

## TERRESTRIAL NATURAL HERITAGE SYSTEM

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## 8.0 TERRESTRIAL NATURAL HERITAGE SYSTEM

The terrestrial natural heritage system is comprised of the forest, wetland and meadow habitats and the communities of species they support. This system is affected by surrounding land use changes and regional climate change. Historically, the terrestrial natural heritage system of the Etobicoke and Mimico Creeks watersheds has gone through several periods of change with agricultural settlement followed by urbanization. Through the 20<sup>th</sup> century these watersheds became completely urbanized with the exception of 20% of Etobicoke Creek, mostly in the headwaters, where agriculture prevailed. A detailed description of the watersheds in these periods of time can be found in *Greening Our Watersheds: Revitalization Strategies for Etobicoke and Mimico Creeks* (TRCA, 2002).

Predictions of climate change and the potential impacts on the terrestrial natural heritage system and its responses are diverse. While increased temperatures through climate change may support greater biodiversity, there is expected to be a shift toward greater numbers of exotic species. Also, urban landscapes tend to create barriers to the dispersal of native species and facilitate dispersal of exotics. Given the predominance of urban land uses, the Etobicoke and Mimico Creeks watersheds would have an increased potential for more exotic species than native species.

In response to concerns over the loss of terrestrial habitats and species throughout its jurisdiction and the need to build resilience in the system for future climates, The Toronto and Region Conservation Authority (TRCA) adopted a Regional Terrestrial Natural Heritage System Strategy (TNHSS) to protect and improve regional biodiversity (TRCA, 2007; see **Box 1**). The Strategy used a modelling approach to identify an expanded targeted terrestrial natural heritage system that would be necessary to support regional biodiversity. TRCA intended that the regional targeted system would be refined at more detailed watershed and community planning scales.

This **Terrestrial Natural Heritage System (TNHS) Section** presents a refined target TNHS for the Etobicoke and Mimico Creeks watersheds, based on the TRCA's Regional TNHS (TRCA, 2007). The discussion is guided by the relevant objectives and indicators for terrestrial natural heritage, as defined in the previous watershed report card, and recommends revised targets based on this Technical Update. This section presents a summary of existing terrestrial natural heritage, including quantity of natural cover, quality of natural cover, species and vegetation communities, invasive species and effects of surrounding land use (matrix); and also identifies priority management areas.

### 8.1 WATERSHED OBJECTIVES, INDICATORS AND TARGETS

The Terrestrial Natural Heritage objectives and indicators used in undertaking this Technical Update were taken from *Turning over a new leaf: The Etobicoke and Mimico Creeks Watersheds Report Card* (TRCA, 2006), and are presented in **Table 8-1** with revised targets.

**Table 8-1: Watershed Objectives, Indicators and Targets**

| Terrestrial Natural Heritage System<br>Objective: Forest and wetland habitats are preserved, regenerated and created, ensuring the healthiest possible conditions, and the greatest possible representation of native plant and animal communities and species. |  |
|---|--|
| Indicator   | Targets  |
| Quantity of natural cover   | <ul style="list-style-type: none"> <li>• 14.1% of the watersheds (combined area) should be natural cover <sup>1</sup></li> </ul>   |
| Quality of natural cover  | <ul style="list-style-type: none"> <li>• There should be an increase in the quality of natural areas in the watersheds as measured by the proportion of “good” (L2) and “fair” (L3) total patch scores (Baseline as per Technical Update, TRCA, 2010)</li> </ul> |

<sup>1</sup> Target revised as of Technical Update (TRCA, 2010) to reflect the watersheds (combined area) refined regional target TNHS.

### 8.2 OBJECTIVES OF TECHNICAL UPDATE

*Turning over a new leaf: The Etobicoke and Mimico Creeks Watersheds Report Card 2006* (TRCA, 2006) recommended that TRCA should: complete the inventory for all natural cover and indicator species in the watersheds; refine the regional target system outlined in TRCA’s Regional Terrestrial Natural Heritage System Strategy (TNHSS) (TRCA, 2007) for these watersheds; and identify priority protection, enhancement and securement areas. Part of this work began prior to this Technical Update, however this report serves as a vehicle for consolidating and presenting the work through integrated watershed management.

Drawing upon this new information, the principle objectives of the Terrestrial Natural Heritage System (TNHS) component of this Technical Update are as follows:

- Characterize the existing Terrestrial Natural Heritage System (TNHSS) for the Etobicoke and Mimico Creeks watersheds;
- Refine the Regional Target (TNHSS) at the watershed scale; and
- Identify recommendations for priority management opportunities.

**Box 1**

**Regional Terrestrial Natural Heritage System Strategy**

*TRCA has developed a Regional Terrestrial Natural Heritage System Strategy (TRCA, 2007) for retaining and recovering terrestrial natural heritage within its jurisdiction to protect and improve biodiversity. The strategy incorporates target-setting for improvement and modelling of natural cover at the regional level. The targets include improving the quality distribution and quantity of natural cover. The quantity target is essentially the amount of natural cover necessary to achieve the quality distribution targets for vegetation and biodiversity. The aim of the target is to achieve a conservation strategy designed both to protect elements of the natural system (i.e., vegetation communities, flora and fauna species) before they become rare and to promote improved ecological function of the natural system as a whole.*

*The Strategy addresses the decline in biodiversity in two ways:*

- 1. By applying a systems approach that emphasizes the importance of the terrestrial natural heritage system as a single functional unit, rather than as separate natural areas; and*
- 2. By determining targets for the quality, distribution, and quantity indicators of terrestrial natural heritage needed in the landscape, in order to support native biodiversity and a sustainable city/region. These targets will provide direction in planning at all scales.*

*A modelling exercise shows how to accomplish by identifying areas for restoration that will have the most benefit to the ecological integrity and biological diversity of the larger regional system. In the Landscape Analysis Model (LAM) each discrete habitat patch in the study area is scored for three landscape ecology measures: size, shape, and matrix influence. Scripts are then written in Arcview GIS in order to run the LAM across the region. Then the patch results are considered together, across the region, as a system. A target was established to improve regional habitat quality from 'fair' to 'good'.*

*A Geographic Information System (GIS) raster analysis was used to assess which lands would be most valuable to add to the natural heritage system. The top 30% were selected as the target natural system. Evaluation of habitat quality of this expanded system, using the LAM, confirmed that the target system achieved the objective of having, on average, quality scores of "fair" to "good", thus suggesting it would be capable of supporting TRCA Species of Conservation Concern. Quality scores range from excellent to very poor or L1-L5 (local ranks); fair and good scores correspond to L3 and L2 respectively.*

*Past observations and analysis of biota distribution suggest that there is a range of species-specific responses to habitat fragmentation and urban/residential development that ranges from tolerant/well adapted to intolerant/averse. The TRCA has classified species and vegetation communities along that continuum into classes L5 (tolerant) to L1 (intolerant). Based on the LAM, a few species can live in "poor" quality patches, however most TRCA Species of Conservation Concern (L1-L3, and L4 in urban areas) require at least "fair" quality habitat. This information suggested that if the system supported a full range of quality, but emphasized "good" quality patches (11-12 points), then most TRCA Species of Conservation Concern (and associated ecosystem benefits) would be protected throughout the system, notwithstanding potential influences from climate change.*

*Further refinement of the regional modelled target system is carried out at more detailed scales, such as through watershed planning studies.*

## 8.3 DATA SOURCES AND METHODS

### 8.3.1 Data Sources

Data Layers used for the refinement of the TNHS at the watershed scale are as follows:

- Environmentally Significant Areas (ESAs), TRCA, 1997.
- Waterbodies and Watercourses, TRCA, 1999.
- Natural Cover – 2002. Air Photo Interpretation, TRCA, 2002; in addition 2005 air photos were reviewed to assess any significant change in cover between 2002 and 2005.
- Regional TNHS – Existing and Potential Natural Cover, TRCA, 2002.
- Areas of Natural and Scientific Significance (ANSIs), Ontario Ministry of Natural Resources (OMNR), 2003.
- 2005 Ortho aerial photography, JD Barnes Limited, 2005.
- Regulation Limit (Generic Reg.), TRCA, 2006.
- Land Use – Etobicoke & Mimico Watersheds. Macaulay Shiomi Howson Ltd., February, 2006. Map 02 – Zoned Land Use.
- Management Zones – from *Heart Lake Conservation Area Management Plan, 2006*. TRCA, 2006.
- Roads, OMNR, 2007.
- Vegetation Type Ecological Land Classification (ELC); Flora and Fauna - Classified by LRank, TRCA, 2007

Data Layers used in identifying priority management areas:

- Watercourses, TRCA, 1999
- TNHS - Planning Zone, TRCA, 2002
- Subwatershed Percentage Cover (Existing vs. Target)
  - Natural Cover – 2002. Air Photo Interpretation, TRCA, 2002; in addition 2005 air photos were reviewed to assess any significant change in cover between 2002 and 2005.
  - Regional TNHS, TRCA, 2002
- Drainage Lines and Catchments (30 hectare drainage limit)
  - Created from ArchHydro DEM, OMNR, 2002
- Interior Forest
  - Interior created from Regional Terrestrial Natural Heritage System (TNHS), TRCA, 2002
- 2005 Ortho aerial photography, JD Barnes Limited, 2005
- Levels of Protection
  - Environmentally Significant Areas (ESAs), TRCA, 1997
  - Provincially Significant Wetlands (PSWs), OMNR, 2003
  - Greenbelt Natural Heritage System, Ministry of Municipal Affairs and Housing (MMAH), 2005
  - Generic Regulation Limit, TRCA, 2006
  - Property Division, TRCA, 2007
- Physiographic Zone
- Biodiversity Hotspots, TRCA, 2007
- Roads, OMNR, 2007
- Flora and Fauna Biodiversity Hotspots, TRCA, 2007

- Flora Diversity
  - Flora (L1-L3 Communities)
  - Flora Grid (100m x 100m)
  - Flora Diversity Hotspots
- Vegetation Community Biodiversity Hotspots, TRCA, 2007
  - Vegetation Type (Ecological Land Classification (ELC)) L1 – L3 communities)
- Forest Community Age
  - Ecological Land Classification (ELC) TRCA, 2007

### 8.3.2 Methods

The existing TNHS in each major subwatershed of the Etobicoke and Mimico Creeks has been characterized using two indicators: (1) Quantity of natural cover and (2) Quality and distribution of natural cover. Connectivity, species and vegetation communities, and surrounding land use (matrix influence) are also briefly discussed in characterizing the system.

The Regional Target TNHS has been refined for the Etobicoke and Mimico Creeks watersheds using the same process as in the Rouge, Humber, and Don River Watershed Plans (e.g. *Rouge River Watershed Scenario Modelling and Analysis Report*, TRCA, 2007). This process involves making minor changes to the regional system based on updated information. Lost restoration opportunities are removed and new opportunities are added (for details see **Appendix 8-A**).

The priority management areas have been identified by applying numerous ecological criteria to the landscape. The areas that meet the greatest number of criteria are considered priority management areas from a terrestrial natural heritage perspective (for details see **Appendix 8-B**).

## 8.4 EXISTING CONDITIONS AND INTERPRETATION

### 8.4.1 Quantity of Natural Cover

The quantity of natural cover refers to the amount of natural habitat within a given area. The broad habitat types of natural cover include forest, wetland, successional, meadow, and beach/bluff. This report will generally focus on forests and wetlands as the Etobicoke and Mimico Creeks watersheds are located in a forest bioregion where forests, and to a lesser extent wetlands, dominated the pre-settlement landscape. These two habitat types are the main focus for restoration. **Table 8-2** outlines the percentage of natural cover by broad habitat type for both the Etobicoke and Mimico Creeks watersheds.

