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City of Mississauga

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# Natural Areas Survey

2006 Update



City of Mississauga

**NATURAL AREAS SURVEY**

**2006 UPDATE**

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City of Mississauga

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## EXECUTIVE SUMMARY

The Natural Areas Survey (NAS) for the City of Mississauga (Geomatics 1996) identified one hundred and forty-four areas representing the best remaining natural features in the City. Of these 144 areas, 141 were classified as Natural Areas which include Significant Natural Sites, Natural Sites, or Natural Green Spaces, and three were classified as Residential Woodlands. Each year one quadrant of the City is reviewed to update the current status of natural features and information on flora, fauna, impacts, boundary changes and management needs. In 2006, the natural areas in Wards 8, 9 and 10 were updated as well as a limited number of additional natural areas in other Wards that were identified as having possible changes. With the completion of the 2006 update (North-South Environmental 2006), the information on the natural areas in the City has been updated twice since the initial study in 1996.

In 2006 two Natural Green Spaces (CM25 and ME13) were added to the NAS which resulted in a total of 138 natural areas. The 138 natural areas comprise 6.65% of the total area of the City which is essentially unchanged from 2002. In 1996 the 141 natural areas comprised 7.10% of the total area of the City. The change in area since 1996 represents an overall loss of 157.14 ha (388.29 a.).

The natural areas in the City have been grouped into three major landform types (valleyland, tableland, and wetland). In 2006, 80% of the natural areas system was associated with valleylands. This proportion has increased from approximately 78.4% of the system in 1996, but is virtually unchanged from 2005. In contrast, tablelands only account for 14.5% of the natural areas system in 2006. This represents a decrease from 16.4% in 1996, but has increased slightly from 2005. From a City-wide perspective, there were steady decreases in the landbase represented in tableland natural areas, from 1.16% in 1996 to 0.97% in 2002. From 2002 until 2006 this proportion has remained constant. Within Mississauga, tableland natural areas (which are mainly wooded) tend to be discrete islands that have limited connections to other remnant natural features. Valleylands are better connected by virtue of the linearity of the landform and because they have historically been better protected from development. This reinforces the need to place a high priority on the protection of the remaining tableland features present within the City, and an emphasis on their management to maintain or improve their quality. The proportion of the natural areas system associated with wetlands has remained more or less constant from 1996 at approximately 5.0%. The proportion of the City that is classified as wetland decreased marginally from 0.36% in 1996 to 0.33% in 2002, but has remained constant from 2002 to 2006.

Generally, the condition of natural areas within the City that were surveyed in 2006 continues to be in fair condition. Natural areas evaluated as in fair condition have moderate disturbances (few trails, limited dumping, some trampling, *etc.*) and an average number of non-native flora species, typical of what can be expected in an urban natural area. The overall condition of the natural areas visited in 2006 remained largely unchanged from previous studies. As indicated in all the previous survey updates, the most common disturbances within natural areas are those associated with an increase in uncontrolled human use of natural areas following development in adjacent areas. Examples of these disturbances include: the creation of *ad hoc* trails, the use of mountain bikes (including the construction of some elaborate racing circuits), the presence of garbage, boundary encroachment, and vandalism (tree carving, tree cutting, spray paint). These

disturbances are more prevalent at almost all of the natural areas surveyed this year. Deterioration of the quality of Mississauga's natural areas can be expected to continue unless there is a substantial effort to manage natural areas through site specific Conservation Plans and community stewardship initiatives.

After eight years of update surveys covering the entire City, two trends continue to emerge. There has been a decrease in the quality of vegetation and there has been a decrease in the amount of tableland (woodland and successional categories). Development between 1996 and 2006 has resulted in the total loss of 157.14 ha (388.29 a.) from the natural areas system including the loss of thirteen natural areas. Two woodland vegetation communities have been lost, as a result of development removing the only two natural areas in which they were represented in the City. Eleven woodland communities, four successional communities and all six of the wetland vegetation communities are uncommon in the City, occupying less than 1% of the total area of the natural areas system. Of these, six of the woodland communities, one successional community and one wetland community are "at risk" in the City, occurring in only one natural area each. In addition, a longer-term conversion of vegetation community composition (from wetland pockets to old field) in some natural areas is also occurring, likely as a result of changes in hydrology resulting from development. These trends reinforce the urgent need to maintain and manage (and where possible restore) all of the remaining natural areas in the City. In particular, tableland natural areas (including woodlands, wetlands and successional vegetation communities) continue to be the most seriously threatened by development.

One positive trend is the naturalization projects undertaken by the City. The majority of naturalization projects initiated between 1996 and 2006 have involved leaving an area of unmowed grass adjacent to a watercourse or woodlot feature to regenerate naturally. While this approach will increase the overall size of the natural area in question, this initiative could be enhanced by taking an approach that includes long-term management which will more likely result in a healthy natural area with a diversity of native plant and animal species, such as the rehabilitation project at Jack Darling Park. In addition, storm water facilities such as Osprey Marsh Wetland adjacent to Osprey Boulevard have been constructed in such a way that they foster wildlife habitat, with gradually sloping edges, and planted cattails and other wetland species. The upland area surrounding the Osprey pond is being allowed to naturalize. This pond already sustains a higher diversity of fauna than that normally seen in storm water management ponds, and has the potential for more species as the vegetation becomes established.

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## 1.0 INTRODUCTION

A Natural Areas Survey for the City of Mississauga was undertaken during 1995 and 1996 (Geomatics 1996) which identified one hundred and forty-four natural areas representing the best remaining natural features in the City. Of these 144 natural areas, 141 were classified as Significant Natural Sites, Natural Sites, or Natural Green Spaces, and three were classified as Residential Woodlands. In 1996 the 141 natural sites comprised 7.10% of the total area of the City. Also identified were 54 Special Management Areas (SMAs) and 40 Linkages. Definitions for these classifications are given in Appendix 1.

Since completion of the Natural Areas Survey in 1996 a number of development projects have been initiated within or adjacent to the natural areas originally identified. In order to keep the Natural Areas database current, updates have been undertaken on an annual basis that focus on areas that may have been affected by these developments. Each year, natural areas in different quadrants of the City are reviewed. With the completion of the 2001 work, all Wards in the City were updated once since the initial study in 1996. The start of the second round of updates commenced in 2002 with natural areas in Wards 5 and 6. Wards 1 and 2 were updated in 2004 and Wards 3, 4 and 7 were updated in 2005. This year natural areas in Wards 8, 9 and 10 were updated, as well as a limited number of additional natural areas in other Wards that may have been impacted by recent development. This completes the second round of updates.

The intent of updating the Natural Areas Survey is to review the current status of natural areas and update information on floristics, fauna, impacts, boundary changes and management needs. Now that the second round of updates is complete, some trends have emerged. Overall, approximately 10% of the natural areas have been altered to the extent that they no longer qualify as natural sites. This results in a decrease of 0.52% in the total area of vegetation communities identified within the City since 1996. Numerous sites which have been added to the natural areas survey since 1996 are generally in poor to fair condition. Overall, 77% of the natural areas in the City of Mississauga are in poor or fair condition. In contrast, 32 sites or 22% of the natural areas are in good or excellent condition. Changes within natural area vegetation communities often result an increase in vegetation assemblages which have a higher proportion of non-native flora species.

This report documents the methods used and presents the data collected to evaluate the natural areas, summarizes any changes that have occurred, and provides some recommendations for the mitigation of impacts and management considerations.

## 2.0 METHODS

### 2.1 Background Review

The primary focus of this update was the 36 natural areas located primarily in Wards 8, 9 and 10. Also reviewed were 3 additional natural areas in the City that have been the subject of Environmental Impact Studies (EIS). These areas are listed in Appendix 5. Information from the reports reviewed was incorporated into the Natural Areas System database. The reports are

listed in Appendix 2. Two new sites were surveyed to determine whether they should be included as natural areas. In addition, nine natural areas (all within Wards 8, 9 and 10) reported as having butternut trees (*Juglans cinerea*) were visited to locate individual trees and facilitate monitoring of their presence and health.

A background review was carried out comprising a careful analysis of digital aerial photographs and a review of reports (inventory reports, EIS, *etc.*) undertaken since the last update study. Colour aerial photographs overlaid with natural area boundaries were used to identify any potential impacts to natural area boundaries. Where necessary, revisions to natural area boundaries were delineated on aerial photographs and verified in the field. A total of 41 sites were thus identified as requiring field investigations (Appendix 3). This includes: all 36 natural areas that occur primarily in Wards 8, 9 and 10, three sites that were subject to Environmental Impact Statements, two sites being considered for inclusion as natural areas, two sites with recent residential redevelopment and 8 sites documented with butternut. Note that some sites fall into more than one of the above categories thus they add up to more than 41. Natural areas within Wards 8, 9 and 10 were, at minimum, the subject of a “drive by” inspection, if no permission was granted to access privately owned sites.

## 2.2 Fieldwork

Visits were made to the 41 field sites which make up the Natural Areas review for 2006. Natural areas MB1, MB2, MB4 and MB9 did not receive a field visit because permission to access these sites was not granted. Landowner contact for natural areas in private ownership was undertaken by the City Planning and Building Department. Full surveys were not conducted at natural areas CRR7 and CRR8 because detailed inventories were obtained in 2004.

Appendix 3 lists the reasons for fieldwork, and the date when fieldwork was conducted for each of the natural areas. For those sites in Wards 8, 9 and 10 in public ownership, or for which access was available, a two season field program was undertaken. This entailed a late spring visit to update information on spring ephemeral plant species and a mid summer visit to document summer flora, disturbances and any other changes. For sites outside of Wards 8, 9 and 10 one field visit was undertaken to document disturbances and any changes.

The following information was recorded on data sheets for each natural area that received a field visit:

- all flora and fauna species observed were recorded, and specimens collected where necessary;
- vegetation community descriptions were updated where necessary;
- evidence of disturbance, regeneration and management needs were noted; and
- the overall condition was qualitatively rated in comparison to other sites in the City.

In addition, breeding bird surveys were conducted in the early morning hours (05:00 to 10:00) between June 1 and July 10, 2005 for all of the natural areas in Wards 8, 9 and 10 where road access was available. For each natural area, a rough tally was obtained to provide an approximation of the numbers of birds. For most sites, the field visit entailed a search

throughout the habitat, but in sites where permission was not granted for access, birds were recorded from as many nearby road access points as possible. Amphibian surveys were also carried out at sites with appropriate habitat.

Butternut surveys were conducted in 9 natural areas where access was available. A maximum of 1 hour was spent in each natural area searching in appropriate vegetation communities (*e.g.*, floodplains, forest edges) to locate individual trees. If a butternut tree was found, it was accurately located in the field using a hand-held Global Positioning System (GPS) unit (Garlon 12). The condition of the individual tree was assessed, including a determination of whether the tree was infected with butternut canker (see discussion in section 4.2).

### 2.3 Analysis

The City of Mississauga database records and fact sheets for each natural area were updated based on the literature review and fieldwork carried out in 2006. Hard copies of species lists and field notes were provided under separate cover to the City.

The provincial rarity ranks of floral and faunal species were also reviewed to determine the need for updating. Provincial rarity status was based on Natural Heritage Information Centre (NHIC 2006) rankings and Species at Risk (Appendix 4). The natural areas summary table (Table 1, page 6) has been updated to allow for comparisons among natural areas in the City.

#### **Floristic Quality Assessment**

The Floristic Quality Assessment system allows for an objective numerical evaluation of an area based on the quality of its flora. It can be used to compare two or more areas or compare an area at two different points in time. It is extremely useful for measuring the success of management and restoration programmes, in combination with other site characteristics and evaluation criteria.

The premise upon which the evaluation method is based derives from the fundamental character of a region's flora, in particular the specific affinity a plant species has for a specific habitat. Some plants exhibit conservative characteristics such that they only persist in very restricted habitats (*e.g.*, prairie, wetlands, *etc.*). Other species are not as restricted and are able to persist in a variety of habitats. Each native species in the flora has been assigned a numerical value from 1 to 10. This is referred to as the "coefficient of conservatism". Species ranked as 10 are the most restrictive or "conservative", and thus are most representative of high quality habitat. The numbers have been assigned for Ontario by a group of experts on the provincial flora (Oldham *et al.* 1995). In order to evaluate a site, a species list is compiled, and the coefficients of all native plants are summed and divided by the total number of native plants to yield a mean coefficient for all the native plants in the site. A Floristic Quality Index (FQI) can then be calculated by multiplying the mean coefficient by the square root of the total number of native species. Natural areas can then be compared using their mean coefficient and/or FQI.

During an inventory of plants in a given area, the mean coefficient of conservatism tends to stabilize quite quickly as new plants are recorded and included in the total for the site. The mean coefficient thus serves as a reliable indicator of natural area quality even when only

reconnaissance inventories are available. However, the FQI is more influenced by species richness; therefore areas that have complete inventories tend to have a higher FQI. Although the FQI is generally sensitive to the species richness of a site, it does not seem to be correlated to the size of a site.

Over the course of the Natural Areas Survey (1996 to 2006) there have been several natural areas where complete inventories of floral species could not be collected. In such cases, issues such as property access due to private ownership or areas where only rare plant species surveys were completed have resulted in incomplete inventories (*i.e.* fewer than 30 native species). For these areas, the Floristic Quality Assessment was not used because the FQI would not be representative of the plant community as a whole. However, natural areas where an inventory of 30 or fewer native species represents a relatively complete inventory, the FQI was used. The mean coefficients and FQI have been categorized as high, medium and low values as follows:

Native mean coefficients - high > 4.00;  
medium = 3.3 to 3.99;  
low < 3.3;  
Floristic Quality Indices - high > 40;  
medium = 30 to 39.99;  
low < 30).

The Floristic Quality Indices were updated for the natural areas where the floral inventory changed between 1996 and 2006.

### **Condition**

The condition of each site is ranked on its current condition as noted during field reconnaissance. Overall disturbance at each site is noted, especially that associated with urban stresses such as litter, vandalism and unplanned trail networks. Aggressive non-native plants are recorded and expressed as a proportion (percentage) of the total known flora of the site. The provincial flora is approximately 27% non-native (Kaiser 1983) which provides some comparison. Sites are evaluated as excellent, good, fair or poor. A site in excellent condition has very little disturbance (*e.g.* no trails, no dumping, limited cutting, no trampling), and few non-native floral species. A site in poor condition has many disturbances (*e.g.* trails, non-natives, garbage). Fair sites were intermediate with respect to disturbance.

Recent disturbances, threats and management needs were noted where they changed from previous assessments undertaken between 1996 and 2006. Recommendations for the mitigation of real or potential impacts that resulted from recent developments, including naturalization projects, are provided.

## **2.4 Mapping**

Boundary changes for natural areas were identified on colour aerial photographs overlaid with the existing natural area boundaries, provided by the City. Boundary delineation is based on the following methods:

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### **Natural Areas**

The boundaries for the majority of natural areas follow the limit of the natural vegetation. The boundaries for open watercourses (manicured or unmanicured), follow the edge of the greenspace. Boundaries for areas designated as Residential Woodland are based on the limits of the continuous tree canopy. Boundaries of urban lakes follow the shoreline vegetation.

Rear lots were generally excluded from natural areas but may be included in areas where past field work indicated that a functioning understory appeared to be present or rear lots could not be delineated with airphoto interpretation. Private estates either within or along the edge of a natural area are also excluded. Undeveloped lands surrounded by a natural area are included within boundaries unless they were currently being utilized (*e.g.* for agriculture or storage). Manicured parks and golf courses occurring within the centre of a natural area are included within boundaries, but those adjacent to natural areas were excluded. A manicured park at the edge of an area is usually partly designated as a Special Management Area. Creeks and rivers are not defined as separate vegetation communities, but are included within the surrounding community.

### **Special Management Areas**

Special management areas were identified on a case by case basis. Undeveloped areas with no known development pressures, adjacent to a natural area, were usually included. An undeveloped piece of land that could reasonably be used to connect either fragments of one area together, or two natural areas was also usually included. Undeveloped areas for which active development applications were known to exist were not included within Special Management Areas.

### **Linkages**

Linkages were determined in the 1996 study using the Open Space Map for the City as well as a map provided by the City “Implementation of water quality and quantity control facilities in the City of Mississauga”. Linkages were identified without regard for land ownership. All of the linkage boundaries have been refined in subsequent studies through site specific work. Linkages are defined where watercourses with associated natural areas continued outside of the City limits. Linkages are only defined across small to medium size roads and where substantial culverts were present. They were not defined between sections of a natural area bisected by roads or railway lines. The following landscape features were used for linkages between two or more natural areas: utility Rights-Of-Way, City parkland, public greenspace (*i.e.* greenbelts), and sections of the Lake Ontario shoreline.

Revisions to maps were subsequently digitized by the City of Mississauga, Geographic Technology Services using MicroStation GeoGraphics GIS. Updated surficial areas (hectares and acres) for the natural areas and vegetation communities were determined using GIS and incorporated into the database. Updated UTM coordinates for the natural areas and vegetation communities were also incorporated into the database.

## **3.0 NATURAL AREAS FRAMEWORK**

Table 1 (page 6) summarizes the current information available for each natural area in the City of

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Mississauga. This updates Table 4 from Geomatics (1996) and summarizes the following information:

- the classification of each natural area;
- designation of natural areas as significant features (ANSI, ESA, evaluated wetland);
- size of each natural area in hectares and acres;
- the number of floral species;
- the proportion of the flora that is non-native;
- the native FQI and native mean coefficient;
- the number of vegetation communities;
- the number of provincially and regionally significant floral and faunal species;
- the number of bird, mammal, amphibian and reptile species;
- the number of Credit Valley Conservation Species of Conservation Interest; and
- the condition of the natural areas.

Appendix 5 documents the changes that occurred in natural areas between 1996 and 2006 using the same categories, but only for those areas evaluated in 2006. Some of the changes outlined in Appendix 5 are minor revisions while others are considered significant in the context of the natural areas program. Significant changes are considered to be:

- a change in the classification of a natural area (*e.g.*, from Significant Natural Site to Natural Site);
- a change in the designation of a natural area (*e.g.*, the removal or addition of ANSI status);
- a change of more than 25% in the original size of a natural area;
- a change in the FQI or native mean coefficient rank for a natural area (*e.g.*, a rank that goes from a high to medium category);
- the addition of rare floral or faunal species (provincial, local and CVC); and
- the addition or deletion of a vegetation community.

Figure 1 (see page 16) shows the location of natural areas, Special Management Areas, Residential Woodlands (RW) and Linkages. This figure updates Figure 2 from Geomatics (1996). Due to the scale of mapping, Significant Natural Sites (SNS), Natural Sites (NS) and Natural Green Space (NGS) are not discriminated on this map, and are all labelled as “natural area”.

