shoreline was collected through both remote-sensing and ground-truthing surveys. This information contains three levels of detail: habitat patch, vegetation community, and species (flora and fauna). This section provides the information collected and its analysis in the context of the TNHS Strategy.

4.1 Regional Context

Based on 2007/08 orthophotography, 25% of the land area in the TRCA jurisdiction consists of natural cover but this figure includes meadow and old field. Although historically, the region would have consisted of up to 95% forest cover, currently (i.e. 2007/08) only about 17% is covered by forest and wetland. Of the non-natural cover (i.e. the remaining 75%), 48% is urban and 27% is rural / agricultural.



The regional level analysis of habitat patches shows that the present average patch quality across the TRCA jurisdiction is “fair” (L3); forest and wetland cover is contained largely in the northern half of the TRCA jurisdiction, especially on the Oak Ridges Moraine; and the quantity is 16.7% of the surface area of the jurisdiction (Map 3). In addition, meadow cover stands at 8.1% of the region. Thus the existing natural system stands below the quantity target that has been set for the region (30%) and also has an unbalanced distribution. The distribution of fauna species of concern is also largely restricted to the northern part of the jurisdiction; fauna species of regional concern are generally absent from the urban matrix (Map 4). The regional picture, being the result of a long history of land-use changes, confirms that **all** site-based decisions contribute to the condition of a region.

4.2 Habitat Patch Findings for Scarborough Shoreline

The following details the study area according to the two natural system indicators used in designing the Terrestrial Natural Heritage System Strategy: the *quality distribution* and *quantity* of natural cover. Analysis was based on 2007/08 ortho-photos.

4.2.1 Quality Distribution of Natural Cover

The results for quality distribution are reported below under the headings of habitat patch size and shape, matrix influence and total score.

Habitat Patch Size and Shape

The Scarborough Shoreline study area consists of a blend of bluff, shoreline, vegetated ravine, and tableland areas. The ravines and tableland have forest patches. The largest continuous forest patch is 31.2 ha associated with Sylvan Park; the patch at Guild Inn covers 21.4 ha but there is an additional 4.5 ha separated by a relatively narrow paved trail. Larger forests are more resilient to negative matrix influences accompanying urbanization or trail systems. Forest patches of a size greater than 10 ha but less than 50 ha are considered “fair” (Map 5) and such patches make up a fairly large proportion of the habitat at the study area. Furthermore, it should be kept in mind that much of the habitat identified as beach/bluff on the Scarborough Shoreline site is in fact treed and therefore might, in certain contexts (e.g. fauna mobility), be considered to effectively extend the size of some of the forest patches. The East Point Park section of the study area has the most extensive meadow habitat patch at 20.3 ha, which scores “fair” for patch size.

Given that the study area has a generally linear configuration, squeezed between the residential property lines and the lake, most of the habitat patches score “poor” and “very poor” for patch shape. This poor shape configuration means that despite relatively extensive forest patches, the amount of forest interior is restricted to just one small patch at the Guild Inn Park forest patch (Map 6). Forest interior provides shaded, moist, cool conditions, and some refuge from external effects, the conditions needed for numerous native plants and animals.



Habitat Patch Matrix Influence

Analysis based on the 2007/08 ortho-photos shows that the habitat in the study area is ranked as “fair” to “good” for matrix influence (i.e. scores three to four out of a possible five points, see Maps 7 and 8). Given the urban setting of this study area, this score is rather high but this anomaly is due to the proximity of the lake which, as natural habitat, is considered as having a positive matrix influence on any adjacent natural cover thus artificially increasing both the matrix influence score and the total patch score. The TRCA measures matrix influence at the landscape level by assigning set values; positive, neutral and negative, to the type of landscape use occurring within 2 km of the subject site. It is important, however, to also understand and consider the matrix influence that occurs at the site and patch level. Such influences include those transferred to an otherwise remote natural habitat patch from a distant urban or suburban development, for example via a trail system.

Habitat Patch Total Score

The combination of “fair” to “good” matrix influence on the site, and the mix of “fair” to “very poor” for habitat patch size and shape, results in an overall “fair” to “poor” or L3/L4 habitat patch quality (Map 9). Note that the largest patch of continuous forest (Sylvan Park) attains a “poor” total score primarily due to the “very poor” shape attribute. Landscape scores are intended to be applied at the broader landscape level and therefore caution needs to be exercised when referring to such measures at the more refined site level.

4.2.2. Quantity of Natural Cover

The total area of the jurisdiction’s waterfront (i.e. the land that is not included in any of the nine watersheds) is approximately 12,166 ha containing 10% natural cover (2007/08), including 576 ha as forest (4.7%, forest plus successional), 453 ha as meadow (3.7%) and 31 ha as wetland (0.3%). As per ground-truthed ELC data, the Scarborough Shoreline study area contains 264.6 ha of natural cover (Appendix 1). The natural cover includes 97.3 ha (40%) of forest (including 14.5 ha plantation), 45.1 ha (6.8%) of successional, 25.9 ha (19.4%) of meadow, and 21.4 ha (0.5%) of wetland (including 8.6 ha treed swamp). A total of 71.4 ha (26.1%) is classified as “dynamic” (i.e. mostly bluff and coastal communities subject to active energy). The share of land functioning at least in part as “forest” is higher than the cited 97.3 ha because a sizeable share of the successional, treed swamp and dynamic habitat has some degree of shrub or tree cover. The Scarborough Shoreline study area contains 21.7% of the total natural cover of the jurisdiction’s waterfront.

4.3 Vegetation Community Findings for Scarborough Shoreline

4.3.1 Vegetation Community Representation

The Scarborough Shoreline study area had total of 103 different ELC vegetation community types described in 2011 (Table 3; full list in Appendix 1). This reflects the range of topographic features



including the Lake Ontario shoreline, vegetated and open bluffs, steep ravines, and tableland woodlots. There are 43 forest communities (31 natural forest, 12 plantation), 15 successional communities, 19 wetlands, 2 vegetated aquatic (plus 2 non-vegetated aquatic), 3 meadows, and 19 dynamic communities. Five communities were recorded solely as complexes and/or inclusions within other communities. Communities range in age and origin from native mature forests on the tableland and stable slopes down to newly deposited fill being placed along the shoreline at time of survey. In between these extremes are mid-aged stabilized bluff communities, established plantations and semi-grown over successional types. The wide range of communities also reflects diversity in soil conditions.

Table 3. Summary of Vegetation Communities, Scarborough Shoreline

Class	Number of Types	Area (hectares)
Forest	43	97.3
Successional	15	45.1
Meadow	3	25.9
Wetland	19	21.4
Aquatic	4	3.6
Dynamic (beach, bluff, barren)	19	71.4
<i>Total</i>	<i>103</i>	<i>264.6</i>

Ecological Land Classification field surveys confirmed that soils are extremely variable. The Lake Iroquois-derived tableland soils are actually only intermittently sandy, with more sand in the western part of the site. Soils based on auger samples show a range from very fine sands on some of the Iroquois plain to silty clay loam on other parts of the Iroquois plain at Guild Inn. Loams and silt loams are prevalent on the highest tableland areas above the Iroquois shoreline. The Scarborough Bluffs themselves include layers of heavier clay and lighter sandy deposits with frequent ground water seeps emerging where the base of a sand layer meets the top of a clay layer. At the base of the Bluffs, anthropogenic fill has been placed along much of the shoreline (shoreline hardening for protecting property from erosion), while sand has accumulated on the east side of Bluffers Park since the fill was placed there in the 1970s.

The site has 97.3 ha of forest (including 82.8 ha of naturally-regenerated forest and 14.5 ha of plantation), over one-third of the whole study area. Mature forest occurs on stable slopes of ravines and the Iroquois shoreline at Cudia Park and Bellamy Ravine, with smaller patches in ravines near Midland Av. at the far west end of the site, the Brimley Road Ravine, and the east side of Sylvan Park. Tableland forest occurs at Guild Inn and in small patches at East Point Park and South Marine Drive Park. Forest at Scarborough Shoreline is overwhelmingly deciduous. Dry-Fresh Sugar Maple – Beech Forest (FOD5-2) occupies a large patch at Cudia Park. Other forest communities with significant coverage (5 ha or more) include Fresh-Moist Sugar Maple – Ash Deciduous Forest (FOD6-1), and the younger Fresh-Moist Ash Deciduous Forest (FOD7-2) Fresh-Moist Manitoba Maple Deciduous Forest (FOD7-a), Fresh-Moist Poplar Deciduous Forest (FOD8-1), and Fresh-Moist Paper Birch Deciduous Forest (FOD8-B). Small areas of mixed forest (mostly



Fresh-Moist Sugar Maple – Hemlock Mixed Forest, FOM6-1) occur at Guild Inn and on some shaded ravine slopes.

Plantation is scattered through the study area. Most of this dates from approximately the 1970s. Black Locust Deciduous Plantation (CUP1-c) has the largest share, and occurs in patches where attempts were made to stabilize parts of the Scarborough Bluffs. This pragmatic approach based only on erosion control concerns has led to these areas being weedy in character with a heavy component of invasive exotic species in the understorey.

Fifteen types of successional semi-woody habitat cover 45.1 ha (17% of the natural cover). These are scattered across the site, occupying formerly agricultural lands plus residential areas acquired and cleared as hazard lands adjacent to the Scarborough Bluffs. Red-osier Dogwood Deciduous Thicket (CUT1-E) and Native Deciduous Successional Woodland (CUW1-A3) occupy the largest area.

Meadow occupies 25.9 ha, (9.8% of total natural cover). Native Forb Meadow (CUM1-A) with a high proportion of native goldenrod (*Solidago altissima*) and aster (*Symphyotrichum* spp.) predominates, with lesser coverage of Exotic Cool-season Grass Graminoid Meadow (CUM1-b) and Exotic Forb Meadow (CUM1-c). Most meadow is at East Point Park, where it includes a substantial complement of prairie species amid the dominant asters, goldenrod and Eurasian cool-season grasses. Perhaps the meadow at East Point Park should be considered intermediate between common old-field vegetation and true prairie. Overall, meadow appears to be decreasing in area as woody species invade. Most of the Scarborough Shoreline has had several decades of succession since urbanization eliminated agriculture.

Wetlands occupy 21.4 ha, 8.1% of the natural cover of the Scarborough Shoreline study area. This is a higher-than-expected figure given the steep topography of much of the site. The wetlands generally fit three different categories: small seepage slopes associated with exposures of sandy glacio-fluvial deposits on the Scarborough Bluffs and ravines (see Section 2.0); small coastal thicket swamps and marshes along sheltered embayments and back-dune areas (mostly at Bluffers Park); and perhaps most surprisingly, upland tableland swamps and meadow-marshes that form where water collects on impermeable substrates. Some of these at Guild Inn are very close to the top-of-slope of the Scarborough Bluffs. There are 8.6 ha of treed swamp, largely at Guild Inn and South Marine Drive Park. These include Red Ash Mineral Deciduous Swamp (SWD2-2), Swamp Maple Mineral Deciduous Swamp (SWD3-3), and White Cedar – Hardwood Mineral Mixed Swamp (SWM1-1).

Seepage slopes are dominated by Willow Mineral Thicket Swamp (SWT2-2) and the invasive Common Reed Mineral Meadow Marsh (MAM2-a).

Aquatic macrophyte communities are poorly-represented (about 1 ha) because the waters of Lake Ontario are too deep and exposed while those of sheltered embayments at Bluffers Park are very turbid due to storm water and combined sewer inputs. Nonetheless, the open lake has small



patches of macrophytes (not sufficient to designate mapped community polygons) and the embayment at Bluffers Park has small fringes of two vegetated aquatic communities.

The Scarborough Shoreline, of course, has bluff communities as one of its most salient features. They cover 52.2 ha, of which over half is the partly-stabilized Sumac – Willow – Cherry Mineral Shrub Bluff (BLS1-A). There are 11.4 ha of active Mineral Open Bluff (BLO1) with very sparse vegetation cover, and 11.9 ha of treed bluff (Deciduous Treed Bluff, BLT1-B; and Exotic Treed Bluff, BLT1-c).

Coastal dynamic communities include 16.0 ha of beach (Sea Rocket Open Sand Beach (BBO1-1), Willow Shrub Beach (BBS1-2A), and Mineral Treed Beach (BBT1-A). These are restricted to areas where the shoreline has not been armoured: at East Point Park extending to Greyabbey Park, and east of Bluffers Park. Accumulation of sand at the east side of Bluffers Park and the mouth of Highland Creek at the extreme east end of East Point Park has resulted in small areas of dune as well (1.1 ha).

Regarding various kinds of disturbance in the various vegetation communities, exotic species are most prominent in areas stabilized with exotic species for erosion control purposes, with many of the seepage areas also heavily affected. Exotic species overall are abundant where natural cover abuts gardens. The more mature mixed forests and swamps are relatively free of exotics. Trail use is moderate to heavy, given that the study area lies within an established part of Toronto, has spectacular views, and is overall attractive for outdoor activities. Some areas are inaccessible due to steepness and private ownership. The Guild Inn, although it is public parkland, is largely surrounded by fencing which helps to direct pedestrian traffic and protects some areas. Deer browse is moderate to heavy, especially at East Point and Guild Inn. Deer are frequently observed, and appear to be having an impact on vegetation.

4.3.2 Vegetation Communities of Concern

The vegetation communities that occur in the TRCA jurisdiction are scored and given a local rank from L1 to L5 based on the two criteria mentioned in Section 3.0. Vegetation communities with a rank of L1 to L3 are considered of regional concern in the jurisdiction while L4 communities are considered of concern in the urban portion of the jurisdiction. The Scarborough Shoreline lies within the urban landscape and so L1 to L4 communities are of conservation concern. On the other hand, community ranks do not take into account the intactness or quality of individual examples of communities; thus, a common type of vegetation community may be of conservation concern at a particular site because of its age, intact native ground layer, or other considerations aside from rank. This is clearly the case for many of the meadow communities at East Point Park, which have a rank of L5 or even L+ but which include unusual prairie species.

Twenty-one communities at the Scarborough Shoreline are ranked L1 to L3 and an additional 34 have a rank of L4 (communities are listed with ranks in Appendix 1; location and boundaries shown on Map 10). The communities of regional conservation concern (L1 to L3) occupy 49.1 ha, 15% of the total natural cover. An additional 34 communities covering 65.5 ha are ranked L4.



Three forest communities have a rank of L3: Fresh-Moist Hardwood Mixed Forest (FOM8-B) located at Guild Inn; Fresh-Moist Oak – Sugar Maple Deciduous Forest (FOD9-1) at Sylvan Park; and Dry-Fresh Hickory Deciduous Forest (FOD2-3) near Eastville Avenue. These are somewhat unusual associations with the former two occurring on heavier soils and the latter on lighter Iroquois sandy loam. Among the L4 communities are the other three mixed forest types: Dry-Fresh Hemlock – Sugar Maple Mixed Forest (FOM3-2), Dry-Fresh White Cedar – Paper Birch Mixed Forest (FOM4-1), and Fresh-Moist Sugar Maple – Hemlock Mixed Forest (FOM6-1). The Dry-Fresh White Cedar – Paper Birch Mixed Forest is one of the furthest south natural stands of cedar in the TRCA jurisdiction; even though cedar forests are abundant on the Oak Ridges Moraine and south into Pickering, they rapidly become scarce in the City of Toronto and the southern parts of Peel Region. The Dry-Fresh Sugar Maple – Beech Forest (FOD5-2) at Cudia Park is ranked L5 but this example is notable for its large area and mature age.

Wetlands include five types ranked L2 and L3, and 10 communities ranked L4. The L2 communities are Red Ash – Hemlock Mineral Mixed Swamp (SWMA-A) at Guild Inn; and two mineral fens at East Point Park: Mineral Fen Meadow Marsh (MAM5-1) and Willow Shrub Mineral Fen (FES2-A). The Red Ash – Hemlock Mineral Mixed Swamp is present only as an inclusion in a larger Red Ash Mineral Deciduous Swamp (SWD2-2); this is the only known example in the TRCA jurisdiction. Two marshes have a rank of L3: a Bur-reed Mineral Shallow Marsh (MAS2-7) in a depression at East Point Park, and Rush Mineral Meadow Marsh (MAM2-C), present as an inclusion in a coastal Willow Mineral Thicket Swamp (SWT2-2).

Treed swamps on tableland are rare in the City of Toronto; Guild Inn and South Marine Drive Park include good examples not only of Red Ash Mineral Deciduous Swamp (SWD2-2), but also of Silver Maple Deciduous Swamp (SWD3-2), Swamp Maple Mineral Deciduous Swamp (SWD3-3), and White Cedar – Hardwood Mineral Mixed Swamp (SWM1-1). These communities, ranked L4, have intact vernal pools and ground vegetation. Unfortunately, because red ash (*Fraxinus pennsylvanica*) is a dominant species in many of them, the impact of the emerald ash borer (*Agrilus planipennis*) is likely to be severe. The City of Toronto is preparing a management plan for this invasive insect that includes Guild Inn and South Marine Drive Park.

The two aquatic macrophyte communities at Bluffers Park: Water Lily – Bullhead Lily Mixed Shallow Aquatic (SAM1-A) and Pondweed Submerged Shallow Aquatic (SAS1-1) have ranks of L3 and L4 respectively. The water lilies were originally planted by TRCA in the 1990s and have successfully established around the edge of an embayment associated with the “Dunker’s Flow” water quality treatment lagoon.

The most notable vegetation communities at Scarborough Shoreline are in the “dynamic” category: the bluff, coastal beach and dune; and prairie communities. There are 12 such vegetation communities with a rank of L1 to L3, and four additional ranked L4. Bluffs occur across the whole study area. The Sumac – Willow – Cherry Shrub Bluff (BLS1-A), ranked L3, has the greatest coverage, while the Serviceberry – Buffaloberry Shrub Bluff (BLS1-B) is a far less common association and has a rank of L2. Open bluffs (BLO1) are actively eroding and have little



vegetation; however, there is an outstanding example on the west side of Bluffers Park where Sunnybrook Till is exposed. The sheer face and sharp pinnacles have made this area known as the “Dutch Church” section.

Coastal beach and dune areas include swaths of Sea Rocket Open Sand Beach (BBO1-1) at Bluffers Park and East Point Park; Switchgrass – Beachgrass Open Sand Dune (SDO1-1) and Willow Shrub Sand Dune (SDS1-A) at Bluffers Park; and a small area of Balsam Poplar Treed Sand Dune (SDT1-2) at the mouth of Highland Creek, East Point Park. These communities are all ranked L1 or L2, and are threatened by shoreline hardening and park construction. There is also a small area of Mineral Treed Beach (BBT1-A) that has grown up on cobble on a cove in part of the hardened shoreline east of Sylvan Park.

Prairie communities have been known at East Point Park since Catling and McKay (1974) discovered an association of prairie plants along the railway embankment on the north side of the park. The railway embankment area was not included in the 2011 field survey, although most of East Point Park was. Catling and McKay (1974) believed that the patch of prairie they observed was the result of introduction along the railway track, especially given that some of the species were markedly disjunct and the site itself was an obviously anthropogenic embankment. However, the numerous prairie elements (with some fen species included) have now been found widespread across much of East Point Park, even several hundred metres south of the railway down to the lakeshore. It is possible that they spread from the railway line over the past several decades, but such competitive ability is unlikely in the absence of fire and the presence of invasive species. The prairie species do not fit easily into defined ELC vegetation types but are rather mostly spread through a matrix of Native Forb Meadow (CUM1-A). Furthermore, the landscape at East Point Park, with its groves of trembling aspen (*Populus tremuloides*) forming patches of Fresh-Moist Poplar Deciduous Forest (FOD8-1), and thickets of shrubs interspersed with meadow bears a very close structural resemblance to aspen parkland ecosystems of west-central Canada (e.g. the Saskatoon area) and the adjacent United States. The ELC system does not capture the prairie component of East Point Park very well due to the fact that it is diluted within more familiar vegetation type classifications. Conservation of the prairie communities requires protection and management of the whole park.

Nonetheless, there has been a couple of identifiable prairie and barren polygons. In 2000, there was a small area identified as Fresh-Moist Tallgrass Prairie (TPO2-1); this was outside the 2011 survey area and close to the railway line. Another community, within the current study area, is actually a small piece of restored prairie that was planted in 1999 after the original soil was removed for remediation purposes. This is identified as Fresh-Moist Tallgrass Prairie Planting (TPO2-A); the planting was tailored to the existing prairie vegetation of East Point Park. Three barren communities have been mapped at East Point: White Cedar Low Treed Clay Barren (CBT1-A), Shrub Clay Barren (CBS1), and an inclusion of Open Clay Barren (CBO1). Notably, soils at East Point Park are more clayey than many Toronto-area prairies; sandy clay loam was observed during ELC soil surveys.



4.4 Flora Findings for Scarborough Shoreline

4.4.1 Flora Species Representation

Floristic surveys conducted across the Scarborough Shoreline in 2000 and 2011 (combined with smaller site visits and incidental observations spanning 1997-2005) identified a total of 658 species of vascular plants (Table 4; full species list in Appendix 2). These included 626 naturally-occurring species and 32 planted species. Of the non-planted species, 344 are native (55%). The high biodiversity of this site (especially given its urban location) is due to its diversity of landform and the presence of dynamic communities with active disturbance regimes (e.g. wind and wave action). In addition, the study area has been subject to multiple visits and thus coverage has been relatively thorough, perhaps allowing more flora species to be observed.

The range of habitats includes not only the dynamic coastal and prairie communities, but also more familiar forest, treed swamp, and successional communities; this would also increase the number of species. The high proportion of exotic species (i.e. 45%) further adds to total species richness; exotic species are to be expected in an urban area with a large number of adjacent gardens. Indeed, the Scarborough Shoreline study area includes numerous horticultural escapes.

The overall flora species richness of this urban study area, as well as the number of species of regional conservation concern (L1 to L3) are comparable to high-quality rural sites in the TRCA jurisdiction, such as the Brock Lands (TRCA 2011).