**Table 8-2: Total Natural Cover by Broad Habitat Type \***

| Watershed       | Forest |     | Wetland |     | Successional |     | Meadow |     | Beach/Bluff |   |
|-----------------|--------|-----|---------|-----|--------------|-----|--------|-----|-------------|---|
|                 | Ha     | %   | Ha      | %   | Ha           | %   | Ha     | %   | Ha          | % |
| Etobicoke Creek | 1046   | 4.6 | 132     | 0.6 | 72           | 0.5 | 1771   | 7.7 | 3           | 0 |
| Mimico Creek    | 172    | 2.0 | 14      | 0.2 | 39           | 0.3 | 656    | 7.6 | 0           | 0 |
| Waterfront      | 5.3    | 0.5 | 1.5     | 0.1 | 1.2          | 0.1 | 41.2   | 3.5 | 0           | 0 |

\* Based on Natural Cover layer, TRCA, 2002

**Figure 8-1** and **Table 8-3** illustrate that there is very little natural cover remaining within these two watersheds; the vast majority of which is located within river valleys or stream corridors. Results of a 2002 riparian assessment concluded that only 45 % of the riparian zone in the Etobicoke Creek and 49 % of the riparian zone in the Mimico Creek has natural cover.

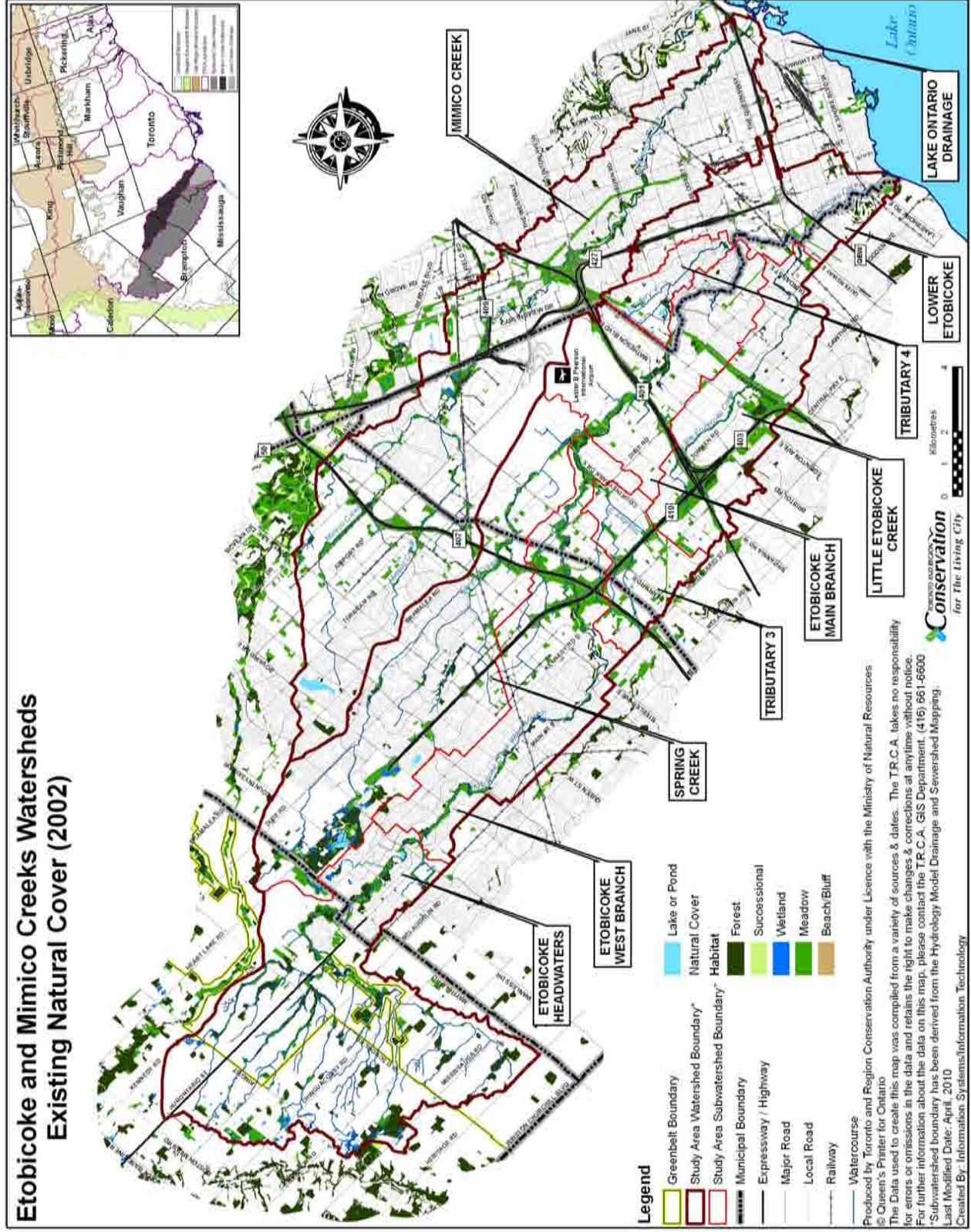
The Little Etobicoke Creek and Tributary 3 subwatersheds contain the greatest amount of existing natural cover. Both of these subwatersheds contain a large portion of cultural meadow habitat associated with transportation corridors and very little forest and wetland habitat. Cultural meadow habitat, in this context, tends to have low ecological function. This is because the meadows tend to be small, convoluted, and fragmented. In contrast, the Etobicoke Creek Headwaters, and to a lesser degree Spring Creek subwatershed contain a much higher proportion of forest and wetland habitat.

**Table 8-3: Total Existing Natural Cover by Subwatershed \***

| Subwatershed          | Area of Habitat | % cover      |
|-----------------------|-----------------|--------------|
| Lower Etobicoke       | 192             | 11.1%        |
| Spring Creek          | 566             | 12.1%        |
| Tributary 4           | 49              | 9.6%         |
| Little Etobicoke      | 426             | 19.0%        |
| Tributary 3           | 161             | 15.9%        |
| Etobicoke Headwaters  | 839             | 14.1%        |
| Etobicoke Main Branch | 284             | 12.0%        |
| Lake Ontario Drainage | 52              | 4.4%         |
| Etobicoke West Branch | 456             | 14.1%        |
| Mimico Creek          | 880             | 10.2%        |
| <b>Total</b>          | <b>3905</b>     | <b>12.4%</b> |

\* Based on Natural Cover layer, TRCA, 2002

Etobicoke and Mimico Creeks Watersheds Existing Natural Cover  
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#### 8.4.2 Connectivity

As with quantity of natural cover, connectivity of habitat throughout the landscape is important for the maintenance of species populations. In both Etobicoke and Mimico Creeks watersheds the north/south connectivity remains through some of the valley corridors. This includes the main Mimico valley and many of the larger tributaries in the Etobicoke Creek watershed. Although habitat may not be continuous in some areas, the habitat patches help to provide a stepping stone effect allowing species to move north and south. These valley corridors play an important role in facilitating both resident and migrant species movement.

In terms of the east/west connectivity in both watersheds, very few linkages remain. This inhibits the ability for species to move between habitat patches both within the Etobicoke and Mimico Creeks watersheds, as well as to the natural systems beyond, in the Credit River and Humber River watersheds.

Seven Provincial 400-series highways (including the QEW) bisect the Etobicoke and Mimico Creeks watersheds in addition to the lands covered by the Pearson International Airport. Area covered by airport in Etobicoke Creek watershed is 6% and highways is 2%; in Mimico Creek watershed the airport covers 6% and highway covers 3% of land area. This is an extremely high density considering the size of these watersheds. There are also a significant number of large municipal roads, some of which are being widened. Two examples include Mayfield Road and Queen Street (an area of current development and an area of intensification). These factors contribute, in a significant way, to the disconnected state of the natural system.

#### 8.4.3 Quality and Distribution of Natural Cover

At the landscape scale, the habitat patches in these watersheds were assessed using the Landscape Analysis Model (LAM), developed by TRCA using ArcView GIS. This model assesses the landscape-level patch quality by assigning scores to each natural habitat patch for its **size** (area), **shape** (perimeter-to-area ratio) and the **matrix influence** (influence of the surrounding land use). The results (patch scores) for size, shape and matrix influence can be used individually or the scores for each of the three measures can be combined together to obtain a total patch score for each patch in the study area. It is the total (combined) patch scores that are used in this report to evaluate the quality of habitat patches for existing conditions.

As illustrated in **Figure 8-2**, the majority of the remaining habitat patches in Etobicoke and Mimico Creeks watersheds are considered to be of either fair or poor quality. The habitat patches tend to be small with convoluted edges and influenced by the surrounding urban landscape.

The habitat patches in the headwaters of Etobicoke Creek tend to be slightly larger and more connected than in other portions of the watershed. The dominant land use remains agricultural, which has less negative influence on the habitat quality than urban land use. The combination of these factors in the headwaters result in the majority of the remaining patches functioning at a higher level (fair) compared to other portions of the watersheds. Fair (L3) condition quality patches are the point at which larger numbers of TRCA Species of Conservation Concern are able to be supported. This is illustrated when comparing **Figure 8-2** and **Figure 8-3**.

Species and Vegetation Communities

As would be expected, the majority of the remaining TRCA Species of Conservation Concern are located in the headwaters of Etobicoke Creek watershed including the upper portion of Spring Creek. Within the upper portion of the Spring Creek subwatershed are the natural features of the Heart Lake, Heart Lake Wetland Complex (see **Box 2**), and Tea Pot Lake (see **Box 3**). These areas support a large population of amphibians, possibly the largest in the Etobicoke and Mimico Creeks watersheds. These vegetation communities, plant species and amphibians are extremely sensitive to urban development impacts.

**Box 2: Heart Lake Wetland Complex**

“The provincially significant Heart Lake Wetland Complex consists of 40 wetlands that are centered on an esker ridge buried in glacial till. The wetland complex captures the diversity of wetland types around the buried esker at Heart Lake with headwater palustrine wetlands, isolated kettle wetlands and lacustrine wetlands around Heart Lake. The wetlands largely occur on organics with the remainder on soils that range from clays to loams and sands. The wetlands are dominated by deciduous swamps, thicket swamps, cattail, graminoid and herbaceous marshes and open water aquatic communities. The wetlands support a diversity of 87 vegetation communities (53 vegetation forms), as well as 400 plant species, 74 breeding bird species and 14 reptiles and amphibians in the wetlands and adjacent lands.” (MNR. 2009)

**Box 3: Tea Pot Lake**

Tea Pot Lake is located in the north eastern portion of the Heart Lake Conservation Area. Although it is relatively small (less than one hectare in size), it has many unique features that set it apart from any other lake within the TRCA jurisdiction. The water in most lakes turns over or mixes at least once every year due to changing temperatures and densities of the water. However, the waters in Tea Pot Lake never fully mix. This is because it is a deep lake with a small surface area that is sheltered from the wind. This type of lake is called a meromictic lake and there are only a few known in all of Ontario. The lack of mixing with upper water layers creates unique conditions in the deepest portions of the lake. There is virtually no life present in the deeper portions of the lake due to anaerobic conditions. This combined with little or no water movement results in very little disturbance to the lake bottom.

Numerous wetland types surround the lake including organic swamps and marshes. The most significant wetland associated with Tea Pot Lake is a Tamarack-leatherleaf treed bog. This is an extremely rare vegetation community requiring exacting geophysical conditions. These wetland communities support numerous plants which are TRCA Species of Conservation Concern, many of which are not located anywhere else in the Etobicoke and Mimico Creeks watersheds.

These natural features have been identified through numerous planning designations including:

- The Heart Lake Provincially Significant Wetland Complex;
- The Heart Lake Forest and Bog Area of Natural and Scientific Interest; and
- The Heart Lake Woodlands Environmentally Significant Area.