**Table 1: Summary of Natural Area Features, Significance and Condition.**

This table represents an update of Table 4 in the Natural Areas Survey (Geomatics 1996). Native FQI and native mean C are defined in section 2.3. Definitions for provincially significant species (prov. sig. species) and regionally significant species (reg. sig. species) are in Appendix 4. See North-South (2000), Section 4.4, for a discussion of Credit Valley Conservation (CVC) Species of Conservation Interest. Condition is explained in section 2.3. Abbreviations used in this table are as follows: n/a = not available. An asterisk indicates areas evaluated that changed between 1996 and 2006 (see Appendix 5 for changes natural area changes among years).

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
1	SD1	Significant Natural Site		19.55	48.28	170	67	39.41%	35.96	3.54	6	1	10	113	7	2		6	Fair
2	SD4	Natural Site		23.67	58.45	106	24	22.64%	31.69	3.50	6		2	13				2	Fair
3	SD5	Significant Natural Site		10.14	25.05	80	17	21.25%	34.65	4.37	3		5	14	1	1		2	Good
4	CL52	Natural Site		6.69	16.53	73	43	58.90%	14.61	2.67	1	1		25	1	2		3	Poor
5	CL1	Significant Natural Site		3.59	8.86	80	17	21.25%	34.65	4.37	1		5	14	1	1		2	Good
6	CL9	Significant Natural Site	ESA,ANSI,wetland	45.62	112.68	501	163	32.53%	80.30	4.37	13	1	133	203	22	21	3	14	Good
7	CL8	Significant Natural Site	wetland	11.28	27.86	85	24	28.24%	24.58	3.15	8		6	28	10	1		5	Good
8	CL15	Natural Site		0.83	2.05	54	9	16.67%	25.79	3.84	1		3	10	3			1	Fair
9	CL16	Significant Natural Site		11.79	29.12	161	49	30.43%	39.02	3.84	6	1	15	42	17			6	Fair - Poor
10	CL17	Residential Woodland		33.28	82.21	73	15	20.55%	0.00	0.00	1		19			4			n/a
11*	CL13	Natural Site		7.03	17.35	87	50	57.47%	15.04	2.54	3		1	11	3			1	Poor
12	CL43	Natural Site		4.16	10.27	87	18	20.69%	31.18	3.75	2		6	14	2			1	Fair - Poor
13	CL42	Natural Site		8.31	20.54	119	34	28.57%	37.31	4.05	3		12	18	1			4	Fair - Poor
14	CL21	Significant Natural Site	ESA,wetland	9.05	22.35	112	23	20.54%	41.23	4.37	3		20	17	3	1		3	Fair - Poor
15	CL39	Significant Natural Site		12.59	31.1	271	79	29.15%	57.23	4.13	2		42	39	6	8		7	Fair
16	CL22	Significant Natural Site	ESA,ANSI	17.75	43.85	134	46	34.33%	37.31	3.98	1	1	13	2	1	6			Good
17	CL30	Significant Natural Site	ESA,ANSI	0.06	0.15	83	33	39.76%	27.86	3.94	1	1	20	1					Fair

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
18	CL31	Significant Natural Site	ESA,ANSI	2.55	6.29	82	34	41.46%	23.09	3.33	1	1	2	4	1				Poor
19	CL24	Significant Natural Site	ESA,ANSI	7.76	19.16	245	65	26.53%	59.89	4.46	5	1	36	20	1	1		3	Good
20	CL26	Significant Natural Site		1.97	4.86	189	70	37.04%	36.03	3.30	1	1	17	19	7				Fair
21	PC1	Natural Site		1.03	2.54	101	49	48.51%	25.17	3.56	1		7	69	1			1	Poor
22	PC2	Natural Green Space		4.37	10.80	26	15	57.69%	0.00	0.00	1			5		1			Poor
23	PC3	Removed		0.00	0.00	11	3	27.27%	0.00	0.00	1								Removed
24	CRR9	Significant Natural Site	ESA,ANSI,wetland	25.63	63.30	49	17	34.69%	20.86	3.69	3		17	40	1	10	2	9	Fair
25	MI4	Residential Woodland		154.32	381.17	28	16	57.14%	0.00	0.00	1		1						Fair
26	MI1	Natural Site		5.64	13.94	57	36	63.16%	0.00	0.00	4			51	2			2	Fair
27	LV3	Natural Site		3.54	8.76	94	36	38.30%	28.23	3.71	5		1	34	3			4	Fair
28	LV4	Natural Site		2.31	5.70	51	27	52.94%	11.29	2.30	5		2	20	1			1	Poor
29	LV5	Natural Green Space		1.12	2.77	115	61	53.04%	22.46	3.06	1		8						Poor
30	LV2	Natural Site		2.09	5.17	40	13	32.50%	13.09	2.52	1			12	1			2	Poor
31	LV1	Significant Natural Site		14.22	35.11	123	46	37.40%	29.74	3.39	5	1	1	27	2			5	Fair
32	ETO8	Significant Natural Site		15.96	39.43	101	37	36.63%	29.21	3.65	4		4	26	6	1		5	Fair
33	LV14	Natural Site		1.86	4.59	51	24	47.06%	15.20	2.93	1			10				1	Poor
34	LV6	Natural Site		2.03	5.01	82	24	29.27%	29.41	3.86	1		4	7	1			1	Fair
35	LV7	Significant Natural Site	ESA,ANSI,wetland	21.56	53.26	336	110	32.74%	63.66	4.23	2	1	62	68	7	5	1	5	Good
36*	ETO7	Significant Natural Site	ESA	31.09	76.79	131	51	38.93%	27.51	3.08	3		8	17	5	11	3	1	Fair
37	SP1	Natural Site		7.17	17.70	194	77	39.69%	39.57	3.66	5		17	27	7			4	Fair
38	SP3	Significant Natural Site		8.54	21.09	134	30	22.39%	40.89	4.01	5		11	13	2	1		2	Good
39	SH6	Natural Site		6.28	15.51	104	49	47.12%	24.68	3.33	4		2	12	3			1	Poor
40*	CRR7	Significant Natural Site	ESA,ANSI	92.82	229.26	115	28	24.35%	41.13	4.44	5	2	18	44	5	7		12	Good

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
41*	CRR8	Significant Natural Site	ESA,ANSI,wetland	109.73	271.04	67	8	11.94%	39.71	5.17	4	1	30	48	8	8	1	14	Good
42	ER6	Significant Natural Site		1.29	3.19	59	26	44.07%	19.50	3.39	1	1		9	1			1	Poor
43*	CRR6	Significant Natural Site	ESA,ANSI	134.55	332.33	302	97	32.12%	66.11	4.62	4	2	73	74	8	18	1	16	Good
44	CV1	Natural Site		1.65	4.09	61	25	40.98%	17.50	2.92	2			11	1				Fair
45	CV2	Residential Woodland		49.53	122.33	143	42	29.37%	41.29	4.11	1	1	10	17	4			3	Fair
46	CV12	Significant Natural Site		7.44	18.37	227	101	44.49%	39.73	3.54	4	1	17	17	2	1		3	Fair
47	CV10	Natural Site		5.05	12.47	85	37	43.53%	21.94	3.17	2		4	17	2			1	Poor
48	CV8	Natural Site		8.09	19.99	86	37	43.02%	18.52	2.65	5		3	17	3			1	Poor
49	ETO6	Significant Natural Site		11.36	28.06	7	5	71.43%	0.00	0.00	4		1	18	1			2	Poor
50	AW1	Significant Natural Site		7.52	18.57	88	34	38.64%	25.23	3.43	3	1	2	21	2			2	Poor
51*	WB1	Natural Site		3.90	9.62	72	18	25.00%	28.85	3.93	5		1	15	2	1		2	Good - Fair
52*	EM30	Natural Site		5.23	12.93	93	19	20.43%	33.83	3.93	5		8	12	8				Good
53*	EM6	Natural Site		1.03	2.55	70	20	28.57%	27.01	3.82	1		1	7	1				Fair
54*	EM2	Significant Natural Site		4.78	11.81	85	15	17.65%	32.99	3.94	1	1	1	12	1				Fair
55*	EM10	Natural Site		3.82	9.43	70	21	30.00%	24.43	3.49	3			9	2	1		1	Fair
56*	EM14	Significant Natural Site		9.38	23.16	94	42	44.68%	21.22	2.94	5	1		15	3	1		1	Fair
57*	EM4	Significant Natural Site	ESA,ANSI	41.93	103.57	258	76	29.46%	57.15	4.24	8	2	36	70	7	6		5	Good - Fair
58*	EM5	Natural Site		4.89	12.09	61	19	31.15%	23.15	3.57	2			6				1	Fair
59*	EM21	Natural Site		0.84	2.08	51	10	19.61%	22.18	3.46	1			2	1				Fair
60	CR1	Significant Natural Site	ESA	4.90	12.10	70	11	15.71%	33.72	4.39	2		6	4	1				Fair
61	FV1	Natural Site		2.05	5.07	59	11	18.64%	23.82	3.44	1		2	8	1			1	Fair
62	FV3	Natural Site		6.35	15.67	108	44	40.74%	28.50	3.56	3			19	2			2	Fair
63	CC1	Significant Natural Site		3.32	8.19	165	54	32.73%	40.03	3.82	1	1	11	18	3		1	3	Fair

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
64	MY1	Significant Natural Site		13.45	33.23	165	54	32.73%	40.03	3.82	2	1	11	18	3		1	3	Fair
65	MY3	Natural Green Space		2.31	5.72	56	34	60.71%	11.09	2.36	1		1	12	1				Poor
66	AW4	Natural Site		11.60	28.64	54	33	61.11%	11.85	2.65	2		3	12					Poor
67	AW3	Natural Green Space		7.96	19.66	58	31	53.45%	14.90	2.92	2		1	18	1			2	Poor
68	ETO5	Significant Natural Site		7.83	19.34	83	46	55.42%	16.36	2.76	6		5	16	1			3	Poor
69	ETO4	Significant Natural Site	ESA	52.81	130.45	179	53	29.61%	45.36	4.09	4	1	18	41	3	5		9	Fair
70	RW5	Natural Site		2.39	5.92	75	37	49.33%	14.83	2.47	1		3	14	1			1	Poor
71	RW6	Natural Site		6.13	15.15	71	37	52.11%	14.61	2.67	1		2	23	1			5	Poor
72	RW4	Natural Site		1.22	3.01	52	8	15.38%	27.14	4.09	2			8	1				Fair
73	RW1	Significant Natural Site		2.11	5.21	77	18	23.38%	34.11	4.44	1		3	1	1				Fair
74	RW2	Natural Green Space		3.84	9.50	57	31	54.39%	16.67	3.27	1			15	1			2	Poor
75*	CM7	Significant Natural Site		11.17	27.58	92	18	19.57%	35.57	4.14	3		3	22	3	5	1	2	Good
76*	CM9	Natural Site		3.91	9.67	78	14	17.95%	31.00	3.88	4		5	13	2	3		1	Good
77	CM11	Removed		0.00	0.00	22	1	4.55%	18.33	4.00	1			1					Removed
78*	CM12	Natural Site		6.05	14.95	87	17	19.54%	31.79	3.80	1		3	19	5	8		1	Good
79	CM17	Removed		0.00	0.00	25	4	16.00%	16.80	3.67	1			5					Removed
80	CM13	Removed		0.00	0.00	37	14	37.84%	16.26	3.39	1			1	1				Removed
81*	CE7	Significant Natural Site		9.33	23.04	109	33	30.28%	35.67	4.09	2	1	7	8	1	7			Good
82*	CE9	Natural Site		5.04	12.44	96	28	29.17%	33.71	4.09	5		7	14	2				Fair
83	CE10	Significant Natural Site		18.20	44.95	111	23	20.72%	39.12	4.17	3		10	13	2	2			Good - Fair
84	CE5	Natural Green Space		5.47	13.50	13	8	61.54%	2.68	1.20	1								Poor
85*	CE1	Natural Green Space		16.84	41.60	85	25	29.41%	23.85	4.15	3			13	1	5		2	Poor
86	CE12	Significant Natural Site		17.62	43.52	97	42	43.30%	22.52	3.04	2	1	1	14	3	1			Fair

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
87	CRR5	Significant Natural Site		24.74	61.10	64	26	40.63%	21.09	3.42	2	1		15	2	2	1	2	Fair
88	CRR4	Significant Natural Site	ESA,ANSI	21.17	52.29	54	22	40.74%	18.07	3.19	4		6	22	3	7	2	5	Good
89	SV12	Significant Natural Site		1.72	4.25	97	42	43.30%	22.52	3.04	1	1	1	14	3	1			Fair
90	SV10	Natural Green Space		3.04	7.50	40	20	50.00%	10.29	2.30	1			1		1			Poor
91	SV1	Significant Natural Site		4.57	11.29	102	23	22.55%	35.67	4.01	2	1	5	10	2				Fair
92	CRR3	Significant Natural Site		68.94	170.28	91	31	34.07%	27.44	3.54	4	1	3	37	5	8	1	7	Fair
93	CRR2	Significant Natural Site	ESA,ANSI	91.30	225.51	112	35	31.25%	33.85	3.86	12		3	45	9	11		11	Good
94	EC22	Natural Site		2.32	5.73	75	9	12.00%	31.14	3.83	1		6	4	2				Fair - Poor
95	EC10	Removed		0.00	0.00	46	10	21.74%	21.83	3.64	2			2					Removed
96	EC13	Significant Natural Site	wetland	4.39	10.84	186	31	16.67%	54.62	4.39	4		71	88	6	11		13	Excellent
97	EC1	Removed	ESA,wetland	0.00	0.00	10	4	40.00%	4.90	2.00	1			5		2			Removed
98	HO1	Natural Site		1.20	2.97	33	7	21.21%	19.81	3.88	1			5	1				Fair - Poor
99	HO2	Removed		0.00	0.00	24	3	12.50%	18.77	4.10	2			3					Removed
100	HO3	Natural Site		14.41	35.59	60	11	18.33%	26.43	3.78	3			13	2				Fair
101	HO6	Natural Green Space		8.50	21.00				0.00	0.00	1								Poor
102	HO7	Natural Site		1.07	2.65	80	17	21.25%	30.62	3.86	2		2	8	1				Fair - Poor
103	HO9	Significant Natural Site	ESA	11.34	28.01	207	55	26.57%	51.34	4.16	1	1	22	19	2	1			Good - Poor
104	NE4	Natural Site		13.15	32.47	134	27	20.15%	39.15	3.79	6		16	24				4	Excellent
105	NE3	Natural Green Space		2.85	7.04	59	26	44.07%	12.19	2.12	2			15	2			3	Poor
106	NE2	Removed		0.00	0.00	55	10	18.18%	28.17	4.20	1			5					Removed
107	NE1	Natural Green Space		1.07	2.65	70	27	38.57%	20.28	3.09	1		2	7	1			2	Fair
108	NE6	Removed		1.64	4.05	91	28	30.77%	26.96	3.40	2	1	2	14	3				Removed
109	NE5	Natural Green Space		12.58	31.07	30	20	66.67%	0.00	0.00	1			14				4	Poor

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
110	NE7	Natural Green Space		2.76	6.82				0.00	0.00	1								Poor
111	ETO3	Significant Natural Site		78.87		400	164	41.00%	56.35	3.67	4	2	59	7	5	5		3	Fair - Poor
112	NE8	Natural Green Space		2.98	7.37				0.00	0.00	1								Poor
113	NE10	Natural Green Space		8.27	20.42				0.00	0.00	1								Poor
114	NE11	Natural Green Space		5.63	13.90				0.00	0.00	1								Poor
115	NE12	Natural Green Space		6.49	16.02				0.00	0.00	1								Poor
116	ETO2	Significant Natural Site		13.01	32.14	31	19	61.29%	7.22	2.08	1			3	1				Poor
117	ETO1	Significant Natural Site		9.13	22.55	39	10	25.64%	15.00	2.79	4		1	4	2				Fair - Poor
118	NE9	Significant Natural Site		46.00	113.61	197	78	39.59%	37.74	3.47	4	1	27	39	3	4		5	Fair
119*	LS1	Significant Natural Site	wetland	26.39	65.17	145	59	40.69%	32.35	3.49	3		10	10	1			1	Good - Poor
120*	LS2	Natural Site		1.03	2.55	59	17	28.81%	24.53	3.79	1			5	1				Poor
121*	LS3	Natural Site		3.00	7.40	113	40	35.40%	29.38	3.44	3		4	6	1	2		1	Fair
122*	ME10	Significant Natural Site		3.39	8.38	73	18	24.66%	27.91	3.76	1	1	3	7	1			1	Fair
123*	ME12	Significant Natural Site		2.90	7.16	87	49	56.32%	16.60	2.73	1		1	15	2	7	1		Poor
124*	ME11	Natural Green Space		4.36	10.78	83	45	54.22%	14.79	2.70	1		5	17	4	4		1	Fair - Poor
125*	ME9	Natural Site		2.26	5.58	64	15	23.44%	30.14	4.31	1		4	4	1				Good
126*	ME8	Significant Natural Site		5.82	14.38	93	24	25.81%	32.02	3.86	1	1	4	15	3	4			Fair
127*	MB9	Natural Green Space		6.60	16.31				0.00	0.00	1					2			Poor
128*	MB7	Natural Green Space		10.23	25.27	43	24	55.81%	7.99	1.83	1			12				1	Poor
129*	MB8	Significant Natural Site		9.86	24.35	93	24	25.81%	32.02	3.86	2	1	4	15	3	4			Fair
130*	MB3	Natural Green Space		5.38	13.28	34	19	55.88%	5.94	1.53	1			12	1	1		1	Fair
131	MB5	Removed		0.00	0.00	42	5	11.90%	23.67	3.89	1								Removed
132*	MB4	Natural Site		1.77	4.36	40	11	27.50%	19.31	3.59	1			8				1	Poor