Table 4. Summary of Flora Species, Scarborough Shoreline

Total # of species	658
Naturally-occurring species	626
Planted species	32
Native (naturally-occurring) species	344
Exotic (naturally-occurring) species	282
Number of L1 - L3 species	94
Number of L4 species	111

4.4.2 Flora Species of Concern

There are 94 vascular plant species of regional conservation concern (rank L1 to L3) at the Scarborough Shoreline study area, with an additional 111 L4 species of urban concern. Appendix 2 lists plant species by ranks and locations are shown on Map 11. The ranks are based on sensitivity to human disturbance associated with development; and habitat dependence, as well as on rarity (TRCA 2010). In most cases, the species are not currently rare but are at risk of long-term decline due to the other criteria.



Forty-seven of these L1 to L4 plants are regionally rare (found in six or fewer of the forty-four 10x10 km UTM grid squares that cover the TRCA jurisdiction). Among them is the spike blazing-star (*Liatris spicata*), designated as a threatened species under the provincial Species at Risk (OMNR 2012). Spike blazing-star is one of the prairie species first observed at East Point Park by Catling and McKay (1974); it is about 200 km disjunct from the next nearest population in southwestern Ontario and so there is some likelihood that this is an introduction. On the other hand, it is part of the suite of unusual species at the park that seems to show evidence of being a natural feature (see Section 4.3.2). Other very rare species at East Point Park include ragged fringed orchis (*Platanthera lacera*), pasture thistle (*Cirsium discolor*), golden Alexanders (*Zizia aurea*) and the white form of bottle gentian (*Gentiana andrewsii* f. *alba*). These are all known only from East Point Park or perhaps one other TRCA location in the case of pasture thistle and golden Alexanders. Rough dropseed (*Sporobolus compositus* var. *compositus*) was found by Catling and McKay (1974); the TRCA record from 2000 needs verification.

Rare species found elsewhere along the Scarborough Shoreline include male fern (*Dryopteris filix-mas*) at Greyabbey Park; the newly observed broad-leaved panicked aster (*Symphotrichum lanceolatum* var. *latifolium*) at South Marine Drive Park, and Oake's evening-primrose (*Oenothera oakesiana*) at Bluffers and East Point Parks. The ox-eye (*Heliopsis helianthoides*) observed at Bluffers Park did not appear to be part of a planting; however, this species is often planted. The hybrid juniper *Juniperus horizontalis* x *virginiana*, is a cross between two native species but likely resulted from cross-pollination among ornamental plantings followed by bird dispersal.

Most of the flora species of concern (184 of 205 L1 to L4 species) are sensitive to development, being vulnerable to at least one kind of disturbance that is associated with land use changes (see Map 7 for sensitivity to development scores). The main threat at Scarborough Shoreline is competition from invasive species, which would include not only well-known invasive exotic plants such as dog-strangling vine (*Cynanchum rossicum*) but also in the case of the prairie species, natural succession and shading by woody species in the absence of fire or other disturbances that maintain open habitat. Such overgrowth at East Point Park, especially the section near the railway line north of Copperfield Road, was noted by Gaia EcoConsultants (2004). This threat is documented for spike blazing-star (OMNR 2012) and would also affect the other prairie species at East Point such as pasture thistle, old-field cinquefoil (*Potentilla simplex*) and golden Alexanders. Pasture thistle was recorded at 13 locations in East Point Park in 2000; and at 9 in 2011; the counts for fringed gentian (*Gentianopsis crinita*) were 15 in 2000 and 6 in 2011, though these figures could have been affected by slightly different study area boundaries. Fringed brome (*Bromus ciliatus*), a grass of cool groundwater seeps, has not been seen at Bluffers Park since 1997. Two small populations were recorded further east in 2011. The groundwater seeps exposed along the Scarborough Bluffs have been heavily invaded by common reed (*Phragmites australis* ssp. *australis*) in recent decades. Woody species such as white oak (*Quercus alba*) and maple-leaved viburnum (*Viburnum acerifolium*) are subject to being overtaken by invasive trees and shrubs; white oak here, as elsewhere in Toronto is experiencing little or no regeneration with only relict old trees remaining. Forest ground layer species could also be vulnerable to invasive species such as dog-strangling vine and garlic mustard (*Alliaria petiolata*).



Wetland species are vulnerable to hydrological changes. It is unusual for vernal pools to remain intact in a city setting, as they have at Guild Inn. Hydrologically-sensitive species at Scarborough Shoreline include marsh marigold (*Caltha palustris*), flat-topped aster (*Doellingeria umbellata*), and mountain maple (*Acer spicatum*). Nutrient inputs from urban runoff can also affect wetlands and other habitats, enabling invaders to grow more rapidly.

Increased human traffic into a natural area results in disturbance caused by trampling and the incursion of invasive species that compete with the existing native flora. The heaviest trampling (due to pedestrian and bike trails) is at Bluffers and East Point Parks. Fencing at Guild Inn has protected parts of the park, while other areas have limited access due to steep slopes. The tableland forest and treed swamp communities at Guild Inn have sensitive forest floor species such as oak fern (*Gymnocarpium dryopteris*), broad-leaved spring beauty (*Claytonia caroliniana*), and sharp-lobed hepatica (*Anemone acutiloba*).

Some species may be deliberately removed if they are seen: in fact, local residents reported that wild leek (*Allium tricoccum*) was being heavily pillaged from Guild Inn as a wild edible in 2011. Yellow lady's slippers (*Cypripedium parviflorum* vars. *makasin* and *pubescens*) and to some extent Michigan lily (*Lilium michiganense*) and several of the fern species are prized for gardens. Wild collection is certainly a serious conservation problem for showy native orchids.

Habitat fragmentation can lead to increased populations of herbivores such as white-tailed deer (*Odocoileus virginianus*); deer were frequently observed at Guild Inn and East Point Park. Certain plants such as white trillium (*Trillium grandiflorum*), fringed gentian, and hemlock (*Tsuga canadensis*) are often browsed. Deer browse of fringed gentian could have particularly serious consequences, as it can prevent seed-set of this biennial plant.

In addition to being sensitive to land use impacts, many of the species of concern can be considered habitat specialists, scoring relatively high in *habitat dependence*. Habitat dependence scores are shown on Map 12. Roughly, they are found in seven or fewer vegetation cohorts (groupings of vegetation types with similar floristic characteristics) (TRCA 2010). Protection of these species requires that their habitat be preserved intact.

Habitat specialists cluster into several different groups, roughly: those of forests; treed swamps; groundwater seeps and fens; prairie; and Great Lakes dunes and beaches. The fen, prairie, and coastal species have some overlap.

Some examples of upland forest species at Scarborough Shoreline include shagbark hickory (*Carya ovata*), wood betony (*Pedicularis canadensis*), and marginal wood fern (*Dryopteris marginalis*). Several spring ephemerals occur in parts of the forested areas, including broad-leaved spring beauty and wild leek.

Mature swamp areas at Guild Inn support marsh marigold, swamp red currant (*Ribes triste*), tall wood reed (*Cinna arundinacea*), and hop sedge (*Carex lupulina*).



Species associated with groundwater seeps include fringed brome, variegated scouring-rush (*Equisetum variegatum*), slender gerardia (*Agalinis tenuifolia*), nodding and shining ladies' tresses (*Spiranthes cernua* and *S. lucida*), and greenish sedge (*Carex viridula*). Many of the most interesting species at East Point Park, such as the bottle and fringed gentians, ragged fringed orchis, and pale sedge (*Carex pallescens*) grow in areas transitional between fen and prairie.

Prairie species at East Point Park include the spike blazing-star, switch grass (*Panicum virgatum*), pasture thistle, golden Alexanders, slender mountain mint (*Pycnanthemum tenuifolium*), and old-field cinquefoil. Big bluestem (*Andropogon gerardii*) was observed a short distance off-site along the railway line; while there is a historic record for little bluestem (*Schizachyrium scoparium*) (Catling and McKay 1974).

Coastal species of beach and dune include sea rocket (*Cakile edentula*) and seaside spurge (*Euphorbia polygonifolia*). The sea-rocket is probably the Great Lakes endemic variety (var. *lacustris*). Other shoreline species include fragrant umbrella-sedge (*Cyperus odoratus*), Great Lakes cinquefoil (*Potentilla supina* ssp. *paradoxa*), and beach pea (*Lathyrus japonicus*). The beach pea was observed at Bluffers Park in 1998 and 1999 and might be best considered an intermittent (though native) plant that periodically colonizes Toronto area beaches from populations further east along Lake Ontario. Buffaloberry (*Shepherdia canadensis*) is mostly restricted to semi-stabilized bluff and barren communities.

Finally, such plants as the hawthorns (*Crataegus* spp.), smooth wild rose (*Rosa blanda*) and American bittersweet (*Celastrus scandens*) are most characteristic of meadow and successional habitats.

Plantings

Numerous plantings, mostly of trees and shrubs, have been undertaken as part of restoration work since about 1990. However, two planting sites involved more specialized attempts to establish particular plant communities using local species. A soil remediation project at East Point Park was the subject of a prairie planting in 1999 (see Section 4.3.2). This involved the augmentation of existing populations of prairie species using seed collected from within the park or nearby. Prairie cord-grass (*Spartina pectinata*) was introduced (mostly from seed collected from Toronto Island coastal prairie) to form a vigorous barrier against common reed.

Bluffers Park has had some dune, aquatic, and one or two upland species successfully introduced through restoration plantings roughly 1992-2002. The dune now has populations of beach grass (*Ammophila breviligulata*) and Schweinitz' umbrella-sedge (*Cyperus schweinitzii*), mostly from Toronto Island, while there is a population of tuberous white water-lily (*Nymphaea odorata* ssp. *odorata*) in the lagoon. Woodland sunflower (*Helianthus divaricatus*) and a few other species have been established in treed areas on the fill peninsulas.



Invasive Species

The Scarborough Shoreline has a very large suite of exotic species, many of which have escaped from backyard gardens or old estates such as the Guild Inn located along the waterfront. Several new species for the TRCA jurisdiction were recorded in 2011 such as: Japanese honeysuckle (*Cryptotaenia japonica*), toadshade trillium (*Trillium sessile*), and field scabious (*Knautia arvensis*). One species, hairy St. John's-wort (*Hypericum hirsutum*), is a new record for North America, being identified from the Guild Inn in 2011 and one other site near the Pickering nuclear power station in 2008 (Heydon *et al.* 201x). These species are so far *adventives*; that is, while they have escaped from cultivation and are reproducing to some extent, they are still very local and it is not clear that they have become established members of the flora. While the majority of exotic plant species appear to have a limited impact on the environment, the Scarborough Shoreline study area includes many of the most notorious invasive species as well.

Unfortunately, dog-strangling vine is ubiquitous in upland habitats across the Scarborough Shoreline study area. It occurs in forests, successional areas and meadows; as well as being a threat to the prairie vegetation at East Point. The situation is consistent with what has been described across the Toronto area (TRCA 2008, Kricsfalusy and Miller 2010). If it follows the trajectory it has taken in Rouge Park and the Seaton Trail / Whitevale Corridor along West Duffins Creek, dog-strangling vine will likely become the dominant ground layer species in most upland habitats except for mature forests. It is too widespread and dominant for effective mechanical and chemical control to be exercised, except perhaps as an interim measure to protect individual populations of sensitive species that are being encroached upon by it. Biological control is the best long-term hope; research trials of a noctuid moth from eastern Europe are showing some promise for controlling dog-strangling vine, at least in shaded habitats (Weed and Casagrande 2010).

Another strangling type of vine present at the Scarborough Shoreline is oriental bittersweet (*Celastrus orbiculatus*). There is a large colony of this woody vine, originally planted and currently localized, at Guild Inn. Other medium-to-large populations can be found at Greyabbey Park and the western end of East Point Park. Oriental bittersweet shares many similarities with its native counterpart, American bittersweet (*Celastrus scandens*) which is also present. The potential for genetic-diversity loss is high as the oriental bittersweet can easily out-compete the American bittersweet for resources. The two species also hybridize, with oriental genes dominating. However, the existing populations may be small enough that mechanical removal is still a possible option.

A third invasive vine is Japanese honeysuckle (*Lonicera japonica*), which is forming local dense colonies at Guild Inn. Further to the south, in the USA, this is a very serious invasive species; in Toronto, it is mostly restricted to the ground surface. However, it is likely to be released by climate change and opening of the canopy due to emerald ash borer damage, so it should be a high priority for control.



Other woody invaders include Norway maple (*Acer platanoides*), European buckthorn (*Rhamnus cathartica*), autumn-olive (*Elaeagnus umbellata*), and shrub honeysuckles (*Lonicera morrowii*, *L. tatarica*, *L. x bella*, and *L. xylosteum*). The shrub honeysuckles are major invasives in the stands of aspen and birch at East Point Park. Autumn-olive is gradually replacing the related native buffaloberry in its semi-stabilized habitats.

Garlic mustard is found in those communities that are successional and/or disturbed in nature. It is often found in association with exotic community types (i.e. Black Locust Deciduous and Mixed Plantations, CUP1-c and CUP2-b). It is likely to spread along trail systems. At present, infiltration of this species into the healthier sections of the site is moderate; although many of the mature deciduous forest patches have a sparse ground cover overall with neither native species nor garlic mustard present in large numbers. Biological control is also the most promising strategy for reducing the impact of garlic mustard (Yates and Murphy 2008).

Common reed is probably the main threat to the seepage slope and marsh habitats. There are a number of areas now dominated by monotypic stands of common reed, especially along the seepage wetlands coming out of the Scarborough Bluffs, and in the few coastal wetland projects at Bluffers Park. Like dog-strangling vine, the common reed is probably too abundant for mechanical removal projects to be feasible except where there are existing species of high conservation concern that need to be protected (OMNR 2011). The priority should be keeping it out of the remaining intact seepage zones. Repeated mowing of common reed has been suggested by Gaia EcoConsultants (2004).

4.5 Fauna Species Findings for the Scarborough Shoreline Study Area

4.5.1 Fauna Species Representation

The TRCA fauna surveys at the Scarborough Shoreline study area in 2011 documented a total of 67 bird species, 11 mammals, and 7 herpetofauna species, for a total of 85 possible breeding vertebrate fauna species. Two additional bird species (gadwall, *Anas strepera*, and eastern screech-owl, *Megascops asio*) can be added from incidental sightings made during the long-term monitoring project and the 2002 Guild Inn inventory. One additional herpetofauna – common musk turtle, *Sternotherus odoratus* – was documented from Bluffers Park in 2003. These additions bring the total to 88 terrestrial vertebrate species potentially breeding within the study area. This total is higher than most other urban sites within the TRCA jurisdiction, in fact the total is higher than those acquired for several rural sites. However, it is important to understand the limitation of simple species' lists as an indicator of site significance. More indicative of a site's significance is the presence and representation of species associated with the specific habitats found at the site. Refer to Appendix 3 for a list of the fauna species and their corresponding L-ranks.



4.5.2 Fauna Species of Concern

Fauna species, like vegetation communities and flora species, are considered of regional concern if they rank L1 to L3 based on their scores for the seven criteria mentioned in Section 3.2. Since the subject site is situated within the urban zone this report considers all species ranked L1 to L4, i.e. those species that are of concern in both the rural and urban landscapes. As with flora, this is a proactive, preventive approach, identifying where conservation efforts need to be made before a species becomes rare.

Fauna surveys at the Scarborough Shoreline study area reported nine bird species of regional concern (L1 to L3), including brown thrasher (*Toxostoma rufum*), pileated woodpecker (*Dryocopus pileatus*), sharp-shinned hawk (*Accipiter striatus*) and wood thrush (*Hylocichla mustelina*). The site accommodated a further 31 breeding bird species ranked as L4. In addition, there were seven L1 to L4 herpetofauna species (including the L2 ranked common musk turtle; and the L3 ranked red-backed salamander, *Plethodon cinereus*, northern leopard frog, *Lithobates pipiens*, and midland painted turtle, *Chrysemys picta marginata*) and seven L4 mammal species (including beaver, *Castor canadensis*, and mink, *Mustela vison*) bringing the total to 54 fauna species of regional and urban concern. Locations of these breeding fauna are depicted on Map 13.

Table 5: Summary of Fauna Species of Concern, Scarborough Shoreline

Fauna	# Species	# L1–L3: Species of Regional Concern	# L4: Species of Urban Concern	Total #L1-L4: Species of Regional or Urban Concern
birds	69	9	31	40
herps	12	4	3	7
mammals	7	0	7	7
TOTALS	88	13	41	54

None of the species documented at Scarborough Shoreline in 2011 are listed on the provincial Species at Risk list, however, in September, 2003, Ministry of Natural Resource (MNR) scientists trapped a common musk turtle (which is listed under provincial Species at Risk) in one of the bays at Bluffer’s Park. Ministry of Natural Resource staff indicated that suitable nest habitat for this threatened species was available in the vicinity, but, due to the life-habits of this elusive species it is difficult to ascertain its real status along the Scarborough Shoreline. It should also be noted that in the 2003 TRCA survey of the private property at the west end of East Point Park (City of Toronto 2004) two points were mapped for bobolink (*Dolichonyx oryzivorus*), a Species at Risk, provincially and federally listed as Threatened. The same site also held two other meadow bird species – savannah sparrow (*Passerculus sandwichensis*) and eastern meadowlark (*Sturnella magna*) - which were not found within the Scarborough Shoreline study area in 2011; the latter of these two species is currently under review for inclusion on the provincial Species at Risk list.

Local occurrence is one of seven scoring criteria for fauna species and is based on TRCA data and information from the Natural Heritage Information Centre (NHIC) of the Ontario Ministry of Natural Resources (OMNR) (NHIC 2008). Using local occurrence as a measure of regional rarity,



any species that is reported as a probable or confirmed breeder in fewer than 10 of the forty-four 10x10 km UTM grid squares in the TRCA jurisdiction is considered regionally rare (i.e. scores three to five points for this criterion) (TRCA 2010).

At the Scarborough Shoreline study area there are three species that are considered regionally rare; two of these rarities are birds that have a typically southern distribution, both being considered Carolinian species. The Carolina wren (*Thryothorus ludovicianus*) is a species that has been fairly well-established, although rather scarce, along the Toronto lakeshore for several decades; the second species, red-bellied woodpecker (*Melanerpes carolinus*) is a somewhat more recent addition to the jurisdictional avifauna. Both species are likely to benefit from any milder winters that might result from the local effects of global climate change, although it is suspected that the popularity of backyard bird-feeders has played a large part in both species' ability to overwinter. The third regionally rare fauna species is gadwall (*Anas strepera*) a duck species which nests sporadically throughout the jurisdiction but primarily at lakeshore sites such as Leslie Street Spit. It should be noted that a fourth species, red-necked grebe (*Podiceps grisegena*), an extreme rarity within the jurisdiction only known from one location along the west-end waterfront, was observed in July as a displaying pair just off-shore from Sylvan Park. There are no real nesting opportunities at this particular location however the nearby marina at Bluffer's Park could provide artificial nesting opportunities in much the same way as Colonel Sam Smith Park in the west-end of the jurisdiction.

Sensitivity to development is another criterion used to determine the L-rank of fauna species. A large number of impacts that result from local land use, both urban and agricultural, can affect the local fauna. These impacts – considered separately from the issue of actual habitat loss – can be divided into two distinct categories. The first category involves changes that arise from local urbanization that directly affect the breeding habitat of the species in question. These changes alter the composition and structure of the vegetation communities; for example, the clearing and manicuring of the habitat (e.g. by removal of dead wood and clearance of shrub understorey). The second category of impacts involves changes that directly affect individuals of the species in question. Examples include increased predation from an increase in the local population of predator species that thrive alongside human developments (e.g. blue jays, *Cyanocitta cristata*; American crows, *Corvus brachyrhynchos*; squirrels, *Sciuridae*; raccoons, *Procyon lotor*; and house cats, *Felis catus*); parasitism (from facilitating the access of brown-headed cowbirds, *Molothrus ater*, a species which prefers more open, edge-type habitat); competition (for nest-cavities with bird species such as house sparrows, *Passer domesticus*; and European starlings, *Sturnus vulgaris*); flushing (causing disturbance and abandonment of nest) and, sensitivity to pesticides.

Fauna species are considered to have a high sensitivity to development if they score three or more points (out of a possible five) for this criterion. At Scarborough Shoreline all 13 of the L3 species and 23 of the 41 L4 species receive this score and are therefore considered sensitive to one or more of the impacts associated with development (Map 8). Of the L3 species, only brown thrasher is represented by more than just one or two breeding territories. On the other hand, several of the sensitive L4 species are very well-represented, indicative of successful populations.



One of the most obvious impacts of an urban landscape on fauna species, other than direct habitat loss, is the persistent disturbance of nesting birds. The degree of impact of such disturbance is very dependent on the height at which the birds nest and this may go some way in explaining the absence of the three ground-nesting meadow species which are known to have nested at the Coronation Drive study area in 2003 but were not reported from anywhere within the Scarborough Shoreline study area in 2011. Dog-walking – both off-leash and leashed – and the heavy use of a complex network of trails at East Point Park likely have played a large part in keeping these three meadow species from nesting successfully in recent years. However, the gradual succession of East Point Park's open meadow habitat to more closed shrub habitat is also diminishing the nesting opportunities for these three species.

Two ground-nesting species do seem to be faring somewhat better within the study area: common yellowthroat (*Geothlypis trichas*) was represented by a total of six territories; however, this species prefers somewhat more damp habitats and this preference may be enough to keep nests out of the reach of most informal trails. Spotted sandpiper (*Actitis macularia*), represented by seven pairs throughout the Scarborough Shoreline study area, has a very different nesting strategy in that the species (as with all shorebirds) produces precocial young which leave the nest very soon after hatching thereby reducing the period over which the nest is vulnerable to disturbance.

Several species that nest in the next level of the vegetation – i.e. the low-nesting species – are fairly well-represented throughout much of the study area. Species such as brown thrasher (10 pairs), indigo bunting (*Passerina cyanea*, 6 pairs) and willow flycatcher (*Empidonax traillii*, 14 pairs), which nest in low shrubs, are however quite capable of raising the level at which they build their nests and therefore are perhaps not as susceptible to ground-borne disturbances. Higher still in the vegetation are species such as the L4 ranked grey catbird (*Dumetella carolinensis*) which proved to be an extremely abundant species throughout the study area with a total of 85 points mapped. This latter species often places its nest well above head-height and furthermore is quite catholic in its selection of habitat, managing to nest in the forest understory, forest edge and shrubby open habitat.