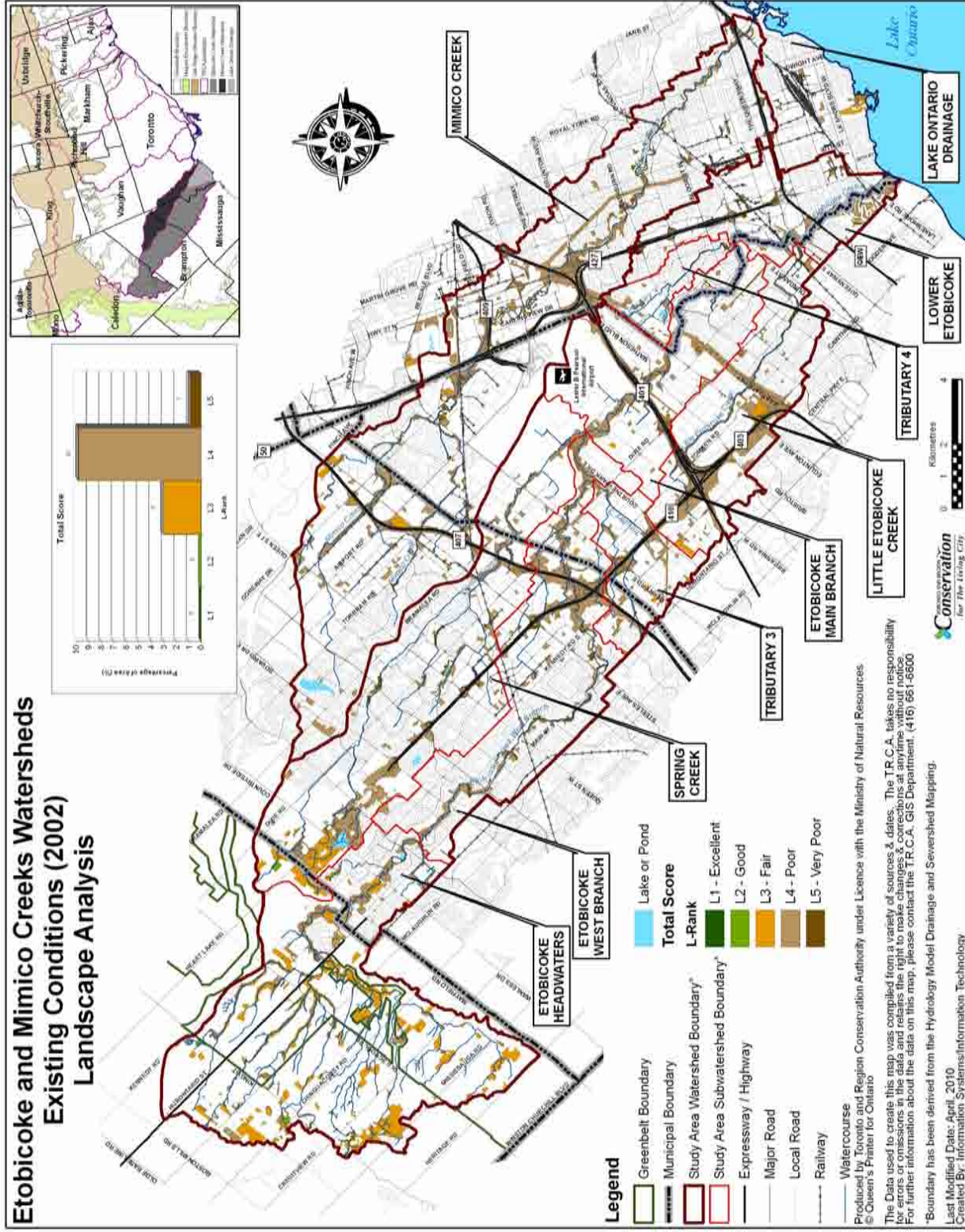
For information on how TRCA Species of Conservation Concern are determined please refer to the *Terrestrial Natural Heritage System Strategy – Appendix B* (TRCA, 2007).

The wetlands within and around Heart Lake contain numerous amphibians including wood frog and spring peeper, both good (L2) species. Although long term data are not available to confirm, it is very likely that the amphibian populations within the Etobicoke and Mimico Creeks watersheds are declining as development continues to isolate and further impact the remaining wetland habitat. Although some fauna Species of Conservation Concern to TRCA remain within the middle and lower portions of the watersheds, there are very few and they likely do not represent stable populations. **Figure 8-3** illustrates that Flora Species of Conservation Concern to TRCA are more evenly distributed throughout both watersheds. Flora species are generally able to persist longer in urban landscapes that represent less than ideal habitat conditions. Some flora Species of Conservation Concern to TRCA include Twinleaf, Royal Fern and Dutchman's breeches (**Figure 8-4**).

### Invasive Species

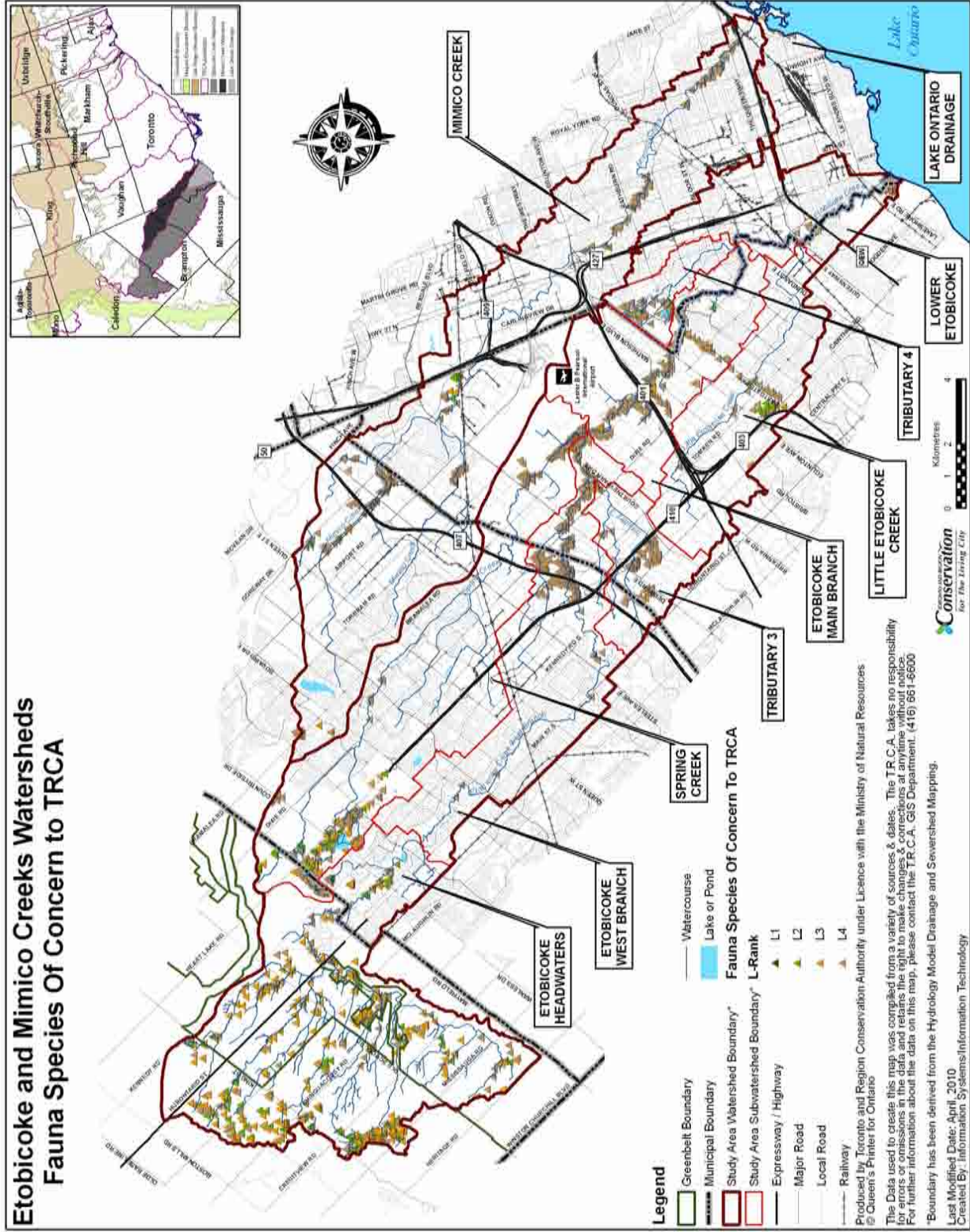
Invasive species can be one of the most significant factors affecting biodiversity within a natural system. This is particularly true for the highly urbanized watersheds of Etobicoke and Mimico Creeks. The natural system is reduced, fragmented, and is subjected to various other impacts associated with anthropogenic activities. The pressure from invasive species is one such impact that poses increasing threat to achieving the Etobicoke and Mimico Creek TNHS targets. Invasive plants tend to be more wide spread and abundant in the southern portions of the watersheds. Having said this, all areas of the natural system are being impacted. Invasive plants must be managed to reduce the negative impacts.

Etobicoke and Mimico Creeks Watersheds Existing Conditions-Landscape Analysis



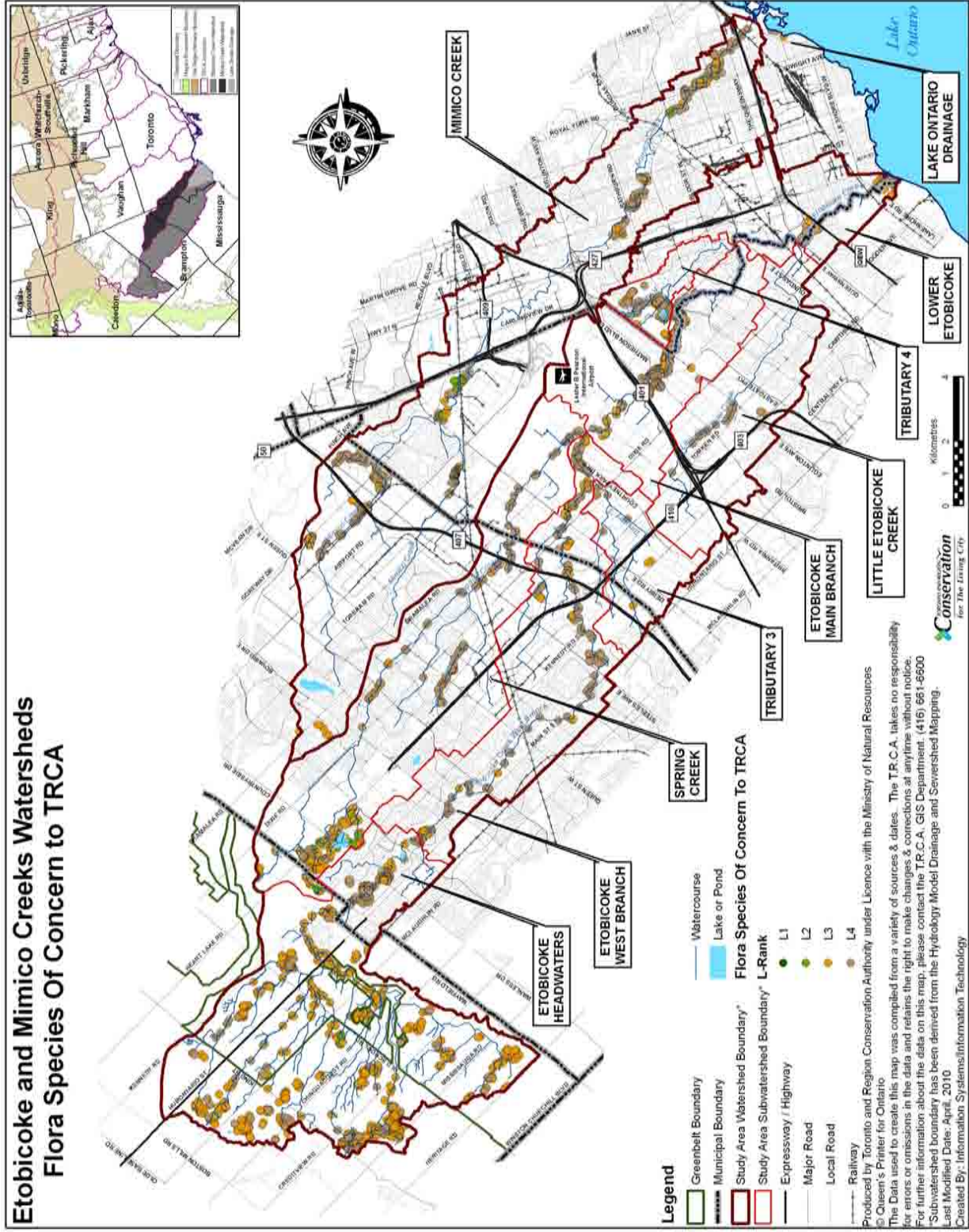
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Figure 8-3: Etobicoke and Mimico Creeks Watersheds - Fauna Species of Concern to TRCA



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Figure 8-4: Etobicoke and Mimico Creeks Watersheds – Flora Species of Concern to TRCA



### Matrix Influence

Matrix influence refers to the extent that surrounding land use affects the integrity of a natural system. This is particularly true for urban watersheds such as the Etobicoke and Mimico Creeks. Although matrix influence is included in the analysis of habitat quality, its significance in these watersheds warrants additional discussion.