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
133*	MB6	Significant Natural Site		23.56	58.20	141	39	27.66%	35.65	3.53	2		13	27	7	2		7	Good
134*	MB2	Natural Site		1.34	3.31	50	6	12.00%	25.63	3.86	1		1	7				1	Poor
135*	MB1	Natural Site		0.77	1.89	34	6	17.65%	22.87	4.32	1			1					Fair
136	MV19	Significant Natural Site		22.93	56.64	212	56	26.42%	51.80	4.15	6		31	23	6	4			Good
137	CRR1	Significant Natural Site	ESA, wetland	69.83	172.47	266	89	33.46%	49.97	3.76	10	1	38	50	7	8		4	Fair
138	MV18	Natural Site		2.60	6.43	19	1	5.26%	0.00	0.00	2		1	7				2	Fair
139	MV2	Significant Natural Site	ESA,ANSI	60.56	149.57	218	71	32.57%	47.33	3.90	5	1	19	67	15	5	1	14	Good - Fair
140	MV3	Removed		0.00	0.00	57	17	29.82%	23.40	3.70	1			6	2				Removed
141	MV12	Natural Site		8.27	20.44	125	35	28.00%	36.26	3.82	2		7	8	4				Fair
142	MV14	Removed		0.00	0.00				0.00	0.00	1								Removed
143	MV11	Natural Site		2.90	7.17	24	4	16.67%	17.44	3.90	1			1					Fair
144	MV15	Natural Site		10.69	26.41	53	24	45.28%	14.48	2.69	2		1	7	1				Poor
145	GT1	Removed		0.00	0.00	41	10	24.39%	18.50	3.32	1			2					Removed
146	GT2	Natural Site		7.20	17.78	68	11	16.18%	29.80	3.95	6		6	10	3	1			Good
147	GT3	Natural Site		2.67	6.59	43	11	25.58%	18.74	3.31	2		1	1					Fair
148	GT4	Removed		0.00	0.00	206	56	27.18%	51.03	4.17	1	1		22	4	1			Removed
149	MA1	Natural Site		24.06	59.42	61	31	50.82%	13.66	2.63	1		3	4					Poor
150	SD7	Significant Natural Site		3.81	9.41	94	49	52.13%	18.84	2.84	3	1	5	54	1			1	Poor
151	MI17	Significant Natural Site		5.98	14.77	167	54	32.34%	43.56	4.10	2		16	19	8	3		3	Fair
152	MI7	Significant Natural Site		4.98	12.30	125	39	31.20%	39.90	4.30	2	1	7	10	4			2	Poor
153	CV6	Natural Site		2.71	6.69	75	16	21.33%	26.17	3.41	1		3	11	1			2	Fair
154*	CRR10	Significant Natural Site	ESA,ANSI	60.42	149.23	373	130	34.85%	67.89	4.36	9	2	70	89	10	11	1	27	Good
155*	CRR11	Significant Natural Site	ESA	32.16	79.44	157	48	30.57%	40.02	3.83	4	1	15	25	3	5		4	Good

Site #	Site Code	Classification	Designation	Area		Flora							Fauna					Condition	
				(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	reg. sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species		CVC
156	ER7	Natural Site		3.15	7.78	77	29	37.66%	21.00	3.06	3		4	13	1			1	Poor
157*	ME13	Natural Green Space		1.42	3.50	25	6	24.00%	18.58	4.26	1			3					Fair - Poor
158*	CM25	Natural Green Space		0.70	1.73	24	11	45.83%	5.27	1.46	2		1	7		1		2	Fair - Poor

**Figure 1: Legend for Natural Area Framework for the City of Mississauga**  
(arranged by Planning District).

(Note: There are 136 natural areas and 3 Residential Woodlands identified on Figure 1, however 143 areas are listed below because 4 areas span two planning districts and are thus listed twice).

**SOUTHDOWN**

1. SD1
2. SD4
3. SD5 (Meadowwood)
150. SD7 (Lakeside)

**CLARKSON-LORNE PARK**

4. CL52 (Meadowwood)
5. CL1 (Meadowwood)
6. CL9 (Ratray Marsh)
7. CL8
8. CL15
9. CL16 (Jack Darling Park)
10. CL17 (Lorne Park Estates)
11. CL13
12. CL43
13. CL42
14. CL21 (Birch Glen)
15. CL39 (Whiteoaks)
16. CL22
17. CL30 (Lorne Park Prairie)
18. CL31 (Lornewood Creek Trail)
19. CL24 (Tecumseh)
20. CL26
24. CRR9 (Credit River Flats)

**PORT CREDIT**

21. PC1 (Rhododendron Gardens)
22. PC2 (Port Credit Memorial)

**MINEOLA**

24. CRR9 (Credit River Flats)
25. MI4
26. MI1
151. MI17 (Mary Fix)
152. M17

**LAKEVIEW**

27. LV3 (Adamson Estate)
28. LV4 (Helen Molasy Memorial)
29. LV5
30. LV2
31. LV1
32. ETO8
33. LV14 (Lakeview Golf Course)
34. LV6
35. LV7 (Cawthra Woods)
36. ETO7

**SHERIDAN PARK**

37. SP1
38. SP3

**SHERIDAN**

39. SH6
40. CRR7
41. CRR8

**ERINDALE**

40. CRR7
41. CRR8
42. ER6
43. CRR6
156. ER7

**COOKSVILLE**

44. CV1 (Iroquois Flats)
45. CV2
46. CV12 (Richard Jones)
47. CV10
48. CV8 (Camilla)
153. CV6 (Stillmeadow)

**DIXIE**

36. ETO7
49. ETO6
50. AW1 (Willowcreek)

**WESTERN BUSINESS PARK**

51. WB1 (Erin Mills Twin Arena)

**ERIN MILLS**

52. EM30 (Tom Chater Memorial)
53. EM6 (King's Masting)
54. EM2 (South Common)
55. EM10
56. EM14
57. EM4
58. EM5 (Glen Erin Trail)
59. EM21 (R.F.C. Mortensen)
154. CRR10

**CREDITVIEW**

60. CR1

**FAIRVIEW**

61. FV1
62. FV3

**CITY CENTRE**

63. CC1 (Bishopstoke Walk)

**MISSISSAUGA VALLEY**

64. MY1 (Mississauga Valley)
65. MY3 (Stonebrook)

**APPLEWOOD**

50. AW1 (Willowcreek)
66. AW4 (Applewood Hills)
67. AW3 (Applewood Hills)
68. ETO5
49. ETO6

**Figure 1 continued...****RATHWOOD**

- 69. ETO4
- 70. RW5 (Applewood Hills)
- 71. RW6 (Applewood Hills)
- 72. RW4 (Rathwood District)
- 73. RW1
- 74. RW2 (Woodington Green)

**CHURCHILL MEADOWS**

- 75. CM7
- 76. CM9
- 78. CM12
- 158. CM25

**CENTRAL ERIN MILLS**

- 81. CE7 (Sugar Maple Woods)
- 82. CE9 (Quenippenon Meadows)
- 83. CE10 (Erin Wood)
- 84. CE5
- 85. CE1 (Woodland Chase Trail)
- 86. CE12 (Bonnie Brae)
- 87. CRR5
- 88. CRR4155.CRR11
- 155 CRR11

**STREETSVILLE**

- 89. SV12 (Bonnie Brae)
- 90. SV10
- 88. CRR4
- 91. SV1 (Turney Woods)
- 92. CRR3
- 93. CRR2

**EAST CREDIT**

- 87. CRR5
- 88. CRR4
- 92. CRR3
- 93. CRR2
- 94. EC22
- 96. EC13
- 155. CRR11

**HURONTARIO**

- 98. HO1
- 100. HO3 (Staghorn Woods)
- 101. HO6
- 102. HO7
- 103. HO9 (Britannia Woods)

**NORTHEAST**

- 104. NE4
- 105. NE3
- 107. NE1
- 108. NE6
- 109. NE5
- 110. NE7
- 69. ETO4
- 111. ETO3
- 112. NE8
- 113. NE10
- 114. NE11
- 115. NE12
- 116. ETO2
- 117. ETO1
- 118. NE9 (Wildwood)

**LISGAR**

- 119. LS1 (Lisgar Meadow Brook)
- 120. LS2
- 121. LS3 (Trelawny Woods)

**MEADOWVALE**

- 122. ME10 (Eden Woods)
- 123. ME12 (Lake Wabukayne)
- 124. ME11 (Lake Aquitaine)
- 125. ME9 (Maplewood)
- 126. ME8 (Windrush Woods)
- 157. ME13

**MEADOWVALE BUSINESS PARK**

- 127. MB9
- 128. MB7 (Mullet Creek)
- 129. MB8
- 130. MB3
- 132. MB4
- 133. MB6 (Totoredaca)
- 134. MB2
- 135. MB1

**MEADOWVALE VILLAGE**

- 136. MV19
- 137. CRR1 (Meadowvale C.A.)
- 138. MV18
- 139. MV2
- 141. MV12
- 143. MV11
- 144. MV15
- 93. CRR2

**GATEWAY**

- 146. GT3
- 147. GT2

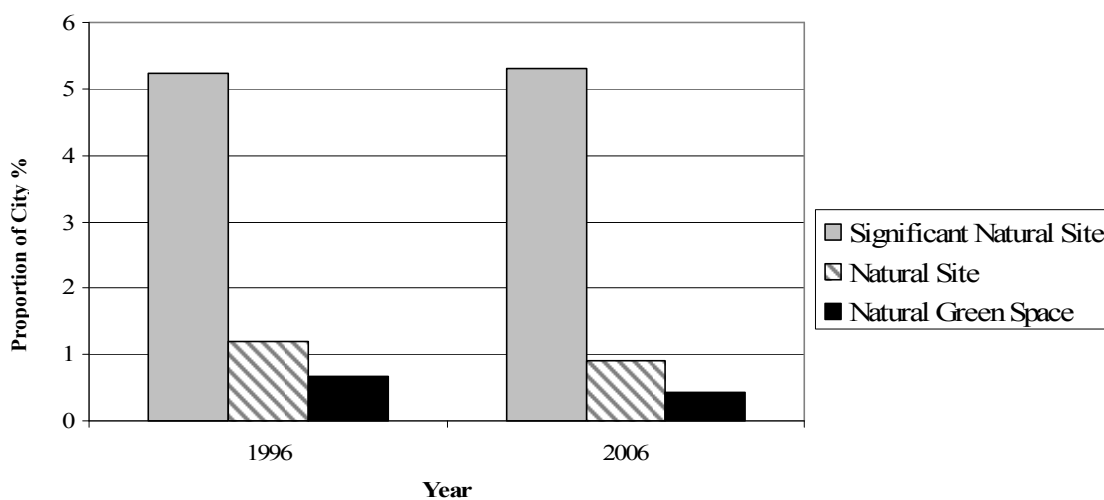
**MALTON**

- 149. MAI



### 3.1 Summary of Changes

Figure 2 illustrates the overall change in total area for each natural area classification between 1996 and 2006 expressed as a proportion of the City that is occupied by the Natural Areas System. A detailed summary of the changes to natural area classification between 1996 and 2006 is provided in Appendix 6. The total number of natural areas (excluding Residential Woodlands) decreased from 141 in 1996 to a low of 136 in 2004. This year the number of sites has increased to 138. The total area of the City identified as part of the Natural Area System in 2006 is 6.65% which is essentially unchanged from 2002. This reflects an overall decline in area from the 7.10% reported in 1996 and represents an overall loss of 157.14 ha (388.29 a.).



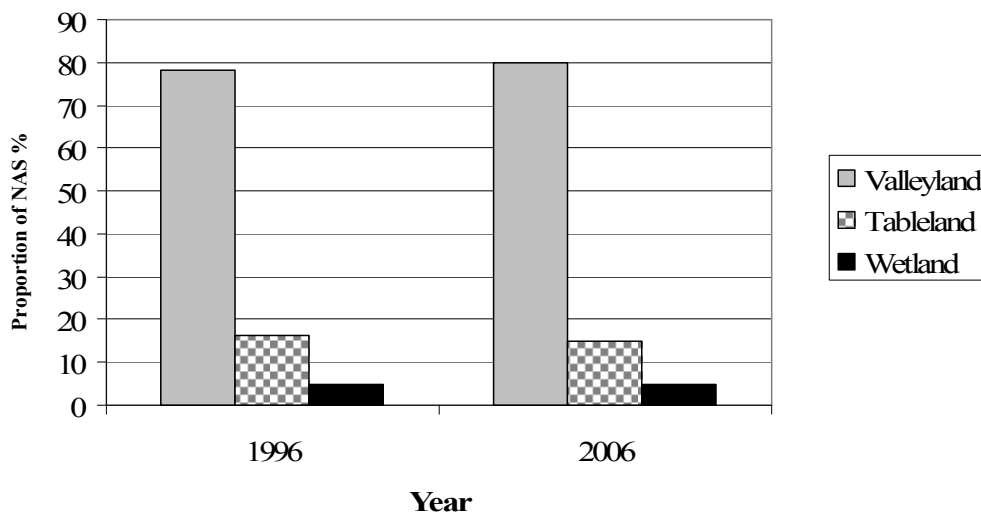
**Figure 2: The proportion of the City contributed by each natural area classification in 1996 and 2006.** (See Appendix 6 for a complete summary)

One Special Management Area associated with natural area CM7 was removed due to development. This brings the 2006 total for Special Management Areas down to 38 from the original number of 55 identified in 1996. The total number of Linkages remains the same (36) as in 2000; but has decreased from 40 noted in 1996. Between 2004 and 2005, the natural area NE6 was substantially reduced in size (over 50%) due to development. Most changes to natural area boundaries in 2006 were minor in nature, and there is an addition of two natural areas (ME13 and CM25). As a result, the overall statistics did not change dramatically from 2002.

The overall change to the three major landform types (valleyland, tableland, and wetland) in the City between 1996 and 2006 is presented in Figure 3. A detailed summary of the changes to the landform types is provided in Appendix 7. Figure 3 illustrates that the majority of the natural areas system (80%) is associated with valleylands in 2006. This proportion has increased from 78.3% of the system in 1996, but is relatively unchanged from 2002. The actual number of valleyland sites decreased from 78 in 2002 to 77 in 2004 with the removal of natural area PC3 for development, and this number remains unchanged in 2006.

In contrast, tablelands only account for 15% of the natural areas system in 2006 (Figure 3). This represents a continued decrease from 16.4% in 1996, but is a slight increase from 2005. The total number of tableland natural areas has decreased from 60 in 1996 to 52 in 2005 but increased by 3 sites in 2006. From a City-wide perspective, there were steady decreases from 1.16% in 1996 to 0.97% in 2002 in the landbase represented in tableland natural areas. In 2006 this proportion has increased slightly to 0.99%. In the City of Mississauga, tableland natural areas (which are mainly wooded) tend to be discrete islands that have limited connections to other remnant natural features. Valleylands are better connected by virtue of the linearity of the landform and because they have historically been better protected from development. This reinforces the need to place a high priority on the protection of the remaining tableland features present within the City, and emphasizes the need for their management to maintain or improve quality.

The proportion of the natural areas system associated with wetlands has remained more or less constant from 1996 at approximately 5.0% (Figure 3). The proportion of the City that is classified as wetland decreased marginally from 0.36% in 1996 to 0.33% in 2002, but has remained constant from 2002 to 2006 (Appendix 7).



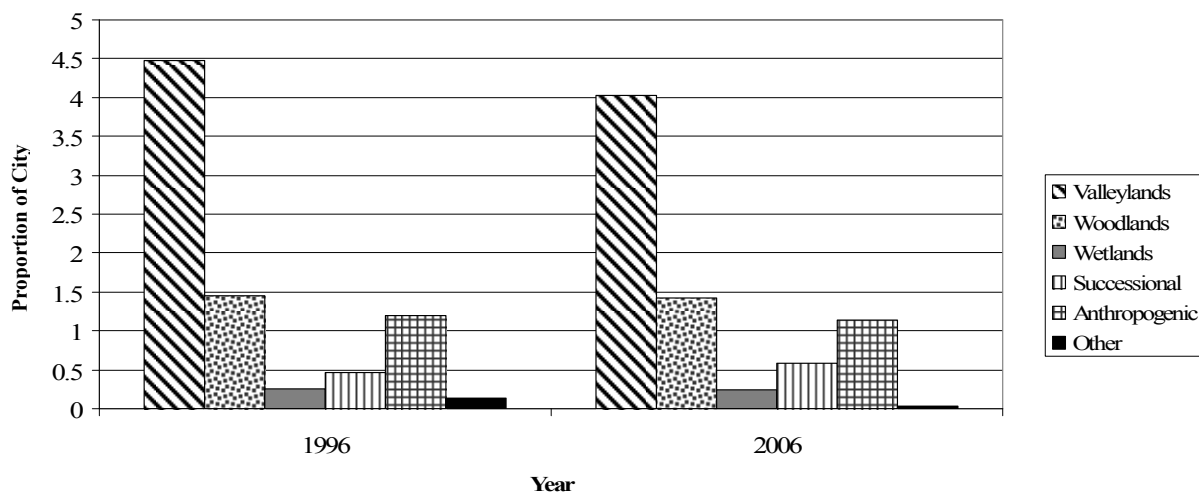
**Figure 3: The proportion of the Natural Areas System contributed by landform type in 1996 and 2006.** (See Appendix 7 for a complete summary.)

The mean size of natural areas in two of the three landscape types has been decreasing since 1996 due to the removal of portions of natural areas for development (Appendix 7). The exception is the mean size of wetlands which increased between 2001 and 2002 with the removal of EC1 which was smaller than most City wetlands, thus reducing the mean size. Currently the mean size of wetlands is 19.2 ha (47.44 a.). Tableland natural areas are generally very small (mean size of 5.3 ha or 13.1 a.) when compared to the valleyland areas (mean size of 19.23 ha or 47.94 a.).

## 4.0 NATURAL ENVIRONMENT OVERVIEW

### 4.1 Vegetation Communities

The 50 vegetation communities described for the City (see Table 2 in Geomatics 1996) were compared between 1996 and 2006 (see Figure 4, as well as Appendices 8 and 9). In 2000, the Ecological Land Classification (ELC) (Lee *et al.* 1998) was applied to the vegetation communities described for the City. A list of the City's vegetation communities and their corresponding ELC vegetation community classification is provided in North-South (2000, Appendix 6). To facilitate the comparison of vegetation communities among updates, the City designations are discussed in this report.



**Figure 4: The proportion of the City contributed by vegetation community in 1996 and 2006.** (See Appendix 8 and 9 for a complete summary).

The vegetation communities have been grouped into six broad categories to facilitate discussion; valleylands, woodlands, successional, wetlands, anthropogenic and other. The category “other” was used for three communities (tall-grass prairie, beach and unknown) that did not easily fit into one of the other five categories. The category “anthropogenic” refers to five communities that have been created and maintained through human intervention (manicured, urban lake, wooded residential, plantation, black walnut grove). The most prevalent vegetation communities within the City remain those in the valleyland category. The tall-grass prairie community is still considered the only provincially rare vegetation community within the City.