It is important to understand that negative matrix influences are not solely associated with the proximity of urban development; many of the negative influences can be transferred deep within an otherwise intact natural matrix by extensive trail networks used by large numbers of people originating from quite distant urban centres. Extensive public use of a natural habitat can have substantial negative impact through the cumulative effects of hiking, dog-walking and biking on the site. Ground-nesting birds are highly susceptible both to increased predation from ground-foraging predators that are subsidized by local residences (house cats, raccoons) and to repeated flushing from the nest (by pedestrians, off-trail bikers and dogs) resulting in abandonment and failed breeding attempts. These same disturbances also have considerable impact on terrestrial herpetofauna in their upland summer-foraging: northern leopard frogs (*Lithobates pipiens*) have a particular tendency to wander considerable distances foraging across open habitat and as such are more sensitive to heavy human traffic in the landscape, be it hikers, bikers, dog-walkers or vehicles.



The impact of the higher density of subsidized predators, such as raccoons, associated with an urban landscape can be seen at East Point Park where several nest-boxes installed for tree swallows (*Tachycineta bicolor*) have been systematically predated, thereby turning a well-intentioned conservation project into a local population sink for tree swallows. All nest-box projects especially those involving multiple installations need to be properly monitored and maintained to be effective.

The tendency for local urbanization to be accompanied by the clearing and maintenance of woodlands and thickets in the vicinity dramatically disrupts any species that is dependent on such shrub cover for nesting or foraging, and certainly a few of the sensitive bird species at the study area have such specific requirements (e.g. mourning warbler, *Geothlypis philadelphia*; eastern towhee, *Pipilo erythrophthalmus*; winter wren, *Troglodytes troglodytes* – species that are dependent on thick, tangled forest understory). The presence of the latter of these two L3 ranked species at Scarborough Shoreline was definitely quite a surprise. Winter wrens are generally associated with moist, mature interior forest condition; it is suspected that 2011 was a rather strange year for this species since they were likewise encountered in other rather urban locations, and furthermore, there was no evidence that either of the two males documented at Guild Inn and East Point in 2011 were paired. The clearing of forest understory to accommodate trails will displace such sensitive species. The occurrence of single territories of the other two L3 species, although interesting, is not as significant as the presence of better represented species.

Various studies have shown that many bird species react negatively to human intrusion (i.e. the mere presence of people) to the extent that nest-abandonment and decreased nest-attentiveness lead to reduced reproduction and survival. One example of such a study showed that abundance was 48% lower for hermit thrushes (a ground-nesting/foraging species) in intruded sites than in the control sites (Gutzwiller and Anderson 1999). Elsewhere, a recent study reported that dog-walking in natural habitats caused a 35% reduction in bird diversity and a 41% reduction in abundance, with even higher impacts on ground-nesting species (Banks and Bryant 2007).

Area sensitivity is a scoring criterion that can be closely related to the issue of a species' need for isolation. Fauna species are scored for area sensitivity based on their requirement for a certain minimum size of preferred habitat. Species that require large tracts of habitat (>100 ha in total) score the maximum five points, while species that either show no minimum habitat requirement, or require <1 ha in total, score one point. Species scoring three points or more (require ≥5 ha in total) are deemed area sensitive species. Researchers have shown that for some species of birds, area sensitivity is a rather fluid factor, dependent and varying inversely with the overall percentage forest cover within the landscape surrounding the site where those species are found (Rosenburg *et al.* 1999).

Six of the L3 ranked fauna species and ten of the L4 ranked species that were identified at the study area are considered area sensitive, including four species that require at least 20 ha of habitat. The majority of these species are forest species and as such are well-accommodated by the two largest forest-habitat patches on the site: Sylvan Park and Guild Inn. Both of these



sections of the study area hosted territories for the two accipiter species: Cooper's hawk (*Accipiter cooperii*, L4) and sharp-shinned hawk (L3). The other area-sensitive L3 forest species – pileated woodpecker, pine warbler (*Setophaga pinus*), and wood thrush - were also restricted to these two larger areas and a third forest patch, Cudia Park, which is nearly continuous with the larger patch at Sylvan Park. Slightly less area-sensitive forest species (mainly L4) were well-distributed throughout the forest /successional forest matrix that constitutes much of the study area. Such species include: blue-grey gnatcatcher (*Polioptila caerulea*, 5 territories); great-crested flycatcher (*Myiarchus crinitus*, 8 territories); hairy woodpecker (*Picoides villosus*, 6 territories); and white-breasted nuthatch (*Sitta carolinensis*, 4 territories). Meanwhile, two area-sensitive meadow species – bobolink and eastern meadowlark – are absent from the main meadow habitat component at East Point Park where the meadow is given as just over 20 ha but in fact is diminishing annually due to shrub and successional forest encroachment.

Species' patch-size constraints are due to a variety of factors including foraging requirements and the need for isolation within a habitat block during nesting. In the latter case, regardless of the provision of a habitat patch of sufficient size, if that block is seriously and frequently disturbed by human intrusion, such species will be liable to abandon the site. Such a variety of habitat needs are more likely satisfied within a larger extent of natural cover. The presence of predators such as the two accipiter species, in addition to the two owl species - eastern screech-owl (*Megascops asio*) and great-horned owl (*Bubo virginianus*) – suggests that despite the relatively heavy use of the area, the forest habitat is extensive enough to afford adequate isolation for these sensitive species, in particular the rather shy and elusive sharp-shinned hawk. The continued presence of this latter species was a particularly pleasant discovery in 2011.

Although not scored as area-sensitive, red-backed salamanders (*Plethodon cinereus*, rank of L3) are in fact indirectly area-sensitive in that the forest conditions that they depend upon are much affected by the forest patch size. As a forest patch reduces in size then the forest floor is more liable to become drier as forest-edge conditions become more prevalent. The only location within the study area that was proven to still hold red-backed salamanders was the largest forest patch – Sylvan Park. In fact, this area repeatedly proved to be the most productive forest fauna habitat.

Patch isolation sensitivity in fauna measures the overall response of fauna species to fragmentation and isolation of habitat patches. One of the two main aspects of this scoring criterion is the physical ability or the predisposition of a species to move about within the landscape and is related to the connectivity of habitat within a landscape. The second main aspect is the potential impact that roads have on fauna species that are known to be mobile. Thus most bird species score fairly low for this criterion (although they prefer to forage and move along connecting corridors) whereas many herpetofauna score very high (since their life cycle requires them to move between different habitat types which may increase likelihood of roadkill). By maintaining and improving the connectivity of natural cover within the landscape (e.g. by reforestation of intervening lands) we are able to positively influence the populations of such species, improving their foraging and dispersal potential.



As should be expected all seven of the herp species of urban and regional concern and five of the seven mammals species of urban and regional concern score high for patch isolation sensitivity. The five mammals are quite mobile and therefore are potential road-kill victims, but these species do not undergo the same seasonal migrations as the herpetofauna species and therefore are not exposed to the same extreme pressures in the spring and fall. Six of the herpetofaunal species are mobile, some (e.g. midland painted turtle, *Chrysemys picta marginata*; eastern gartersnake, *Thamnophis sirtalis*; and northern leopard frog) moving considerable distances across the local landscape to and from breeding and wintering habitats. It is possible that the life-cycle requirements of these species are currently satisfied by habitats available within the site boundaries; as yet there have been no road-kill hotspots identified.

One important consideration regarding habitat connectivity concerns migrant fauna, primarily birds but also migrant bats and the Monarch butterfly (*Danaus plexippus*). Connectivity of natural habitat is extremely important for fauna species that migrate over relatively long distances when those species are passing through an otherwise hostile landscape. Long-distance migrants such as song-birds are quite capable of over-flying obstructions in the landscape, but to have to do so puts considerable extra stress on any individuals that have already been forced to make unscheduled migration stops due to poor weather. In such situations the migrating songbirds will require access to adequate foraging opportunities in order to replenish body fat for the next leg of their journeys and access to shelter from local predators. Furthermore, an important component of the fall migration strategy for many bird and bat species is the concept of “coasting”, i.e. following a continuous line of habitat along a shoreline. Presumably this method provides an easy route for first time migrants in the fall and the provision of well-connected natural habitat along the Toronto waterfront would benefit such migrants tremendously.

Fauna species that score greater than three points under the **habitat dependence** criterion are considered habitat specialists (Map 14). These species exhibit a combination of very specific habitat requirements that range from the microhabitat (e.g. decaying logs, aquatic vegetation) and requirements for particular moisture conditions, vegetation structure or spatial landscape structures, to preferences for certain community series and macro-habitat types. Ten fauna species that occur in the study area are considered habitat specialists with six of these being forest specialists. Considering the amount of forest habitat within the study area this seems a rather low number and may reflect the degree of disturbance that is imposed on this highly urban site. This becomes even more apparent when the actual number of individual forest songbirds involved is considered: one pair of pine warblers and two singing male winter wrens, and it is highly likely that the latter were simply summering males. The other forest dependent bird species comprise pileated woodpecker and three raptors, species that are never present in high densities.

A considerably more significant population of one of the other habitat dependent species is present along almost the entire length of the bluff habitat of the Scarborough Shoreline. Bank swallows (*Riparia riparia*, L4) nest here in their hundreds. Taken as one disparate colony this population constitutes an extremely significant fraction of the regional population for this declining species. This species will initiate and maintain colonies in a diverse range of landscapes; however, it is the species' microhabitat requirement that confers a high degree of habitat dependence (and



likewise for its close relative the northern rough-winged swallow, *Stelgidopteryx serripennis*). Bank swallows excavate burrows in the selected cliff, bank or bluff, but the condition of the sediment is very important – soft enough to allow excavation but stable enough to maintain for at least the length of the nesting season. Sites are not necessarily re-used in subsequent years and to some extent the use of sites is unpredictable. However, the sheer number of birds involved at the Scarborough Shoreline study area suggests that the bluffs along the shoreline provide excellent nesting conditions for this species.

Overall, the study area accommodates a fauna that is largely generalist in habitat requirements and this is best illustrated by the very high number of grey catbirds (85 territories) that nest throughout the study area. This species is a classic generalist, selecting shrub nest-sites in all habitat types: forest, forest edge, meadow, wetland edges. For this reason, grey catbird has been a very successful species throughout much of the urban landscape in Toronto; in fact, within this study area, every bird species that is represented by ten or more territories (including red-eyed vireo, *Vireo olivaceus*; eastern wood-pewee, *Contopus virens*; eastern kingbird, *Tyrannus tyrannus*; but excluding bank swallow) is scored as a generalist (1 point) for habitat dependence.

Richness is essentially the presence or absence of species at a site. Beyond mere presence of single species is the idea that a natural system can be considered as a healthy functioning system if there is an association of several species thriving within that system. Each habitat type supports particular species associations. As the quality of the habitat patch improves so will the representation of flora and fauna species within that habitat. In this way representation biodiversity is an excellent measure of the health of a natural system. The presence of a relatively low number of habitat dependent species, in particular, species that are dependent on forest, indicates that the forest habitat in the study area is not functioning at a particularly high level. The same can also be said of the meadow habitat (e.g. at East Point Park), where meadow associated species are under-represented.

5.0 Summary and Recommendations

The recommendations for the Scarborough Shoreline study area are given in relation to the regional targets for natural heritage in the TRCA jurisdiction. To reach the regional targets for quality distribution and quantity of natural cover, every site will require its own individualized plan of action. Following is a short summary of the study area within the regional context, followed by specific recommendations.

5.1 Site Summary

1. The Scarborough Bluffs dominate the shoreline landscape: a spectacular part of the Toronto landscape with a high-quality exposure of Pleistocene geology.



2. The Scarborough Shoreline study area contains a significant fraction (22%) of the total natural cover of the entire jurisdictional shoreline.
3. Scarborough Shoreline has a highly varied topography including steep bluff, ravine, tableland and coastal habitats.
4. One hundred and three vegetation types were observed (very high for an urban site), including mature forest, treed swamp, mineral fen, bluff, dune and beach, and meadow. This diversity is a result of the varied topography and geology noted above.
5. The Scarborough Shoreline has a large area of bluff and coastal habitat: 52.2 ha of bluff and 18.6 ha of beach and dune.
6. The most extensive patch of continuous forest occurs within Sylvan Park, covering in excess of 30 ha. The Guild Inn portion of the study area includes over 20 ha of continuous forest cover. These two areas constitute the richest forest fauna communities on the site.
7. Twenty-two vegetation communities of conservation concern were observed including Switchgrass – Beach Grass Open Sand Dune (L1), Serviceberry – Buffaloberry Shrub Bluff (L2) and Willow Shrub Mineral Fen (L2).
8. Six hundred and twenty-six naturally-occurring flora species were observed of which 94 are species of regional conservation concern (L1 to L3); flora species of concern were associated especially with coastal, prairie, forest, and swamp communities. Total flora species richness and number of species of concern are comparable to high-quality rural sites in the TRCA jurisdiction.
9. Forty-seven of the 205 L1 to L4 plant species are also regionally rare for the TRCA jurisdiction.
10. The prairie and coastal vegetation at East Point Park is particularly significant with almost half of the highest-ranked (L1 and L2) species. Prairie elements are concentrated especially in the meadows in the central part of the park (north section by railway not surveyed in 2011).
11. East Point Park has the only known natural TRCA population of spike blazing-star (a Species at Risk) and ragged fringed orchis; and one of just two known populations of pasture thistle and golden Alexanders.
12. Guild Inn is one of two known locations for hairy St. John's-wort, a new introduction to North America.
13. The total of 88 vertebrate fauna species observed is especially high for a site within the urban landscape, in fact this total is higher than those acquired for several rural sites.



14. The fauna list includes 13 species of regional concern (ranked L1 – L3) - a surprisingly high number for a site within the urban landscape.
15. The site holds considerable significance for nesting bank swallows with several hundred nesting pairs throughout the site. Taken as one disparate colony this population constitutes an extremely significant fraction of the regional population for this declining species, a species that is currently on the priority list of candidate species at risk expected to be assessed by the Committee on the Status of Species at Risk in Ontario (COSSARO).
16. A population of red-backed salamanders – an important forest indicator – was discovered within the forested ravine system of Sylvan Park.
17. Common musk turtle, a Species at Risk, was observed on the site.
18. The extensive natural cover at the site provides foraging and shelter opportunities for large numbers of grounded migrant songbirds in the spring and fall.

5.2 Site Recommendations

In order to maintain a healthy level of biodiversity at the Scarborough Shoreline, the overall integrity of the natural heritage system that includes the site must be protected. Therefore, habitat patch size and shape needs to be optimized so as to provide large enough habitat patches with interior habitat to support sensitive flora and fauna sustainably. In addition, connectivity between natural habitats within and beyond the Scarborough Shoreline must be improved.

Furthermore, at this urban site, habitat quality and integrity must be protected from the negative matrix influences described in the body of the report. This includes managing public use, allowing healthy dynamic natural processes to proceed, and controlling invasive species.

The following recommendations address the above natural heritage concerns, with perhaps an emphasis upon matrix issues given that opportunities for increasing patch size are limited at Scarborough Shoreline. Thus, we recommend overall that 1) existing habitats and features be protected and enhanced; 2) that public use be managed; 3) that invasive species be controlled; and 4) that some further assessment and monitoring should be done.

1. Protect and Enhance Existing Features

The first priority should be to focus on ***maintaining conditions that allow existing communities or species of conservation concern to thrive***. This is especially true of the prairie at East Point Park, and also the beach habitats that are threatened by shoreline hardening. On the other hand, most of the existing breeding bird community makes use of sheltered forest habitat rather than open or coastal vegetation. Therefore, the integrity of the forest patches is also important.



- a. Maintaining the prairie at East Point Park could be achieved through controlling the encroachment of tree and shrub species (both native and exotic) (Gaia EcoConsultants 2004). Prescribed burns as practiced at High Park, perhaps in combination with late fall mowing on a rotation basis, might achieve this goal. East Point Park may need an awareness campaign to garner support for prairie restoration.
- b. If effective mitigation of ground-borne disturbance (e.g. off-leash dogs) is also undertaken at East Point, prairie restoration could also help meadow birds to recover at this site.
- c. Shoreline hardening has been necessary to protect property (and tableland habitat) from erosion along much of the Scarborough Shoreline. Further hardening should be restricted to areas where it is absolutely necessary for erosion protection. Natural shoreline conditions and beach habitats should be maintained, for example, across much of the eastern part of the study area (e.g. East Point Park and vicinity).
- d. The majority of fauna species thriving at the site nest at levels considerably higher than ground-level. Since it is unlikely, given the urban matrix, that significant populations of low-nesting birds can be encouraged to breed successfully, efforts for fauna should be focused on improving the quality of forest habitat where the taller vegetation structure allows for greater nesting opportunities and success for several otherwise sensitive bird species. Increasing forest cover in and around the current forest patches – where the open areas do not support sensitive open-land species, will improve patch size and shape and enhance opportunities for these birds.
- e. The Scarborough Shoreline has a well-connected corridor of natural cover, creating excellent opportunities for the passage of migrant songbirds and Monarch butterflies; further opportunities for improving habitat connectivity should be pursued.
- f. Existing nest boxes and other habitat structures need to be maintained in order to be successful. For example, the nest boxes provided for tree swallows at East Point Park are in a state of disrepair. This installation needs to be formalized, equipped with effective predator guards and properly monitored annually; or removed altogether.
- g. A formal program for the installation of bat-roost boxes should be initiated.



- h. The bays associated with the marina at Bluffers Park provide opportunities for the installation of artificial nest-platform structures for red-necked grebes. Again, the use and success of such structures should be properly monitored; use by introduced swan species (*Cygnus* spp.) should be deterred.
- i. The Bluffers Park marina complex also provides opportunity for the placement of an artificial nesting facility (“hotel”) for purple martins (*Progne subis*).

2. Manage Public Use

Although landscape metrics indicate that matrix influence at the site is positive (“fair” to “good”), this is largely attributable to the positive score given to Lake Ontario. Human traffic (hikers, bikers, dog-walkers) increases considerably throughout the summer and early fall. There is certainly more disturbance to the study area than the matrix scores suggest. **Controlling disturbance associated with urbanization and public land use is also a high priority.** This is especially true for East Point Park, which has a very extensive network of informal trails throughout the open habitat.

- a. Any future trail planning needs to consider the locations of flora and fauna species of concern and to direct visitor pressure away from these areas. Likewise, restoration plantings should target non-sensitive areas.
- b. Dogs should be excluded from the more sensitive areas of Scarborough Shoreline such as East Point Park or at the very least, the leash by-law should be properly enforced.
- c. Installation of boardwalks instead of typical ground-borne trails should be considered as a means of protecting sensitive flora and fauna species that occur or potentially could occur at East Point Park and the Guild Inn.
- d. The existing fence system at Guild Inn, which helps to contain trail use, should be maintained. Some trails at Guild Inn, especially in the forest and swamp to the southwest, should be narrowed and possibly converted to boardwalk.
- e. The digging of wild leek observed at Guild Inn should be prevented through enforcement of relevant municipal by-laws and TRCA policy. This would need to be focused during the leaf-out season in spring when the plants are visible.
- f. Amphibians and reptiles, especially basking snakes, are at risk of road kill from both car and bicycle traffic. Roadkill hotspots should be identified and mitigation measures installed.



3. Control Invasive Species

The Scarborough Shoreline is subject to threats from multiple invasive species, including the emerald ash borer as well as several invasive plants. ***It is essential that well-planned and realistic measures be undertaken to control invasive species.***

- a. Emerald ash borer is a threat to the ash stands at Guild Inn and South Marine Drive Park in particular; where they will be part of a management plan. We recommend that only hazard trees be removed in order to leave opportunities for resistant ash to survive. The impending decline of ash in these areas will also open up opportunities for invasive plant species to grow; thus, we also recommend that proactive control be undertaken before emerald ash borer significantly opens up the canopy. Underplanting with native species should also be considered. Emerald ash borer management, like other activities, should also avoid locations of species of concern.
- b. Localized invasive plant species such as oriental bittersweet, Japanese honeysuckle, Norway maple, and autumn olive should be aggressively targeted for removal while it is still feasible to do so. Cutting and use of glyphosate-based herbicides on cut stumps may be a successful course of action.
- c. More abundant invasive species such as dog-strangling vine and common reed cannot be realistically removed. Instead, the problem should be contained through controlling sources of disturbance such as erosion (in forests), nutrient input, and trampling. Competitive and screening plantings may play a role in containing exotic invasions, and biological control may act in the longer term.
- d. Disturbed wetlands that are invaded by common reed (and hybrid cattail monotypic stands) may be suitable for intensive restoration activities (e.g. involving changing water levels, excavation and grading, habitat creation) depending on the presence or absence of existing sensitive fauna species (e.g. turtles and frogs).
- e. The Scarborough Shoreline, especially but not only East Point Park, should be considered as a trial site for release of biological controls for dog-strangling vine.



4. Further Assessment and Monitoring

In order to address some remaining questions as well as to assess the efficacy of habitat protection and restoration work, certain aspects of ***the Scarborough Shoreline should be subject to further assessment and monitoring.***

- a. The TRCA's long-term monitoring plots at the Scarborough Waterfront should be continued as part of the regional program.
- b. The status of the Threatened common musk turtle at Bluffers Park should be properly assessed since this could have considerable implications for management and use at this site.
- c. Monitoring for amphibian and reptile roadkill hotspots on any of the paved surfaces along the waterfront needs to be conducted so as to enable planning for mitigation measures.
- d. Populations of sensitive prairie and coastal plants (for example the Threatened spike blazing-star) should be monitored with attention to correcting potential problems such as decline before they become irreversible.