The character of the urban land use can either help to reduce negative impacts or intensify them. For example, the more mature neighbourhoods in the lower Etobicoke and Mimico Creeks watersheds with their open spaces, mature street trees and yard gardens help to soften the line between the edge of the natural features and the urban development. This makes the landscape more accessible and hospitable to resident and migrant fauna species. In contrast, industrial areas tend to have little or no open space or tree cover. As well, new residential developments have little to no tree canopy from street and yard trees. These types of landscapes are quite inhospitable to migrating birds and other species and do little to integrate the urban landscape with the remaining natural areas. Much of the development in the middle to upper portions of the watersheds contains this type of landscape.

In a regional context, the characteristics of the Etobicoke and Mimico Creeks natural system are shared by other watersheds within the Toronto and Region Conservation Authority jurisdiction. For example, the Don River watershed is highly urbanized and exhibits similar natural system function to the Etobicoke and Mimico Creeks watersheds. The Etobicoke and Mimico Creeks watersheds have lower ecological integrity when compared to the neighbouring watersheds of the Humber River to the north/east and the Credit River to the north/west. This is mainly due to the fact that both the Humber and the Credit extend onto the Oak Ridges Moraine and Niagara Escarpment. Physiographic constraints and more recently legislation have restricted many intensive human land uses in these areas. These factors have helped to maintain a more robust and intact natural system in the headwaters of the Humber and Credit Rivers watersheds. Although currently impaired, the Etobicoke and Mimico Creeks natural system helps to provide connectivity between the Humber and Credit River systems. With restoration, this function can be improved.

#### *8.4.4 Summary of Existing Conditions*

The existing natural heritage system of Etobicoke and Mimico Creeks is degraded with impaired ecological function. This is the result of many factors. These watersheds have a long history of human land use. Much of the habitat was originally cleared for agricultural purposes and over the last several decades the majority of these agricultural lands have been converted to urban development. Only 12.4% natural cover remains in these watersheds. The habitat patches tend to be small, convoluted and disconnected. This type of habitat configuration limits the species and ecological functions that the natural system can support.

Urban development results in numerous other impacts. These include hydrological changes, over use from recreational activities, spread of invasive species and pollution. When the landscape habitat characteristics (amount and configuration) combine with the negative influences of urban uses, the result is a degraded, impaired natural system.

Although the system is degraded, there remain some positive and important aspects to the natural system. These watersheds continue to provide habitat for TRCA Species of

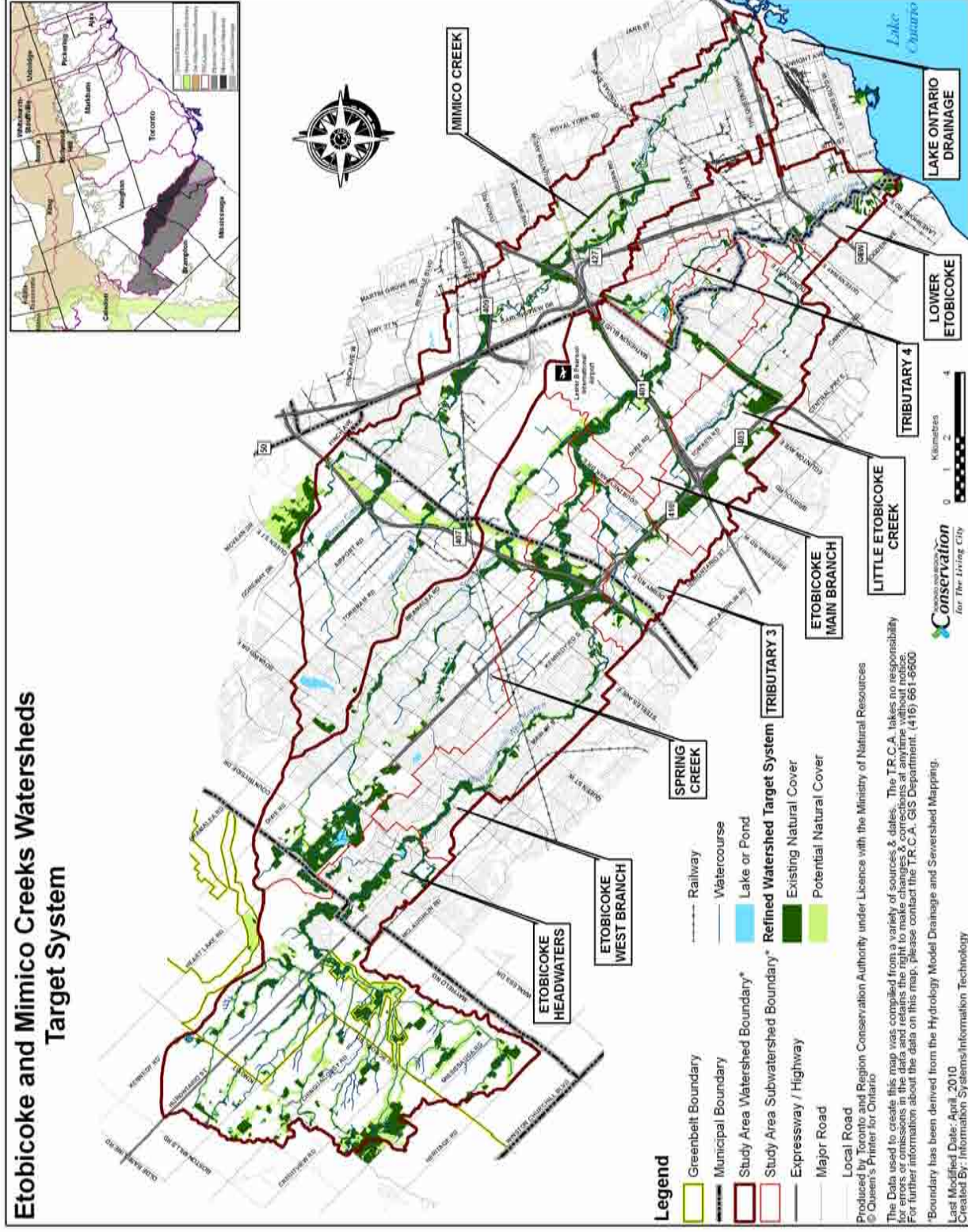
Conservation Concern, including some L2 species. The valley systems provide important wildlife corridors for both migrant and resident species. The Heart Lake Conservation Area and the Etobicoke Creek Headwaters support a diversity of forests and wetlands. These key areas provide the foundation for expanding and improving the natural heritage system.

### **8.5 TARGET TERRESTRIAL NATURAL HERITAGE SYSTEM**

The reduced ecological function experienced in the Etobicoke and Mimico Creeks watersheds is not unique to these watersheds. It is occurring at various degrees throughout the Toronto and Region Conservation Authority (TRCA) jurisdiction and across much of southern/central Ontario. In an effort to protect and restore native terrestrial biodiversity, the TRCA developed a Regional Target Terrestrial Natural Heritage System (TRCA, 2007). This System has identified the quantity and general configuration of natural cover required to improve habitat quality and protect and restore native biodiversity, which consists of existing habitat patches as well as lands that should be added (restored to natural cover).

The TRCA Regional Target TNHS has been refined at the watershed scale, creating a more accurate system for identification of restoration opportunities that may have been over looked at the regional scale (see **Figure 8-5**). For complete details of the refinement process for the Etobicoke and Mimico Creeks watersheds see **Appendix 8-A**. The following sections present an evaluation of the potential improvements to the function of the targeted natural heritage system of these watersheds using natural cover quantity and quality parameters.

Figure 8-5: Etobicoke and Mimico Creeks Watersheds – Target System



**8.5.1 Quantity of Natural Cover**

The refined target TNHS for the Etobicoke and Mimico Creeks watersheds results in a small increase in the area of natural cover over existing conditions (see **Table 8-4**). The refinement results in approximately 14.1% natural cover compared to 12.4% under existing conditions. This is a result of identifying opportunities for habitat restoration. The area of natural cover increased in many subwatersheds, and most significantly in the Etobicoke Headwaters where the refined target TNHS makes up approximately 25% of the land base. This represents an increase from 11% of the total subwatershed area under existing conditions.

**Table 8-4: Quantity of Natural Cover by Subwatershed: Watershed Refined Target Terrestrial Natural Heritage System compared with Total Existing Natural Cover by Subwatershed**

| Subwatershed                 | Watershed Refined Target TNHS |             | Total Existing Natural Cover |             |
|------------------------------|-------------------------------|-------------|------------------------------|-------------|
|                              | Area of Habitat               | % Cover     | Area of Habitat              | % Cover     |
| <b>Lower Etobicoke</b>       | 170                           | 9.8         | 192                          | 11.1        |
| <b>Spring Creek</b>          | 709                           | 15.2        | 566                          | 12.1        |
| <b>Tributary 4</b>           | 96                            | 19.0        | 49                           | 9.6         |
| <b>Little Etobicoke</b>      | 268                           | 12.0        | 426                          | 19.0        |
| <b>Tributary 3</b>           | 155                           | 15.3        | 161                          | 15.9        |
| <b>Etobicoke Headwaters</b>  | 1507                          | 25.2        | 839                          | 14.1        |
| <b>Etobicoke Main Branch</b> | 284                           | 12.0        | 284                          | 12.0        |
| <b>Lake Ontario Drainage</b> | 18                            | 0.2         | 52                           | 4.4         |
| <b>Etobicoke West Branch</b> | 475                           | 14.7        | 456                          | 14.1        |
| <b>Mimico Creek</b>          | 777                           | 9.0         | 880                          | 10.2        |
| <b>Total</b>                 | <b>4459</b>                   | <b>14.1</b> | <b>3905</b>                  | <b>12.4</b> |

Total natural cover appears to decrease in some of the subwatersheds under the refined target TNHS compared to the existing conditions. These apparent losses are most pronounced in the Little Etobicoke subwatershed. These decreases can be generally attributed to various factors such as:

- Existing habitat which was not captured in the refined target TNHS, for example, areas approved for development or low functioning areas. Much of the existing TNHS in some of the subwatersheds is cultural meadow within or adjacent to transportation corridors that contributes little to overall biodiversity; some of which have not been included in the refined target TNHS.
- Refined and updated information which more accurately delineates existing conditions. The existing conditions base mapping was produced based on 2002 air photos. Minor changes that have occurred since that time have been incorporated into the refined target TNHS.

Because many of the subwatersheds are small with little remaining terrestrial habitat, minor changes in targeted conditions can show up as apparently significant changes in the percentage of habitat. This can be illustrated by examining the Lake Ontario Drainage subwatershed. There is approximately 52 hectares of existing habitat within the entire subwatershed (4.4% of the landbase). Much of this habitat is tableland cultural meadow associated with transportation corridors or vacant land that will likely be developed. When these factors are taken into consideration through the refinement process, the percentage drops to 0.2% in the targeted condition.