Appendices 8 and 9 summarize the changes in the vegetation community categories between 1996 and 2006. There was a decrease in the total percentage of the combined vegetation community categories within the City (expressed as a proportion of the area of the City) from 7.96% in 1996 to 7.43% in 2006 (Appendix 9) (Note: this figure is higher than reported in section 3.1 due to the inclusion of wooded residential areas in the anthropogenic category). In the “other” category there is a 0.1% loss in size since 1996. The only provincially significant community “tall-grass prairie” occurs within this category. In contrast, there is an increase of

0.13% within the wetland community category. Overall, the 0.52% loss of vegetation communities across the City of Mississauga is primarily related to the changes in the communities within the valleylands, as discussed in the section below. Ultimately, the continued loss of vegetation communities within the City will result in a reduction in biodiversity which is contrary to the goals and objectives of the Natural Areas Program (Geomatics 1996).

### Valleylands

Valleylands include eight vegetation communities, two of which “open with wooded slopes” (M) and “manicured with wooded slopes” (O) no longer occur in the natural areas system as a result of naturalization programs initiated by the City (listed in Appendices 8 and 9). Even though this category is termed valleylands, the boundaries of these vegetation communities do not necessarily follow floodplain boundaries. For example, wooded slope could occur on valley slopes or above the top of bank (tableland is included in wooded slope as long as it contiguous with the valleyland). In 2006, this category comprised 4.02 % of the total City area (Figure 4). This category has seen a decrease in area between 1996 and 2006 of 124.71 ha (Table 2). More than half of this loss (59%) occurred between 2001 and 2002 with a decrease of 58.28 ha (143.95 a.). Four of the vegetation communities in this category continue to be the most widespread in the City: wooded slope, floodplain, wooded non-native valleyland, and open with open slopes valleyland.

**Table 2: Changes to the area of vegetation communities 1996-2006.**

Vegetation Community Category	Areal Change (1996 – 2006)		Areal Change (2005 - 2006)		Reason for Changes Between 2005 - 2006
	hectares	acres	hectares	acres	
Valleylands	-124.71	- 308.16	- 0.42	- 1.04	Revision of communities in LS1, CRR10
Woodlands	- 8.51	- 21.03	- 0.25	+ 0.62	Revision of communities in EM2, LS1 Addition of community in ME13
Successional	+ 36.64	+ 90.54	+ 2.72	+ 6.72	Addition of communities in CRR7 Revision of communities in CM7, EM4, EM5, WB1 Removal of NE6
Wetland	- 6.17	- 15.25	+ 0.06	+ 0.15	Revision of communities in LS1 Addition of community in CM25
Anthropogenic	- 19.17	- 47.37	+ 0.82	+ 2.02	Revision of valleyland communities in several sites
Other	- 27.96	- 69.09	0.00	0.00	No change in 2006

Wooded slope valleylands (A) decreased substantially in 2005 by 7.25 ha (17.91 a.), and this trend continued with a further, marginal decrease in 2006 of 0.79 ha (1.95 a.) (Appendix 8). Wooded non-native valleylands (J) increased in size by 4.20 ha (10.38 a.) in 2005, however, in 2006 there was a 4.59 ha decrease in size. Floodplain valleylands (B) and open with manicured slopes valleyland (N) continued to decrease in size in 2006 but only marginally by 0.43 ha (1.06 a.), 0.22 ha (0.54 a.), respectively. However, open with open slopes valleyland (K) increased by 2.25 ha (5.56 a.) in 2006 (Appendix 8). The decreases can primarily be attributed to minor revisions of natural area boundaries.

### **Woodlands**

Woodlands include twenty vegetation communities (listed in Appendices 8 and 9), all of which occur outside of valleylands, although intermittent streams may be present within. Two of these communities, “bur oak - American beech forest” (QQ) and “bur oak - black walnut forest” (WW), no longer occur in the natural areas system due to their removal as a result of development. In 2006, the woodlands category comprised 1.42% of the total City area, unchanged from 2004 (Figure 4). This category has seen a total decrease between 1996 and 2006 of 8.51 ha (21.03 a.). Between 2005 and 2006 this category saw a decrease of 0.25 ha (0.62 a.) (Table 2 and Appendix 8). This change is due to minor revisions to natural area boundaries. Ten of the vegetation communities in this category (see Appendix 8 for a complete list) are considered uncommon in the City, each occupying less than 1% of the total area of natural areas or containing an uncommon “working-group” (Krahn *et al.* 1995). Six of these ten communities can also be considered “at risk” in the City, each represented only in a single natural area. These communities are: sugar maple-eastern hemlock forest (GG); sugar maple-black cherry forest (II); sugar maple-American beech-eastern hemlock forest (LL); white pine-eastern hemlock-sugar maple forest (MM); American beech forest (PP); and black cherry-eastern hemlock-white ash forest (VV). Four of these communities: GG, II, LL and MM are found within natural areas EM4 and MB4 (Erin Mills and Meadowvale Business Park). The American beech forest (PP) is found within GT3 and CE10 (Gateway and Central Erin Mills); the black cherry-eastern hemlock-white ash forest (VV) is found within natural area LV6 (Lakeview).

An emphasis should be placed on the protection and management of the remaining woodland vegetation communities. Even though these communities remained essentially unchanged in total size in 2006 there is still an overall continued loss of these communities that will result in a subsequent loss of plant and animal species from the City. The additional pressures associated with development adjacent to natural areas will jeopardize the remaining communities even more (see section 5.0 for a discussion of disturbances related to development).

### **Successional**

The successional category has six vegetation communities (listed in Appendices 8 and 9). This category has increased in size by 36.64 ha (90.54 a.) between 1996 and 2006 (Table 2) with 59% (21.55 ha) of this increase occurring in 2004. In 2006 this category continued to increase by 2.72 ha (6.72 a.). Even though successional vegetation communities continue to increase in size to date, this category comprises only 0.59 % of the total City area (Figure 4). Four of the vegetation communities in this category remain uncommon in the City occupying approximately 1% of the total area of natural areas (Appendix 9). One of these five communities, birch forest, can also be considered “at risk” in the City, as it is represented in only one natural area.

“Early successional forest” (E) increased marginally by 0.01 ha (0.02 a.) between 2005 and 2006. This community occupies 1.53% of the total of natural areas and is no longer considered uncommon in the City. “Old field” (C) continues to increase, this year by 2.07 ha (5.11 a.) between 2005 and 2006, in part this reflects the addition of old field communities to natural areas ETO5 and RW4 in 2005. The small overall size of successional communities in the City continues to highlight the perception that these types of communities do not contribute to the biodiversity of the City and, therefore are not important to retain. However, these communities perform a number of important ecological functions: they provide habitat for a number of plant

and animal species (including birds), they act as a buffer between forests and adjacent development, they provide structural diversity to a site (variation in the height and spatial structure of plants provides a wider range of animal habitat), and they provide habitat for small mammals and insects, which in turn provide a prey base for other species higher up the food chain.

### **Wetland**

The wetland category is composed of six vegetation communities (listed in Appendices 8 and 9). Between 1996 and 2006 this category decreased in size by 6.17 ha (15.25 a.) to only 0.24% of the total City area (Table 2 and Figure 4). Between 2005 and 2006 this category decreased marginally by 0.06 ha (0.15 a.). Each of the vegetation communities in this category continues to be considered uncommon in the City occupying approximately 1% of the total area of natural areas (cattail marsh is 1.2%). One of these six communities, “willow-buttonbush swamp thicket” (X), can also be considered “at risk” in the City as it is represented in only one natural area.

Despite their small size, wetland communities tend to contribute a disproportionately high amount of biodiversity to the City. A large number of both plant and animal species are restricted to this habitat. In addition to the concern about outright removal of these communities for development, there is also the concern that even if a wetland is retained within a subdivision, alterations to the hydrological and/or hydrogeological regime from the development will result in undesirable impacts. These areas are especially important for amphibian species which can be key indicators of overall habitat quality.

### **Anthropogenic**

Anthropogenic is composed of five vegetation communities (listed in Appendices 8 and 9). Between 2005 and 2006 this category increased by 0.82 ha (2.03) due in part to slight revisions in site boundaries. Overall, the size of this category decreased between 1996 and 2006 by 19.17 ha (47.37 a.) and currently comprises 1.14% of the total City area (Table 2 and Figure 4). This is more than the amount of the City occupied by wetlands (0.24%) and successional (0.59%) communities combined. “Wooded residential” is still considered to be one of the largest communities in the City. The community “manicured” (F) continues to increase in size, with this survey, by 0.82 ha (2.07 a.) between 2005 and 2006.

### **Other**

The “other” category is composed of three vegetation communities (listed in Appendices 8 and 9): “beach”, “tall grass prairie” and “unknown”. This category has had an overall decrease in size by 27.96 ha (69.09 a.) between 1996 and 2006 (Table 2). However, there has been no change to this category in 2006. The “other” category now only occupies 0.03 % of the total City area (Table 2 and Figure 4) and is found among natural areas CL8, CL9, CL30, LV3, LV4 and SD1.

## **4.2 Flora**

The total number of flora species in the City of Mississauga stands at 1124 (see database for a complete list). There are 673 native species in Mississauga (60% of the flora) and non-natives

number 451 (40% of the flora). Three native species, Virginia mountain-mint (*Pycnanthemum virginianum*), hay sedge (*Carex siccata*), and purple oat grass (*Schizachne purpurascens*), were added to the plant list this year. The first two species were located in natural area CRR11, and the third in natural area CRR6. All three species are considered to be rare within the City (known from 3 or fewer locations).

Butternut is currently designated as Endangered nationally by COSEWIC and provincially by Ontario Ministry of Natural Resources (OMNR). Species listed as Endangered in the province are afforded habitat protection under the Provincial Policy Statement of the Planning Act (OMNR 2004). Butternut was listed as Endangered because it is being infected throughout its entire North American range by a fungal infection, butternut canker (*Sirococcus clavignenti-juglandacearum*). A number of the butternut records for the City's natural areas date prior to 1984 (are greater than 20 years old). The current existence and health of some of these trees is unknown. In 2005 surveys, for butternut were conducted in 31 natural areas of the 34 documented sites where access was available. Butternut trees were observed in 9 natural areas (Appendix 10).

There was only one change in the regional rarity rankings with the addition of low bindweed (*Calystegia spithamea*) identified during the 2005 survey (S.K. Mainguy); with a regional rarity rank of "rare". Of the 673 native species recorded in the Mississauga flora, 36 (5%) are considered extirpated, 400 (59%) are rare (known from only 1 to 3 locations in the City) or uncommon (known from 4 to 10 locations in the City), and 237 (35%) are common (known from more than 10 locations in the City).

There were no additional plants designated as provincially rare in 2006, this remains unchanged from 2004 (Appendix 11).

Table 3 lists the plant species documented in natural areas in the literature reviewed in 2006 that are currently still not confirmed as occurring in the City of Mississauga [*i.e.*, to our knowledge there are no confirmed specimens and they are not listed by Kaiser (2001)]. These species need to be confirmed prior to their inclusion in the flora of Mississauga.

**Table 3: Flora species documented for the City of Mississauga that require confirmation.**

Numbers in the source column correspond to Appendix 2.

Scientific Name	Common Name	Site	Reg Rank	NHIC Rarity	Source	Status in Kaiser (2001)
<i>Raphanus raphanistrum</i>	wild radish	LV5	new	SE3	226	not documented in Peel
<i>Epilobium strictum</i>	downy willow herb	LV5	new	SE5	226	not documented in Peel
<i>Polygonum erectum</i>	prostrate knotweed	LV5	new	S1	226	not documented in Peel
<i>Sorbus americana</i>	mountain ash	LV5	new	S5	226	not documented in Peel

### 4.3 Floristic Quality Assessment

Table 1 (page 6) provides the FQIs and native mean coefficients for all natural areas that are

assessed, and changes are provided in Appendix 5 (some of the changes noted in this appendix are significant in the context of the natural areas program while others are considered minor revisions). In 1996, 107 of the 144 natural areas were assessed. FQIs ranged from 2.68 to 80.10 and the native mean coefficients ranged from 1.20 to 4.82. With the inclusion of the 2006 study, a total of 125 of the 138 natural areas and one residential woodland have been assessed. Currently, the FQIs range from 2.68 to 80.30 and the native mean coefficients range from 1.20 to 4.59. High, medium and low values are defined in section 2.3.

In 1996, the majority of natural areas fell in the medium range of native mean coefficients (3.3 to 3.99) and in the low range for the FQIs (< 30.00). This is still the case in 2006 for both FQIs and native mean coefficients. In 2006, 71 of the 125 (57%) natural areas assessed have low FQIs. Thirty-seven of the 125 (30%) natural areas assessed have low native mean coefficients (< 3.3) while 56 of the 125 (45%) natural areas assessed have medium native mean coefficients (3.3 to 3.99).

Lower native mean coefficients indicate an increase in the presence of non-native plant species characteristic of disturbed environments, and/or a decrease in plant species that indicate high quality habitat. Species with low coefficients tend to occur in a wide range of habitats and are not as susceptible to disturbance. In contrast, plant species with high coefficients tend to be conservative in their habitat requirements (see section 2.3). The decrease in the high end of the native mean coefficient range, from 4.82 in 1996 to 4.59 (a 5% decrease), reflects a trend towards increasing disturbance in Mississauga's natural areas.

FQIs and native mean coefficients were re-calculated for the 34 natural areas re-assessed through field studies in 2006; *i.e.*, for those natural areas that had a change in their floral inventories. Of these 34 natural areas, over half (19) have medium mean coefficients and over half (20) have low FQI values. The proportion of sites with medium mean coefficients has decreased from 2002 and the proportion with low FQI values has increased. FQIs and native mean coefficients for the natural areas evaluated in 2006 are basically unchanged and likely represent minor revisions resulting from additional fieldwork. Three sites (EM2, CM9 and LS1) were found to have significant increases in FQI ranges, increasing from a low to a medium value. One site's FQI range increased from a low to a high value (CRR11). One natural area had a significant increase in native mean coefficient from a medium to a high value, and a second site decreased from a high to a medium value (CE7 and MB2, respectively).

#### **4.4 Fauna**

No new species were added to the fauna of the City of Mississauga in 2006 through field work conducted in 2006 and literature reviewed. The breeding bird surveys conducted in natural areas in Wards 8, 9 and 10 documented a probable breeding Cooper's hawk (LS1, EM30) and scarlet tanager (MB6), both for the second time in the natural areas system. A possible breeding record was obtained for the first time for white-throated sparrow (MB6), a common resident in northern forests but a very rare breeder in southern Ontario.

The 2006 studies continued to document the widespread use of most natural areas by habitat-generalist breeding bird species. Despite habitat becoming increasingly fragmented, a few habitat-specialists are still present in larger patches and patches with a high diversity of vegetation communities. Many of these species are significant (birds of conservation concern) in the Credit River Watershed (updated by Credit Valley Conservation, undated) (Appendix 12). For example, highlights included extensive riparian areas with connected tableland forest, such as the Credit River (CRR10, CRR6). These sites sustained the highest number of possible breeding bird species of any areas surveyed in 2006, with a high diversity of adaptable species tolerant of urban habitats (*e.g.*, American robin, northern cardinal and song sparrow), as well as more habitat-specific, and area-sensitive species (for example, pine warbler, hairy woodpecker, pileated woodpecker, cooper's hawk). A few wetland-specific species were noted from larger wetland areas (for example alder flycatcher and mourning warbler in CRR10, willow flycatcher and common yellowthroat from MB3).

Species dependent on certain specific microhabitats (for example species that depend on bluffs such as bank swallow, rough-winged swallow, belted kingfisher) were only found along the Credit River and larger creek valleys. These habitats were also among the few that supported a few habitat-specific species that require larger tracts of habitat, for example Cooper's hawk and mourning warbler. The most common Credit Valley Species of Concern were the mid-to late-successional species: eastern kingbird, common grackle and gray catbird. This is not because the habitats are successional (this vegetation type is not common in Mississauga), but because the narrow band of riparian vegetation along the smaller creek valleys contain many elements common to successional areas, such as shrubs and young trees. This is likely because of the high level of disturbance and high light levels. Species that are dependent solely on large forests as habitat were present in only one natural area (MB6), as were marsh area-sensitive species. However, pine warbler and hairy woodpecker, considered forest area-sensitive by MNR, were present in several sites with a high density of mature trees. These have also been noted in older neighbourhoods. Raptorial birds are also uncommon, reflecting the lack of open natural areas to support a forage base, with red-tailed hawk noted only in a few areas where forests abut undeveloped fields. Cooper's hawk was noted twice, from larger woodlots contiguous with other tracks of habitat (LS1, EM30). However, Cooper's hawks both nest and forage in forests, and though birds are usually reported as their main prey one family group was observed hunting black squirrels (MB6). This may represent an adaptation to urban habitats, and may partly explain why they are becoming more common in Mississauga forests, as well as generally in the Greater Toronto Area. Older areas of the City still provide habitat for declining bird species that depend on human structures in older neighbourhoods, which are sensitive to human tolerance and are not present in new residential areas: such as barn swallow, chimney swift and cliff swallow.

No changes to provincial rarity ranks for fauna species have occurred since 2004 (Appendix 13). However, there are a few species for which the status will change in the near future, as recent status reports from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) have recommended a change in status. Red-shouldered hawk will likely be uplisted from a Species of Special Concern to a species Not at Risk. Golden-winged warbler will likely be designated as Threatened. Status in Ontario will likely change to reflect the status given by COSEWIC. Golden-winged warbler has been heard singing during the breeding season in two

natural areas of Mississauga in the past (CL9 and CRR10), but was not observed in CRR10 during 2006 surveys. It should be noted that identification of this species needs to be backed up by a sighting in future studies, as it is now known that golden-winged warbler and blue-winged warbler (which is not at risk) sing each other's songs.

Most provincially significant bird species noted in the City are migrants. However, the one provincially significant bird species considered a confirmed breeder is peregrine falcon, which nested on a building (the Mississauga Executive Centre complex) adjacent to CC1. This species has been monitored intensively during the breeding season since 2002, and the fate of the nestlings can be found on the website: [www.peregrine-foundation.ca/tops/missmec.html](http://www.peregrine-foundation.ca/tops/missmec.html).

There has been no change to the status of Credit Valley Conservation species of conservation interest (updated by Credit Valley Conservation, undated). A complete list of bird species of conservation interest documented from natural areas is provided in Appendix 12. Currently, 95 bird species of conservation interest are documented, of which 61 species are possibly breeding in natural areas. As described above, most of these species of conservation concern are habitat specialists, for which habitat is more likely to be eliminated as natural areas become isolated, fragmented and altered by surrounding development.