6.0 References

- Banks P.B. and Bryant J.V. 2007. ***Four-legged friend or foe? Dog walking displaces native birds from natural areas.*** *Biology Letters* (2007) 3. 611-613. Available on-line at: <http://rsbl.royalsocietypublishing.org/content/3/6/611.full.pdf> [Accessed 8 January 2010].
- Cadman M.D., Sutherland D.A., Beck G.G., Lepage D., and Couturier A.R. (eds). 2007. ***Atlas of the Breeding Birds of Ontario, 2001 – 2005.*** Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp.
- Catling P.M. and McKay S.M. 1974. ***An interesting association of plants along a railway track at West Hill, Ontario.*** *Ontario Field Biologist* 28(74): 48-51.
- City of Toronto 2001. ***City of Toronto Natural Heritage Study – final report.*** City of Toronto and Toronto Region Conservation Authority.
- City of Toronto 2004. ***Coronation Drive Natural Heritage Review.*** City of Toronto, Coronation Drive Employment District Landowners, and Toronto Region Conservation Authority.
- Eyles N. 2004. ***Toronto Rocks: the geological legacy of the Toronto Region.*** Markham, ON: Fitzhenry and Whiteside.
- Gaia EcoConsultants. 2004. ***East Point Park Draft Management Plan.*** City of Toronto, Parks and Recreation Natural Environment and Horticulture Section.
- Gutzwiller K.J. and Anderson S.H. 1999. ***Spatial extent of human-intrusion effects on subalpine bird distributions.*** *Condor* 101:378-389.
- Heydon P.A., Miller G.C., and Oldham M.J. 201x (in press). ***Hairy St. John's-wort (Hypericum hirsutum L.) in the Toronto area, new to North America.*** *Canadian Field-Naturalist* xxx(x): xxx-xxx.
- Kilgour B. 2003. ***Landscape and patch character as a determinant of occurrence of eighty selected bird species in the Toronto area.*** A report prepared for the TRCA. Jacques-Whitford Ltd.
- Kricsfalusy V.V. and Miller G.C. 2010. ***Community ecology and invasion of natural vegetation by Cynanchum rossicum (Asclepiadaceae) in the Toronto region, Canada.*** *Thaiszia - J. Bot., Košice*, 20: 53-70, 2010.
- Lee H., Bakowsky W.D., Riley J., Bowles J., Puddister M., Uhlig P. and McMurray S. 1998. ***Ecological land classification for southern Ontario: first approximation and its***

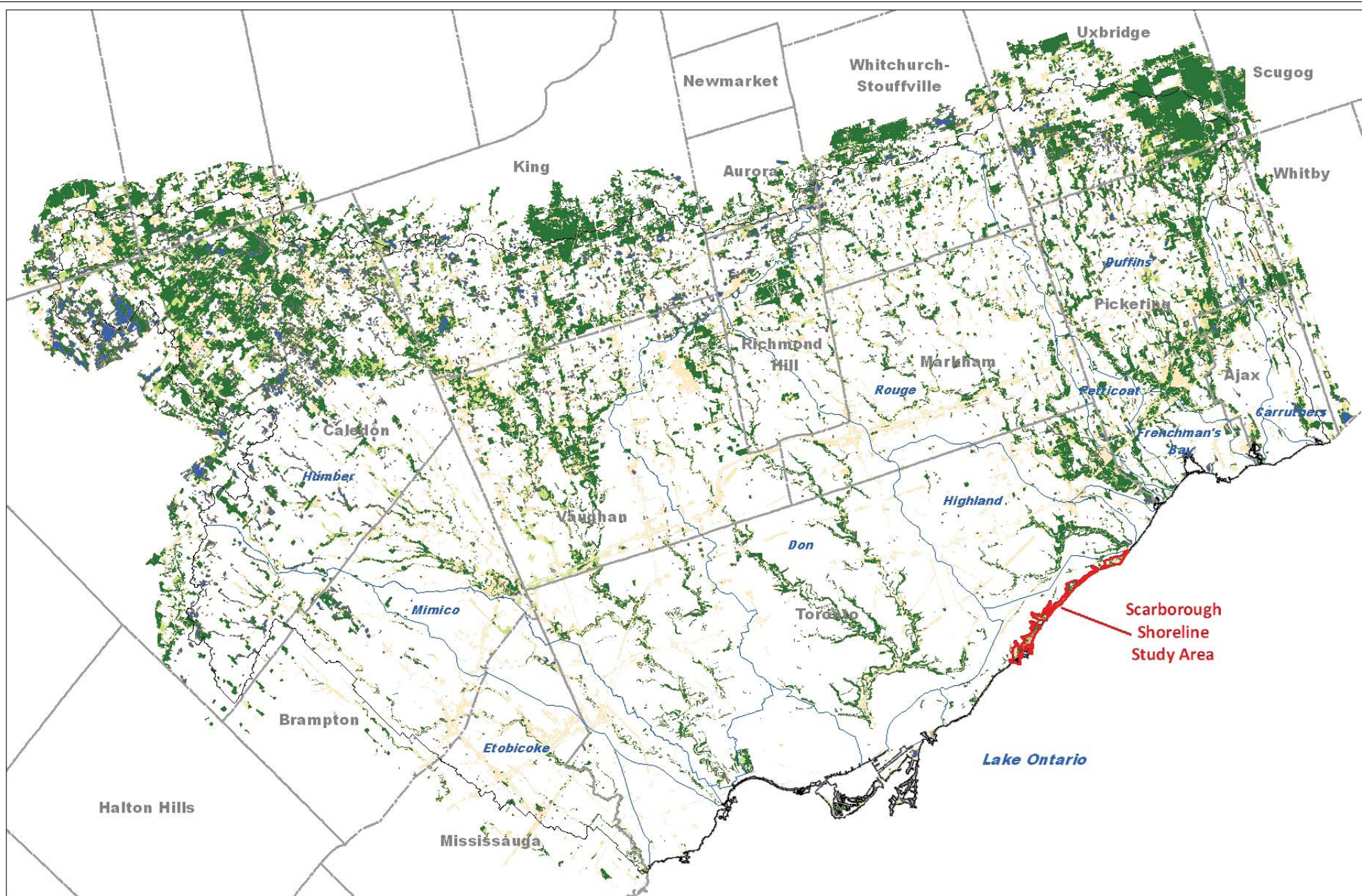


- application.** Peterborough, Ontario: Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch.
- Marshall, Macklin, Monaghan. 1997. **East Point Park Environmental Planning Update.** Prepared for Metro Toronto Parks and Culture.
- NHIC [Ontario Natural Heritage Information Centre] 2008. Natural Heritage Information website. Available on-line at: http://nhic.mnr.gov.on.ca/nhic_cfm [Accessed 14 February 2011].
- OMNR [Ontario Ministry of Natural Resources] 2011. **Invasive Phragmites – Best Management Practices.** Ontario Ministry of Natural Resources, Peterborough, Ontario. Version 2011. 17 pp.
- OMNR [Ontario Ministry of Natural Resources] 2012. **Species At Risk in Ontario (SARO) List.** Available on-line at: <http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/276722.html> [Accessed 23 January 2012].
- Rosenburg K.V., Rohrbaugh R.W. Jr., Barker S.E., Hames R.S. and Dhondt A.A. 1999. **A land manager's guide to improving habitat for scarlet tanagers and other forest-interior birds.** Ithaca, NY: The Cornell Lab of Ornithology.
- TRCA 2002. **Guild Inn Biological Inventory and Impact Assessment.** Toronto Region Conservation Authority.
- TRCA 2007a. **The Terrestrial Natural Heritage System Strategy.** Toronto Region Conservation Authority.
- TRCA 2007b. **Setting Terrestrial Natural Heritage System Targets.** Toronto Region Conservation Authority.
- TRCA 2007c. **Evaluating and Designing Terrestrial Natural Heritage Systems.** Toronto Region Conservation Authority.
- TRCA 2007d. **Terrestrial Natural Heritage Program Data Collection Methodology.** Toronto Region Conservation Authority.
- TRCA 2008. **Dog-strangling vine – Cynanchum rossicum (Kleopow) Borhidi: a review of distribution, ecology and control of this invasive plant.** Toronto and Region Conservation Authority.
- TRCA 2010. **Vegetation Community and Species Ranking and Scoring method.** Toronto Region Conservation Authority.



- TRCA 2011a. **Port Union Waterfront Park Study Area: terrestrial biological inventory and assessment.** Toronto Region Conservation Authority.
- TRCA 2011b. **Brock Lands: terrestrial biological inventory and assessment.** Toronto Region Conservation Authority.
- Weed A.S. and Casagrande R.A. 2010. **Biology and larval feeding impact of *Hypena opulenta* (Christoph) (Lepidoptera: Noctuidae): A potential biological control agent for *Vincetoxicum nigrum* and *V. rossicum*.** Biological Control 53(2): 214-222.
- Yates C.N. and Murphy S.D. 2008. **Observations of herbivore attack on garlic mustard (*Alliaria petiolata*) in southwestern Ontario, Canada.** Biol Invasions 10:757-760.






Date: January 2012

* Landscape analysis based on 2007/2008 Orthophotography


Map 1: Scarborough Shoreline Study Area in the Context of Regional Natural Cover

Natural Cover *		Legend	
	Forest		Scarborough Shoreline Study Area
	Successional		TRCA Jurisdiction
	Meadow		Watershed
	Wetland		Municipal Boundary
	Beach/Bluff		





TORONTO AND REGION
Conservation
for The Living City





0 250 500 1,000 1,500 2,000
 Meters

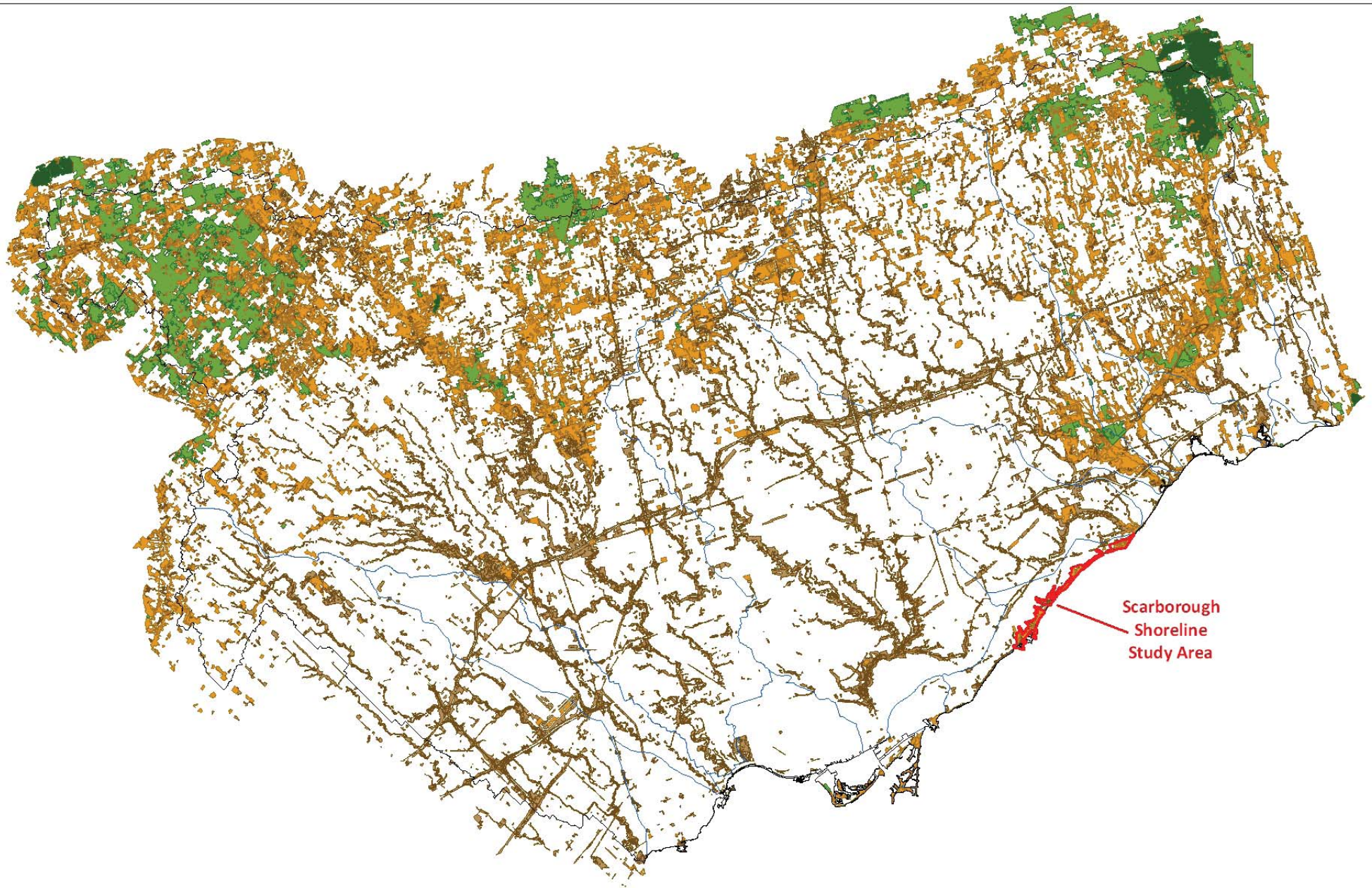
Date: January 2012
 Orthophoto: Spring 2005-2010, First Base Solutions Inc.

Map 2:
Scarborough Shoreline
Study Area with Major
Landmarks Discussed in Text

Legend

 Scarborough Shoreline Boundary

 Park Location



Scarborough
Shoreline
Study Area



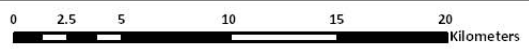
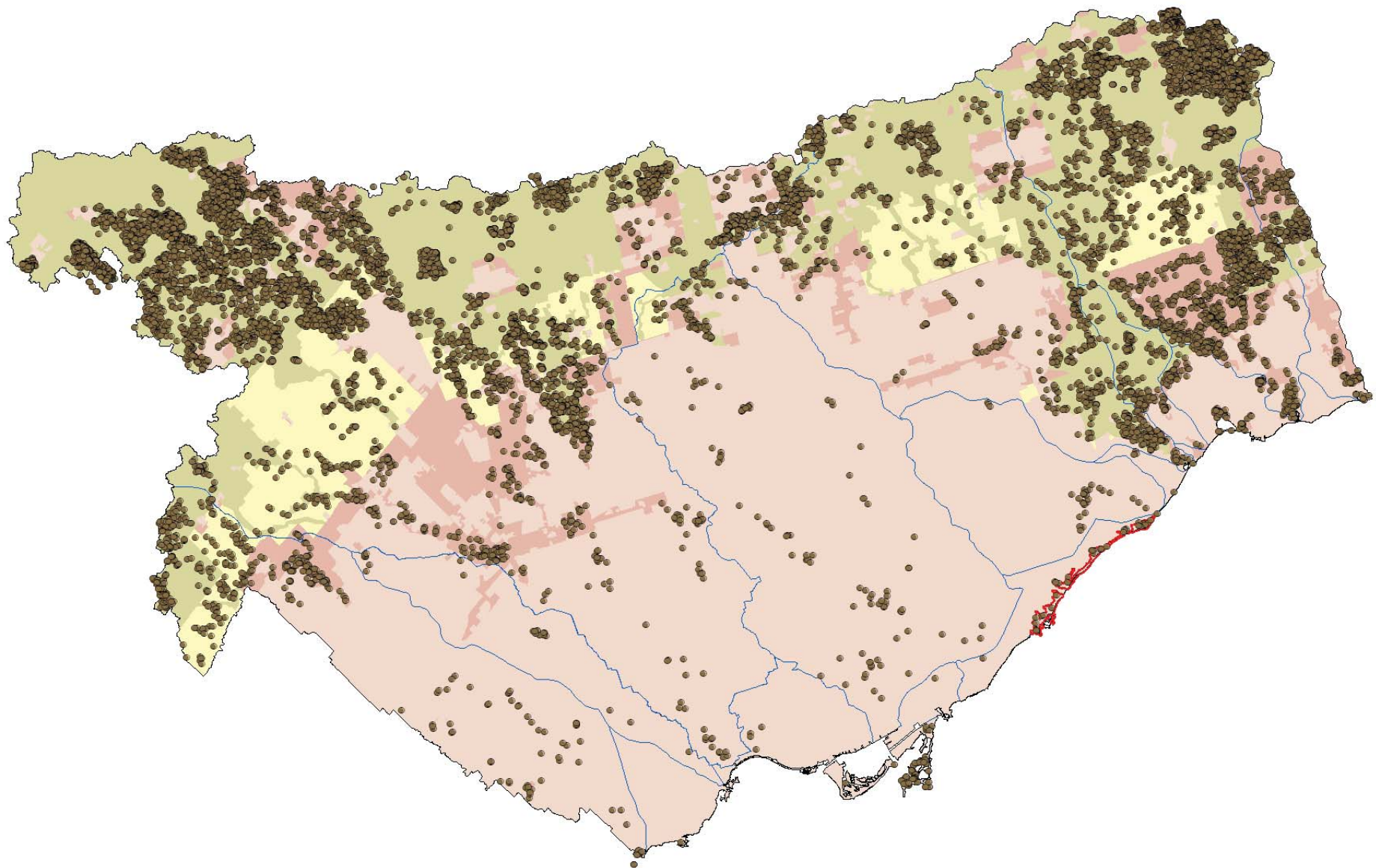
Map 3: Regional Natural System Habitat Patch Quality

Habitat Patch Quality *

- L1 - Excellent
- L2 - Good
- L3 - Fair
- L4 - Poor
- L5 - Very Poor

Legend

- Scarborough Shoreline Study Area
- TRCA Jurisdiction
- Watershed



Date: January 2012

Map 4:
Distribution of Fauna
Regional Species of Concern

- Legend**
- Fauna Species of Concern (L1 - L3)
 - Scarborough Shoreline Study Area
 - TRCA Jurisdiction
 - Watershed
 - Agricultural & Rural Area
 - Built-up Area
 - Designated Greenfield Area
 - Greenbelt Area



Fauna Area Sensitivity Scores

- ▲ 5 - >100ha
- ▲ 4 - >20ha
- ▲ 3 - > 5ha
- ▲ 2 - > 1ha
- ▲ 1 - < 1ha

- △ Fauna Species
- Frog Species

Habitat Patch Size Scores *

- 5 - Excellent
- 4 - Good
- 3 - Fair
- 2 - Poor
- 1 - Very Poor



0 250 500 1,000 1,500 2,000 Meters

Date: January 2012
 Orthophoto: Spring 2005-2010, First Base Solutions Inc.
 * Landscape analysis based on 2007/2008 Orthophotography

**Map 5:
 Habitat Patch Size
 Scores with Fauna Area
 Sensitivity Scores**

Legend

- Scarborough Shoreline Study Area

NOTE: All fauna species with their associated scores for area sensitivity can be found in Appendix #3.








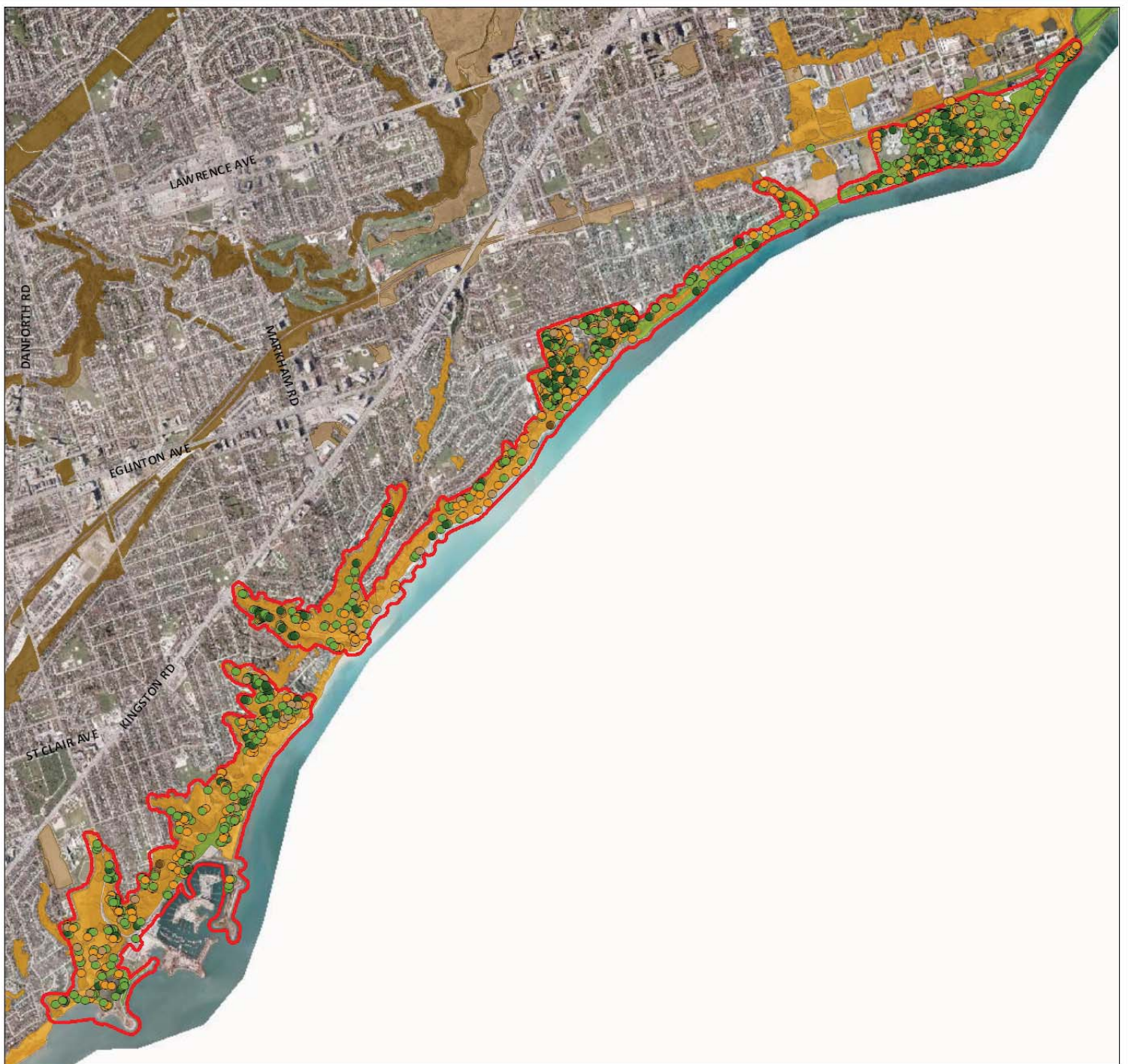
0 250 500 1,000 1,500 2,000
 Meters

Date: January 2012
 Orthophoto: Spring 2005-2010, First
 Base Solutions Inc.
 * Landscape analysis based on 2007/2008
 Orthophotography

Map 6: Interior Forest at Scarborough Shoreline

Legend

-  Scarborough Shoreline Study Area
-  Forest
- Forest Interior
 -  100m-200m
 -  200m-300m
 -  300m-400m



Flora Sensitivity to Development Scores

- 5 - Species receives severe negative impact from development-related disturbances
- 4 - Species receives moderately severe negative impact from development-related disturbances
- 3 - Species receives significant negative impact from development-related disturbances
- 2 - Species receives slight negative impact from development-related disturbances
- 1 - Species experiences no overall benefit or detriment from development-related disturbances (neutral)
- 0 - Species benefits significantly from development-related disturbances

NOTE: All flora species with their associated scores for sensitivity to development can be found in Appendix #2.