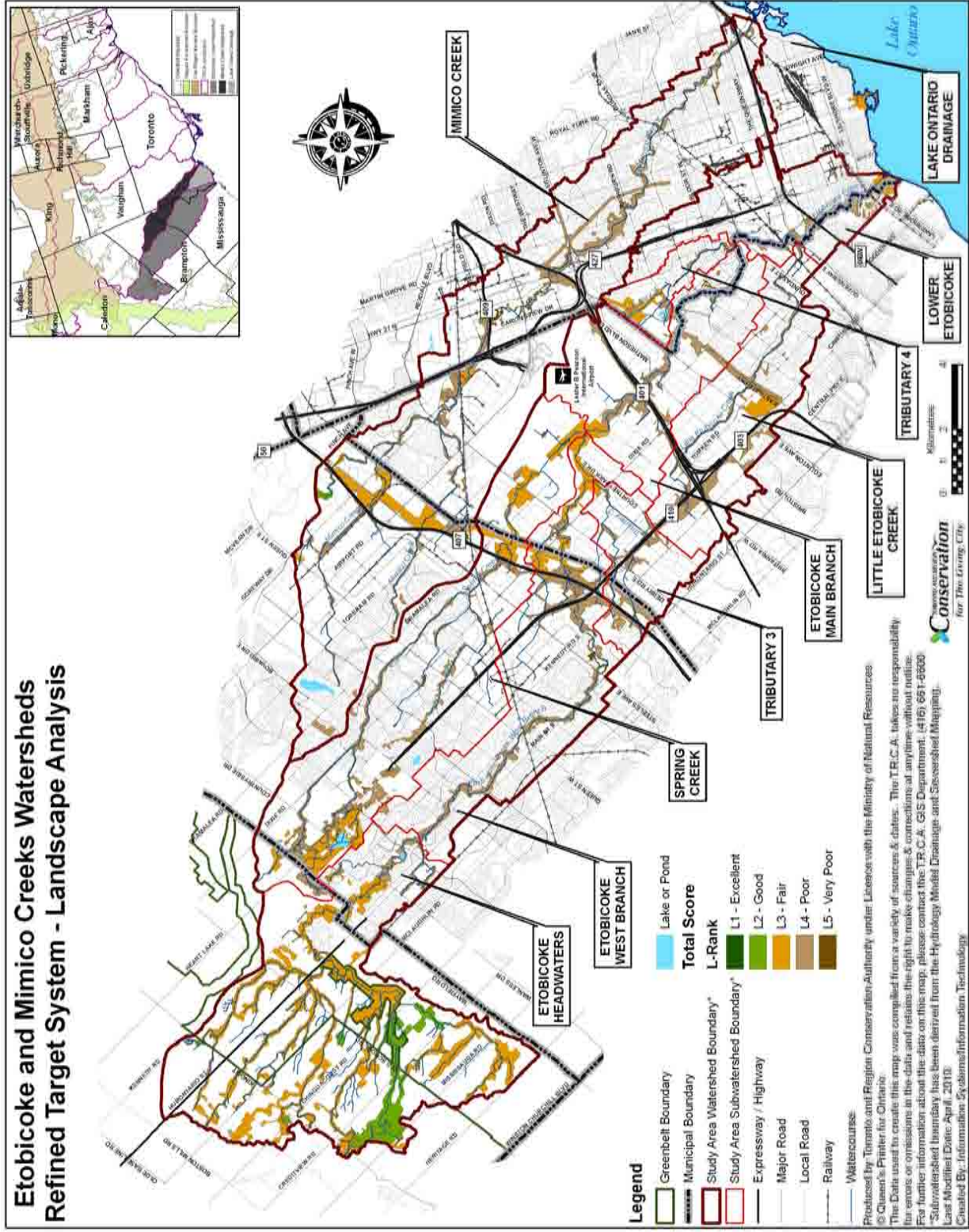
East/west connectivity throughout the watershed is severely reduced due to the limited natural cover. The refined target TNHS addresses the lack of connectivity by identifying new habitat areas that help to provide some east/west connections. One example of this is the hydro corridor located south of the 407 highway. This corridor extends across the middle portions of both watersheds and represents an excellent opportunity to enhance connectivity. The type of habitat that can establish in the hydro corridor is limited due to height restrictions under the hydro lines. However, there are opportunities to create meadow, marsh and thicket habitat.

### 8.5.2 *Quality of habitat*

The increased area of natural cover under the refined target TNHS, as compared to existing conditions will result in increased habitat quality. This becomes evident when **Figure 8-2** and **Figure 8-6** are compared.

Although much of the habitat in the lower portions of the watersheds remains poor, other significant improvements are expected to occur if the Watershed Refined Target TNH System is fully implemented. Many of the habitats within the middle portions of the watersheds would improve to a fair (L3) condition from poor. This is the point at which the habitats start to support TRCA Species of Conservation Concern in greater numbers. A large area in the Etobicoke Headwaters achieves a good quality score. This is achieved by increasing the size of existing habitat patches and connecting them through the riparian corridor.

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### *8.5.3 Priority Management Areas*

The locations of potential priority management areas within the Etobicoke and Mimico Creeks watersheds are shown on **Figure 8-7**. **Table 8-5** lists priority candidate sites for short and long term restoration, enhancement and management activities. These sites represent areas with some specific to general recommendations that, over a phased time period, will result in the maximum benefit to the natural heritage features within each site and at the broader watershed and regional scales. It should also be understood that the sites presented here are simply the higher priority sites selected from the entire Target System. The Target System should be considered as a continuous series of potential restoration sites and opportunities.

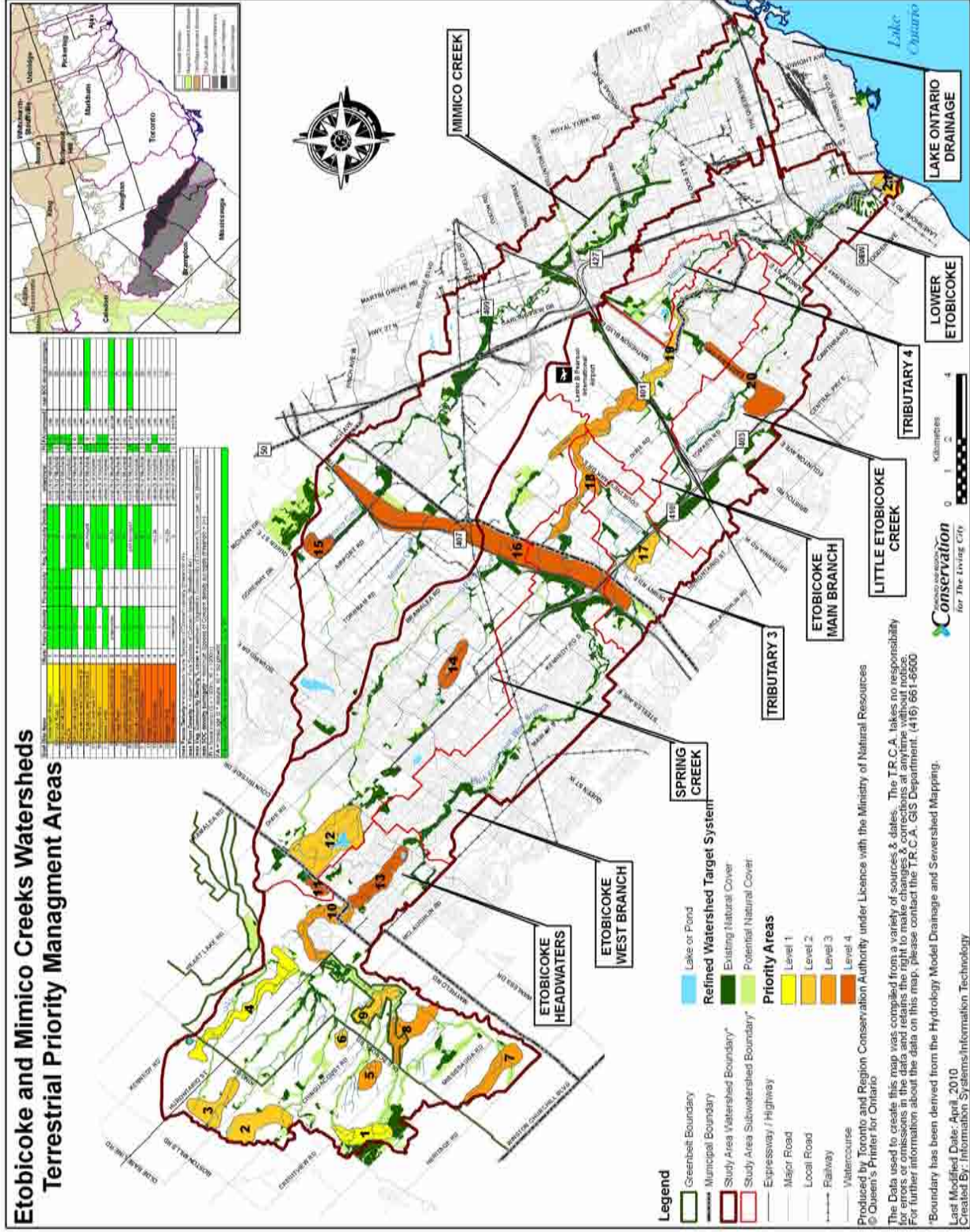
**Appendix 8-B** provides a methodology for identifying priority management areas that applies only to terrestrial aspects of the Etobicoke and Mimico watersheds (TRCA, 2007b). This methodology, which can be integrated with elements of other restoration exercises, focuses more on existing and known features that require protection through restoration, enhancement and management.

Priority candidate sites were ranked from 1 - 4, based on ecological gains to the terrestrial system as well as urgency. However, all areas identified in the Target System represent excellent potential for restoration/management work if opportunities arise. Priority sites shown on **Figure 8-7** indicate areas of both existing and potential natural cover. Where existing natural cover is captured in a priority area, management and enhancement will be indicated; while potential cover will indicate restoration. In that case a more detailed prescription by site is developed. This work includes additional desktop and field techniques by TRCA in support of a more detailed restoration planning and project implementation. This work provides guidance for terrestrial vegetation community selection and prioritization including riparian, wetland and reforestation opportunities (Restoration Opportunities Planning, TRCA, 2010). In both the 'potential' and 'existing' sites, there may be a requirement for stewardship or securement in those areas not protected by current legislation.