Amphibian surveys were conducted for the first time as part of the natural areas update in 2006 (Appendix 14). The surveys were focused on forest breeding amphibians that require vernal pools: spring peeper, wood frog and gray treefrog. However, surveys for other amphibian species were conducted in conjunction with other faunal surveys whenever possible. Generally, very few sites provide habitat for forest breeding amphibians, which require "fishless" ponds near woodlands for breeding. These ponds are characteristically fed by snow melt, groundwater and/or rainfall, and are full in early spring but dry down slowly over the summer. However, the water in the ponds needs to persist long enough to allow amphibian larvae to transform into adults, generally until mid-July. This habitat is very rare in Mississauga. The only one of these woodland frog species heard in Wards 7, 8 and 9 during 2006 surveys was spring peeper, and it was heard from only one forest site that encompassed a vernal pool which persisted until July, and had not yet become surrounded by development (CM25). Many sites where spring peepers were heard in the past were surveyed (*e.g.*, CRR10, CRR6, CRR7, CM7, Wabukayne Lake), but none were detected.

Spotted salamanders, which have similar requirements to woodland frog species but spend the non-breeding period underground, were noted in three locations, two for the first time. The new locations were CM25, where four were noted in a small woodlot encompassing a woodland pond, where development had not yet surrounded the site, and in CRR10, in a small spring-fed pool at the Mississauga garden-park site, where 15 adults were seen. Spotted salamanders were also seen in two pools in CRR6 near Erindale campus of the University of Mississauga, where they had been noted in the past. The larger of these two pools is also well-known as the only site where breeding Jefferson's salamanders (not hybrids) have been noted in Ontario (according to research conducted by the University of Toronto, Erindale Campus). However, only 4 Jefferson salamanders were noted during surveys, and there is concern that the pond may be drying up over an increasingly shorter period of time, and this population may be in decline. Credit Valley Conservation and the University of Toronto are conducting coverboard studies to study this

population. Coverboard studies entail the placement of boards at a pond's edge to determine the location and the length of time that salamanders remain around a pond after the breeding season has ended.

Western chorus frogs were heard in only one location in 2006 (CM9). This species has been reported from a total of 4 sites in Mississauga, three of which were surveyed in 2006 (CRR6, CM7, CM9). CM9 is very close to CM7, but these frogs were not heard in the latter location. The only other location for this species, CM12, was not surveyed in 2006. This species requires open marshy or grassy ponds for breeding, and spends the non-breeding period in a variety of open uplands and woodlands. Ponds in grassy areas are some of the first habitats to become developed in most urban growth areas.

Green frog, which is a much more adaptable species that uses stormwater ponds for breeding, will likely persist in Mississauga. It is also likely that American toads and leopard frogs are still extant, as they can use a number of upland and wetland habitats for foraging and breeding. Bullfrogs have been reported from Wards 7, 8 and 9 in the past (*e.g.*, from Wabukayne Lake), but bullfrogs require extensive emergent vegetation and this type of habitat is also rare in Mississauga, except in the marshes at the mouth of the Credit River. Bullfrogs were not heard at any site in 2006.

#### **4.5 Significant Features**

There are no changes to Areas of Natural and Scientific Interest (ANSIs) since they were last updated by the MNR, as reported in the 1998 NAS update report (Geomatics International Inc. 1998).

### **5.0 NATURAL AREA CLASSIFICATION SCHEME**

In 2004, the criteria for classifying the natural areas were updated (see section 3.0, North-South Environmental 2004). No updates are proposed in 2006 and thus the 2004 criteria are considered current and are provided in Appendix 1.

### **6.0 CONDITION OF NATURAL AREAS**

#### **6.1 Condition**

Generally, the natural areas within the City that were surveyed in 2006 continue to be in fair condition (see Table 1, Appendix 5). Natural areas evaluated as in fair condition have moderate disturbances (few trails, limited dumping, some trampling, *etc.*) and an average number of non-native flora species typical of what can be expected in an urban natural area (see section 2.3 for definitions of "condition"). The overall condition of the natural areas visited in 2006 remained largely unchanged from previous studies.

Spring surveys in natural areas in Wards 8, 9, and 10 documented an abundance of spring

ephemeral plant species in natural areas other than those considered to be in “poor” condition (33% of natural areas surveyed in 2006). Similar results were found in the spring 2005 in natural areas in Wards 3, 4 and 7. This indicates that suitable conditions (*e.g.*, adequate moisture, soils that are not compacted, adequate nutrients, *etc.*) are present to support these plant species in most natural areas in the City.

Two new sites were incorporated into the natural area survey in 2006; ME13 and CM25. These sites are evaluated as in fair to poor condition. The condition of these sites relates to several factors which include a low number of species, higher proportions of non-native species (especially at CM25 with over 45% of the flora species being non-native including garlic mustard and common buckthorn), the presence of unplanned trails, the dumping of waste materials, and soil compaction. Natural area CM25 is isolated, surrounded by development and an old field.

## **6.2 Disturbances**

As with all of the other survey updates, the most common disturbances within natural areas are those associated with an increase in uncontrolled human use of natural areas following development in adjacent areas. Examples of these disturbances include: the creation of *ad hoc* trails, the use of mountain bikes (including the construction of some elaborate racing circuits), the presence of garbage, boundary encroachment, and vandalism (tree carving, tree cutting, spray paint). These disturbances have become more prevalent at all of the natural areas surveyed this year.

Observations at natural areas in Mississauga are consistent with reports from the literature that human use of natural areas results in the alteration of decomposition and nutrient cycles through: the loss of understory vegetation (particularly herbaceous species) (Friesen 1998, Matlock 1993); the loss of leaf litter, humus as well as moss species; and soil compaction (Matlock 1993). Matlock (1993) also suggested that the recovery of soil and understory vegetation could take 10 to 20 years after the cessation of traffic. Deterioration of the quality of Mississauga’s natural areas can be expected to continue unless there is a substantial effort to manage natural areas through site specific Conservation Plans and community stewardship initiatives.

## **6.3 Development**

Direct impacts from development have resulted in the removal of portions of, as well as entire, natural areas. Development can include the removal of entire natural areas through the construction of a new residential subdivision or industrial complex, infill construction of a single residential dwelling within a natural area, or the expansion of an industrial or commercial parking lot into a natural area.

In addition, 20 of the 41 natural areas surveyed in 2006 decreased in overall size due to development. Some of the associated indirect impacts that resulted from the removal of portions of natural areas included: increased light penetration in the remainder of the area, and changes in the vegetation composition (*e.g.*, invasion of non-native species, removal of canopy tree species, *etc.*). Other potential long-term impacts that could occur are: changes in moisture (soil and air),

increased impacts from air pollution and temperature within the natural area, and the less-well documented impacts of increased light and noise pollution.

#### **6.4 Non-native Species**

There has been a continual increase in the proportion of non-native to native plant species in the natural areas surveyed between 1996 and 2006 (see Appendix 5). An increase in the presence and dominance of non-native species within the City's natural areas is a serious management concern. Without active management, species such as Norway maple (*Acer platanoides*), garlic mustard (*Alliaria petiolata*), European buckthorn (*Rhamnus cathartica*), and others will result in a ongoing loss of native plant species in natural areas. A City-wide strategy to deal with aggressive non-native species impacts needs to be formulated and management plans developed to remove the most invasive exotic species as soon as possible, at least in high quality natural areas.

Naturalization projects initiated at a number of natural areas typically has involved leaving an area of unmowed grass to regenerate naturally. While the size of the natural areas increases as a result of this regeneration, this strategy also provides habitat for invasive plants such as dog-strangling vine (*Cynachum rossicum*). In addition, if the natural area occurs in a valleyland its inherent ability to function as a linkage will promote the spread of these invasive species within the City.

As noted in previous studies, the dumping of discarded horticultural plants, largely as a result of encroachment where residents use the natural areas behind their house for compost and dumping yard waste, is a common vector for the introduction of non-native plants to natural areas. This was present in most of the residential areas visited during this update.

### **7.0 CONCLUSIONS**

After eight years of update surveys all of the natural areas within the City, where access was provided, have now been surveyed twice. This monitoring has shown that the Natural Areas System has declined in several ways.

1. There has been a decrease in the quality of vegetation as indicated by an increase in the number of natural areas with lower native mean coefficients (section 4.3).
2. There has been a decrease in the amount of tableland (woodland and successional categories) and wetland habitats (section 3.1).
3. The Natural Areas System has declined in overall size as development between 1996 and 2006 has resulted in the total loss of 157.14 ha (388.29 a.), including the loss of thirteen natural areas.
4. Two woodland vegetation communities have been lost, as a result of development removing the only two natural areas in which they were represented in the City (section 4.1).
5. Six of the woodland communities, one successional community and one wetland community are "at risk" in the City, each occurring in only one natural area (section 4.1).

6. Disturbances such as those caused by the increased and uncontrolled human use of natural areas following development in adjacent areas continue to negatively impact natural areas.
7. The occurrence of non-native species, which can more easily adapt to disturbed conditions, continues to increase. Several of these species, such as garlic mustard (*A. petiolata*) and common buckthorn (*R. cathartica*), have become more dominant within several of the natural areas. Species with more specialized ecological requirements will likely be less able to withstand changes brought about by more severe disturbances which result in altered light and moisture regimes.
8. Impacts from development have resulted in the removal of portions of natural areas as well as entire natural areas. Twenty of the 41 natural areas surveyed in 2006 decreased in overall size due to development.

There are numerous plant communities that are uncommon within the City representing a wide range of diverse plant communities within the natural areas system. Of the 41 sites that were reviewed as a part of the 2006 update, several natural areas experienced marginal growth as a result of boundary changes. Virtually all of the sites where bird surveys were completed had corresponding increases in the number of bird species identified within the natural areas. Notable increases in bird diversity occurred in natural areas CRR6, CRR7, EM14 and LS1. Similarly, there were increased observations of mammals at several of the natural areas within the City.

Another positive development since 1996 has been the naturalization projects undertaken by the City. The majority of naturalization projects initiated between 1996 and 2006 have involved leaving an area of unmowed grass adjacent to a watercourse or woodlot feature to regenerate naturally. While this approach will increase the overall size of the natural area in question, this initiative could be enhanced by taking an approach that includes long-term management. Jack Darling Park is an example where prairie species were planted and many have since become established. With more indepth planning for such naturalization projects, developing increased areas with natural habitat will create more diverse plant and animal communities.

## **8.0 RECOMMENDATIONS**

1. All of the remaining natural areas in the City should be protected from development and managed to maintain the current natural biodiversity of the City. Of particular importance is the protection and subsequent management of all woodlands, wetlands and successional habitats wherever possible. Protection of those wetlands in close proximity to forested and cultural habitats is particularly important as this is important habitat for amphibians.
2. It is recommended that the City consider prioritizing the natural areas based on significance, representation, size and condition, and initiate Conservation Plans for those of greatest value. Consideration should also be given to those natural areas that are somewhat more isolated as these areas might have better chances of long-term success, or those areas that could provide linkages between natural areas.

3. Initiate greater control over natural areas to reduce impacts related to human use. This is best achieved through site-specific Conservation Plans. Issues addressed in the Conservation Plans should include, but not be limited to: access, encroachment, appropriate activities, non-native plant control, and restoration initiatives (see Geomatics 1996 for a complete description of Conservation Plan requirements).
4. Initiate a public education program in concert with community-based stewardship initiatives to involve local citizens in the conservation and management of natural areas, as outlined in the Natural Areas Survey (Geomatics 1996). The key to this is demonstrating the ongoing degradation of woodland through careless and improper use. The public education and stewardship activities on-going in Cawthra Woods (LV7) offer a good example of what can be achieved.
5. Formulate a City-wide strategy to deal with non-native species and develop management initiatives to address the most invasive exotic species. Part of such a study should include an assessment of the feasibility of managing some aggressive exotics. Species that are a high priority are Norway maple, garlic mustard, purple loosestrife, dog-strangling vine, buckthorn, white poplar (*Populus alba*), Japanese knotweed (*Polygonum cuspidatum*), white mulberry (*Morus alba*). At a minimum the City should immediately adopt policies to restrict or prevent the planting of invasive non-native plants, as well as providing encouragement and a mechanism for the City and the community to work together to remove such plants.
6. All naturalization (creation of natural habitat from manicured parkland) projects undertaken in natural areas by the City should involve both the planting/seeding of native species and the control of non-native species. Some of the naturalization projects undertaken have involved leaving an area of unmowed grass adjacent to a watercourse or woodlot feature to regenerate naturally. This approach will increase the overall size of the natural area in question, and may eventually result in wooded communities. This initiative could be enhanced by taking an approach that will result in long-term changes which could eventually be self-sustaining.
7. Investigate the possibility of rehabilitating the compacted soils of mountain bike circuits through a combination of levelling the circuits and undertaking planting trials in publicly owned natural areas. This could be combined with a community education program and involve local volunteers. Some publicly owned natural areas that would benefit include ME8, CL39, CL1, and MI17.
8. At confirmed locations, continued monitoring of butternut is warranted and contact should be made with the Butternut Conservation Coalition to determine if any conservation strategies have been developed.
9. Monitoring of amphibians should continue to be incorporated as a part of the natural areas survey as a means to monitor amphibian diversity. These species also provide important information regarding habitat quality. During 2006, North-South undertook amphibian surveys.

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## 9.0 REFERENCES CITED

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- Stantec Consulting Limited. 2005. Orlando Mississauga Environmental Impact Study. Report prepared for Orlando Development Corporation. 33pp.
- Toronto and Region Conservation Authority. 2005. Comments on Site Plan Application. Report prepared for the City of Mississauga. 7pp.

**Appendix 1: Natural Area Classification Scheme**

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## Appendix 1: Natural Area Classification Scheme. As updated in Section 5.0 (North-South Environmental Inc. 2004)

With recent changes to the rarity status of significant species at the national, provincial and regional levels, the criteria for classifying the natural areas were updated in 2004. Changes to the criteria as defined in Geomatics (1996) are highlighted in bold. Areas still need only fulfill one criteria in any class to be designated in that class.

### *Significant Natural Site*

These are areas that are outstanding from a natural areas perspective, in the context of the City of Mississauga. Significant Natural Sites must fulfill one of the following criteria:

- ANSI, ESA and other areas designated for outstanding ecological features
- areas with a Floristic Quality Index (FQI) of  $\geq 40.00$
- areas with a mean floristic coefficient of  $\geq 4.50$
- woodlands  $\geq 10\text{ha}$  (25 acres) in size
- areas that support provincially significant (**S1, S2, S3**) or “**species at risk**” listed as **special concern**, threatened or endangered (**designated by COSEWIC or COSSARO**)
- woodlands with the potential to provide interior conditions (*i.e.*, no dimension of the woodland is  $< 700\text{m}$ )
- woodlands that support old-growth trees ( $\geq 100$  years old)
- wetlands  $\geq 2\text{ha}$  (5 acres) in size regardless of rank
- the Credit River and Etobicoke Creek valleys

### *Natural Site*

These are areas that represent good examples of remnant features that once characterized the City of Mississauga. Natural Sites must fulfill one of the following criteria:

- woodlands  $\geq 2\text{ha}$  (5 acres) but  $< 10\text{ha}$  (25 acres) (defined as forests which support appropriate understory and canopy species)
- **areas** that represent uncommon vegetation associations in the City
- **areas that support regionally significant plant (in the City of Mississauga) or animal species (CVC species of concern)**
- areas with a Floristic Quality Index (FQI) of 25.00 to 39.99
- areas with a mean floristic coefficient of 3.50 to 4.49
- areas that include natural (*i.e.*, not engineered) landscape features [*i.e.*, valley lands, watercourses, unusual (in the context of the City) landform features]

### ***Natural Green Space***

This class includes areas which perform ecological functions but do not satisfy any of the criteria for the previous two natural area classes. Natural Green Space includes:

- watercourses with vegetation other than mowed grass, even if they are predominantly engineered (*i.e.*, straightened or channelized)
- wooded areas that are < 2ha (5 acres) in size and do not fulfill any of the other criteria for Natural Site or Significant Natural Site
- Lakes Aquitaine and Wabukayne

### ***Residential Woodland***

These are older residential areas, generally with large lots, and almost completely in private ownership. They support trees with a mature, fairly continuous canopy, but the native understory is generally absent or degraded, usually through maintenance of residential lawns and landscaping. However, these areas still serve some functions such as: providing habitat for tolerant canopy birds, both in migration and for breeding; fixing atmospheric carbon; and facilitating groundwater recharge owing to the high proportion of permeable ground cover. With approaches that involve landscaping with native species, the ecological function of these areas would be greatly increased.

### ***Special Management Areas***

These are areas adjacent to or close to existing natural areas, and which have the potential for restoration, or which should be planned or managed specially. They are primarily identified to alert planners to the possibility of directing compatible land uses to lands adjacent to natural areas.

### ***Linkages***

These are areas which serve to link two or more of any of the five previous classes within the City, or to natural areas outside of the City boundaries. Linkages could include:

- stormwater management facilities including ponds and watercourses;
- designated open space;
- rights of way; and
- greenspace along major arterial roads providing there is an adequate barrier between the linkage and roadway.

**Appendix 2: Reports Examined for Background Review**

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## Appendix 2: Reports Examined for Natural Areas Survey Updates

The format of this appendix follows Appendix 2 in the Natural Areas Survey (Geomatics 1996). The numbers correspond to those used in the database for literature references.

- 225 Gartner Lee Limited. 2004. Environmental Impact Study for the Proposed Training Facility, Part of Lot 2, Concession 4, East of Hurontario Street, Part 1.
- 226 Dillon Consulting Limited. 2003. Beaverbrook Homes (Lakeshore Village) Project Inc. "Lakeshore Village" Environmental Analysis Report.
- 227 Gartner Lee Limited. 2003. Scoped Environmental Impact Study, Glenerin Inn Redevelopment, City of Mississauga.
- 229 Philips Engineering Limited. 2004. North Sixteen District 'Scoped' Subwatershed Study and Ninth Line District Floodplain Mapping.
- 230 Stantec Consulting Ltd. 2004. Letter to Glen Schnarr & Associates Inc. re: Derrydale Golf Course - Ecological Constraints.
- 231 Bird and Hale Limited. 2003. Tree Evaluation Report 816 Meadow Wood Road Mississauga
- 232 Stantec Consulting Ltd. 2004. Credit River Pedestrian Bridge City of Mississauga Environmental Impact Study.
- 233 Aboud & Associates. 2004. Scoped Environmental Impact Study and Arborist Report. 77 Indian Valley Trail, Mississauga.
- 234 Dillon Consulting Limited. 2005. Greefield South Power Plant Site Tree Inventory. Final Report.
- 235 Dillon Consulting Limited. 2005. Greenfield South Power Plant Site Environmental Impact Study – Vegetation Community Addendum. Final Report.
- 236 Gartner Lee Limited. 2005. Environmental Impact Study Update – Proposed EUSA Hydropole Training Facility, Creekbank Road and Matheson Boulevard, City of Mississauga.
- 237 Stantec Consulting Limited. 2004. Stonebrook Properties Inc. Scoped Environmental Impact Statement.
- 239 Stantec Consulting Limited. 2005. Orlando Mississauga Environmental Impact Study.
- 240 Toronto and Region Conservation Authority. 2005. Comments on Site Plan Application.