○ Flora Species

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0 250 500 1,000 1,500 2,000
Meters

Date: January 2012

Orthophoto: Spring 2005-2010, First Base Solutions Inc.

* Landscape analysis based on 2007/2008 Orthophotography

**Map 7:
Scores for Matrix Influence
and Flora Sensitivity to
Development**

Legend

Habitat Matrix Influence Scores *

- 5 - Excellent
- 4 - Good
- 3 - Fair
- 2 - Poor
- 1 - Very Poor

▭ Scarborough Shoreline Study Area



Fauna Sensitivity to Development Scores

- ▲ ■ 5 - Species receives severe negative impact from development-related disturbances
- ▲ ■ 4 - Species receives moderately severe negative impact from development-related disturbances
- ▲ ■ 3 - Species receives significant negative impact from development-related disturbances
- ▲ ■ 2 - Species receives slight negative impact from development-related disturbances
- ▲ ■ 1 - Species experiences no overall benefit or detriment from development-related disturbances (neutral)
- ▲ ■ 0 - Species benefits significantly from development-related disturbances

NOTE: All fauna species with their associated scores for sensitivity to development can be found in Appendix #3.

- △ Fauna Species
- Frog Species



Map 8:
Scores for Matrix Influence
and Fauna Sensitivity to
Development

Legend

Habitat Matrix Influence Scores *

- 5 - Excellent
- 4 - Good
- 3 - Fair
- 2 - Poor
- 1 - Very Poor

- Scarborough Shoreline Study Area



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0 250 500 1,000 1,500 2,000
 Meters

Date: January 2012
 Orthophoto: Spring 2005-2010, First Base Solutions Inc.
 * Landscape analysis based on 2007/2008
 Orthophotography

Map 9: Habitat Patch Quality

Legend

Habitat Patch Quality *

- L1 - Excellent
- L2 - Good
- L3 - Fair
- L4 - Poor
- L5 - Very Poor

Scarborough Shoreline Study Area



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0 250 500 1,000 1,500 2,000
 Meters


Date: January 2012
 Orthophoto: Spring 2005-2010, First Base
 Solutions Inc.

Map 10: Vegetation Communities with their Associated Local Ranks

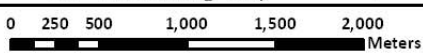
Legend

Vegetation Community Ranks

	L1		L4
	L2		L5
	L3		L+

 Scarborough Shoreline
 Study Area

NOTE: All vegetation communities with their associated scores and ranks can be found in Appendix #1.




Date: January 2012
 Orthophoto: Spring 2005-2010, First Base
 Solutions Inc.

Map 11: Location of Flora Species of Concern

Legend

Flora Species of
Concern (L1-L4)

- L1
- L2
- L3
- L4

 Scarborough Shoreline Study Area



Flora Habitat Dependence Scores

- 5 - Extreme habitat specialist
- 4 - Strong habitat specialist
- 3 - Moderate habitat specialist
- 2 - Moderate habitat generalist
- 1 - Strong habitat generalist
- 0 - Extreme habitat generalist

○ Flora Species

NOTE: All flora species with their associated scores for habitat dependence can be found in Appendix #2.

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0 250 500 1,000 1,500 2,000
 Meters



Date: January 2012
 Orthophoto: Spring 2005-2010, First Base Solutions Inc.

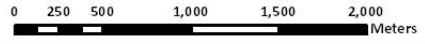
**Map 12:
 Flora Species Habitat
 Dependence Scores**

Legend

 Scarborough Shoreline Study Area






Date: January 2012
 Orthophoto: Spring 2005-2010, First Base Solutions Inc.

Map 13: Location of Fauna Species of Concern

Legend

<p>Fauna Species of Concern</p> <ul style="list-style-type: none"> ▲ L1 ▲ L3 ▲ L2 ▲ L4 	<p>Frog Species of Concern</p> <ul style="list-style-type: none"> ■ L1 ■ L3 ■ L2 ■ L4
---	--

 Scarborough Shoreline Study Area



Fauna Habitat Dependence Scores

- ▲ 5 - Extreme habitat specialist
- ▲ 4 - Strong habitat specialist
- ▲ 3 - Moderate habitat specialist
- ▲ 2 - Moderate habitat generalist
- ▲ 1 - Strong habitat generalist
- ▲ 0 - Extreme habitat generalist

NOTE: All fauna species with their associated scores for habitat dependence can be found in Appendix #3.

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0 250 500 1,000 1,500 2,000
Meters

Date: January 2012
Orthophoto: Spring 2005-2010, First Base Solutions Inc.

**Map 14:
Fauna Species
Habitat Dependence
Scores**

Legend

- Scarborough Shoreline Study Area
- △ Fauna Species
- Frog Species

Appendix 1: Scarborough Waterfront Vegetation Communities - 2011						
ELC Code	Vegetation Type (* indicates present as inclusion and/or complex only)	Tot. area # ha	Scores			Local Rank (2010-04)
			Local Occur.	Geophy. Requir.	Total Score	
Forest						
FOM3-2	Dry-Fresh Hemlock - Sugar Maple Mixed Forest	0.3	2.5	2.0	4.5	L4
FOM4-1	Dry-Fresh White Cedar - Paper Birch Mixed Forest	0.3	3.5	1.0	4.5	L4
FOM6-1	Fresh-Moist Sugar Maple - Hemlock Mixed Forest	2.7	1.5	2.0	3.5	L4
FOM8-B	Fresh-Moist Hardwood Mixed Forest	0.4	3.5	2.0	5.5	L3
FOD2-3	Dry-Fresh Hickory Deciduous Forest	0.3	4.0	1.0	5.0	L3
FOD2-4	Dry-Fresh Oak - Hardwood Deciduous Forest	0.5	2.5	2.0	4.5	L4
FOD3-1	Dry-Fresh Poplar Deciduous Forest	0.2	2.0	2.0	4.0	L4
FOD3-2	Dry-Fresh Paper Birch Deciduous Forest	0.5	2.5	1.0	3.5	L4
FOD4-1	Dry-Fresh Beech Deciduous Forest	0.1	2.5	1.0	3.5	L4
FOD4-A	Dry-Fresh Ironwood Deciduous Forest	0.2	3.5	1.0	4.5	L4
FOD4-d	Dry-Fresh Norway Maple Deciduous Forest	0.3	3.5	0.0	3.5	L+
FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest	0.8	1.0	0.0	1.0	L5
FOD5-2	Dry-Fresh Sugar Maple - Beech Deciduous Forest	18.0	1.5	0.0	1.5	L5
FOD5-3	Dry-Fresh Sugar Maple - Oak Deciduous Forest	2.7	1.5	2.0	3.5	L4
FOD5-4	Dry-Fresh Sugar Maple - Ironwood Deciduous Forest	1.2	2.5	0.0	2.5	L5
FOD5-6	Dry-Fresh Sugar Maple - Basswood Deciduous Forest	0.7	2.5	0.0	2.5	L5
FOD5-8	Dry-Fresh Sugar Maple - White Ash Deciduous Forest	1.1	1.5	0.0	1.5	L5
FOD5-10	Dry-Fresh Sugar Maple - Paper Birch - Poplar Deciduous Forest	0.6	2.5	1.0	3.5	L4
FOD5-b	Dry-Fresh Sugar Maple - Norway Maple Deciduous Forest	0.5	3.5	0.0	3.5	L4
FOD6-1	Fresh-Moist Sugar Maple - Ash Deciduous Forest	4.4	2.0	0.0	2.0	L5
FOD6-5	Fresh-Moist Sugar Maple - Hardwood Deciduous Forest	5.1	1.5	0.0	1.5	L5
FOD7-2	Fresh-Moist Ash Deciduous Forest	5.5	1.5	1.0	2.5	L5
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest	3.1	2.0	0.0	2.0	L5

Appendix 1: Scarborough Waterfront Vegetation Communities - 2011						
ELC Code	Vegetation Type (* indicates present as inclusion and/or complex only)	Tot. area # ha	Scores			Local Rank (2010-04)
			Local Occur.	Geophy. Requir.	Total Score	
FOD7-4	Fresh-Moist Black Walnut Lowland Deciduous Forest	1.9	2.5	1.0	3.5	L4
FOD7-a	Fresh-Moist Manitoba Maple Lowland Deciduous Forest	9.1	1.5	0.0	1.5	L5
FOD7-b	Fresh-Moist Norway Maple Deciduous Forest	0.4	3.5	0.0	3.5	L+
FOD7-E	Fresh-Moist Hawthorn - Apple Deciduous Forest	3.8	3.0	0.0	3.0	L4
FOD7-F	Fresh-Moist Basswood Lowland Deciduous Forest	0.8	3.0	1.0	4.0	L4
FOD8-1	Fresh-Moist Poplar Deciduous Forest	10.7	1.0	0.0	1.0	L5
FOD8-B	Fresh-Moist Paper Birch Deciduous Forest	5.6	3.0	0.0	3.0	L4
FOD9-1	Fresh-Moist Oak - Sugar Maple Deciduous Forest	1.0	3.5	2.0	5.5	L3
CUP1-4	Hybrid Poplar Deciduous Plantation	1.0	3.0	0.0	3.0	L5
CUP1-A	Restoration Deciduous Plantation	1.7	2.5	0.0	2.5	L5
CUP1-b	Willow Deciduous Plantation	1.0	3.5	0.0	3.5	L5
CUP1-c	Black Locust Deciduous Plantation	4.5	2.5	0.0	2.5	L+
CUP2-A	Restoration Mixed Plantation	1.1	2.5	0.0	2.5	L5
CUP2-b	Black Locust - Conifer Mixed Plantation	0.4	3.5	0.0	3.5	L+
CUP2-c	Norway Maple - Conifer Mixed Plantation	1.9	3.5	0.0	3.5	L+
CUP2-E	Silver Maple - Conifer Mixed Plantation	1.7	3.5	0.0	3.5	L5
CUP2-f	Hybrid Poplar - Conifer Mixed Plantation	0.4	3.5	0.0	3.5	L5
CUP2-h	Horticultural Mixed Plantation	0.4	3.5	0.0	3.5	L+
CUP3-G	White Cedar Coniferous Plantation	0.4	2.5	0.0	2.5	L5
*CUP3-H	*Mixed Conifer Coniferous Plantation		1.5	0.0	1.5	L5
Successional						
CUT1-1	Sumac Deciduous Thicket	4.6	2.0	0.0	2.0	L5
CUT1-A1	Native Deciduous Sapling Regeneration Thicket	0.4	2.0	0.0	2.0	L5
CUT1-c	Exotic Deciduous Thicket	3.5	2.0	0.0	2.0	L+
CUT1-E	Red Osier Dogwood Deciduous Thicket	11.2	3.0	0.0	3.0	L4
CUT1-G	Willow Deciduous Thicket	4.1	4.5	0.0	4.5	L4
CUH1-A	Treed Hedgerow	0.4	1.5	0.0	1.5	L5
CUH1-d	Exotic Shrub Hedgerow	0.1	3.5	0.0	3.5	L+

Appendix 1: Scarborough Waterfront Vegetation Communities - 2011						
ELC Code	Vegetation Type (* indicates present as inclusion and/or complex only)	Tot. area # ha	Scores			Local Rank (2010-04)
			Local Occur.	Geophy. Requir.	Total Score	
CUT1-H	Ninebark Planted Deciduous Thicket	0.05	5.0	0.0	5.0	L5
CUS1-2A	White Cedar Successional Savannah	0.2	2.5	1.0	3.5	L4
CUS1-A1	Native Deciduous Successional Savannah	2.8	1.5	0.0	1.5	L5
CUS1-b	Exotic Successional Savannah	1.5	1.5	0.0	1.5	L+
CUW1-A1	White Cedar Successional Woodland	0.4	2.5	1.0	3.5	L4
CUW1-A3	Native Deciduous Successional Woodland	10.0	1.5	0.0	1.5	L5
CUW1-b	Exotic Successional Woodland	4.1	1.5	0.0	1.5	L+
CUW1-D	Hawthorn Successional Woodland	1.7	2.5	0.0	2.5	L5
Wetland						
SWM1-1	White Cedar - Hardwood Mineral Mixed Swamp	0.6	2.0	2.0	4.0	L4
*SWMA-A	*Red Ash - Hemlock Mineral Mixed Swamp		4.5	2.0	6.5	L2
SWD2-2	Red (Green) Ash Mineral Deciduous Swamp	5.8	2.5	2.0	4.5	L4
SWD3-2	Silver Maple Mineral Deciduous Swamp	0.3	2.5	2.0	4.5	L4
SWD3-3	Swamp Maple Mineral Deciduous Swamp	1.2	2.5	2.0	4.5	L4
SWD4-1	Willow Mineral Deciduous Swamp	0.5	2.0	1.0	3.0	L4
SWD4-3	Paper Birch - Poplar Mineral Deciduous Swamp	0.1	2.0	2.0	4.0	L4
SWT2-2	Willow Mineral Thicket Swamp	4.4	2.0	2.0	4.0	L4
SWT2-5	Red-osier Mineral Thicket Swamp	0.3	2.0	2.0	4.0	L4
MAM5-1	Mineral Fen Meadow Marsh	0.1	3.5	3.0	6.5	L2
FES2-A	Willow Shrub Mineral Fen	0.04	5.0	3.0	8.0	L2
*MAM2-9	*Jewelweed Mineral Meadow Marsh		2.0	1.0	3.0	L4
MAM2-10	Forb Mineral Meadow Marsh	0.8	1.5	1.0	2.5	L5
MAM2-a	Common Reed Mineral Meadow Marsh	4.3	3.0	0.0	3.0	L+
*MAM2-C	*Rush Mineral Meadow Marsh		3.5	2.0	5.5	L3
MAS2-1b	Narrow-Leaved Cattail Mineral Shallow Marsh	1.2	2.0	0.0	2.0	L+
MAS2-2	Bulrush Mineral Shallow Marsh	0.1	3.0	1.0	4.0	L4
MAS2-7	Bur-reed Mineral Shallow Marsh	0.03	3.5	2.0	5.5	L3
MAS2-a	Common Reed Mineral Shallow Marsh	1.7	3.0	0.0	3.0	L+

Appendix 1: Scarborough Waterfront Vegetation Communities - 2011						
ELC Code	Vegetation Type (* indicates present as inclusion and/or complex only)	Tot. area # ha	Scores			Local Rank (2010-04)
			Local Occur.	Geophy. Requir.	Total Score	
Aquatic						
SAS1-1	Pondweed Submerged Shallow Aquatic	0.6	2.0	2.0	4.0	L4
SAM1-A	Water Lily - Bullhead Lily Mixed Shallow Aquatic	0.3	3.0	2.0	5.0	L3
OA01	Open Aquatic (deep or riverine unvegetated)	0.3	1.5	0.0	1.5	L5
OA01-T	Turbid Open Aquatic (disturbed unvegetated)	2.4	2.0	0.0	2.0	L+
Dynamic (Beach, Bluff, Barren, Prairie, Savannah)						
BBO1	Mineral Open Beach	3.0	3.0	2.0	5.0	L3
BBO1-1	Sea Rocket Open Sand Beach	4.4	3.5	3.0	6.5	L2
BBO2-A	Rubble Open Shoreline	6.2	3.5	0.0	3.5	L5
BBS1-2A	Willow Shrub Beach	2.1	5.0	3.0	8.0	L4
BBT1-A	Mineral Treed Beach	0.3	5.0	2.0	7.0	L2
BBT2-A	Rubble Treed Shoreline	1.4	4.0	0.0	4.0	L4
SDO1-1	Switchgrass - Beachgrass (- Little Bluestem) Open Sand Dune	0.3	4.5	5.0	9.5	L1
SDS1-A	Willow Shrub Sand Dune	0.3	4.0	2.0	6.0	L3
SDT1-2	Balsam Poplar Treed Sand Dune	0.5	4.5	3.0	7.5	L2
BLO1	Mineral Open Bluff	11.4	2.5	2.0	4.5	L4
BLS1-A	Sumac - Willow - Cherry Shrub Bluff	27.5	3.5	2.0	5.5	L3
BLS1-B	Serviceberry - Buffaloberry Shrub Bluff	1.5	4.5	3.0	7.5	L2
BLT1-B	Deciduous Treed Bluff	8.9	3.5	2.0	5.5	L3
BLT1-c	Exotic Treed Bluff	3.0	3.5	2.0	5.5	L+
*CBO1	*Open Clay Barren		4.0	4.0	8.0	L2
CBS1	Shrub Clay Barren	0.1	3.5	4.0	7.5	L2
CBT1-A	White Cedar Low Treed Clay Barren	0.04	4.5	3.5	8.0	L2
SBO2	Anthropogenic Sand / Gravel Barren	0.1	4.5	0.0	4.5	L4
TPO2-A	Fresh-Moist Tallgrass Prairie Planting	0.3	5.0	1.0	6.0	L5

Appendix 1: Scarborough Waterfront Vegetation Communities - 2011						
ELC Code	Vegetation Type (* indicates present as inclusion and/or complex only)	Tot. area # ha	Scores			Local Rank (2010-04)
			Local Occur.	Geophy. Requir.	Total Score	
Meadow						
CUM1-A	Native Forb Meadow	13.9	1.5	0.0	1.5	L5
CUM1-b	Exotic Cool-season Grass Graminoid Meadow	4.9	1.0	0.0	1.0	L+
CUM1-c	Exotic Forb Meadow	7.2	1.5	0.0	1.5	L+

SUMMARY OF VEGETATION COMMUNITY STATISTICS

Number of all Vegetation Types	103
Number of Forest Communities	43
(Number of Natural Forest Communities)	31
(Number of Plantation Forest Communities)	12
Number of Successional Communities	15
Number of Wetland Communities	19
Number of Aquatic Communities	4
Number of Dynamic Communities	19
Number of Meadow Communities	3
Area of all Vegetation Types (hectares)	264.6
Area of Forest Communities	97.3
(Area of Natural Forest Communities)	82.8
(Area of Plantation Forest Communities)	14.5
Area of Successional Communities	45.1
Area of Wetland Communities	21.4
(Area of Treed Swamp)	8.6
Area of Aquatic Communities	3.6
Area of Dynamic Communities	71.4
(Area of Beach and Dune)	18.6
(Area of Bluff)	52.2
Area of Meadow Communities	25.9
Number of L1-L3 Communities	21
Number of L4 Communities	34
Area of L1-L3 Communities (hectares)	49.1
Area of L4 Communities (hectares)	65.5

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Liatriis spicata</i>	spike blazing-star	5	4	5	5	19	L1
<i>Pedicularis canadensis</i>	wood-betony	4	5	5	5	19	L1
<i>Platanthera lacera</i>	ragged fringed orchis	5	4	5	5	19	L1
<i>Potamogeton richardsonii</i>	redhead pondweed	4	5	5	5	19	L1
<i>Cakile edentula</i>	sea-rocket	4	4	5	4	17	L2
<i>Carex grayi</i>	Gray's sedge	4	5	4	4	17	L2
<i>Cirsium discolor</i>	pasture thistle	5	5	4	4	18	L2
<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	larger yellow lady's slipper	4	4	5	4	17	L2
<i>Euphorbia polygonifolia</i>	seaside spurge	5	4	5	4	18	L2
<i>Gentiana andrewsii</i> f. <i>alba</i>	white bottle gentian	5	4	4	5	18	L2
<i>Gentianopsis crinita</i>	fringed gentian	4	4	5	5	18	L2
<i>Heliopsis helianthoides</i>	ox-eye	5	5	4	4	18	L2
<i>Lathyrus japonicus</i>	beach pea	5	4	5	4	18	L2
<i>Pyrola asarifolia</i>	pink pyrola	3	4	5	5	17	L2
<i>Quercus alba</i>	white oak	3	5	4	5	17	L2
<i>Spiranthes lucida</i>	shining ladies' tresses	4	4	5	5	18	L2
<i>Acer x freemanii</i>	hybrid swamp maple	5	3	5	2	15	L3
<i>Agalinis tenuifolia</i>	slender gerardia	3	4	5	4	16	L3
<i>Alnus incana</i> ssp. <i>rugosa</i>	speckled alder	2	4	4	5	15	L3
<i>Anaphalis margaritacea</i>	pearly everlasting	3	4	4	3	14	L3
<i>Andropogon gerardii</i>	big bluestem	4	2	4	4	14	L3
<i>Anemone acutiloba</i>	sharp-lobed hepatica	2	4	4	5	15	L3
<i>Aquilegia canadensis</i>	wild columbine	2	4	3	5	14	L3
<i>Artemisia campestris</i> ssp. <i>caudata</i>	beach wormwood	4	4	4	4	16	L3
<i>Bromus ciliatus</i>	fringed brome grass	2	4	4	5	15	L3
<i>Carex alopecoidea</i>	foxtail wood sedge	2	3	5	4	14	L3
<i>Carex cephaloidea</i>	thin-leaved sedge	3	3	5	3	14	L3
<i>Carex eburnea</i>	bristle-leaved sedge	3	4	4	4	15	L3
<i>Carex lupulina</i>	hop sedge	2	4	4	4	14	L3
<i>Carex pallescens</i>	pale sedge	3	3	5	3	14	L3
<i>Carex platyphylla</i>	broad-leaved sedge	3	4	4	3	14	L3
<i>Carex tuckermanii</i>	Tuckerman's sedge	2	4	4	4	14	L3