Table 8-5: Terrestrial Priority Management Areas in the Etobicoke and Mimico Creeks Watersheds

| Site# | Site Name                       | Rank | Fauna Density | Flora Density | Veg. Community Density | urban/rural           | FI | FA | surveyed | max SOC density surrogate |
|-------|---------------------------------|------|---------------|---------------|------------------------|-----------------------|----|----|----------|---------------------------|
| 1     | Cheltenham Wetland              | 1    | 5             | 7             | 10                     | rural (N of Mayfield) | 10 | 5  | yes      | (8)                       |
| 4     | Kennedy Road N                  | 1    | 5             | 4             | 9                      | rural (N of Mayfield) | 5  | 10 | yes      | (8)                       |
| 3     | King and McLaughlin N           | 2    | 4             | 4             | 4                      | rural (N of Mayfield) | 5  | 5  | yes      | (5)                       |
| 12    | HLCA                            | 2    | 7             | 6             | 10                     | urban (S of Mayfield) | 10 | 5  | yes      | (6)                       |
| 2     | King and McLaughlin S           | 2    | 9             | 3             | 8                      | rural (N of Mayfield) | 5  | 0  | yes      | (8)                       |
| 6     | Chinguacousy and Old School N   | 2    | 2             | 2             | 10                     | rural (N of Mayfield) | 0  | 5  | yes      | (6)                       |
| 9     | Chinguacousy and Old School E   | 2    | 4             | 2             | unsurveyed             | rural (N of Mayfield) | 10 | 0  | no       | 5                         |
| 17    | Derry Rd. and Hwy 410           | 2    | 4             | 1             | 7                      | urban (S of Mayfield) | 5  | 0  | yes      | (3)                       |
| 19    | Matheson Blvd                   | 2    | 3             | 4             | 9                      | urban (S of Mayfield) | 5  | 5  | yes      | (4)                       |
| 21    | Arsenal Lands                   | 2    | 4             | 2             | 10                     | urban (S of Mayfield) | 5  | 5  | yes      | (4)                       |
| 5     | Chinguacousy and Old School W   | 3    | unsurveyed    | 2             | no L3s                 | rural (N of Mayfield) | 5  | 0  | partial  | 5                         |
| 7     | Heritage Road                   | 3    | 3             | 2             | 10                     | rural (N of Mayfield) | 5  | 0  | yes      | (7)                       |
| 8     | Chinguacousy and Old School S   | 3    | 4             | 2             | 9                      | rural (N of Mayfield) | 5  | 0  | yes      | (5)                       |
| 10    | Mayfield West Creek Corridor    | 3    | 4             | 2             | part surveyed          | rural (N of Mayfield) | 10 | 0  | partial  | 5                         |
| 18    | Etobicoke Creek from 401 to 407 | 3    | 4             | 2             | 6                      | urban (S of Mayfield) | 5  | 0  | yes      | (4)                       |
| 11    | Mayfield West Wetland           | 4    | 7             | 3             | 8                      | rural (N of Mayfield) | 5  | 0  | yes      | (5)                       |
| 13    | Snelgrove                       | 4    | 3             | 3             | 5                      | urban (S of Mayfield) | 5  | 0  | yes      | (3)                       |
| 15    | West of Claireville             | 4    | 3             | 3             | no L3s                 | urban (S of Mayfield) | 0  | 5  | yes      | (4)                       |
| 16    | Hwy 407 Hydro Corridor          | 4    | 3             | 1             | 4                      | urban (S of Mayfield) | 5  | 0  | yes      | (4)                       |
| 20    | Eastgate Pkwy                   | 4    | 3             | 1             | no L3s                 | urban (S of Mayfield) | 5  | 0  | yes      | (5)                       |
| 14    | Norton Place Park               | 4    | unsurveyed    | 3             | 3                      | urban (S of Mayfield) | 0  | 0  | partial  | 1                         |

max Fauna Density = maximum fauna Species of Concern density (threshold 4+)  
 max Flora Density = maximum flora Species of Concern density (threshold 4+)  
 max Veg. Community Density % cover = maximum Vegetation Community of Concern % cover (per ha). (threshold 5+)  
 max SOC density surrogate = maximum Species of Concern density surrogate (threshold = 5+)  
 FI = forest interior (5 = >100m, 10 = >200m)  
 FA = forest age (5 = mature, 10 = old growth)  
 indicates that the site scores above threshold, i.e. a "hit"



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## 8.7 APPENDIX 8-A: ETOBICOKE AND MIMICO CREEKS WATERSHEDS – TERRESTRIAL NATURAL HERITAGE SYSTEM REFINEMENT

Producing a map illustrating the Refined Terrestrial Natural Heritage System for the Etobicoke and Mimico Creeks watersheds (showing the existing, potential and refined natural cover) was a gradual process that considered a number of criteria and involved several TRCA staff with particular local knowledge. The process was conducted using 2005 orthophotography.

Having already delineated the Regional Target (TNHSS) line, considering existing and potential natural cover, it was important to limit the speculation for further additions to refine the system (the line around the system) to areas of open space that were not likely to be associated with future development plans. This limited the palette to land that fell within the following categories.

- Urban open space/Recreational land. An attempt was made to respect active use areas unless a portion of the land represented a significant gain in terms of a connection or the protection of a sensitive feature;
- Agricultural Land;
- Hydro Corridors;
- Golf courses. Attempts were made to try to improve connectivity between existing fragmented patches and to apply buffers to watercourses while respecting the intended land use. It is hoped that if or when any existing golf course is proposed for closure that the whole site will be considered for inclusion in the TNH target system.

The Regional Target (TNHSS) line was refined using:

- Updated refined landuse layer 2004;
- ArcHydro lines based on 30 ha catchments (proved for selecting priority locations for new terrestrial and hydrological connections);
- Local knowledge of TRCA biologists and planning ecologists regarding opportunities that had been lost to urbanization or gained through development permitting;
- Species of Concern (SOC) and Vegetation Communities of Concern (VCOC) mapping;
- Previous TRCA work executed in 2004 that contributed to the GTAA Living City project. This being the 'refined' TNHS delivered for this project specific to the GTAA lands and areas surrounding;
- Existing management plans, such as the Heart Lake Conservation Area;
- The Greenbelt Plan natural heritage system.

Refinement of the Regional Target (TNHSS) line resulted in the following:

- Where existing habitat was lost to urbanization, it was replaced as habitat within the targeted system as close to the site as possible while respecting the limiting landuse categories;
- Land was captured/added into the target system where it represented a potentially significant wildlife corridor between patches (e.g. along watercourses and hydro corridors);

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- Land was captured/added into the target system where it improved the size/shape of a habitat patch;
- Land was captured/added into the target system where it buffered sensitive SOC or VCOC, or captured existing habitat that had SOC or VCOC within it;
- “Holes” in the target system (patches with small exclusions within them) and “slivers” (small, isolated patches of potential habitat) were filled/deleted and corrected for respectively (such holes and slivers were often the result and relic of the modelling algorithms).

The preceding process was conducted on hard-copy ortho-photos; the resulting hand-drawn refinements were then passed to TRCA GIS to digitise and produce a final map.

## **8.8 APPENDIX 8-B: ETOBICOKE AND MIMICO CREEKS WATERSHEDS TERRESTRIAL PRIORITY MANAGEMENT AREAS**

### **Introduction**

The following is a methodology for identifying priority management <sup>1</sup> areas that applies only to terrestrial aspects of the Etobicoke and Mimico watersheds. This methodology, which can be integrated with elements of other restoration exercises, focuses more on existing and known features that require protection through restoration, enhancement and management.

The list detailed in this present document includes candidate sites for short and long term restoration, enhancement and management activities. These sites represent areas with some specific to general recommendations that, over a phased time period, will result in the maximum benefit to the natural heritage features within each site and at the broader watershed and regional scales. The list is presented in the full realization that in some situations more detailed recommendations may be needed at the project/site implementation phase. Terrestrial Natural Heritage staff can provide further direction at this phase of implementation in coordination with other TRCA personnel. It should also be understood that the sites presented here are simply the higher priority sites selected from the entire Target System. The Target System should be considered as a continuous series of potential restoration sites and opportunities.

### **Coverage**

As might be expected for such a small pair of watersheds the proportion of natural cover within the watersheds that has been surveyed (identified here as those areas that have undergone ELC surveys) is relatively high. Nevertheless, the inventory is nowhere near complete and there is a lack of uniformity in the coverage within the watersheds. The middle reaches of the watersheds (from about Hwy 401 north to Mayfield Rd.) have been best covered, this increased coverage having been driven largely by the GTAA study conducted by the TRCA in 2003. The upper reaches of the watersheds (north of Mayfield Road) have also been well-covered, again primarily driven by a specific inventory project: the Upper Etobicoke Headwaters Subwatershed study (2003). The lower reaches of the two watersheds have the largest proportion of natural cover still requiring ELC coverage. Much of the unsurveyed natural cover in the lower reaches is highly fragmented and restricted to riparian corridors and is unlikely to accommodate particularly high faunal biodiversity although there is always potential for significant flora to persist in such areas. The most significant unsurveyed areas are therefore in the upper reaches of the Etobicoke watershed, and this further emphasizes the need to maintain the highest restoration priorities in this section of the watersheds.

It should be re-iterated here that this priority ranking exercise for potential restoration sites in the Etobicoke-Mimico Watersheds is based on maps produced in 2005 and therefore does not include any data from the 2006 and 2007 field seasons. It is highly likely, if the method was run again using additional data from those subsequent field seasons, that there would be

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<sup>1</sup> The term "management" used here refers to management, restoration and enhancement activities.

additional hotspots identified within the watersheds, for example along the lower reaches of Mimico Creek (surveyed in 2006).

**Management vs. Restoration vs. Enhancement**

Management activities encompass those activities that are ongoing and are often implemented to mitigate negative influences both human related or related to troublesome flora or fauna. Examples are the spraying of herbicides or the mechanical removal of invasive flora species, building a boardwalk over a sensitive habitat feature or diverting the trail altogether, creating seasonal no-trespass zones within the park to protect nesting habitat for sensitive breeding fauna.

Restoration refers to the actual ‘in-the-ground’ reestablishment of the natural community that historically might have occupied the area in question. For the purposes of this report, unless stated otherwise, the assumption is that most of the restoration will be towards native forest types. The types of communities restored will be highly dependent on the specifics of the site e.g. local topography, surficial hydrology and soils. When restoring communities all these factors are considered, but clues can also be drawn by looking at the remnant local native flora (and fauna in some cases) and adjacent communities to determine what vegetation type might also have occupied the area in question.

Enhancement refers to those activities that occur around or in existing habitat features, their aim is not restoration, but to add additional attributes, such as habitat structures, or correcting a habitat impairment that will ‘enhance’ the productivity and function of that habitat feature.

**The Priority Restoration Sites**

The priority candidate sites have been ranked from 1 - 4, based on ecological gains to the terrestrial system as well as urgency **Table 8-1**. However, all areas identified in the Target System represent excellent potential for restoration/management work if opportunities arise. Priority sites shown on **Figure 1** indicate areas of both **existing** and **potential** natural cover. Where existing natural cover is captured in a priority area, management and enhancement will be indicated; while potential cover will indicate restoration. In both the ‘potential’ and ‘existing’ sites, there may be a requirement for stewardship or securement in those areas not protected by current legislation.

**Table 1: Terrestrial Priority Management Areas in the Etobicoke and Mimico Creeks Watersheds**

| Site# | Site Name                       | Rank | Fauna Density | Flora Density | Veg. Community Density | urban/rural           | FI | FA | surveyed | max SOC density surrogate |
|-------|---------------------------------|------|---------------|---------------|------------------------|-----------------------|----|----|----------|---------------------------|
| 1     | Cheltenham Wetland              | 1    | 5             | 7             | 10                     | rural (N of Mayfield) | 10 | 5  | yes      | (8)                       |
| 4     | Kennedy Road N                  | 1    | 5             | 4             | 9                      | rural (N of Mayfield) | 5  | 10 | yes      | (8)                       |
| 3     | King and McLaughlin N           | 2    | 4             | 4             | 4                      | rural (N of Mayfield) | 5  | 5  | yes      | (5)                       |
| 12    | HLCA                            | 2    | 7             | 6             | 10                     | urban (S of Mayfield) | 10 | 5  | yes      | (6)                       |
| 2     | King and McLaughlin S           | 2    | 9             | 3             | 8                      | rural (N of Mayfield) | 5  | 0  | yes      | (8)                       |
| 6     | Chinguacousy and Old School N   | 2    | 2             | 2             | 10                     | rural (N of Mayfield) | 0  | 5  | yes      | (6)                       |
| 9     | Chinguacousy and Old School E   | 2    | 4             | 2             | unsurveyed             | rural (N of Mayfield) | 10 | 0  | no       | 5                         |
| 17    | Derry Rd. and Hwy 410           | 2    | 4             | 1             | 7                      | urban (S of Mayfield) | 5  | 0  | yes      | (3)                       |
| 19    | Matheson Blvd                   | 2    | 3             | 4             | 9                      | urban (S of Mayfield) | 5  | 5  | yes      | (4)                       |
| 21    | Arsenal Lands                   | 2    | 4             | 2             | 10                     | urban (S of Mayfield) | 5  | 5  | yes      | (4)                       |
| 5     | Chinguacousy and Old School W   | 3    | unsurveyed    | 2             | no L3s                 | rural (N of Mayfield) | 5  | 0  | partial  | 5                         |
| 7     | Heritage Road                   | 3    | 3             | 2             | 10                     | rural (N of Mayfield) | 5  | 0  | yes      | (7)                       |
| 8     | Chinguacousy and Old School S   | 3    | 4             | 2             | 9                      | rural (N of Mayfield) | 5  | 0  | yes      | (5)                       |
| 10    | Mayfield West Creek Corridor    | 3    | 4             | 2             | part surveyed          | rural (N of Mayfield) | 10 | 0  | partial  | 5                         |
| 18    | Etobicoke Creek from 401 to 407 | 3    | 4             | 2             | 6                      | urban (S of Mayfield) | 5  | 0  | yes      | (4)                       |
| 11    | Mayfield West Wetland           | 4    | 7             | 3             | 8                      | rural (N of Mayfield) | 5  | 0  | yes      | (5)                       |
| 13    | Snelgrove                       | 4    | 3             | 3             | 5                      | urban (S of Mayfield) | 5  | 0  | yes      | (3)                       |
| 15    | West of Claireville             | 4    | 3             | 3             | no L3s                 | urban (S of Mayfield) | 0  | 5  | yes      | (4)                       |
| 16    | Hwy 407 Hydro Corridor          | 4    | 3             | 1             | 4                      | urban (S of Mayfield) | 5  | 0  | yes      | (4)                       |
| 20    | Eastgate Pkwy                   | 4    | 3             | 1             | no L3s                 | urban (S of Mayfield) | 5  | 0  | yes      | (5)                       |
| 14    | Norton Place Park               | 4    | unsurveyed    | 3             | 3                      | urban (S of Mayfield) | 0  | 0  | partial  | 1                         |