**Appendix 3: Fieldwork Identified and Date Completed**

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**Appendix 3: Fieldwork Identified and Date Completed**

Natural areas for which the need for a field visit was identified based on aerial photograph interpretation and literature review. Natural areas are grouped into categories based on the type of change identified either within or adjacent to the natural area. Field Visit indicates the type of visit the natural area received, field work or a road side visit (see section 2.2 for an explanation). Ownership indicates whether the natural area is privately owned and therefore required access permission or whether it is a City owned site (*i.e.*, parkland or greenbelt).

Natural Area	Reason for Field Visit (based on review of aerial photography and literature)	Field Visit		Ownership	Date
		Type	Timing		
<b>Major Development Within Natural Area</b>					
CM7	Subdivision development adjacent	field work	breeding birds	parkland	08/07/06
			spring flora		07/06/06
			summer flora		05/09/06
CM9	Subdivision development adjacent	field work	breeding birds	parkland	18/04/06
			amphibians		18/04/06
			spring flora		07/06/06
			summer flora		05/09/06
CM12	Subdivision development adjacent	field work	breeding birds	parkland	29/06/06
			amphibians		15/03/06
			spring flora		07/06/06
			summer flora		05/09/06
EM2	Expansion of Community Centre along southern edge; search for butternut (last observation 1995)	field work	breeding birds	parkland	08/07/06
			spring flora		10/05/06
			summer flora		11/08/06
			butternut		11/08/06

Natural Area	Reason for Field Visit (based on review of aerial photography and literature)	Field Visit		Ownership	Date
		Type	Timing		
LS1	Subdivision development adjacent	field work	breeding birds	parkland	01/06/06
			amphibians		27/04/06
			spring flora		01/06/06
			summer flora		24/08/06
<b>Minor Development Within Natural Areas</b>					
CE1	Expansion of parking lot	field work	breeding birds	parkland	29/06/06
			spring flora		29/06/06
			summer flora		05/09/06
CRR6	Expansion of parking lot on Erindale Campus; search for butternut (last observation 1998); investigate salamander breeding	field work	breeding birds	parkland	31/03/06
			amphibians		11/03/06
			spring flora		11/06/06
			summer flora		17/08/06
			butternut		30/08/06
CRR7	House development on Prince John Boulevard	road visit	breeding birds	Credit Valley Golf & Country Club	18/08/06
			road visit		18/08/06
CRR8	House development	road visit	breeding birds	Mississauga Golf & Country Club	10/07/06
			road visit		10/07/06
MB8	Expansion of industrial parking lot; search for butternut (last observation 1995)	field work	breeding birds	greenbelt	01/06/06
			spring flora		01/06/06
			summer flora		05/09/06
			butternut		05/09/06

Natural Area	Reason for Field Visit (based on review of aerial photography and literature)	Field Visit		Ownership	Date
		Type	Timing		
WB1	Expansion of industrial parking lot	field work	breeding birds	parkland	30/06/06
			spring flora		10/05/06
			summer flora		11/08/06
<b>Major Development Within Natural Areas</b>					
CRR10	Construction of the Mississauga Garden Park; search for butternut (last observation 2001); investigate salamander breeding	field work	breeding birds	parkland	03/06/06
			amphibians		11/03/06
			spring flora		03/06/06
			summer flora		17/08/06
			butternut		17/08/06
EM4	Condominium development in southwestern portion west of the Collegeway; search for butternut (last observation 1995)	field work	breeding birds	parkland	30/06/06
			spring flora		10/05/06
			summer flora		17/08/06
			butternut		17/08/06
<b>No change</b>					
CE7	Minor boundary revision required; search for butternut (literature record 1976)	field work	breeding birds	parkland	30/06/06
			spring flora		10/05/06
			summer flora		11/08/06
			butternut		11/08/06
CE9	Minor boundary revision required	field work	breeding birds	parkland	30/06/06
			spring flora		10/05/06
			summer flora		11/08/06
CRR11	No change; scoped EIS for Howlett Development	field work	breeding birds	parkland	29/06/06
			spring flora		29/06/06
			summer flora		17/08/06

Natural Area	Reason for Field Visit (based on review of aerial photography and literature)	Field Visit		Ownership	Date
		Type	Timing		
EM5	No change	field work	breeding birds	greenbelt	08/07/06
			spring flora		10/05/06
			summer flora		17/08/06
EM6	No change	field work	breeding birds	parkland	08/07/06
			spring flora		10/05/06
			summer flora		11/08/06
EM10	No change	field work	breeding birds	parkland	09/07/06
			spring flora		10/05/06
			summer flora		11/08/06
EM14	Minor boundary revision required; search for butternut (last observation 2001)	field work	breeding birds	parkland	09/07/06
			spring flora		10/05/06
			summer flora		11/08/06
			butternut		11/08/06
EM21	No change	field work	breeding birds	parkland	03/06/06
			spring flora		03/06/06
			summer flora		07/09/06
EM30	Minor boundary revision required	field work	breeding birds	parkland	08/07/06
			amphibians		06/04/06
			spring flora		10/05/06
			summer flora		11/8/06
LS2	No change	field work	breeding birds	parkland	01/06/06
			spring flora		01/06/06
			summer flora		24/08/06
LS3	No change	field work	breeding birds	parkland	01/06/06
			spring flora		01/06/06
			summer flora		24/08/06

Natural Area	Reason for Field Visit (based on review of aerial photography and literature)	Field Visit		Ownership	Date
		Type	Timing		
MB1	No change	road visit	breeding birds	private	04/07/06
			road visit		05/09/06
MB2	No change	road visit	breeding birds	private	04/07/06
			road visit		05/09/06
MB3	Minor boundary revision required	field work	breeding birds	parkland	04/07/06
			spring flora		04/07/06
			summer flora		05/09/06
MB4	No change	field work	breeding birds	private	04/07/06
			spring flora		01/06/06
			summer flora		01/06/06
MB6	No change; EIS for Orlando Developments on east side	field work	breeding birds	Totoredaca Park	04/07/06
			spring flora		07/06/06
			summer flora		05/09/06
MB7	No change	field work	breeding birds	parkland	04/07/06
			spring flora		04/07/06
			summer flora		05/09/06
MB9	No change	road visit	breeding birds	private	01/06/06
			road visit		01/06/06
ME8	No change	field work	breeding birds	private	01/06/06
			spring flora		01/06/06
			summer flora		05/08/06

Natural Area	Reason for Field Visit (based on review of aerial photography and literature)	Field Visit		Ownership	Date
		Type	Timing		
ME9	Minor boundary revision required	field work	breeding birds	parkland	01/06/06
			spring flora		01/06/06
			summer flora		24/08/06
ME10	No change; locate butternut (last observation 2001)	field work	breeding birds	parkland	04/07/06
			spring flora		01/06/06
			summer flora		24/08/06
			butternut		24/08/06
ME11	No change	field work	breeding birds	parkland	18/04/06
			amphibians		18/04/06
			spring flora		01/06/06
			summer flora		24/08/06
ME12	No change	field work	breeding birds	parkland	18/04/06
			amphibians		18/04/06
			spring flora		01/06/06
			summer flora		24/08/06
<b>Locate Butternut</b>					
CE7	literature record 1976	field work	summer	parkland	11/08/06
CRR6	last observation 1998	field work	summer	parkland	30/06/06
CRR10	last observation 2001	field work	summer	parkland	17/08/06
EM2	last observation 1995	field work	summer	parkland	11/08/06
EM4	last observation 1995	field work	summer	parkland	17/08/06
EM14	last observation 2001	field work	summer	parkland	11/08/06
MB8/ ME8	last observation 1995	field work	summer	parkland	05/09/06
ME10	last observation 2001	field work	summer	parkland	24/08/06
NE6	last observation 2005	road visit	summer	private	No access

Natural Area	Reason for Field Visit (based on review of aerial photography and literature)	Field Visit		Ownership	Date
		Type	Timing		
<b>Confirmation and Adjustment of Communities/Inventory Based on Literature</b>					
NE6	Environmental Study Area; locate butternut (last observation 1996 and 2004)	field work	locate butternut	private	07/09/06
					07/09/06
CL13	Scoped Environmental Impact Study	field work	road visit	private	07/09/06
ET07	Environmental Impact Study	road visit	road visit	private	07/09/06
					07/09/06
<b>Examination of City Parks for Inclusion in NAS</b>					
ME13	Windwood Park	field work	breeding birds	parkland	01/06/06
			spring flora		01/06/06
			summer flora		24/08/06
CM25	Wetland in Park 450	field work	breeding birds	parkland	31/04/06
			spring flora		06/04/06
			summer flora		07/09/06

**Appendix 4: Rarity Status Definitions**

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## **Appendix 4: Rarity Status Definitions**

The following six rarity ranks follow the Natural Heritage Information Centre (NHIC 2006).

### **Global Rarity (G\_Rank)**

Global ranks are assigned by a consensus of the network of conservation data centres, scientific experts, and The Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies or variety. This ranking system ranges from G1 to G5; with G1 being extremely rare and G5 being common.

### **COSEWIC**

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) provides assessments for species' at risk of extinction or extirpation and provides a subsequent designation. These designations range from Endangered (E), Extirpated (XT), Extinct (X), Not at Risk (NAR), Special Concern (SC), and Threatened (T). The Canadian list of Species at Risk is developed from these assessments.

### **SARA**

The Species at Risk Act (SARA) is one part of a three part Government of Canada strategy for the protection of wildlife species at risk. This three part strategy also includes commitments under the Accord for the Protection of Species at Risk and activities under the Habitat Stewardship Program for Species at Risk. The species assessment process is conducted by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (see above). A committee of experts use status reports to conduct a species assessment and assign the status of a wildlife species believed to be at some degree of risk nationally.

### **National Rank (N\_RANK)**

National Rank is a term used by conservation data centres and NatureServe to refer to the national conservation status rank of an element.

### **MNR Status**

The Ontario Ministry of Natural Resources assigns rarity ranks ranging from Extinct, Extirpated, Endangered (Regulated), Endangered (Not Regulated), Threatened, Special Concern to Not at Risk.

### **COSSARO**

The Committee on the Status of Species at Risk in Ontario is based on a Ministry of Natural Resources (MNR) committee that evaluates the conservation status for species at risk in Ontario. The Ontario list of Species at Risk, on which the Ontario Endangered Species Act and sections of the Planning Act are based, is developed from these assessments.

### **Provincial Rank (S\_RANK)**

Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario. The NHIC evaluates provincial ranks on a continual basis and produces

updated lists at least annually. The ranking system ranges from S1 to S5; with S1 being critically imperiled and S5 being secure.

**Provincially Significant Species**

Flora species ranked S1, S2 or S3 by the NHIC are considered to be provincially significant.

Fauna species ranked S1, S2 or S3 by the NHIC are currently breeding, or have bred historically (prior to 1970) within the City are considered to be provincially significant.

**Regional Rarity (R\_Rank)**

The regional rarity ranks are assigned to plant species within the City of Mississauga based on Webber (1984), and updated through contributions from Jocelyn Webber, consultant's reports, and 1995 field work.

The regional ranking system is as follows:

- 0 extirpated within the City;
- 1 1 to 3 locations within the City, these species are considered to be regionally rare;
- 2 4 to 10 locations within the City, these species are considered to be regionally significant
- 3 11 to 39 locations within the City; and
- 4 > 40 locations within the City.

**Appendix 5: Changes in Natural Areas Updated (1996 to 2006)**

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**Appendix 5: Changes in Natural Areas Updated (1996 to 2006)**

Changes within natural areas evaluated in 2006. All changes between 1996 and 2006 are shown for natural areas where changes occurred. Blank cells represent no change from the previous year. Abbreviations as follows: SNS = Significant Natural Site, NS = Natural Site, NGS = Natural Green Space, Increase = ↑, Decrease = ↓. Some of the increases or decreases are significant in the context of the natural areas program while others are considered minor. Native FQI and native mean coefficient as well as definitions for provincially and regionally significant species are defined in section 2.3. Condition is explained in section 2.3. Credit Valley Conservation (CVC) Species of Conservation Interest are discussed in North-South (2000).

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
11	CL13	96	NGS		1.50	3.70	40	23 (55.00%)	8.25	1.94	2	0	0	2	0	0	0	0	Poor	
		98																		
		99	↑NS		↑8.42	↑20.70	↑61	↑34 (55.74%)	↑13.47	↑2.59				↑1	↑5					
		00																		
		01						↑74	↑43 (58.11%)	↑14.37	↓2.58	↑3			↑8					
		02																		
		04				↓7.03	↓17.35	↑86	↑49 (56.98%)	↑15.04	↑2.54				↑11	↑1			↑1	
		05																		
		06					↑87	↑50 (57.47%)						↑3						
36	ET07	96	SNS	ESA	27.18	67.13	84	35 (39.30%)	21.39	3.04	2	0	2	11	2	11	2	0	Fair	
		98																		
		99				↑27.36	↑67.59	↑96		↑25.1	↑3.21			↑4						
		00				↓21.14	↓52.29		↑36 (37.11)					↑5					↑1	
		01																		
		02				↑27.37	↑67.61	↑97	↓33 (34.02%)	↓24.89	↓3.11	↑3		↑6				↑3		
		04				↑32.40	↑80.02	↑103	↑38 (36.89%)	↓24.82	↓3.08									
		05																		
		06			↓31.09	↓76.96	↑131	↑51 (38.93%)	↑27.51				↑8	↑17	↑5					

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
40	CRR7	96	SNS	ESA,ANSI	88.96	219.73	61	10 (13.10%)	33.89	4.75	3	1	8	0	0	9	0	0	Good	
		98					↑ 74	↑ 18 (23.00%)	↑ 34.88	↓ 4.66			↑ 9							
		99						↑ 92	↑ 24 (26.00%)	↓ 34.68	↓ 4.21				↑ 4	↑ 1				
		00				↓ 88.94	↓ 219.69										↓ 6			
		01						↑ 93	↓ 23 (24.73%)	↑ 34.90	↓ 4.17			↑ 10	↑ 29	↑ 5	↑ 7		↑ 8	
		02																		
		04																		
		05					↑ 92.95	↑ 229.68	↑ 115	↑ 28 (24.35%)	↑ 41.13	↑ 4.44	↑ 5	↑ 2	↑ 18	↑ 41				↑ 12
06				↓ 92.82	↓ 229.26								↑ 44							
41	CRR8	96	SNS	ESA,ANSI	110.62	273.23	43	3 (7.00%)	n/a	n/a	4	2	31	8	1	4	0	0	Good	
		98		↑ ESA,ANSI,wetland																
		99																		
		00																		
		01						↑ 50					↓ 1	↓ 30	↑ 38	↑ 6	↑ 8		↑ 6	
		02																		
		04																		
		05				↑ 110.73	↑ 273.61	↑ 67	↑ 8 (11.94%)	↑ 39.71	↑ 5.17				↑ 48	↑ 8		↑ 1	↑ 14	↓ Good-Fair
06				↓ 109.73	↓ 271.04													↑ Good		
43	CRR6	96	SNS	ESA,ANSI	213.66	527.74	269	88 (32.30%)	63.63	4.73	4	4	65	87	8	17	1	0	Good	
		98			↓ 213.22	↓ 526.64	↑ 277	↑ 91 (32.50%)	↑ 64.67	↑ 4.74		↓ 3	↑ 73							
		99					↑ 281	↑ 92 (32.70%)	↑ 65.03	↓ 4.73			↓ 72							
		00						↓ 91 (32.38%)											↑ 8	
		01				↓ 135.16	↓ 333.86	↓ 264	↓ 88 (33.33%)	↓ 61.21	↓ 4.61		↓ 2	↓ 62	↓ 67		↑ 18		↑ 10	
		02				↓ 134.94	↓ 333.30	↑ 272	↑ 91 (33.46%)	↑ 61.74	↓ 4.59			↑ 64		↓ 7				
		04																		
		05																		
		06				↓ 134.55	↓ 332.33	↑ 302	↑ 97 (32.12%)	↑ 66.11	↑ 4.62			↑ 73	↑ 74	↑ 8				↑ 16

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition			
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC		
51	WB1	96	NS		7.12	17.58	53	9 (16.98%)	25.93	3.91	5	0	0	4	0	1	0	0	Fair		
		98																			
		99																			
		00																			
		01				↓3.94	↓9.73	↑57	↑10 (17.54%)	↑26.11	↓3.81				↑5					↓Fair-Poor	
		02																			
		04																			
		05																			
		06			↓3.90	↓9.62	↑72	↑18 (25.00%)	↑28.85	↑3.93			↑1	↑15	↑2			↑2	↑Good-Fair		
52	EM30	96	NS		5.57	13.75	52	5 (9.62%)	29.61	4.32	2		6	5	8	0	0	0	Good		
		98																			
		99																			
		00																			
		01						↑68	↑8 (11.76%)	↑30.73	↓3.97	↑5		↑7	↑7						
		02																			
		04																			
		05																			
		06			↓5.23	↓12.93	↑93	↑19 (20.43%)	↑33.83	↓3.93			↑8	↑12							
53	EM6	96	NS		1.07	2.65	53	11 (20.75%)	25.00	3.86	1	0	1	6	1	0	0	0	Fair		
		98																			
		99																			
		00																			
		01						↑58	↑14 (24.14%)	↓24.72	↓3.73										
		02																			
		04																			
		05																			
		06			↓1.03	↓2.55	↑70	↑20 (28.57%)	↑27.01	↑3.82				↑7							