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Carex viridula</i> ssp. <i>viridula</i>	greenish sedge	3	3	5	5	16	L3
<i>Carya ovata</i>	shagbark hickory	2	4	4	4	14	L3
<i>Celastrus scandens</i>	American bittersweet	2	4	3	5	14	L3
<i>Ceratophyllum demersum</i>	coontail	2	3	5	4	14	L3
<i>Chelone glabra</i>	turtlehead	2	3	4	5	14	L3
<i>Cinna arundinacea</i>	tall wood reed	3	4	4	3	14	L3
<i>Claytonia caroliniana</i>	broad-leaved spring beauty	2	4	5	5	16	L3
<i>Cornus amomum</i> ssp. <i>obliqua</i>	silky dogwood	3	3	5	3	14	L3
<i>Cyperus odoratus</i>	fragrant umbrella-sedge	5	2	5	4	16	L3
<i>Cypripedium parviflorum</i> var. <i>makasin</i>	smaller yellow lady's slipper	3	4	4	5	16	L3
<i>Cystopteris tenuis</i>	Mackay's fragile fern	2	4	5	5	16	L3
<i>Desmodium glutinosum</i>	pointed-leaved tick-trefoil	3	4	4	5	16	L3
<i>Doellingeria umbellata</i> var. <i>umbellata</i>	flat-topped aster	3	4	3	4	14	L3
<i>Dryopteris filix-mas</i>	male fern	5	2	5	3	15	L3
<i>Elodea nuttallii</i>	Nuttall's water-weed	4	3	5	3	15	L3
<i>Equisetum x nelsonii</i>	Nelson's horsetail	4	2	5	3	14	L3
<i>Gentiana andrewsii</i>	bottle gentian	3	4	4	5	16	L3
<i>Gymnocarpium dryopteris</i>	oak fern	2	3	5	5	15	L3
<i>Hamamelis virginiana</i>	witch-hazel	2	4	4	4	14	L3
<i>Helianthus decapetalus</i>	thin-leaved sunflower	4	3	4	3	14	L3
<i>Hydrophyllum canadense</i>	Canada waterleaf	2	3	5	4	14	L3
<i>Juglans cinerea</i>	butternut	1	5	4	4	14	L3
<i>Juncus</i> cf. <i>alpinoarticulatus</i>	Richardson's rush	4	3	4	3	14	L3
<i>Juniperus communis</i>	common juniper	2	3	4	5	14	L3
<i>Lemna trisulca</i>	star duckweed	2	4	5	3	14	L3
<i>Lilium michiganense</i>	Michigan lily	2	4	3	5	14	L3
<i>Lonicera canadensis</i>	fly honeysuckle	2	4	4	4	14	L3
<i>Lonicera dioica</i>	wild honeysuckle	3	4	4	4	15	L3
<i>Luzula acuminata</i>	hairy wood rush	4	3	4	3	14	L3
<i>Luzula multiflora</i> ssp. <i>multiflora</i>	wood rush	4	4	4	3	15	L3
<i>Nabalus albus</i>	white wood lettuce	3	4	4	3	14	L3
<i>Oenothera oakesiana</i>	Oake's evening-primrose	5	3	5	3	16	L3

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Oenothera parviflora</i>	smaller evening-primrose	5	3	4	3	15	L3
<i>Osmorhiza longistylis</i>	smooth sweet cicely	4	4	4	4	16	L3
<i>Panicum virgatum</i>	switch grass	3	2	5	5	15	L3
<i>Polystichum acrostichoides</i>	Christmas fern	1	3	5	5	14	L3
<i>Potamogeton foliosus</i>	leafy pondweed	2	3	5	4	14	L3
<i>Potentilla simplex</i>	old-field cinquefoil	4	3	4	3	14	L3
<i>Potentilla supina</i> ssp. <i>paradoxa</i>	bushy cinquefoil	4	3	5	4	16	L3
<i>Prunus nigra</i>	Canada plum	2	4	4	4	14	L3
<i>Pycnanthemum tenuifolium</i>	narrow-leaved mountain-mint	5	2	5	3	15	L3
<i>Pyrola elliptica</i>	shinleaf	2	4	4	4	14	L3
<i>Ribes triste</i>	swamp red currant	2	4	4	5	15	L3
<i>Salix lucida</i>	shining willow	2	4	5	3	14	L3
<i>Sanicula odorata</i>	clustered sanicle	5	2	4	3	14	L3
<i>Scirpus cyperinus</i>	woolly bulrush	2	3	4	5	14	L3
<i>Scirpus pendulus</i>	drooping bulrush	3	4	5	4	16	L3
<i>Shepherdia canadensis</i>	russet buffalo-berry	3	4	5	4	16	L3
<i>Sicyos angulatus</i>	bur cucumber	4	5	2	4	15	L3
<i>Sisyrinchium montanum</i>	blue-eyed grass	2	3	4	5	14	L3
<i>Sparganium eurycarpum</i>	great bur-reed	2	4	5	4	15	L3
<i>Sphenopholis intermedia</i>	slender wedge grass	3	3	4	4	14	L3
<i>Spiranthes cernua</i>	nodding ladies' tresses	3	3	5	4	15	L3
<i>Spirodela polyrhiza</i>	greater duckweed	2	4	5	3	14	L3
<i>Sporobolus compositus</i> var. <i>compositus</i>	rough dropseed	5	3	5	3	16	L3
<i>Symphyotrichum lanceolatum</i> var. <i>latifolium</i>	broad-leaved paniced aster	5	3	3	3	13	L3
<i>Symphyotrichum urophyllum</i>	arrow-leaved aster	3	3	4	4	14	L3
<i>Taxus canadensis</i>	Canada yew	2	4	4	5	15	L3
<i>Teucrium canadense</i> ssp. <i>canadense</i>	wood-sage	3	3	4	4	14	L3
<i>Uvularia grandiflora</i>	large-flowered bellwort	1	4	5	5	15	L3
<i>Viburnum acerifolium</i>	maple-leaved viburnum	2	3	4	5	14	L3
<i>Zizia aurea</i>	golden Alexanders	5	4	4	3	16	L3
<i>Acer rubrum</i>	red maple	2	4	1	5	12	L4
<i>Acer saccharinum</i>	silver maple	1	2	5	3	11	L4

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Acer saccharum</i> ssp. <i>nigrum</i>	black maple	2	3	4	2	11	L4
<i>Acer spicatum</i>	mountain maple	2	3	4	4	13	L4
<i>Actaea pachypoda</i>	white baneberry	2	3	4	3	12	L4
<i>Actaea rubra</i> f. <i>neglecta</i>	white form red baneberry	5	3	1	3	12	L4
<i>Allium tricoccum</i>	wild leek	1	3	4	4	12	L4
<i>Amelanchier arborea</i>	downy serviceberry	3	2	4	3	12	L4
<i>Amelanchier interior</i>	hybrid serviceberry complex	4	3	3	3	13	L4
<i>Amelanchier laevis</i>	smooth serviceberry	2	2	4	3	11	L4
<i>Amelanchier sanguinea</i>	round-leaved serviceberry	3	2	3	4	12	L4
<i>Antennaria howellii</i> ssp. <i>howellii</i>	Howell's pussytoes	4	2	3	3	12	L4
<i>Apios americana</i>	ground-nut	3	4	3	3	13	L4
<i>Apocynum androsaemifolium</i>	spreading dogbane	2	3	2	4	11	L4
<i>Apocynum cannabinum</i> var. <i>hypericifolium</i>	clasping-leaved hemp dogbane	4	2	3	2	11	L4
<i>Asarum canadense</i>	wild ginger	2	3	4	3	12	L4
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	swamp milkweed	1	3	4	4	12	L4
<i>Betula alleghaniensis</i>	yellow birch	1	4	3	5	13	L4
<i>Betula papyrifera</i>	paper birch	1	4	2	4	11	L4
<i>Calamagrostis canadensis</i>	Canada blue joint	1	3	4	4	12	L4
<i>Caltha palustris</i>	marsh marigold	2	4	3	4	13	L4
<i>Cardamine diphylla</i>	broad-leaved toothwort	2	3	4	4	13	L4
<i>Carex arctata</i>	nodding wood sedge	2	4	2	3	11	L4
<i>Carex aurea</i>	golden-fruited sedge	2	2	4	4	12	L4
<i>Carex communis</i>	fibrous-rooted sedge	2	4	3	3	12	L4
<i>Carex deweyana</i>	Dewey's sedge	2	4	3	3	12	L4
<i>Carex gracillima</i>	graceful sedge	2	3	4	2	11	L4
<i>Carex hirtifolia</i>	hairy wood sedge	2	3	4	3	12	L4
<i>Carex hystericina</i>	porcupine sedge	2	3	2	5	12	L4
<i>Carex intumescens</i>	bladder sedge	2	4	4	2	12	L4
<i>Carex laxiflora</i>	loose-flowered sedge	3	3	4	3	13	L4
<i>Carex pedunculata</i>	early-flowering sedge	2	3	3	3	11	L4
<i>Carex pellita</i>	woolly sedge	2	3	4	3	12	L4
<i>Carex pensylvanica</i>	Pennsylvania sedge	2	4	3	4	13	L4

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Carex pseudocyperus</i>	pseudocyperus sedge	2	3	3	4	12	L4
<i>Carex retrorsa</i>	retrorse sedge	2	3	3	4	12	L4
<i>Carex sparganioides</i>	bur-reed sedge	2	2	5	2	11	L4
<i>Carex sprengei</i>	long-beaked sedge	2	4	4	2	12	L4
<i>Carex tenera</i> var. <i>echinodes</i>	straw sedge	2	3	3	3	11	L4
<i>Carpinus caroliniana</i> ssp. <i>virginiana</i>	blue beech	1	3	4	3	11	L4
<i>Carya cordiformis</i>	bitternut hickory	2	4	4	2	12	L4
<i>Caulophyllum giganteum</i>	long-styled blue cohosh	2	3	4	4	13	L4
<i>Cornus rugosa</i>	round-leaved dogwood	2	4	4	3	13	L4
<i>Corylus cornuta</i>	beaked hazel	2	4	3	4	13	L4
<i>Crataegus coccinea</i> var. <i>coccinea</i>	scarlet hawthorn	4	2	3	3	12	L4
<i>Crataegus holmesiana</i>	Holmes' hawthorn	3	3	4	3	13	L4
<i>Crataegus macracantha</i>	long-spined hawthorn	2	2	4	3	11	L4
<i>Danthonia spicata</i>	poverty oat grass	2	4	3	4	13	L4
<i>Dichanthelium acuminatum</i> ssp. <i>acuminatum</i>	hairy panic grass	2	3	3	3	11	L4
<i>Diervilla lonicera</i>	bush honeysuckle	2	3	2	4	11	L4
<i>Dryopteris intermedia</i>	evergreen wood fern	2	4	4	3	13	L4
<i>Dryopteris marginalis</i>	marginal wood fern	2	3	3	4	12	L4
<i>Dryopteris x triploidea</i>	confusing hybrid wood fern	5	2	3	3	13	L4
<i>Elymus canadensis</i>	Canada wild rye	3	2	5	3	13	L4
<i>Elymus hystrix</i>	bottle-brush grass	2	3	4	3	12	L4
<i>Epifagus virginiana</i>	beech-drops	2	3	5	2	12	L4
<i>Epilobium coloratum</i>	purple-leaved willow-herb	2	3	4	2	11	L4
<i>Equisetum variegatum</i> ssp. <i>variegatum</i>	variegated scouring-rush	2	2	5	4	13	L4
<i>Eupatorium perfoliatum</i>	boneset	1	3	4	3	11	L4
<i>Eurybia macrophylla</i>	big-leaved aster	2	3	2	4	11	L4
<i>Fagus grandifolia</i>	American beech	1	4	3	4	12	L4
<i>Fraxinus nigra</i>	black ash	2	4	4	3	13	L4
<i>Galium aparine</i>	cleavers	3	3	4	2	12	L4
<i>Geranium maculatum</i>	wild geranium	3	3	4	3	13	L4
<i>Glyceria grandis</i>	tall manna grass	2	3	4	2	11	L4
<i>Helianthus strumosus</i>	pale-leaved sunflower	4	2	4	3	13	L4

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Impatiens pallida</i>	yellow touch-me-not	3	2	4	2	11	L4
<i>Juncus arcticus</i> ssp. <i>balticus</i>	Baltic rush	4	2	5	2	13	L4
<i>Juncus effusus</i>	soft rush	2	4	4	3	13	L4
<i>Juncus nodosus</i>	knotted rush	2	2	5	3	12	L4
<i>Juncus torreyi</i>	Torrey's rush	2	3	4	2	11	L4
<i>Juniperus horizontalis</i> x <i>virginiana</i>	red cedar - creeping juniper hybrid	5	2	4	1	12	L4
<i>Lycopus americanus</i>	cut-leaved water-horehound	2	4	3	3	12	L4
<i>Lycopus uniflorus</i>	northern water-horehound	2	3	3	3	11	L4
<i>Maianthemum canadense</i>	Canada May-flower	1	4	1	5	11	L4
<i>Monarda fistulosa</i>	wild bergamot	3	3	2	3	11	L4
<i>Myosotis laxa</i>	smaller forget-me-not	2	4	3	4	13	L4
<i>Osmorhiza claytonii</i>	woolly sweet cicely	2	3	4	3	12	L4
<i>Persicaria pensylvanica</i>	Pennsylvania smartweed	3	2	4	3	12	L4
<i>Pinus strobus</i>	white pine	1	4	3	4	12	L4
<i>Polygonatum pubescens</i>	downy Solomon's seal	2	4	2	5	13	L4
<i>Populus grandidentata</i>	large-toothed aspen	2	3	4	3	12	L4
<i>Populus x jackii</i>	Jack's poplar	5	2	4	1	12	L4
<i>Prunella vulgaris</i> ssp. <i>lanceolata</i>	heal-all (native)	4	2	3	2	11	L4
<i>Prunus pensylvanica</i>	pin cherry	2	4	3	3	12	L4
<i>Pteridium aquilinum</i> var. <i>latiusculum</i>	eastern bracken	2	4	2	4	12	L4
<i>Quercus macrocarpa</i>	bur oak	2	4	3	3	12	L4
<i>Quercus rubra</i>	red oak	1	4	2	4	11	L4
<i>Rorippa palustris</i> ssp. <i>palustris</i>	Fernald's marsh cress	3	2	4	2	11	L4
<i>Rosa blanda</i>	smooth wild rose	2	3	3	4	12	L4
<i>Rudbeckia hirta</i>	black-eyed Susan	1	4	4	3	12	L4
<i>Salix amygdaloides</i>	peach-leaved willow	2	2	5	3	12	L4
<i>Salix bebbiana</i>	Bebb's willow	2	3	3	4	12	L4
<i>Salix discolor</i>	pussy willow	2	3	4	3	12	L4
<i>Salix pentandra</i>	slender willow	2	3	5	3	13	L4
<i>Sanicula marilandica</i>	sanicle	3	3	3	3	12	L4
<i>Schoenoplectus pungens</i> var. <i>pungens</i>	three-square	3	2	5	3	13	L4
<i>Schoenoplectus tabernaemontani</i>	soft-stemmed bulrush	2	2	5	3	12	L4

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		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Sium suave</i>	water-parsnip	3	2	4	4	13	L4
<i>Smilax tamnoides</i>	bristly greenbrier	3	3	3	3	12	L4
<i>Solidago juncea</i>	early goldenrod	3	3	4	2	12	L4
<i>Solidago rugosa</i> ssp. <i>rugosa</i>	rough-stemmed goldenrod	3	3	2	3	11	L4
<i>Stuckenia pectinata</i>	sago pondweed	2	2	5	3	12	L4
<i>Symphotrichum oolentangiense</i>	sky-blue aster	3	1	4	3	11	L4
<i>Symphotrichum</i> x <i>amethystinum</i>	amethyst aster	5	2	2	2	11	L4
<i>Thuja occidentalis</i>	white cedar	1	4	1	5	11	L4
<i>Tiarella cordifolia</i>	foam-flower	1	3	3	4	11	L4
<i>Trillium erectum</i>	red trillium	1	4	3	5	13	L4
<i>Trillium grandiflorum</i>	white trillium	1	3	4	5	13	L4
<i>Tsuga canadensis</i>	eastern hemlock	1	4	3	5	13	L4
<i>Typha latifolia</i>	broad-leaved cattail	1	4	4	4	13	L4
<i>Acalypha rhomboidea</i>	three-seeded mercury	3	1	2	0	6	L5
<i>Acer saccharum</i>	sugar maple	1	3	0	2	6	L5
<i>Achillea millefolium</i> ssp. <i>lanulosa</i>	woolly yarrow	2	2	0	1	5	L5
<i>Actaea rubra</i> ssp. <i>rubra</i>	red baneberry	2	3	1	3	9	L5
<i>Ageratina altissima</i> var. <i>altissima</i>	white snakeroot	2	2	2	1	7	L5
<i>Agrimonia gryposepala</i>	agrimony	2	2	0	2	6	L5
<i>Alisma plantago-aquatica</i>	water-plantain	2	2	4	2	10	L5
<i>Ambrosia artemisiifolia</i>	common ragweed	2	1	3	0	6	L5
<i>Ambrosia trifida</i>	giant ragweed	4	1	4	0	9	L5
<i>Amphicarpaea bracteata</i>	hog-peanut	2	2	2	2	8	L5
<i>Anemone canadensis</i>	Canada anemone	2	2	2	2	8	L5
<i>Anemone virginiana</i>	common thimbleweed	2	3	0	3	8	L5
<i>Apocynum cannabinum</i>	hemp dogbane	2	2	2	2	8	L5
<i>Aralia nudicaulis</i>	wild sarsaparilla	2	3	1	4	10	L5
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	1	3	2	3	9	L5
<i>Asclepias syriaca</i>	common milkweed	2	2	0	2	6	L5
<i>Athyrium filix-femina</i> var. <i>angustum</i>	northeastern lady fern	2	3	1	3	9	L5
<i>Bidens cernua</i>	nodding bur-marigold	2	2	3	3	10	L5
<i>Bidens frondosa</i>	common beggar's-ticks	2	1	4	0	7	L5

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		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Calystegia sepium</i> ssp. <i>angulatus</i>	hedge bindweed	3	2	3	2	10	L5
<i>Carex bebbii</i>	Bebb's sedge	2	2	3	3	10	L5
<i>Carex blanda</i>	common wood sedge	2	2	1	2	7	L5
<i>Carex cristatella</i>	crested sedge	2	2	4	1	9	L5
<i>Carex granularis</i>	meadow sedge	2	2	1	3	8	L5
<i>Carex radiata</i>	straight-styled sedge	2	2	2	2	8	L5
<i>Carex rosea</i>	curly-styled sedge	2	2	3	2	9	L5
<i>Carex stipata</i>	awl-fruited sedge	2	3	2	3	10	L5
<i>Carex vulpinoidea</i>	fox sedge	2	2	4	1	9	L5
<i>Cicuta maculata</i>	spotted water-hemlock	2	2	2	2	8	L5
<i>Circaea canadensis</i> ssp. <i>canadensis</i>	enchanter's nightshade	2	1	1	1	5	L5
<i>Clematis virginiana</i>	virgin's bower	2	2	2	3	9	L5
<i>Cornus alternifolia</i>	alternate-leaved dogwood	2	2	1	2	7	L5
<i>Cornus foemina</i> ssp. <i>racemosa</i>	grey dogwood	2	2	4	2	10	L5
<i>Cornus stolonifera</i>	red osier dogwood	1	2	0	3	6	L5
<i>Crataegus punctata</i>	dotted hawthorn	2	2	3	3	10	L5
<i>Cryptotaenia canadensis</i>	honestwort	2	2	4	1	9	L5
<i>Desmodium canadense</i>	showy tick-trefoil	2	2	3	3	10	L5
<i>Dryopteris carthusiana</i>	spinulose wood fern	2	3	2	2	9	L5
<i>Echinochloa muricata</i> var. <i>microstachya</i>	small-spiked barnyard grass	4	2	4	0	10	L5
<i>Echinocystis lobata</i>	wild cucumber	2	2	3	1	8	L5
<i>Eleocharis erythropoda</i>	creeping spike-rush	2	2	4	1	9	L5
<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	sticky willow-herb	2	2	2	2	8	L5
<i>Equisetum arvense</i>	field horsetail	1	2	1	1	5	L5
<i>Equisetum hyemale</i> ssp. <i>affine</i>	scouring-rush	2	2	2	2	8	L5
<i>Erigeron annuus</i>	daisy fleabane	2	2	0	1	5	L5
<i>Erigeron canadensis</i>	horse-weed	3	1	2	0	6	L5
<i>Erigeron philadelphicus</i> var. <i>philadelphicus</i>	Philadelphia fleabane	2	2	0	1	5	L5
<i>Erigeron strigosus</i>	rough fleabane	3	2	1	1	7	L5
<i>Erythronium americanum</i> ssp. <i>americanum</i>	yellow trout-lily	2	3	3	2	10	L5
<i>Euthamia graminifolia</i>	grass-leaved goldenrod	2	1	4	1	8	L5
<i>Eutrochium maculatum</i> var. <i>maculatum</i>	spotted Joe-Pye weed	2	2	3	3	10	L5