**max Fauna Density** = maximum fauna Species of Concern density (threshold 4+)

**max Flora Density** = maximum flora Species of Concern density (threshold 4+)

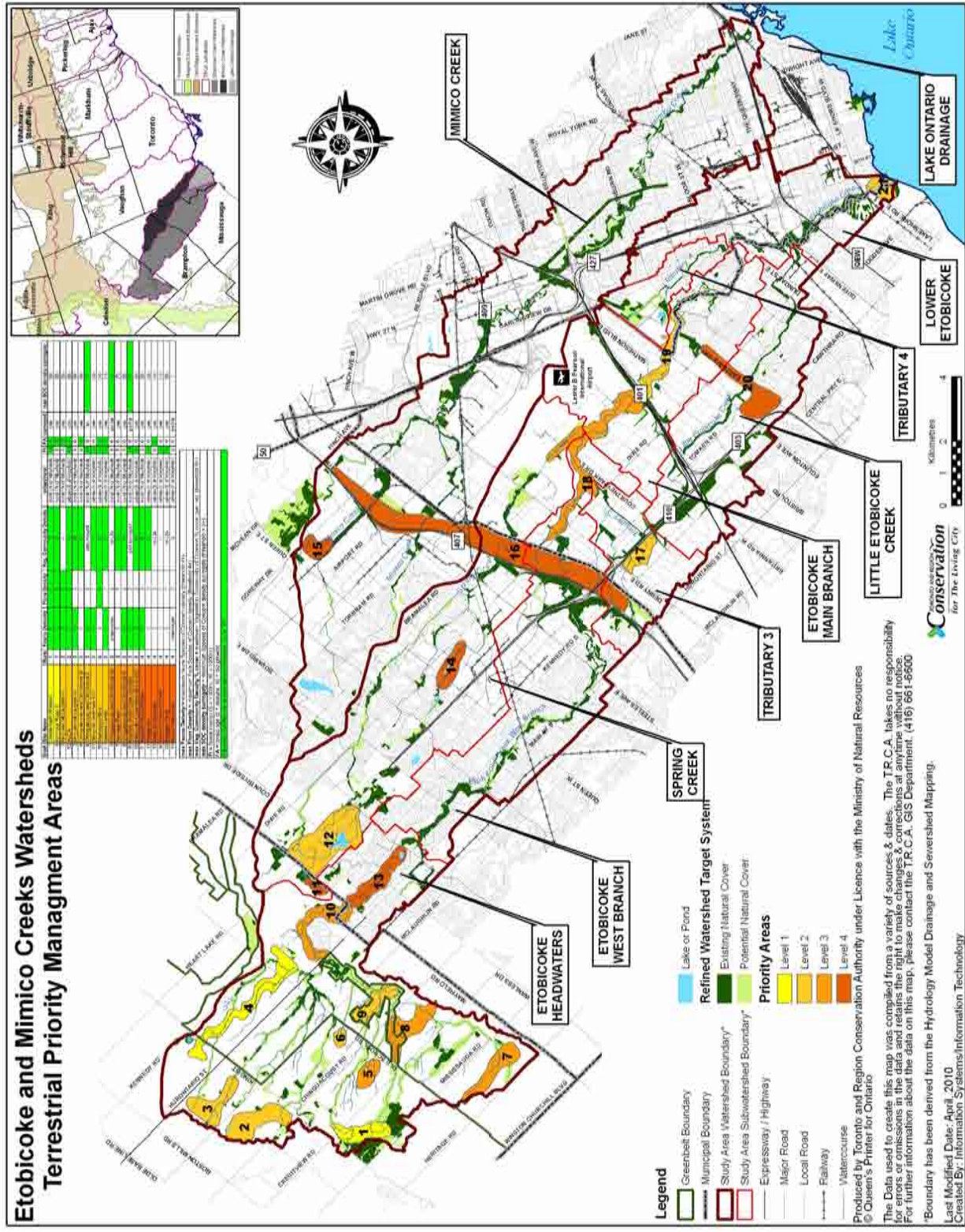
**max Veg. Community Density % cover** = maximum Vegetation Community of Concern % cover (per ha). (threshold 5+)

**max SOC density surrogate** = maximum Species of Concern density surrogate (threshold = 5+)

**FI** = forest interior (5 = >100m, 10 = >200m)

**FA** = forest age (5 = mature, 10 = old growth)

**indicates that the site scores above threshold, i.e. a "hit"**



Sites #14, 15, 16 and 20 were identified by a more detailed investigation of patches that did not fully satisfy the priority selection criteria. These sites are included through consideration of special features which are described in the text. Site descriptions are provided as follows with recommendations for management activities:

1. **Cheltenham Wetland:** Rank 1. This is the highest quality habitat in the Etobicoke – Mimico watersheds (E-M), with the most potential for maintaining a high quality and functioning natural system. This site is located across several subwatersheds that are currently scoring as furthest away from the targeted condition (i.e. the area of the existing system is considerably below the proposed area of the target system). Securement and restoration of adjacent lands and connections to other patches through riparian corridors will be an important aspect of management and restoration of this site. The forest and wetland patches contained within this site score 6 and 7 points maximum for the Species of Concern Point Density Surrogate score; the uneven shape of the patches probably has a large negative influence on these scores. The small wetland to the north of King Street should be included – this patch achieves the highest score for Species of Concern Density Surrogate (8 points). (Protected by Greenbelt).
2. **King and McLaughlin South:** Rank 2. See #3. Patches within this site score a maximum Species of Concern Point Density Surrogate of 6 points. This site should be extended to the south-west to include the high scoring wetland patch on Chinguacousy (Species of Concern Point Density Surrogate of 8 points). (Partly Protected by Regulation Limit)
3. **King and McLaughlin North:** Rank 2. Another collection of four lower scoring hotspots (“warmspots”) which taken as a whole create a higher priority site encompassing several patches that score a maximum of 5 points for Species of Concern Point Density Surrogate. Creating effective connections between these smaller sites would benefit the natural heritage of the local landscape. Existing quality will be enhanced by restoring intervening land and expanding existing natural cover. (Protected by Regulation Limits)
4. **Kennedy Road North:** Rank 1. A series of four biodiversity hotspots situated along a pair of parallel watercourses. The site includes a patch of forest identified as old growth – the only such patch within the two watersheds. Connections between the hotspots should be improved through riparian corridors. Expanding and enhancing existing habitats would create a continuous patch. Attempts should be made to connect through the tributary and Site #10 to the Snelgrove corridor to the south of Mayfield Road; such a connection to Site #10 could be achieved either through an enhanced hedgerow system to the east of Kennedy Road, or through the existing riparian cover to the west of Kennedy Rd. The highest score for Species of Concern Point Density Surrogate is achieved by the wetland in the extreme north of the site (north of King St.) which scores 8 points. (Partly Protected by Regulation Limit)
5. **Chinguacousy and Old School West:** Rank 3. This patch of forest does not score as a hotspot for any of the SOC or VCOC (although there are numerous L3 plants, and the site was not surveyed for fauna), however it is identified by the LAM generated Species of Concern Point Density Surrogate as a site that should support relatively high density of SOC points (score 5 points). If this somewhat isolated patch could be connected via riparian corridors either to the low ranking site to the south, or to the very high ranking Cheltenham Wetland complex to the west, considerable improvements to the overall connectivity throughout the Upper Etobicoke subwatershed could be achieved. (No Protection; small part in Regulation Limit)

6. **Chinguacousy and Old School North:** Rank 2. A much smaller site that encompasses two small but adjacent forest patches which score 5 and 6 points for the Species of Concern Point Density Surrogate. This site should undergo restoration, expansion and enhancement. (Partly Protected by Regulation Limit).
7. **Heritage Road:** Rank 3. A pair of closely linked lower scoring hotspots (“warmspots”) which taken together result in a fairly extensive patch of quality natural cover. The small patch of forest at the north end of the site scores highest for Species of Concern Point Density Surrogate with 7 points; the remainder of the site scores 5 and 6 points. This site should undergo restoration, expansion and enhancement – with particular attention paid to the connection between the patches north to south along the watercourse. (Protected by Regulation Limit)
8. **Chinguacousy and Old School South:** Rank 3. As with #7, but also including a patch of forest that does not register as a hotspot, but which by association with neighbouring patches would be part of a larger, high quality patch. This site should undergo restoration, expansion and enhancement. This site should also include the forest patch to the south-east. (Protected by Regulation Limit and Greenbelt)
9. **Chinguacousy and Old School East:** Rank 2. Similar to #8 albeit joining patches that register only as Forest Interior patches to a fauna hotspot. Note that this area had not yet been fully surveyed for flora SOC and ELC but the Species of Concern Point Density Surrogate score for this site is 5 points. This site should undergo restoration, expansion and enhancement. (Protected by Regulation Limit and Greenbelt)
10. **Mayfield West Creek Corridor:** Rank 3. See note below for full explanation of inclusion and ranking of this site. Attempts should be made to design connections between this site and Mayfield West Wetland site (#11) and between this site and the Kennedy Road North site (#4). Existing corridors to the west of Kennedy Road should be maintained to act as connections with the rich biodiversity to the west. The site includes patches that have not yet been inventoried for ELC which score 5 points for Species of Concern Point Density Surrogate. (Protected by Regulation Limit and as TRCA Property)
11. **Mayfield West Wetland:** Rank 4. While this site is significant given its existing attributes, the opportunity it represents to act as a connection between Heart Lake and Snelgrove to the west (over Kennedy Rd.) and northwards is equally significant. The site appears to be the source of the Etobicoke Creek East Branch. Reforestation, management of invasives and corrections to impaired hydrology would represent the bulk of the work. (Protected by Regulation Limits and as PSW)
12. **Heart Lake Conservation Area:** Rank 2. Restoration opportunities at this site are somewhat limited. Enhancement and management of existing habitat is indicated, particularly in the north end of the property. Management should include the control of invasive species and the mitigation of Matrix Influence (visitor pressures) through appropriate trail design. Management should also ensure that the Conservation Area does not become isolated as local development continues (to the north and east). Maintenance and improvement of surrounding habitat - creating effective corridors - will be of significant importance along watercourses to the east of Heart Lake Road; likewise to the north and north-west in the vicinity of Mayfield (connecting to Snelgrove). Much of the site includes patches with poor shape attributes and therefore the maximum Species of Concern Point Density Surrogate is 6 points although this is lower than scores for fauna, flora and vegetation communities of concern. Note that there are extensive patches of natural cover to the south of HLCA that have yet to be inventoried for ELC: south of Sandalwood Parkway, toward Bovaird Drive. There are a series of incidental fauna records from these areas. (Protected)