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
54	EM2	96	SNS		4.90	12.09	63	12 (19.05%)	28.85	4.04	1	1	0	8	1	0	0	0	Fair	
		98																		
		99																		
		00	↓NS									↓0								
		01						↑74	↑15 (20.27%)	↑29.81	↓3.88									
		02																		
		04																		
		05																		
		06			↓4.78	↓11.81	↑85	↓15 (17.65%)	↑32.99	↑3.94		↑1	↑1	↑12						
55	EM10	96	NS		3.99	9.86	43	9 (20.93%)	21.78	3.74	2	0	0	4	2	0	0	0	Fair	
		98																		
		99																		
		00																		
		01				↓3.73	↓9.22	↑54	↑13 (24.07%)	↑22.96	↓3.59									
		02																		
		04																		
		05																		
		06			↑3.82	↑9.43	↑70	↑21 (30.00%)	↑24.43	↓3.49	↑3			↑9		↑1		↑1		
56	EM14	96	NS		9.61	23.74	49	22 (44.90%)	15.40	2.96	2	0	0	4	0	0	0	0	Poor	
		98																		
		99																		
		00																		
		01				↓9.19	↓22.70	↑74	↑36 (48.65%)	↑17.36	↓2.82				↑8					↑Fair
		02																		
		04																		
		05																		
		06	↑SNS		↑9.38	↑23.16	↑94	↑42 (44.68%)	↑21.22	↑2.94	↑5	↑1		↑15	↑3	↑1		↑1		

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition	
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC
57	EM4	96	SNS	ESA,ANSI	46.82	115.65	225	61 (26.70%)	55.05	4.30	8	2	28	67	4	6	0	0	Good - Fair
		98					↑ 228					↓ 1	↑ 30						
		99				↓ 43.18	↓ 106.65	↑ 235	↑ 64 (27.20%)	↑ 56.28			↑ 31		↑ 5				
		00																	
		01				↓ 42.98	↓ 106.17		↓ 62 (26.38%)	↓ 55.96	↓ 4.25		↑ 2						↑ 2
		02																	
		04						↑ 240	↑ 66 (27.50%)	↑ 56.25	↑ 4.26			↑ 32					
		05				↑ 42.99	↑ 106.22	↑ 251	↑ 75 (29.88%)	↓ 56.01	↓ 4.22								
06				↓ 41.93	↓ 103.57	↑ 258	↑ 76 (29.46%)	↑ 57.15	↑ 4.24			↑ 36	↑ 70	↑ 7			↑ 5		
58	EM5	96	NS		1.88	4.64	49	9 (32.70%)	22.27	3.94	1			4					Fair
		98																	
		99																	
		00																	
		01																	
		02																	
		04																	
		05																	
06				↑ 4.89	↑ 12.09	↑ 61	↑ 19 (31.15%)	↑ 23.15	↓ 3.57	↑ 2			↑ 6				1		
59	EM21	96	NS		1.13	2.79	42	8 (16.70%)	21.27	3.65	1			2	1				Fair
		98																	
		99																	
		00																	
		01																	
		02																	
		04																	
		05																	
06				↓ 0.84	↓ 2.08	↑ 51	↑ 10 (19.61%)	↑ 22.18	↓ 3.46									Fair	

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
75	CM7	96	SNS		11.38	28.11	88	18 (20.50%)	34.78	4.16	3	0	5	15	1	5	0	0	Excellent	
		98																		
		99																		
		00																		
		01																		
		02								↑35.13	↑4.17			↓3					↑1	
		04																		
		05																		
		06			↓11.17	↓27.58	↑92	↓18 (19.57%)	↑35.57	↓4.14			↑22	↑3		↑1	↑2	↓Good		
76	CM9	96	NS		3.37	8.32	62	12 (17.7%)	27.58	3.90	2	0	3	8	2	0	0	0	Good	
		98																		
		99																		
		00																		
		01																		
		02								↑27.74	↓3.85									
		04																		
		05																		
		06			↑3.91	↑9.67	↑78	↑14 (17.95%)	↑31.00	↑3.88	↑4		↑5	↑13		↑3		↑1		
78	CM12	96	NS		8.22	20.30	54	8 (14.80%)	27.42	4.04	2	0	2	11	2	5	0	0	Good	
		98																		
		99				↓8.21	↓20.28	↑76	↑15 (19.74%)	↑29.96	↓3.84			↑3	↑14	↑5	↑6			
		00																		
		01				↓5.77	↓14.25	↑82		↑30.42	↓3.72	↓1								
		02																		
		04																		
		05																		
		06			↑6.05	↑14.95	↑87	↑17 (19.54%)	↑31.79	↑3.80				↑19		↑8		↑1	Good	

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
81	CE7	96	SNS		10.08	24.90	88	28 (31.82%)	30.47	3.93	2	0	4	2	1	7	0	0	Good	
		98																		
		99																		
		00																		
		01						↑98	↑29 (29.59%)	↑33.11	↑3.99			↑6	↑4					
		02																		
		04																		
		05																		
		06			↓9.33	↓23.04	↑109	↑33 (30.28%)	↑35.67	↑4.09		↑1	↑7	↑8						
82	CE9	96	NS		4.83	11.94	58	14 (24.10%)	26.99	4.07	3	0	2	2	1	0	0	0	Fair	
		98																		
		99																		
		00						↑76	↑16 (21.05%)	↑32.29	↑4.20									
		01				↓4.74	↓11.70	↑78	↑17 (21.79%)	↑32.52	↓4.16			↑5	↑10	↑2				
		02																		
		04																		
		05																		
		06			↑5.04	↑12.44	↑96	↑28 (29.17%)	↑33.71	↓4.09	↑5		↑7	↑14						
85	CE1	96	NGS		16.94	41.84	50	24 (46.00%)			2			3					Poor	
		98																		
		99																		
		00																		
		01																		
		02																		
		04																		
		05																		
		06			↓16.84	↓41.60	↑85	↑25 (29.41%)	23.85	4.15	↑3			↑13	1	5		2		

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition			
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC		
119	LS1	96	SNS	Wetland	28.92	71.42	63	14 (22.22%)	27.14	3.88	3	0	6	4	0	0	0	0	0	Good - Fair	
		98																			
		99																			
		00																			
		01				↓28.47	↓70.32	↑111	↑39 (35.14%)	↑28.99	↓3.42			↑7	↑9	↑1					
		02																			
		04																			
		05																			
		06			↓26.39	↓65.17	↑145	↑59 (40.69%)	↑32.35	↑3.49			↑10	↑25	↑2				↑1		
120	LS2	96	NS		1.27	3.13	45	13 (28.89%)	22.09	3.97	1	0	0	2	0	0	0	0	0	↓Fair	
		98																			
		99																			
		00																			
		01				↓1.03	↓2.55	↑52	↑15 (28.85%)	↑23.18	↓3.81				↑5	↑1					↓Fair-Poor
		02																			
		04																			
		05																			
		06					↑59	↑17 (28.81%)	↑24.53	↓3.79				↑6						↓Poor	
121	LS3	96	NS		3.00	7.40	66	22 (33.33%)	23.94	3.65	2	0	2	1	1	2	0	0	0	Fair	
		98																			
		99																			
		00																			
		01						↑95	↑29 (30.53%)	↑27.94	↓3.44	↑3		↑4	↑4						
		02																			
		04																			
		05																			
		06					↑113	↑40 (35.40%)	↑29.38				↑11	↑2					↑1		

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
122	ME10	96	SNS		4.18	10.33	55	15 (27.27%)	24.67	3.90	1	1	2	4	0	0	0	0	Fair	
		98										↓0	↑3							
		99																		
		00																		
		01				↓2.92	↓7.22	↑64	↑17 (26.56%)					↓2		↑1				
		02																		
		04																		
		05																		
		06			↑3.39	↑8.38	↑73	↑18 (24.66%)	↑27.91	↓3.76		↑1	↑3	↑7				↑1		
123	ME12	96	NGS		2.90	7.16	49	27 (55.10%)	12.00	2.62	1	0	0	7	2	7	0	0	Poor	
		98																		
		99																		
		00																		
		01						↑64	↑36 (56.25%)	↑14.55	↑2.75				↑8					
		02																		
		04																		
		05																		
		06	↑SNS				↑87	↑49 (56.32%)	↑16.60	↓2.73			↑1	↑18	↑3	↑7	↑1			
124	ME11	96	NGS		4.36	10.78	41	21 (51.20%)	11.40	2.55	1	0	0	5	2	4	0	0	Poor	
		98																		
		99																		
		00						↑51	↑22 (43.14%)	↑16.17	↑3.11			↑3						
		01						↑56	↑27 (48.21%)	↑17.08	↑3.17				↑9					
		02																		
		04																		
		05																		
		06					↑83	↑45 (54.22%)	↓14.79	↓2.70			↑5	↑17	↑4			↑1	↑Fair-Poor	

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition	
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC
125	ME9	96	NS		2.39	5.90	44	11 (25.00%)	25.59	4.45	1	0	2	2	1	0	0	0	Fair
		98																	
		99																	
		00																	
		01						↑54	↑13 (24.07%)	↑29.20	↑4.56			↑3					
		02																	
		04																	
		05																	
		06			↓2.26	↓5.58	↑64	15 (23.44%)	↑30.14	↓4.31			↑4	↑4					↑Good
126/ 129	ME8/ MB8	96	SNS		15.98	39.47	87	13 (26.40%)	30.25	3.78	2	1	4	3	3	4	0	0	Fair
		98										↓0							
		99																	
		00						↓88	↑24 (27.27%)										
		01						↑90		↑31.27	↑3.85								
		02																	
		04																	
		05																	
		06			↓15.68	↓38.74	↑93	↓24 (25.81%)	↑32.02	↑3.86		↑1		↑15					
127	MB9	96	NGS		6.60	16.30	0	0	0	0	1	0	0	0	0	2	0	0	Poor
		98																	
		99																	
		00																	
		01																	
		02																	
		04																	
		05																	
		06																	

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
128	MB7	96	NGS		10.45	25.80	0	0	n/a	n/a	1	0	0	0	0	0	0	0	Poor	
		98																		
		99																		
		00																		
		01						↑35	↑21 (60.00%)	↑6.68	↑1.79				↑4					
		02																		
		04																		
		05																		
		06			↓10.23	↓25.27	↑43	↑24 (55.81%)	↑7.99	↑1.83				↑12				↑1		
130	MB3	96	NGS		7.11	17.55	0	0	n/a	n/a	1	0	0	0	0	0	0	0	Poor	
		98																		
		99																		
		00																		
		01				↓4.91	↓12.13	↑26	↑15 (57.69%)	↑4.82	↑1.45				↑3		↑1			
		02																		
		04																		
		05																		
		06			↑5.38	↑13.28	↑34	↑19 (55.88%)	↑5.94	↑1.53				↑15	↑1			↑1	↑Fair	
132	MB4	96	NS		1.93	4.77	40	11 (27.50%)	19.31	3.59	1								Poor	
		98																		
		99																		
		00																		
		01																		
		02																		
		04																		
		05																		
		06			↓1.77	↓4.36								↑8				↑1		



Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition		
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC	
154	CRR10	96																		
		98																		
		99																		
		00																		
		01	SNS	ESA,ANSI	43.75	108.07	359	129 (35.93%)	65.28	4.30	2	1	64	88	8	9	1	25	Good	
		02			↑65.25	↑161.16	↑361	↑130 (36.01%)	↑65.75	↑4.33	↑9					↑10				
		04																		
		05																		
		06			↓60.42	↓149.23	↑373	↓130 (34.85%)	↑67.89	↑4.36		↑2	↑70	↑89	↑10	↑11		↑27		
155	CRR11	96																		
		98																		
		99																		
		00																		
		01	SNS	ESA	32.16	79.44	0	0	n/a	n/a	2	0	0	12	1	5	0	0	Good	
		02					↑101	↑44 (43.56%)	24.64	3.26	↑4		↑3	↑19	↑2					
		04																		
		05																		
06					↑157	↑48 (30.57%)	↑40.02	↑3.83		↑1	↑15	↑25	↑3							
157	ME13	96																		
		98																		
		99																		
		00																		
		01																		
		02																		
		04																		
		05																		
		06	NGS		1.42	3.50	25	6 (24.00%)	18.58	4.26	1			3					Poor - Fair	

Site #	Site Code	Year	Classification	Designation	Area		Flora						Fauna					Condition				
					(ha)	(acres)	total	# non-native (proportion)	native FQI	native mean C	# veg. comm.	prov. sig. species	reg. sig. species	# birds	# mammals	# herptiles	prov. sig. species		CVC			
158	CM25	96																				
		98																				
		99																				
		00																				
		01																				
		02																				
		04																				
		05																				
		06	NGS				0.70	1.73	24	11 (45.83%)	5.27	1.46	2		1	7		1		2	Fair - Poor	

**Appendix 6: Comparison of Classifications (1996 to 2006)**

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**Appendix 6: Comparison of Natural Area Classifications (1996 to 2006)\***

Comparison Categories	Year	Classification				
		Significant Natural Site (SNS)	Natural Site (NS)	Natural Green Space (NGS)	Residential Woodland (RW)	TOTAL
Number of Sites	1996	51	59	31	3	144
	1998	45	64	31	3	143
	1999	46	68	28	3	145
	2000	45	70	27	3	145
	2001	47	67	26	3	143
	2002	47	66	24	3	140
	2004	62	53	21	3	139
	2005	61	61	14	3	139
	2006	62	53	23	3	141
Total Area (ha)	1996	1530.17	349.92	197.05	252	2329.14
	1998	1423.39	426.35	171.55	252	2273.29
	1999	1425.44	445.66	160.18	239.93	2271.21
	2000	1416.56	456.57	148.86	237.42	2259.41
	2001	1413.16	433.64	145.89	237.42	2230.11
	2002	1388.21	428.56	133.63	237.42	2182.82
	2004	1552.40	267.64	123.15	238.25	2181.44
	2005	1548.29	299.69	90.31	237.13	2175.42
	2006	1541.65	268.45	124.77	237.13	2172.00
Proportion of Natural Areas System	1996	74%	17%	9%	-	100%
	1998	70%	21%	9%	-	100%
	1999	70%	22%	8%	-	100%
	2000	70%	23%	7%	-	100%
	2001	71%	22%	7%	-	100%
	2002	71%	22%	7%	-	100%
	2004	80%	14%	6%	-	100%
	2005	80%	15%	5%	-	100%
	2006	80%	14%	6%	-	100%

Comparison Categories	Year	Classification				
		Significant Natural Site (SNS)	Natural Site (NS)	Natural Green Space (NGS)	Residential Woodland (RW)	TOTAL
Proportion of the City	1996	5.23%	1.2%	0.67%	-	7.10%
	1998	4.91%	1.41%	0.60%	-	6.92%
	1999	4.87%	1.52%	0.55%	-	6.94%
	2000	4.84%	1.56%	0.51%	-	6.91%
	2001	4.83%	1.48%	0.50%	-	6.81%
	2002	4.73%	1.46%	0.46%	-	6.65%
	2004	5.30%	0.91%	0.42%	-	6.63%
	2005	5.29%	1.02%	0.31%	-	6.62%
	2006	5.30%	0.92%	0.43%	-	6.65%

\*Note: Residential Woodlands were not used in the calculations for proportion of natural areas system or proportion of the City.

**Appendix 7: Comparison of Major Landform Types (1996 to 2006)**

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**Appendix 7: Comparison of Major Landform Types (1996 and 2006)\***

Comparison Categories	Year	Landform Type			
		valleylands and associated tablelands	tablelands	wetlands and associated valleylands	TOTAL
Number of Sites	1996	73	60	6	139
	1998	73	59	6	138
	1999	76	58	6	140
	2000	76	58	6	140
	2001	79	53	6	138
	2002	78	52	5	135
	2004	77	52	5	134
	2005	77	52	5	134
	2006	77	55	5	137
Total Area (ha)	1996	1626.3	339.9	103.7	2069.9
	1998	1588.0	328.5	100.4	2016.9
	1999	1622.1	301.6	100.3	2024
	2000	1594.8	319.7	100.3	2014.7
	2001	1593.9	291.2	100.3	1985.4
	2002	1555.3	285.2	97.7	1938.1
	2004	1554.8	285.1	96.0	1935.9
	2005	1550.08	284.98	95.97	1931.03
	2006	1542.49	289.15	95.97	1927.61
Mean Size (ha)	1996	22.3	5.7	17.3	-
	1998	21.8	5.6	16.7	-
	1999	21.3	5.2	16.7	-
	2000	20.2	5.3	16.7	-
	2001	19.4	5.3	16.7	-
	2002	19.2	5.4	19.5	-
	2004	19.4	5.4	19.2	-
	2005	19.4	5.4	19.2	-
	2006	19.23	5.3	19.20	-
Proportion of Natural Areas System	1996	78.30%	16.40%	5.00%	99.70%
	1998	78.50%	16.20%	5.00%	99.70%
	1999	79.90%	14.80%	4.90%	99.70%
	2000	79.10%	15.80%	4.90%	99.80%
	2001	80.30%	14.70%	5.00%	100%

Comparison Categories	Year	Landform Type			
		valleylands and associated tablelands	tablelands	wetlands and associated valleylands	TOTAL
	2002	80.30%	14.70%	5.00%	100%
	2004	80.30%	14.70%	5.00%	100%
	2005	80.30%	14.70%	5.00%	100%
	2006	80.00%	15.00%	5.00%	100%
Proportion of the City	1996	5.60%	1.16%	0.36%	7.10%
	1998	5.43%	1.12%	0.34%	6.90%
	1999	5.55%	1.03%	0.34%	6.92%
	2000	5.45%	1.09%	0.34%	6.88%
	2001	5.45%	0.99%	0.34%	6.78%
	2002	5.31%	0.97%	0.33%	6.62%
	2004	5.31%	0.97%	0.33%	6.61%
	2005	5.30%	0.97%	0.33%	6.60%
	2006	5.27%	0.99%	0.33%	6.59%

\*Note: two small areas that did not readily fall into these three categories and the residential woodlands were omitted from this analysis so figures differ slightly from those provided elsewhere in the report.

**Appendix 8: Comparison of Community Size (1996 to 2006)**

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**Appendix 8: Comparison of Community Size (1996 to 2006).**

A comparison of the area (in hectares) of vegetation communities mapped for the City of Mississauga from 1996 to 2006 (grouped according to six broad categories). Communities are based on classifications of Bakowsky (1995) and Kavanaugh and McKay-Kuja (1992) see Geomatics (1996). See North-South (2000), Appendix 5, for a comparison of the vegetation communities with the Ecological Land Classification (Lee *et al.* 1998).