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Fragaria virginiana</i>	wild strawberry	2	2	0	2	6	L5
<i>Fraxinus americana</i>	white ash	1	2	0	3	6	L5
<i>Fraxinus pennsylvanica</i>	red ash	2	2	2	3	9	L5
<i>Galium palustre</i>	marsh bedstraw	2	2	3	3	10	L5
<i>Galium triflorum</i>	sweet-scented bedstraw	2	2	2	2	8	L5
<i>Geum aleppicum</i>	yellow avens	2	3	3	2	10	L5
<i>Geum canadense</i>	white avens	2	2	1	2	7	L5
<i>Glyceria striata</i>	fowl manna grass	2	2	1	2	7	L5
<i>Hackelia virginiana</i>	Virginia stickseed	2	2	0	2	6	L5
<i>Helianthus tuberosus</i>	Jerusalem artichoke	3	1	2	0	6	L5
<i>Heracleum maximum</i>	cow-parsnip	3	2	3	2	10	L5
<i>Hydrophyllum virginianum</i>	Virginia waterleaf	2	2	1	2	7	L5
<i>Impatiens capensis</i>	orange touch-me-not	1	2	0	2	5	L5
<i>Juglans nigra</i>	black walnut	2	1	2	1	6	L5
<i>Juncus articulatus</i>	jointed rush	2	2	4	2	10	L5
<i>Juncus bufonius</i>	toad rush	4	1	4	1	10	L5
<i>Juncus dudleyi</i>	Dudley's rush	2	2	3	1	8	L5
<i>Juncus tenuis</i>	path rush	2	2	1	1	6	L5
<i>Juniperus virginiana</i>	red cedar	2	1	4	1	8	L5
<i>Leersia oryzoides</i>	rice cut grass	2	2	3	2	9	L5
<i>Lemna minor</i>	common duckweed	2	2	4	2	10	L5
<i>Maianthemum racemosum</i> ssp. <i>racemosum</i>	false Solomon's seal	2	3	2	3	10	L5
<i>Maianthemum stellatum</i>	starry false Solomon's seal	2	2	1	3	8	L5
<i>Matteuccia struthiopteris</i> var. <i>pennsylvanica</i>	ostrich fern	1	2	2	2	7	L5
<i>Mentha arvensis</i> ssp. <i>borealis</i>	wild mint	2	2	3	2	9	L5
<i>Muhlenbergia mexicana</i> var. <i>mexicana</i>	common muhly grass	3	2	0	1	6	L5
<i>Nabalus altissimus</i>	tall wood lettuce	2	3	2	2	9	L5
<i>Oenothera biennis</i>	common evening-primrose	2	1	1	1	5	L5
<i>Onoclea sensibilis</i>	sensitive fern	2	3	1	3	9	L5
<i>Ostrya virginiana</i>	ironwood	2	3	2	2	9	L5
<i>Oxalis stricta</i>	common yellow wood-sorrel	3	1	1	1	6	L5
<i>Panicum capillare</i>	panic grass	3	1	4	1	9	L5

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Parthenocissus inserta</i>	thicket creeper	1	2	0	1	4	L5
<i>Persicaria lapathifolia</i>	pale smartweed	2	1	4	0	7	L5
<i>Pilea pumila</i>	dwarf clearweed	2	2	1	1	6	L5
<i>Plantago rugelii</i>	red-stemmed plantain	2	2	0	1	5	L5
<i>Poa palustris</i>	fowl meadow-grass	2	2	3	2	9	L5
<i>Podophyllum peltatum</i>	May-apple	1	3	3	3	10	L5
<i>Populus balsamifera</i>	balsam poplar	1	2	3	2	8	L5
<i>Populus deltoides</i>	cottonwood	2	1	4	1	8	L5
<i>Populus tremuloides</i>	trembling aspen	1	3	1	3	8	L5
<i>Potentilla anserina</i> ssp. <i>anserina</i>	silverweed	3	2	3	2	10	L5
<i>Prunus serotina</i>	black cherry	2	2	0	2	6	L5
<i>Prunus virginiana</i> var. <i>virginiana</i>	choke cherry	1	2	0	1	4	L5
<i>Ranunculus abortivus</i>	kidney-leaved buttercup	2	3	1	2	8	L5
<i>Ranunculus recurvatus</i> var. <i>recurvatus</i>	hooked buttercup	2	3	2	3	10	L5
<i>Ranunculus sceleratus</i>	cursed crowfoot	2	2	3	2	9	L5
<i>Rhus typhina</i>	staghorn sumach	2	1	2	2	7	L5
<i>Ribes americanum</i>	wild black currant	2	3	2	2	9	L5
<i>Ribes cynosbati</i>	prickly gooseberry	2	3	2	2	9	L5
<i>Rubus allegheniensis</i>	common blackberry	2	3	0	1	6	L5
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	wild red raspberry	1	1	0	1	3	L5
<i>Rubus occidentalis</i>	wild black raspberry	2	1	0	1	4	L5
<i>Rubus odoratus</i>	purple-flowering raspberry	2	2	2	2	8	L5
<i>Salix eriocephala</i>	narrow heart-leaved willow	2	1	3	1	7	L5
<i>Salix interior</i>	sandbar willow	2	1	5	2	10	L5
<i>Sambucus canadensis</i>	common elderberry	2	3	2	2	9	L5
<i>Sambucus racemosa</i> ssp. <i>pubens</i>	red-berried elder	2	3	2	2	9	L5
<i>Sanguinaria canadensis</i>	bloodroot	2	3	0	3	8	L5
<i>Scirpus atrovirens</i>	black-fruited bulrush	2	2	4	2	10	L5
<i>Solanum ptychanthum</i>	American black nightshade	4	1	4	0	9	L5
<i>Solidago altissima</i>	tall goldenrod	1	2	0	0	3	L5
<i>Solidago caesia</i>	blue-stemmed goldenrod	2	2	4	2	10	L5
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod	2	2	0	1	5	L5

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Solidago flexicaulis</i>	zig-zag goldenrod	2	1	3	2	8	L5
<i>Solidago gigantea</i>	late goldenrod	2	1	1	1	5	L5
<i>Solidago nemoralis</i> ssp. <i>nemoralis</i>	grey goldenrod	2	2	2	2	8	L5
<i>Symphotrichum cordifolium</i>	heart-leaved aster	2	1	0	2	5	L5
<i>Symphotrichum ericoides</i> var. <i>ericoides</i>	heath aster	2	1	2	1	6	L5
<i>Symphotrichum lanceolatum</i> var. <i>lanceolatum</i>	panicked aster	1	2	3	1	7	L5
<i>Symphotrichum lateriflorum</i> var. <i>lateriflorum</i>	calico aster	2	2	3	2	9	L5
<i>Symphotrichum novae-angliae</i>	New England aster	1	2	2	1	6	L5
<i>Symphotrichum puniceum</i> var. <i>puniceum</i>	swamp aster	2	2	2	2	8	L5
<i>Thalictrum dioicum</i>	early meadow rue	2	3	3	2	10	L5
<i>Thalictrum pubescens</i>	tall meadow rue	2	3	2	2	9	L5
<i>Tilia americana</i>	basswood	1	4	2	3	10	L5
<i>Toxicodendron radicans</i> var. <i>radicans</i>	poison ivy (vine form)	2	2	4	2	10	L5
<i>Toxicodendron radicans</i> var. <i>rydbergii</i>	poison ivy (shrub form)	2	2	0	2	6	L5
<i>Ulmus americana</i>	white elm	1	4	0	2	7	L5
<i>Urtica dioica</i> ssp. <i>gracilis</i>	American stinging nettle	2	3	2	2	9	L5
<i>Verbena hastata</i>	blue vervain	2	2	4	2	10	L5
<i>Verbena urticifolia</i>	white vervain	2	2	2	2	8	L5
<i>Viburnum lentago</i>	nannyberry	2	3	1	2	8	L5
<i>Viola labradorica</i>	dog violet	2	2	0	2	6	L5
<i>Viola pubescens</i>	stemmed yellow violet	2	3	1	2	8	L5
<i>Viola sororia</i>	common blue violet	2	2	0	2	6	L5
<i>Vitis riparia</i>	riverbank grape	1	1	0	0	2	L5
<i>Xanthium strumarium</i>	clotbur	3	1	4	0	8	L5
<i>Acer platanoides</i>	Norway maple	3				3	L+
<i>Acer tataricum</i> ssp. <i>ginnala</i>	Amur maple	4	0	0	2	6	L+
<i>Achillea millefolium</i> ssp. <i>millefolium</i>	European yarrow	4				4	L+
<i>Aegopodium podagraria</i>	goutweed	4				4	L+
<i>Aesculus hippocastanum</i>	horse-chestnut	4				4	L+
<i>Agropyron cristatum</i>	crested wheat-grass	5				5	L+
<i>Agrostis gigantea</i>	redtop	3				3	L+
<i>Ailanthus altissima</i>	tree-of-heaven	5				5	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Ajuga reptans</i>	common bugle	5				5	L+
<i>Alliaria petiolata</i>	garlic mustard	2				2	L+
<i>Allium cf. sativum</i>	garlic	5					L+
<i>Alnus glutinosa</i>	European alder	4				4	L+
<i>Alnus glutinosa</i> x <i>incana</i> ssp. <i>rugosa</i>	hybrid European - speckled alder	4					L+
<i>Alnus incana</i> ssp. <i>incana</i>	grey alder	4				4	L+
<i>Amaranthus retroflexus</i>	red-root pigweed	4				4	L+
<i>Amorpha fruticosa</i>	shrubby false indigo	5				5	L+
<i>Anagallis arvensis</i>	scarlet pimpernel	5				5	L+
<i>Anthriscus sylvestris</i>	wild chervil	5				5	L+
<i>Aquilegia vulgaris</i>	garden columbine	5				5	L+
<i>Arctium lappa</i>	great burdock	3				3	L+
<i>Arctium minus</i>	common burdock	3				3	L+
<i>Artemisia biennis</i>	biennial wormwood	5				5	L+
<i>Artemisia vulgaris</i>	common mugwort	4				4	L+
<i>Asparagus officinalis</i>	asparagus	4				4	L+
<i>Barbarea vulgaris</i>	winter cress	3				3	L+
<i>Berberis thunbergii</i>	Japanese barberry	4				4	L+
<i>Berberis vulgaris</i>	common barberry	5				5	L+
<i>Betula pendula</i>	European white birch	4				4	L+
<i>Bromus commutatus</i>	upright chess	5				5	L+
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	soft brome	5				5	L+
<i>Bromus inermis</i>	smooth brome grass	3				3	L+
<i>Bromus racemosus</i>	spiked chess	4					L+
<i>Bromus tectorum</i>	downy chess	4				4	L+
<i>Campanula persicifolia</i>	peach-leaved bellflower	5				5	L+
<i>Campanula rapunculoides</i>	creeping bellflower	3				3	L+
<i>Capsella bursa-pastoris</i>	shepherd's purse	4				4	L+
<i>Cardamine impatiens</i>	balsam bitter cress	5				5	L+
<i>Carex flacca</i>	heath sedge	5				5	L+
<i>Carex spicata</i>	spiked sedge	3				3	L+
<i>Celastrus orbiculatus</i>	oriental bittersweet	4				4	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	spotted knapweed	4				4	L+
<i>Cerastium fontanum</i>	mouse-ear chickweed	3				3	L+
<i>Chaenorhinum minus</i> ssp. <i>minus</i>	dwarf snapdragon	5				5	L+
<i>Chenopodium album</i>	lamb's quarters	3				3	L+
<i>Chenopodium glaucum</i>	oak-leaved goosefoot	4				4	L+
<i>Cichorium intybus</i>	chicory	3				3	L+
<i>Cirsium arvense</i>	creeping thistle	2				2	L+
<i>Cirsium vulgare</i>	bull thistle	3				3	L+
<i>Convallaria majalis</i>	lily-of-the-valley	3				3	L+
<i>Convolvulus arvensis</i>	field bindweed	4				4	L+
<i>Cotinus coggygria</i>	European smoke-tree	5				5	L+
<i>Cotoneaster acutifolius</i>	Peking cotoneaster	5				5	L+
<i>Crataegus monogyna</i>	English hawthorn	3	1	4	0	8	L+
<i>Crocus vernus</i>	crocus	5				5	L+
<i>Cucumis sativus</i>	cucumber	5				5	L+
<i>Cycloloma atriplicifolium</i>	winged pigweed	5				5	L+
<i>Cynanchum rossicum</i>	dog-strangling vine	3				3	L+
<i>Cynoglossum officinale</i>	hound's tongue	4				4	L+
<i>Cyperus</i> cf. <i>fuscus</i>	brown umbrella-sedge	5				5	L+
<i>Dactylis glomerata</i>	orchard grass	3				3	L+
<i>Daphne mezereum</i>	daphne	5				5	L+
<i>Daucus carota</i>	Queen Anne's lace	3				3	L+
<i>Digitaria sanguinalis</i>	hairy crab grass	5				5	L+
<i>Diploxys muralis</i>	wall rocket	5				5	L+
<i>Dipsacus fullonum</i>	teasel	4				4	L+
<i>Echinacea purpurea</i>	purple coneflower	5				5	L+
<i>Echinochloa crus-galli</i>	barnyard grass	4				4	L+
<i>Echium vulgare</i>	viper's bugloss	4				4	L+
<i>Elaeagnus angustifolia</i>	Russian olive	3				3	L+
<i>Elaeagnus commutata</i>	silver-berry	5				5	L+
<i>Elaeagnus umbellata</i>	autumn olive	4				4	L+
<i>Elymus repens</i>	quack grass	3				3	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Epilobium hirsutum</i>	European willow-herb	4				4	L+
<i>Epilobium parviflorum</i>	small-flowered willow-herb	4				4	L+
<i>Epipactis helleborine</i>	helleborine	3				3	L+
<i>Eragrostis minor</i>	little love grass	5				5	L+
<i>Erucastrum gallicum</i>	dog mustard	5				5	L+
<i>Erysimum cheiranthoides</i>	wormseed mustard	4				4	L+
<i>Euonymus alatus</i>	winged spindle-tree	5				5	L+
<i>Euonymus europaeus</i>	European spindle-tree	4				4	L+
<i>Euonymus fortunei</i>	wintercreeper euonymus	5				5	L+
<i>Euphorbia helioscopia</i>	sun spurge	5				5	L+
<i>Fallopia convolvulus</i>	black bindweed	4				4	L+
<i>Fallopia japonica</i> var. <i>japonica</i>	Japanese knotweed	4				4	L+
<i>Festuca filiformis</i>	hair fescue	5				5	L+
<i>Festuca rubra</i> ssp. <i>rubra</i>	red fescue	3				3	L+
<i>Filipendula ulmaria</i>	queen-of-the-meadow	5				5	L+
<i>Forsythia viridissima</i>	forsythia	5				5	L+
<i>Fraxinus excelsior</i>	European ash	5				5	L+
<i>Galeopsis tetrahit</i>	hemp-nettle	4				4	L+
<i>Galinsoga quadriradiata</i>	hairy galinsoga	5				5	L+
<i>Galium mollugo</i>	white bedstraw	3				3	L+
<i>Galium odoratum</i>	sweet woodruff	5				5	L+
<i>Galium sylvaticum</i>	wood bedstraw	5				5	L+
<i>Geum urbanum</i>	urban avens	3				3	L+
<i>Glechoma hederacea</i>	creeping Charlie	3				3	L+
<i>Hedera helix</i>	English ivy	5				5	L+
<i>Helianthus annuus</i>	common sunflower	5				5	L+
<i>Hemerocallis fulva</i>	orange day-lily	4				4	L+
<i>Hesperis matronalis</i>	dame's rocket	2				2	L+
<i>Hieracium vulgatum</i>	blotched hawkweed	5				5	L+
<i>Hosta</i> cf. <i>ventricosa</i>	hosta lily	4					L+
<i>Hydrangea macrophylla</i>	broad-leaved hydrangea	5					L+
<i>Hypericum hirsutum</i>	hairy St. Johnswort	5					L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Hypericum perforatum</i>	common St. Johnswort	3				3	L+
<i>Impatiens glandulifera</i>	Himalayan balsam	5				5	L+
<i>Inula helenium</i>	elecampane	3				3	L+
<i>Ipomoea purpurea</i>	common morning-glory	5				5	L+
<i>Iris germanica</i>	garden iris	5				5	L+
<i>Iris pseudacorus</i>	yellow flag	4				4	L+
<i>Juglans ailantifolia</i>	Japanese walnut	5				5	L+
<i>Juglans regia</i>	English walnut	5				5	L+
<i>Juncus compressus</i>	round-fruited rush	4				4	L+
<i>Juniperus chinensis</i>	Chinese juniper	5				5	L+
<i>Juniperus cf. scopulorum</i>	Rocky Mountain juniper	5					L+
<i>Juniperus x pfitzeriana</i>	pfitzer juniper	4					L+
<i>Lactuca serriola</i>	prickly lettuce	3				3	L+
<i>Lamium maculatum</i>	spotted dead-nettle	5				5	L+
<i>Lapsana communis</i>	nipplewort	5				5	L+
<i>Lathyrus tuberosus</i>	tuberous vetchling	5				5	L+
<i>Leonurus cardiaca ssp. cardiaca</i>	motherwort	3				3	L+
<i>Lepidium campestre</i>	field pepper-grass	4				4	L+
<i>Leucanthemum vulgare</i>	ox-eye daisy	3				3	L+
<i>Ligustrum vulgare</i>	privet	5				5	L+
<i>Linaria vulgaris</i>	butter-and-eggs	3				3	L+
<i>Linum cf. perenne</i>	perennial flax	5				5	L+
<i>Lithospermum officinale</i>	Eurasian gromwell	4				4	L+
<i>Lolium perenne</i>	perennial rye	4				4	L+
<i>Lonicera japonica</i>	Japanese honeysuckle	5				5	L+
<i>Lonicera morrowii</i>	Morrow's honeysuckle	3				3	L+
<i>Lonicera tatarica</i>	Tartarian honeysuckle	4				4	L+
<i>Lonicera x bella</i>	shrub honeysuckle	3				3	L+
<i>Lonicera xylosteum</i>	European fly honeysuckle	4				4	L+
<i>Lotus corniculatus</i>	bird's foot trefoil	3				3	L+
<i>Lycopus europaeus</i>	European water-horehound	4				4	L+
<i>Lysimachia nummularia</i>	moneywort	4				4	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Lysimachia vulgaris</i>	garden loosestrife	5				5	L+
<i>Lythrum salicaria</i>	purple loosestrife	3				3	L+
<i>Malus prunifolia</i>	Chinese crab-apple	4					L+
<i>Malus pumila</i>	apple	2				2	L+
<i>Malus sp.</i>	apple sp.	3					L+
<i>Malva moschata</i>	musk mallow	5				5	L+
<i>Malva neglecta</i>	common mallow	5				5	L+
<i>Matricaria chamomilla</i>	wild chamomile	4				4	L+
<i>Matricaria discoidea</i>	pineappleweed	5				5	L+
<i>Medicago falcata</i>	alfalfa	5				5	L+
<i>Medicago lupulina</i>	black medick	3				3	L+
<i>Medicago sativa ssp. sativa</i>	alfalfa	3				3	L+
<i>Melilotus albus</i>	white sweet clover	3				3	L+
<i>Melilotus officinalis</i>	yellow sweet clover	3				3	L+
<i>Melissa officinalis</i>	lemon-balm	3				3	L+
<i>Mirabilis nyctaginea</i>	wild four o'clock	5				5	L+
<i>Morus alba</i>	white mulberry	4				4	L+
<i>Muscari botryoides</i>	grape hyacinth	5				5	L+
<i>Myosotis scorpioides</i>	true forget-me-not	3				3	L+
<i>Myosotis sylvatica</i>	woodland forget-me-not	5				5	L+
<i>Myosoton aquaticum</i>	giant chickweed	5				5	L+
<i>Narcissus poeticus</i>	narcissus	5				5	L+
<i>Narcissus pseudonarcissus</i>	daffodil	5				5	L+
<i>Nasturtium microphyllum</i>	small-leaved watercress	4				4	L+
<i>Nepeta cataria</i>	catnip	3				3	L+
<i>Oenothera fruticosa ssp. glauca</i>	sundrops	5				5	L+
<i>Paeonia officinalis</i>	peony	5				5	L+
<i>Panicum dichotomiflorum</i>	fall panic grass	5				5	L+
<i>Pastinaca sativa</i>	wild parsnip	4				4	L+
<i>Persicaria maculosa</i>	lady's thumb	3				3	L+
<i>Persicaria orientalis</i>	prince's feather	5				5	L+
<i>Phleum pratense</i>	Timothy grass	3				3	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Phlox paniculata</i>	garden phlox	5				5	L+
<i>Phragmites australis</i> ssp. <i>australis</i>	common reed	3				3	L+
<i>Picris hieracioides</i>	hawkweed oxtongue	5				5	L+
<i>Pilosella piloselloides</i>	smooth yellow hawkweed	3				3	L+
<i>Pilosella</i> x <i>floribunda</i>	smoothish hawkweed	5				5	L+
<i>Pinus sylvestris</i>	Scots pine	3				3	L+
<i>Plantago lanceolata</i>	English plantain	4				4	L+
<i>Plantago major</i>	common plantain	3				3	L+
<i>Poa compressa</i>	flat-stemmed blue grass	3				3	L+
<i>Poa nemoralis</i>	woodland spear grass	4				4	L+
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky blue grass	3				3	L+
<i>Polygonum achoreum</i>	striate knotweed	5				5	L+
<i>Polygonum aviculare</i>	prostrate knotweed	4				4	L+
<i>Populus alba</i>	white poplar	4				4	L+
<i>Populus nigra</i>	black poplar	5				5	L+
<i>Populus</i> x <i>canadensis</i>	Carolina poplar	5				5	L+
<i>Populus</i> x <i>heimburgeri</i>	Heimbürger's poplar	5				5	L+
<i>Portulaca oleracea</i>	purslane	5				5	L+
<i>Potamogeton crispus</i>	curly pondweed	4				4	L+
<i>Potentilla argentea</i>	silvery cinquefoil	5				5	L+
<i>Potentilla inclinata</i>	lintermediate cinquefoil	5				5	L+
<i>Potentilla recta</i>	sulphur cinquefoil	3				3	L+
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	heal-all (European)	5				5	L+
<i>Prunus avium</i>	mazzard cherry	5				5	L+
<i>Prunus domestica</i>	common plum	5				5	L+
<i>Prunus tomentosa</i>	Manchu cherry	5				5	L+
<i>Puccinellia distans</i>	alkali grass	4				4	L+
<i>Pulmonaria officinalis</i>	lung-wort	4				4	L+
<i>Ranunculus acris</i>	tall buttercup	3				3	L+
<i>Ranunculus repens</i>	creeping buttercup	4				4	L+
<i>Rhamnus cathartica</i>	common buckthorn	2				2	L+
<i>Ribes rubrum</i>	garden red currant	3				3	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Robinia pseudoacacia</i>	black locust	3				3	L+
<i>Rosa canina</i>	dog rose	5				5	L+
<i>Rosa multiflora</i>	multiflora rose	3				3	L+
<i>Rudbeckia fulgida</i>	orange coneflower	5				5	L+
<i>Rudbeckia triloba</i>	brown-eyed Susan	4				4	L+
<i>Rumex crispus</i>	curly dock	3				3	L+
<i>Rumex obtusifolius</i>	bitter dock	4				4	L+
<i>Salix alba</i>	white willow	3				3	L+
<i>Salix x fragilis</i>	European tree willow	3				3	L+
<i>Salix x fragilis</i>	crack willow	4				4	L+
<i>Salix x sepulcralis</i>	weeping willow	4				4	L+
<i>Salsola cf. collina</i>	Russian thistle	5				5	L+
<i>Salsola tragus</i>	Russian thistle	5				5	L+
<i>Saponaria officinalis</i>	bouncing Bet	4				4	L+
<i>Schedonorus arundinaceus</i>	tall fescue	5				5	L+
<i>Schedonorus pratensis</i>	meadow fescue	3				3	L+
<i>Scilla siberica</i>	Siberian squill	4				4	L+
<i>Securigera varia</i>	crown vetch	4				4	L+
<i>Sedum acre</i>	mossy stonecrop	5				5	L+
<i>Sedum album</i>	white stonecrop	5					L+
<i>Setaria faberi</i>	giant foxtail	5				5	L+
<i>Setaria verticillata</i>	bristly foxtail	5				5	L+
<i>Setaria viridis</i>	green foxtail	4				4	L+
<i>Silene latifolia</i>	evening lychnis	4				4	L+
<i>Silene vulgaris</i>	bladder campion	4				4	L+
<i>Sinapis arvensis</i>	charlock	4				4	L+
<i>Solanum dulcamara</i>	bittersweet nightshade	3				3	L+
<i>Solanum lycopersicum</i>	tomato (incl. cherry tomato)	5				5	L+
<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	glandular perennial sow-thistle	5				5	L+
<i>Sonchus asper</i>	spiny sow-thistle	5				5	L+
<i>Sonchus oleraceus</i>	annual sow-thistle	5				5	L+
<i>Sorbaria sorbifolia</i>	false spiraea	4				4	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Sorbus aucuparia</i>	European mountain-ash	3				3	L+
<i>Spergularia media</i>	intermediate sand spurrey	5				5	L+
<i>Spiraea x vanhouttei</i>	bridalwreath spiraea	5				5	L+
<i>Stellaria graminea</i>	grass-leaved chickweed	4				4	L+
<i>Stellaria media</i>	common chickweed	5				5	L+
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	western snowberry	5				5	L+
<i>Symphytum officinale</i>	common comfrey	5				5	L+
<i>Syringa vulgaris</i>	common lilac	3				3	L+
<i>Tanacetum vulgare</i>	tansy	4				4	L+
<i>Taraxacum officinale</i>	dandelion	3				3	L+
<i>Taxus cuspidata</i>	Japanese yew	5				5	L+
<i>Thlaspi arvense</i>	penny-cress	3				3	L+
<i>Tilia cordata</i>	little-leaf linden	5				5	L+
<i>Torilis japonica</i>	hedge-parsley	4				4	L+
<i>Tragopogon dubius</i>	lemon-yellow goat's beard	3				3	L+
<i>Tragopogon pratensis</i>	meadow goat's beard	3				3	L+
<i>Trifolium hybridum</i>	alsike clover	5				5	L+
<i>Trifolium pratense</i>	red clover	3				3	L+
<i>Trifolium repens</i>	white clover	3				3	L+
<i>Tripleurospermum inodorum</i>	scentless chamomile	4				4	L+
<i>Tulipa x hybrida</i>	garden tulip	4					L+
<i>Tussilago farfara</i>	coltsfoot	2				2	L+
<i>Typha angustifolia</i>	narrow-leaved cattail	3				3	L+
<i>Typha x glauca</i>	hybrid cattail	3				3	L+
<i>Ulmus glabra</i>	Scotch elm	5				5	L+
<i>Ulmus pumila</i>	Siberian elm	4				4	L+
<i>Urtica dioica</i> ssp. <i>dioica</i>	European stinging nettle	4				4	L+
<i>Valeriana officinalis</i>	common valerian	4				4	L+
<i>Verbascum thapsus</i>	common mullein	3				3	L+
<i>Veronica arvensis</i>	corn speedwell	5				5	L+
<i>Veronica longifolia</i>	long-leaved speedwell	5				5	L+
<i>Veronica serpyllifolia</i> ssp. <i>serpyllifolia</i>	thyme-leaved speedwell	5				5	L+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Viburnum lantana</i>	wayfaring tree	4				4	L+
<i>Viburnum opulus</i>	European highbush cranberry	3				3	L+
<i>Vicia cracca</i>	cow vetch	3				3	L+
<i>Vinca minor</i>	periwinkle	4				4	L+
<i>Yucca filamentosa</i>	Adam's needle	5				5	L+
<i>Acer negundo</i>	Manitoba maple	2	0	0	2	4	L+?
<i>Agrostis stolonifera</i>	creeping bent grass	3				3	L+?
<i>Atriplex patula</i>	halberd-leaved orache	5				5	L+?
<i>Atriplex prostrata</i>	spreading orache	5				5	L+?
<i>Euphorbia glyptosperma</i>	ridge-seeded spurge	5				5	L+?
<i>Euphorbia maculata</i>	spotted spurge	5				5	L+?
<i>Geranium robertianum</i>	herb Robert	3				3	L+?
<i>Humulus lupulus</i> var. <i>lupulus</i>	common hops	5				5	L+?
<i>Lepidium densiflorum</i>	common pepper-grass	5				5	L+?
<i>Persicaria hydropiper</i>	water-pepper	5				5	L+?
<i>Phalaris arundinacea</i>	reed canary grass	3				3	L+?
<i>Sporobolus neglectus</i>	overlooked dropseed	5				5	L+?
<i>Sporobolus vaginiflorus</i>	ensheathed dropseed	5				5	L+?
<i>Pinus resinosa</i>	red pine	2	5	5	5	17	pL2
<i>Abies balsamea</i>	balsam fir	2	3	4	5	14	pL3
<i>Larix laricina</i>	tamarack	2	4	4	4	14	pL3
<i>Physocarpus opulifolius</i>	ninebark	3	2	5	4	14	pL3
<i>Abies alba</i>	white fir	5					pL+
<i>Chaenomeles japonica</i>	flowering quince	5				5	pL+
<i>Forsythia suspensa</i>	weeping forsythia	5				5	pL+
<i>Juglans x bisbyi</i>	buartnut	5					pL+
<i>Larix decidua</i>	European larch	4				4	pL+
<i>Picea abies</i>	Norway spruce	5				5	pL+
<i>Picea pungens</i>	Colorado spruce	5				5	pL+
<i>Pinus banksiana</i>	Jack pine	5				5	pL+
<i>Pinus nigra</i>	Austrian pine	5				5	pL+
<i>Pseudotsuga menziesii</i> var. <i>glauca</i>	Rocky Mountain Douglas-fir	5				5	pL+