13. **Snelgrove:** Rank 4. A series of ELC, flora and fauna hotspots (“warmspots”) that are already fairly well connected along a wide riparian corridor. This site would not be able to expand, but there is plenty of potential for further restoration and enhancement. The whole site scores rather low for Species of Concern Point Density Surrogates (1 – 3 points) but to some extent this is to be expected in a riparian situation since the shape criterion will score very low. Extending the site to the north of Mayfield would include a patch of wider riparian cover that scores 5 points for Species of Concern Point Density Surrogate (and has not yet been inventoried for ELC). Including this more northerly section (see Site #10) would provide a good opportunity to improve connectivity between the rural landscape to the north of Mayfield and the urban landscape to the south of Mayfield – this road has the potential to act as a considerable barrier to movement and dispersal of fauna along the Etobicoke watershed. (Protected)
14. **Norton Place Park:** Rank 4. Again, a very isolated site in the centre of the highly urbanized landscape in downtown Brampton. Although not quite attaining “hotspot” status (value = 3), there are several significant flora species (royal fern, cinnamon fern). No fauna surveys have been conducted at this site although it is known to host fairly large numbers of migrant songbirds in the fall. This latter aspect is perhaps a little contradictory since the very reason for this site’s hosting of large numbers of migrant songbirds may well be due to it’s extreme isolation, much as a coastal island will often seemingly attract large numbers of migrating songbirds. Effectively, what is happening is that night-flying songbirds put-down in foul weather into whatever natural cover is handy, and then disperse across the landscape. If there is no outlet for dispersal from the “island” then the concentration of downed migrants remains high through the day. This is good news for the birder but not for the bird. This being the case, all opportunities to restore even narrow corridors for dispersal away from the “island” are worth exploring. In the case of Norton Place Park such egress may be sought northwards to HLCA or south toward the natural cover flanking the 407 and then on to the riparian corridor associated with the lower reaches of the east and west branches of Etobicoke creek. (Protected)
15. **West of Claireville:** Rank 4. A small annex to Claireville Conservation Area; a flora and fauna “warmspot” (below the 4 point threshold for “hotspot” status) that could be enhanced by restoring the adjacent open habitat (e.g. providing extra wetland opportunities for the chorus frogs) and improving the connection to Claireville itself. The motivation for inclusion of this site is primarily the presence of Chorus Frog; this site acts as a satellite to the larger population within the neighbouring Clairville Conservation Area. It is possible that the presence of Goreway Drive will be enough to completely isolate this small satellite population regardless of any effective restoration work on-site. If this is the case then the priority of this site is much diminished although it remains a hotspot for flora species. (Not protected)
16. **Hwy 407 Hydro Corridor:** Rank 4. The Hydro Corridor running approximately west to east across the two watersheds presents an excellent opportunity to create and maintain west-east linkage between the neighbouring Credit Valley and Humber watersheds. The entire Etobicoke Watershed portion of this corridor is listed as already “built up” when in fact much of the corridor is still open ground and as a hydro corridor it is unlikely to be further developed; meanwhile the Mimico Watershed portion is listed as Designated Greenfield. What the latter designation entails with respect to this strip of open ground is unclear, if however it is maintained in the same state as the Etobicoke portion there remain opportunities for managing scrub and meadow habitat throughout the length of the corridor. The corridor runs through and alongside a series of minor

“hotspots”: the fauna and ELC concentrations at the Derry and 407 Priority Site (#17), ELC concentrations at Derry and Dixie, and at 407 and Bramalea, and the more recently surveyed (2006) patch of extensive open meadow habitat at Steeles and Goreway. There is a considerable concentration of L4 fauna species points at Tomken and 407 which does not quite make “hotspot” status, but since this area lies at the confluence of the relatively well-vegetated Etobicoke Creek corridor and the Hydro Corridor, it becomes more significant.

17. **Derry Rd. and Hwy 410:** Rank 2. This site is very isolated in a highly urbanized landscape. There is a good number of L4 fauna species locally and the presence of a small but healthy stand of the regionally rare (L3) shagbark hickory (*Carya ovata*) within a regionally rare ELC community (FOD 9-4) is highly significant. In such a landscape the opportunities for enhancing faunal biodiversity are minimal, however, maintaining this stand of shagbark is extremely important in terms of the local seed-bank (and particularly in the light of climate change since this species is a Carolinian species). (No protection)
18. **Etobicoke Creek from 401 to 407:** Rank 3. This site comprises a series of minor fauna and ELC hotspots along the creek as it runs along the west flank of the airport lands.
19. **Mathesson Blvd.:** Rank 2. This site would require management, restoration and enhancement. Steps should be taken to improve the size and shape of existing patches where possible, and to ensure good connectivity with expanded habitats within Centennial Park to the east, the hydro corridor to the west, and to Burnhamthorpe Rd. to the south. (Protected)
20. **Eastgate Pkwy:** Rank 4. This site is an annex to Priority Site #19 and exists as an opportunity to create an east – west linkage between the lower Etobicoke Creek and the neighbouring Credit Valley Watershed. The site comprises a fauna biodiversity hotspot connected via the restoration potential of an extensive hydro corridor running along Eastgate Parkway. There is an opportunity to expand the existing forest patch on the west end into a significant habitat core. (Unprotected)
21. **Arsenal Lands:** Rank 2. There is potential at this site to restore lakefront species and community types (beach/dune communities); such opportunities are among the most limited in our jurisdiction. There is also large scale potential to enhance the mature forest at this site. The maximum Vegetation Community of Concern % Cover score for this area is 10 points – very high for the lower reaches of the Etobicoke/Mimico watersheds and in part this high score is due to the presence of regionally scarce coastal communities. (Protected)

Note that despite all of the potential restoration sites within the upper half of the Etobicoke watershed there is still a significant break between the Upper Etobicoke subwatershed and the remainder of the watershed, particularly in the vicinity of Mayfield Road. This issue needs to be addressed so as to mitigate the isolating effects of this increasingly busy road. The problem lies not just with the widening of Mayfield Road but with the increasingly urbanized district of Mayfield West. Efforts should be made to ensure that the current riparian corridors running through Mayfield West (both on the East Branch and West Branch of the Creek) maintain as much natural cover as possible. Site #4 confers an extensive south-north connection on the east edge of the subwatershed but this site is situated more than 2 km north of Mayfield Road. Efforts should be made to extend effective riparian cover along the West Branch, and its tributaries, to Site#4.

Enhancing the riparian corridor through Mayfield West (sites #10 and #11) will also enhance connections with the group of sites (including Cheltenham Wetlands) to the west, primarily through existing rural riparian corridors. The riparian corridor that runs from Mayfield Road north and west to Kennedy Road is a crucial link to the higher biodiversity natural heritage in the north and west reaches of the Etobicoke Watershed. Thus, Restoration Sites #10 and #11, although only achieving Rank 3 and 4 respectively, could potentially be considered as higher priorities.

Mimico Watershed north of the 407 and much of the eastern section of the Etobicoke Watershed north of the 407 (at least until Heart Lake) presents a rather inhospitable landscape as far as Natural Heritage is concerned. It is important to provide dispersing and migrating fauna species with opportunities to either cross or skirt around this largely hostile urban landscape where urban tree cover and healthy ravine systems, found through much of the rest of urban Toronto, are not available. Natural cover maintained in the 407 Hydro Corridor (site #16) would provide connection between Claireville and the middle and lower reaches of Mimico Creek, and further across to Etobicoke Creek in the west.

### Methodology

The selection of priority sites within the refined **Targeted Terrestrial Natural Heritage System**, as shown on **Figure 8-7** were developed from a raster based tool created for the Don River watershed regeneration priorities project. This tool was applied to the Etobicoke-Mimico watersheds and a methodology developed to define priorities for restoration, enhancement and management.

The product of the tool developed for this project was a series of 10-meter raster based maps indicating several criteria:

1. Flora Species of Concern mapped point density hotspots (presented as number of mapped species points per hectare)
2. Fauna Species of Concern mapped point density hotspots (presented as number of mapped species points per hectare). *(Note: this does not actually deal with biodiversity but rather with the density of mapped points – all points could be referring to only one species, i.e. biodiversity would be low, abundance high. Due to the variance in species requirements it would be difficult to arrive at a formula that could estimate and compare actual biodiversity. Such a formula would require the inclusion and consideration of 1) Total number of species points in an area, 2) Total number of distinct species in an area, and 3) the Total number of mapped points for each species within an area. At this juncture the number of mapped species points per ha serves as a very simple surrogate for biodiversity.)*
3. Vegetation Community of Concern % cover hotspots (presented as the proportion of a 1 hectare square covered by 10 metre VCOC raster squares)
4. Forest Interior (100m+ and 200m+ forest interior)
5. Forest community age (higher scores for mature and old growth).
6. Protected lands
7. Species of Concern (SOC) density surrogate values derived from Landscape Analysis Model (LAM). Initially this was conducted only for areas that had not been fully surveyed, but this did not enable any useful calibration of the surrogate, therefore the same process was applied to all natural cover within the system, both surveyed and otherwise. Fortunately, most of those areas identified as hotspots by this surrogate

method that had actually been surveyed, coincided with areas that held high densities of mapped points, thus suggesting that the LAM surrogate worked well as a predictor of point density hotspot location.

8. Hydrological subwatersheds where there is the largest difference between the existing habitat and the targets set out in the regional targeted terrestrial system

Note that none of the criteria listed above were weighted in any way: as soon as a criterion was identified as above threshold for any of the sites, that site would acquire a single hit, up to a possible total of 8 hits or points.

### **Thresholds**

- flora and fauna: patches that scored a 4 and higher in the criteria for species density were selected as 'hot spots'.
- vegetation communities: patches that scored a 5 and higher in the criterion for VCOC % cover were selected as 'hot spots' (a threshold lower than "5" picked up vast areas, so the rationale was to raise the threshold for inclusion to improve definition of sites/patches).
- Interior forest: scored for 100m+ and 200 m+ forest interior. In the urban envelope (identified as that part of the watersheds to the south of Mayfield Road) larger groupings of cells scoring 5 (100 m +) and over were selected. In the rural areas only cells with the score of 10 (200 m+) were selected
- Forest community age (higher scores for mature to old growth). Cells scoring 5 (mature) and 10 (old growth) were selected, while polygons of a small and isolated nature were left out.
- SOC density surrogate values. This layer was used in a post processing fashion to determine if there were some obvious areas that had not been field surveyed, that should also be captured in the prioritization, so as not to bias the process too heavily to areas that had been fully surveyed. The subject area needed to score 4 or above in the "SOC density surrogate". This criterion was only scored when data was not available for one or more of the Species Density or Vegetation Communities of Concern % Cover criteria, i.e. the survey was incomplete.
- Protection: subject areas that were afforded no protection (e.g. from TRCA ownership) scored in this criterion.
- Hydrological subwatersheds showing the largest difference from the targets set out in the regional targeted terrestrial system (represented by scores and bar graphs) scored in this criterion.

Areas were delineated on the map based on the above criteria at a scale of 1:60 000. Areas meeting several of the criteria were denoted as areas of higher value for protection, enhancement, management or restoration – i.e. areas where there was a clustering of criteria hotspots.

Once these areas were selected an overlay process was undertaken to determine what lands within these areas were protected/unprotected. This provided a further tool to prioritize lands for either stewardship, or securement efforts.

Areas were then prioritized from 1 to 4 (1 being the highest, 4 the lowest) based on the number of hotspots within each site cluster. Additional sites that did not meet the criteria were identified

and appraised on the opportunities for improvement, urban matrix constraints and opportunities for contributing to connectivity within the landscape and ranked using the same priority ranking.

Priority ranking was allocated based upon the following scores, the thresholds for each rank having been arbitrarily placed depending on the spread of ranks through the 21 sites.

**Priority Scores**

1. Areas meeting 6 or more of the 8 criteria.
2. Areas meeting 4 or 5 of the criteria.
3. Areas meeting 3 of the criteria.
4. Areas meeting 1 or 2 of the criteria.