Appendix 2: Flora Species Scarborough Waterfront 1997-2011							
		Local	Popn.	Hab.	Sens.	Total	Rank
		Occur.	Trend	Dep.	Dev.	Score	TRCA
New Scientific Name	Common Name	1-5	1-5	0-5	0-5	2-20	(03/2009)
<i>Salix caprea</i>	goat willow	5				5	pL+
<i>Salix pentandra</i>	laurel willow	5				5	pL+
<i>Tilia x flavescens</i>	hybrid linden	5					pL+
<i>Prunus pumila</i> var. <i>pumila</i>	sand cherry	5		5		10	pL+?
<i>Ammophila breviligulata</i>	marram grass	4	4	5	4	17	prL2
<i>Cyperus schweinitzii</i>	Schweinitz's umbrella-sedge	4	4	5	4	17	prL2
<i>Nymphaea odorata</i> ssp. <i>tuberosa</i>	tuberous water-lily	5	4	5	3	17	prL2
<i>Carex flava</i>	yellow sedge	3	3	5	4	15	prL3
<i>Helianthus divaricatus</i>	woodland sunflower	5	3	4	4	16	prL3
<i>Physostegia virginiana</i> ssp. <i>virginiana</i>	false dragonhead	4	3	4	4	15	prL3
<i>Picea glauca</i>	white spruce	1	5	4	4	14	prL3
<i>Spartina pectinata</i>	prairie cord grass	4	3	5	3	15	prL3
<i>Silphium perfoliatum</i>	cup-plant	5	1	3	2	11	prL4
<i>Cryptotaenia japonica</i>	Asiatic honewort (purple form)	5					prL+
<i>Knautia arvensis</i>	field scabious	5					prL+
<i>Pachysandra terminalis</i>	Japanese spurge	5				5	prL+
<i>Syringa x prestoniae</i>	Preston lilac	4					prL+
<i>Trillium sessile</i>	toadshade trillium	5					prL+
Summary of observations 1997-2011							
Total # of species		658					
Naturally-occurring species		626		95%			
Planted species		32		5%			
Native (naturally-occurring) species		344		55%			
Exotic (naturally-occurring) species		282		45%			
Number of L1 - L3 species		94		15%			
Number of L4 species		111		18%			
L1 - L4 species with LO score ≥ 4		47		23%			
L1 - L4 species with HD score ≥ 3		188		92%			
L1 - L4 species with SD score ≥ 3		184		90%			

Appendix 3: List of Fauna Species for Scarborough Shorelines, 2002 - 2011.

Common Name	Code	Scientific Name	count	LO	PTn	PTt	AS	PIS	HD	StD	+	TS	L-Rank
Survey Species: species for which the TRCA protocol effectively surveys.													
Birds													
black-billed cuckoo	BBCU	<i>Coccyzus erythrophthalmus</i>	1	0	3	2	3	1	3	3	0	15	L3
bobolink*	BOBO	<i>Dolichonyx oryzivorus</i>	(2)	0	3	3	3	1	1	5	1	17	L3
brown thrasher	BRTH	<i>Toxostoma rufum</i>	10	0	3	3	2	2	1	4	0	15	L3
eastern towhee	EATO	<i>Pipilo erythrophthalmus</i>	1	2	3	2	2	2	1	4	0	16	L3
mourning warbler	MOWA	<i>Geothlypis philadelphia</i>	1	0	3	2	2	2	2	4	0	15	L3
pileated woodpecker	PIWO	<i>Dryocopus pileatus</i>	2	0	2	2	4	1	3	3	0	15	L3
pine warbler	PIWA	<i>Setophaga pinus</i>	1	0	2	2	4	1	3	3	0	15	L3
red-necked grebe**	RNGR	<i>Podiceps grisegena</i>	*	5	2	1	3	1	3	4	0	19	L3
sharp-shinned hawk	SSHA	<i>Accipiter striatus</i>	2	1	2	2	4	1	3	3	0	16	L3
winter wren	WIWR	<i>Troglodytes troglodytes</i>	2	1	2	2	3	2	3	5	1	19	L3
wood thrush	WOTH	<i>Hylocichla mustelina</i>	2	0	3	2	3	2	2	4	0	16	L3
American kestrel	AMKE	<i>Falco sparverius</i>	1	1	2	3	1	1	2	0	0	10	L4
American redstart	AMRE	<i>Setophaga ruticilla</i>	4	0	2	2	3	1	2	4	0	14	L4
bank swallow	BANS	<i>Riparia riparia</i>	10	1	3	2	1	1	3	3	0	14	L4
barn swallow	BARS	<i>Hirundo rustica</i>	1	0	2	3	1	1	2	1	0	10	L4
belted kingfisher	BEKI	<i>Ceryle alcyon</i>	2	0	3	2	2	1	2	2	0	12	L4
blue-grey gnatcatcher	BGGN	<i>Poliophtila caerulea</i>	5	1	1	1	3	1	1	3	0	11	L4
Carolina wren	CARW	<i>Thryothorus ludovicianus</i>	3	3	2	2	1	2	2	1	0	13	L4
chimney swift	CHSW	<i>Chaetura pelagica</i>	1	1	3	3	1	1	1	1	0	11	L4
common yellowthroat	COYE	<i>Geothlypis trichas</i>	6	0	2	2	1	2	1	4	0	12	L4
Cooper's hawk	COHA	<i>Accipiter cooperii</i>	2	0	2	1	4	1	3	2	0	13	L4
eastern kingbird	EAKI	<i>Tyrannus tyrannus</i>	10	0	4	2	2	1	1	3	0	13	L4
eastern meadowlark*	EAME	<i>Sturnella magna</i>	(1)	0	3	2	3	1	1	3	0	13	L4
eastern screech-owl	EASO	<i>Megascops asio</i>	3	0	2	2	1	2	3	3	0	13	L4
eastern wood-pewee	EAWP	<i>Contopus virens</i>	10	0	4	2	2	1	1	3	0	13	L4
gadwall	GADW	<i>Anas strepera</i>	1	4	1	2	1	2	1	3	0	14	L4
great-crested flycatcher	GCFL	<i>Myiarchus crinitus</i>	8	0	2	2	3	1	2	2	0	12	L4
great-horned owl	GHOW	<i>Bubo virginianus</i>	1	0	2	2	2	2	1	2	0	11	L4
grey catbird	GRCA	<i>Dumetella carolinensis</i>	85	0	2	2	1	1	1	3	0	10	L4
hairy woodpecker	HAWO	<i>Picoides villosus</i>	6	0	2	2	3	1	2	2	0	12	L4
indigo bunting	INBU	<i>Passerina cyanea</i>	6	0	2	2	1	1	2	4	0	12	L4
least flycatcher	LEFL	<i>Empidonax minimus</i>	1	0	4	2	2	1	1	3	0	13	L4
northern flicker	NOFL	<i>Colaptes auratus</i>	7	0	3	2	1	1	2	3	0	12	L4

Appendix 3: List of Fauna Species for Scarborough Shorelines, 2002 - 2011.

Common Name	Code	Scientific Name	count	LO	PTn	PTt	AS	PIS	HD	StD	+	TS	L-Rank
northern rough-winged swallow	NRWS	<i>Stelgidopteryx serripennis</i>	7	0	1	2	1	1	3	2	0	10	L4
red-bellied woodpecker	RBWO	<i>Melanerpes carolinus</i>	1	4	1	2	2	1	1	2	0	13	L4
red-breasted nuthatch	RBNU	<i>Sitta canadensis</i>	3	0	1	2	3	1	1	2	0	10	L4
red-eyed vireo	REVI	<i>Vireo olivaceus</i>	20	0	2	2	2	1	1	3	0	11	L4
rose-breasted grosbeak	RBGR	<i>Pheucticus ludovicianus</i>	3	0	2	2	3	1	2	3	0	13	L4
ruby-throated hummingbird	RTHU	<i>Archilochus colubris</i>	3	0	2	2	1	1	2	2	0	10	L4
savannah sparrow*	SAVS	<i>Passerculus sandwichensis</i>	(3)	0	3	2	1	1	1	4	0	12	L4
spotted sandpiper	SPSA	<i>Actitis macularia</i>	7	0	2	3	1	2	1	4	0	13	L4
tree swallow	TRES	<i>Tachycineta bicolor</i>	5	0	2	2	1	1	2	2	0	10	L4
white-breasted nuthatch	WBNU	<i>Sitta carolinensis</i>	4	0	2	2	3	1	2	2	0	12	L4
willow flycatcher	WIFL	<i>Empidonax traillii</i>	14	0	4	2	1	1	1	3	0	12	L4
American Crow	AMCR	<i>Corvus brachyrhynchos</i>	x	0	1	2	1	1	0	0	0	5	L5
American goldfinch	AMGO	<i>Carduelis tristis</i>	x	0	2	2	1	1	0	1	0	7	L5
American robin	AMRO	<i>Turdus migratorius</i>	x	0	1	2	1	1	0	1	0	6	L5
Baltimore oriole	BAOR	<i>Icterus galbula</i>	x	0	2	2	1	1	0	1	0	7	L5
black-capped chickadee	BCCH	<i>Parus atricapillus</i>	x	0	1	2	1	1	0	1	0	6	L5
blue jay	BLJA	<i>Cyanocitta cristata</i>	x	0	4	2	1	1	0	1	0	9	L5
brown-headed cowbird	BHCO	<i>Molothrus ater</i>	x	0	2	2	1	1	0	1	0	7	L5
Canada goose	CANG	<i>Branta canadensis</i>	x	0	1	1	1	2	1	0	0	6	L5
cedar waxwing	CEDW	<i>Bombycilla cedrorum</i>	x	0	1	2	1	1	0	1	0	6	L5
chipping sparrow	CHSP	<i>Spizella passerina</i>	x	0	2	2	1	1	0	2	0	8	L5
common grackle	COGR	<i>Quiscalus quiscula</i>	x	0	3	2	1	1	0	1	0	8	L5
downy woodpecker	DOWO	<i>Picoides pubescens</i>	x	0	3	2	1	1	1	1	0	9	L5
house wren	HOWR	<i>Troglodytes aedon</i>	x	0	2	2	1	2	1	1	0	9	L5
killdeer	KILL	<i>Charadrius vociferus</i>	x	0	2	2	1	2	0	2	0	9	L5
mallard	MALL	<i>Anas platyrhynchos</i>	x	0	2	2	1	2	0	1	0	8	L5
mourning dove	MODO	<i>Zenaidura macroura</i>	x	0	2	2	1	1	0	0	0	6	L5
northern cardinal	NOCA	<i>Cardinalis cardinalis</i>	x	0	2	2	1	1	1	2	0	9	L5
northern mockingbird	NOMO	<i>Mimus polyglottos</i>	x	0	2	0	1	1	1	1	0	6	L5
orchard oriole	OROR	<i>Icterus spurius</i>	9	1	2	1	1	1	0	1	0	7	L5
red-winged blackbird	RWBL	<i>Agelaius phoeniceus</i>	x	0	2	2	1	1	0	2	0	8	L5
song sparrow	SOSP	<i>Melospiza melodia</i>	x	0	2	2	1	2	0	2	0	9	L5
warbling vireo	WAVI	<i>Vireo gilvus</i>	x	0	1	2	1	1	1	2	0	8	L5
yellow warbler	YWAR	<i>Setophaga petechia</i>	x	0	1	2	1	1	1	3	0	9	L5
European starling	EUST	<i>Sturnus vulgaris</i>	x										L+

Appendix 3: List of Fauna Species for Scarborough Shorelines, 2002 - 2011.

Common Name	Code	Scientific Name	count	LO	PTn	PTt	AS	PIS	HD	StD	+	TS	L-Rank
house finch	HOFI	<i>Carpodacus mexicanus</i>	x										L+
house sparrow	HOSP	<i>Passer domesticus</i>	x										L+
mute swan	MUSW	<i>Cygnus olor</i>	x										L+
rock dove	ROPI	<i>Columba livia</i>	x										L+
trumpeter swan	TRUS	<i>Cygnus buccinator</i>	x										L+
Herpetofauna													
eastern red-backed salamander	RBSA	<i>Plethodon cinereus</i>	2	0	2	2	1	4	3	4	0	16	L3
northern leopard frog	LEFR	<i>Lithobates pipiens</i>	1	0	3	2	1	4	2	5	1	18	L3
American toad	AMTO	<i>Anaxyrus americanus</i>	3	0	3	2	1	4	0	4	0	14	L4
green frog	GRFR	<i>Lithobates clamitans</i>	2	0	2	2	1	3	1	4	0	13	L4
Incidental Species: species that are reported on as incidental to the TRCA protocol.													
Mammals													
beaver	BEAV	<i>Castor canadensis</i>	1	1	2	1	2	3	1	3	0	13	L4
eastern chipmunk	EACH	<i>Tamias striatus</i>	6	0	2	2	2	3	1	3	0	13	L4
eastern cottontail	EACO	<i>Sylvilagus floridanus</i>	2	0	2	2	1	3	1	2	0	11	L4
meadow vole	MEVO	<i>Microtus pennsylvanicus</i>	2	2	2	2	1	2	1	2	0	12	L4
mink	MINK	<i>Mustela vison</i>	1	1	2	2	3	3	0	3	0	14	L4
red squirrel	RESQ	<i>Tamiasciurus hudsonicus</i>	3	0	2	2	1	3	1	2	0	11	L4
white-tailed deer	WTDE	<i>Odocoileus virginianus</i>	4	0	2	1	3	2	2	1	0	11	L4
grey squirrel	GRSQ	<i>Sciurus carolinensis</i>	x	0	2	2	1	3	0	0	0	8	L5
raccoon	RACC	<i>Procyon lotor</i>	x	0	2	2	1	3	1	0	0	9	L5
striped skunk	STSK	<i>Mephitis mephitis</i>	x	1	2	2	1	3	0	0	0	9	L5
domestic cat	DOCA	<i>Felis catus</i>	x										L+
Herpetofauna													
common musk turtle	STIN	<i>Sternotherus odoratus</i>	1	5	3	2	2	4	2	4	0	22	L2
midland painted turtle	MPTU	<i>Chrysemys picta marginata</i>	1	0	2	2	1	5	1	4	1	16	L3
brownsnake	BRSN	<i>Storeria dekayi</i>	1	2	2	2	1	3	0	4	0	14	L4
eastern gartersnake	EAGA	<i>Thamnophis sirtalis sirtalis</i>	8	0	2	2	1	3	0	3	0	11	L4
red-eared slider	SLID	<i>Trachemys scripta elegans</i>	1										L+