Code	Vegetation Community	# Occurrences									Area (hectares)								
		1996	1998	1999	2000	2001	2002	2004	2005	2006	1996	1998	1999	2000	2001	2002	2004	2005	2006
	<b>Valleylands</b>																		
A	wooded slope	19	20	20	20	22	22	22	21	22	347.36	348.54	348.72	340.69	347.85	341.65	335.38	328.13	327.34
B	floodplain	22	21	21	21	23	23	23	24	24	458.42	426.21	426.10	426.10	426.32	393.50	390.48	387.52	387.09
DD	sugar maple-American beech forest	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2.48
G	golf course	4	4	4	4	4	4	4	4	4	101.18	101.19	101.19	101.13	101.13	99.73	99.73	99.30	100.17
J	wooded non-native valleylands	18	18	20	20	22	22	24	27	28	93.43	94.36	100.27	100.22	109.09	109.09	115.56	119.76	115.17
K	open with open slopes valleylands	31	32	33	33	33	33	33	33	35	229.02	210.58	217.50	217.62	215.34	197.49	196.47	192.81	195.06
L	wooded native valleylands	5	5	5	5	5	5	5	5	5	39.77	39.78	39.64	39.64	38.64	38.64	33.49	33.32	33.32
M	open with wooded slopes valleylands	2	2	2	2	1	1	1	0	0	5.26	5.25	5.25	5.25	0.82	0.82	0.82	0.00	0.00
N	open with manicured slopes valleylands	2	2	3	2	2	2	2	2	2	22.16	22.15	22.15	22.15	22.15	22.15	22.15	16.65	16.43
O	manicured with wooded slopes valleylands	1	1	1	1	0	0	0	0	0	5.17	5.17	5.17	5.17	0.00	0.00	0.00	0.00	0.00
	<b>Totals</b>										<b>1301.77</b>	<b>1253.23</b>	<b>1265.99</b>	<b>1257.98</b>	<b>1261.35</b>	<b>1203.0</b>	<b>1194.08</b>	<b>1177.48</b>	<b>1177.06</b>
	<b>Woodlands</b>																		
BB	red ash-American elm forest	14	15	15	15	16	16	18	18	18	35.32	35.61	37.35	37.16	36.40	36.40	48.14	47.83	47.87
CC	sugar maple forest	7	7	7	7	7	7	7	7	7	14.79	13.12	13.12	13.12	13.12	11.62	11.62	11.15	11.00
DD	sugar maple-American beech forest	15	16	16	17	16	16	16	16	17	108.35	102.44	100.07	100.07	95.15	97.23	93.06	93.08	93.55
EE	sugar maple-white ash forest	9	9	9	9	9	9	9	9	9	63.06	62.18	62.18	61.73	61.27	61.20	61.07	62.36	62.65
FF	sugar maple-red oak forest	10	10	10	9	9	9	10	10	10	42.48	44.96	44.96	43.12	42.76	42.70	43.44	43.45	42.87
GG	sugar maple-eastern hemlock forest	1	1	1	1	1	1	1	1	1	16.03	16.07	16.07	16.07	15.97	15.97	15.97	15.97	15.86
II	sugar maple-black cherry forest	1	1	1	1	1	1	1	1	1	1.93	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.77
KK	sugar maple-American beech-red oak forest	5	5	5	5	5	5	5	5	5	29.46	29.46	29.46	29.46	29.46	28.92	28.92	28.80	28.50
LL	sugar maple-American beech-eastern hemlock forest	1	1	1	1	1	1	1	1	1	4.44	4.45	4.44	4.45	4.45	4.45	4.45	4.45	4.26

Code	Vegetation Community	# Occurrences									Area (hectares)								
		1996	1998	1999	2000	2001	2002	2004	2005	2006	1996	1998	1999	2000	2001	2002	2004	2005	2006
MM	white pine-eastern hemlock-sugar maple forest	1	1	1	1	1	1	1	1	1	6.77	6.77	5.69	5.69	5.69	5.69	5.69	5.69	5.82
NN	eastern hemlock forest	3	3	3	3	3	4	4	4	4	4.09	4.11	4.11	4.11	4.11	5.20	5.20	5.20	5.20
OO	red maple-red oak forest	5	6	6	6	6	6	6	6	6	30.24	30.24	30.42	30.42	30.42	30.42	29.89	29.89	29.89
PP	American beech forest	1	1	1	1	1	1	1	1	1	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
QQ	bur oak-American beech forest	1	1	1	1	0	0	0	0	0	2.24	2.24	2.24	2.24	0.00	0.00	0.00	0.00	0.00
RR	oak-ash forest	8	9	9	10	10	9	9	9	9	28.61	28.57	24.75	27.34	27.34	24.23	23.94	23.88	23.60
SS	oak-hickory forest	5	7	7	7	7	8	8	8	8	24.20	23.56	23.55	23.31	22.58	27.22	26.92	26.65	27.37
TT	ash-hickory forest	3	3	3	3	3	3	4	4	4	6.94	6.68	6.68	6.68	6.21	6.21	8.88	8.88	8.77
VV	black cherry-eastern hemlock-white ash forest	1	1	1	1	1	1	1	1	1	2.02	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03
WW	bur oak-black walnut forest	1	1	1	1	0	0	0	0	0	0.90	0.90	0.90	0.90	0.00	0.00	0.00	0.00	0.00
ZZ	oak-white pine forest	0	0	2	2	2	2	2	2	2	0	0	2.35	2.35	2.35	2.35	2.35	2.35	2.35
	<b>Totals</b>										<b>424.43</b>	<b>417.89</b>	<b>414.87</b>	<b>414.73</b>	<b>403.81</b>	<b>406.32</b>	<b>416.07</b>	<b>416.17</b>	<b>415.92</b>
	<b>Successional</b>																		
C	old field	26	27	27	27	32	36	40	41	43	88.45	95.33	95.33	95.30	97.75	109.12	116.24	113.09	115.16
D	hedgerow	5	5	4	4	4	4	4	4	4	7.68	7.01	6.95	6.95	5.46	5.46	5.46	5.46	5.45
E	early successional forest	9	10	10	10	7	9	12	16	17	21.68	14.66	14.66	12.82	7.68	11.12	24.33	33.18	33.28
P	hawthorn thicket	4	4	4	4	4	5	5	4	5	14.54	14.35	14.35	14.35	14.35	14.57	14.36	13.80	14.36
XX	birch forest	1	1	1	1	1	1	1	1	1	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
YY	poplar forest	1	2	2	2	2	2	4	4	4	2.37	1.69	1.69	1.69	1.69	1.69	3.11	3.11	3.11
	<b>Totals</b>										<b>135.18</b>	<b>133.5</b>	<b>133.44</b>	<b>131.56</b>	<b>127.39</b>	<b>142.41</b>	<b>163.96</b>	<b>169.10</b>	<b>171.82</b>
	<b>Wetland</b>																		
AA	silver maple forest	5	5	5	5	3	3	3	3	3	18.59	18.14	18.14	17.58	7.24	7.24	7.24	7.24	6.57
V	cattail marsh	13	14	14	14	15	16	16	17	18	27.73	26.99	26.99	26.99	27.07	27.21	27.10	26.18	26.54
W	open water marsh	6	6	6	6	7	7	8	8	8	22.70	22.70	22.70	22.70	22.56	22.56	21.29	21.29	21.55
X	willow-buttonbush swamp thicket	1	1	1	1	1	1	1	1	2	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.97
Y	wet meadow	1	3	3	3	3	4	5	5	5	3.43	3.72	3.72	3.72	3.72	4.23	10.91	10.91	10.88
Z	willow-ash forest	2	2	2	2	2	2	3	3	3	0.55	0.56	0.56	0.56	0.56	0.56	1.15	1.15	1.09
	<b>Totals</b>										<b>75.77</b>	<b>74.88</b>	<b>74.88</b>	<b>74.32</b>	<b>63.92</b>	<b>64.56</b>	<b>70.46</b>	<b>69.54</b>	<b>69.60</b>

Code	Vegetation Community	# Occurrences									Area (hectares)								
		1996	1998	1999	2000	2001	2002	2004	2005	2006	1996	1998	1999	2000	2001	2002	2004	2005	2006
	<b>Anthropogenic</b>																		
F	manicured	11	11	11	12	13	12	16	18	19	72.41	75.16	75.16	76.28	72.99	61.25	58.52	65.67	66.49
H	urban lake	2	2	2	2	2	2	2	2	2	7.26	7.26	7.26	7.26	7.26	7.26	7.26	7.26	7.26
I	wooded residential	3	3	3	3	3	3	3	3	3	251.59	251.59	239.93	237.43	237.43	238.26	237.13	237.13	237.13
T	plantation	11	11	11	13	12	13	14	15	15	21.58	21.57	21.60	21.73	20.80	20.92	22.67	22.80	22.88
UU	black walnut grove	1	1	1	1	1	1	1	1	1	0.17	0.17	0.17	0.17	0.17	0.17	0.08	0.08	0.08
	<b>Totals</b>										<b>353.01</b>	<b>355.75</b>	<b>344.12</b>	<b>342.87</b>	<b>338.65</b>	<b>327.03</b>	<b>326.79</b>	<b>333.02</b>	<b>333.84</b>
	<b>Other</b>																		
R	beach	3	3	4	4	4	4	6	6	6	2.36	1.96	2.18	2.18	2.18	2.18	2.72	2.72	2.72
S	tall grass prairie	1	1	1	1	1	1	1	1	1	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
U	unknown	5	3	3	3	3	3	1	1	1	35.65	35.64	35.68	35.68	35.68	35.68	7.33	7.33	7.33
	<b>Totals</b>										<b>38.07</b>	<b>37.66</b>	<b>37.92</b>	<b>37.92</b>	<b>37.92</b>	<b>37.92</b>	<b>10.11</b>	<b>10.11</b>	<b>10.11</b>

**Appendix 9: Comparison of Community Proportion (1996 to 2006)**

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**Appendix 9: Comparison of Community Proportion (1996 to 2006).**

A comparison of the proportion of the vegetation communities within the Natural Areas System and the City of Mississauga from 1996 to 2006 (grouped according to six broad categories). Communities are based on classifications of Bakowsky (1995) and Kavanaugh and McKay-Kuja (1992) see Geomatics (1996). North-South (2000) Appendix 5 shows a comparison of the vegetation communities with the Ecological Land Classification (Lee *et al.* 1998).

Code	Vegetation Community	Proportion of Natural Areas (%)										Proportion of City Area (%)									
		1996	1998	1999	2000	2001	2002	2004	2005	2006	1996	1998	1999	2000	2001	2002	2004	2005	2006		
	<b>Valleylands</b>																				
A	wooded slope	14.92	15.33	15.4	15.08	15.40	15.12	14.84	15.08	14.49	1.19	15.33	15.35	1.16	1.19	1.17	1.15	1.12	1.12		
B	floodplain	19.69	18.75	18.8	18.86	18.87	17.42	17.28	17.81	17.13	1.57	18.75	18.76	1.46	1.46	1.34	1.33	1.32	1.32		
G	golf course	4.35	4.45	4.45	4.48	4.48	4.41	4.41	4.56	4.43	0.35	4.45	4.45	0.35	0.35	0.34	0.34	0.34	0.34		
J	wooded non-native valleylands	4.01	4.15	4.42	4.44	4.83	4.83	5.11	5.50	5.10	0.32	4.15	4.42	0.34	0.37	0.37	0.39	0.41	0.39		
K	open with open slopes valleylands	9.84	9.26	9.58	9.63	9.53	8.74	8.70	8.86	8.63	0.78	9.26	9.58	0.74	0.74	0.67	0.67	0.66	0.67		
L	wooded native valleylands	1.71	1.75	1.75	1.75	1.71	1.71	1.48	1.53	1.47	0.14	1.75	1.75	0.14	0.13	0.13	0.11	0.11	0.11		
M	open with wooded slopes valleylands	0.23	0.23	0.23	0.23	0.04	0.04	0.04	0.00	0.00	0.02	0.23	0.23	0.02	0.00	0.00	0.00	0.00	0.00		
N	open with manicured slopes valleylands	0.95	0.97	0.97	0.98	0.98	0.98	0.98	0.77	0.73	0.08	0.97	0.97	0.08	0.08	0.08	0.08	0.06	0.06		
O	manicured with wooded slopes valleylands	0.22	0.23	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.02	0.23	0.23	0.02	0.00	0.00	0.00	0.00	0.00		
	<b>Totals</b>	<b>55.92</b>	<b>55.12</b>	<b>55.74</b>	<b>55.68</b>	<b>55.83</b>	<b>53.25</b>	<b>52.93</b>	<b>54.13</b>	<b>51.98</b>	<b>4.47</b>	<b>55.12</b>	<b>55.74</b>	<b>4.30</b>	<b>4.31</b>	<b>4.11</b>	<b>4.08</b>	<b>4.02</b>	<b>4.01</b>		
	<b>Woodlands</b>																				
BB	red ash-American elm forest	1.52	1.57	1.64	1.64	1.61	1.61	2.13	2.20	2.12	0.12	1.57	1.64	0.13	0.12	0.12	0.16	0.16	0.16		
CC	sugar maple forest	0.64	0.58	0.58	0.58	0.58	0.51	0.51	0.51	0.49	0.05	0.58	0.58	0.04	0.04	0.04	0.04	0.04	0.04		
DD	sugar maple-American beech forest	4.65	4.51	4.41	4.43	4.21	4.30	4.12	4.28	4.35	0.37	4.51	4.41	0.34	0.33	0.33	0.32	0.32	0.33		
EE	sugar maple-white ash forest	2.71	2.74	2.74	2.73	2.71	2.71	2.70	2.87	2.77	0.22	2.74	2.74	0.21	0.21	0.21	0.21	0.21	0.21		
FF	sugar maple-red oak forest	1.82	1.98	1.98	1.91	1.89	1.89	1.92	2.00	1.90	0.15	1.98	1.98	0.15	0.15	0.15	0.15	0.15	0.15		
GG	sugar maple-eastern hemlock forest	0.69	0.71	0.71	0.71	0.71	0.71	0.71	0.73	0.70	0.05	0.71	0.71	0.05	0.05	0.05	0.05	0.05	0.05		
II	sugar maple-black cherry forest	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.08	0.01	0.08	0.08	0.01	0.01	0.01	0.01	0.01	0.01		
KK	sugar maple-American beech-red oak forest	1.27	1.30	1.30	1.30	1.30	1.28	1.28	1.32	1.26	0.10	1.30	1.30	0.10	0.10	0.10	0.10	0.10	0.10		

Code	Vegetation Community	Proportion of Natural Areas (%)									Proportion of City Area (%)								
		1996	1998	1999	2000	2001	2002	2004	2005	2006	1996	1998	1999	2000	2001	2002	2004	2005	2006
LL	sugar maple-American beech-eastern hemlock forest	0.19	0.20	0.19	0.20	0.20	0.20	0.20	0.20	0.19	0.02	0.20	0.19	0.02	0.02	0.02	0.02	0.02	0.01
MM	white pine-eastern hemlock-sugar maple forest	0.29	0.30	0.25	0.25	0.25	0.25	0.25	0.26	0.26	0.02	0.30	0.25	0.02	0.02	0.02	0.02	0.02	0.02
NN	eastern hemlock forest	0.18	0.18	0.18	0.18	0.18	0.23	0.23	0.24	0.23	0.01	0.18	0.18	0.01	0.01	0.02	0.02	0.02	0.02
OO	red maple-red oak forest	1.30	1.33	1.33	1.35	1.35	1.35	1.32	1.37	1.32	0.10	1.33	1.33	0.10	0.10	0.10	0.10	0.10	0.10
PP	American beech forest	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.64	0.01	0.11	0.11	0.01	0.01	0.01	0.01	0.01	0.01
QQ	bur oak-American beech forest	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.10	0.01	0.00	0.00	0.00	0.00	0.00
RR	oak-ash forest	1.23	1.26	1.09	1.21	1.21	1.07	1.06	1.10	1.04	0.10	1.26	1.09	0.09	0.09	0.08	0.08	0.08	0.08
SS	oak-hickory forest	1.04	1.04	1.04	1.03	1.00	1.20	1.19	1.23	1.21	0.08	1.04	1.04	0.08	0.08	0.09	0.09	0.09	0.09
TT	ash-hickory forest	0.30	0.29	0.29	0.30	0.27	0.27	0.39	0.41	0.39	0.02	0.29	0.29	0.02	0.02	0.02	0.03	0.03	0.03
VV	black cherry-eastern hemlock-white ash forest	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.01	0.09	0.09	0.01	0.01	0.01	0.01	0.01	0.01
WW	bur oak-black walnut forest	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
ZZ	oak-white pine forest	0.00	0.00	0.1	0.10	0.10	0.10	0.10	0.11	0.10	0.00	0.00	0.1	0.01	0.01	0.01	0.01	0.01	0.01
	<b>Totals</b>	<b>18.25</b>	<b>18.41</b>	<b>18.25</b>	<b>18.36</b>	<b>17.87</b>	<b>17.98</b>	<b>18.42</b>	<b>19.13</b>	<b>19.04</b>	<b>1.45</b>	<b>18.41</b>	<b>18.25</b>	<b>1.42</b>	<b>1.38</b>	<b>1.39</b>	<b>1.42</b>	<b>1.42</b>	<b>1.43</b>
	<b>Successional</b>																		
C	old field	3.80	4.19	4.19	4.22	4.33	4.83	5.14	5.20	5.10	0.30	0.33	0.33	0.33	0.33	0.37	0.40	0.39	0.39
D	hedgerow	0.33	0.31	0.31	0.31	0.24	0.24	0.24	0.25	0.24	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
E	early successional forest	0.93	0.65	0.65	0.57	0.34	0.49	1.08	1.53	1.47	0.07	0.05	0.05	0.04	0.03	0.04	0.08	0.11	0.11
P	hawthorn thicket	0.62	0.63	0.63	0.64	0.64	0.64	0.64	0.63	0.64	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
XX	birch forest	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
YY	poplar forest	0.10	0.07	0.07	0.07	0.07	0.07	0.14	0.14	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	<b>Totals</b>	<b>5.8</b>	<b>5.87</b>	<b>5.87</b>	<b>5.82</b>	<b>5.64</b>	<b>6.30</b>	<b>7.26</b>	<b>7.77</b>	<b>7.61</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.46</b>	<b>0.44</b>	<b>0.49</b>	<b>0.56</b>	<b>0.58</b>	<b>0.58</b>

Code	Vegetation Community	Proportion of Natural Areas (%)									Proportion of Natural Areas (%)								
		1996	1998	1999	2000	2001	2002	2004	2005	2006	1996	1998	1999	2000	2001	2002	2004	2005	2006
	<b>Wetland</b>																		
V	cattail marsh	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.17	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
W	open water marsh	0.97	1.00	1.00	1.00	1.00	1.00	0.94	0.98	0.95	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07
X	willow-buttonbush swamp thicket	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Y	wet meadow	0.15	0.16	0.16	0.16	0.16	0.19	0.48	0.50	0.48	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.04	0.04
Z	willow-ash forest	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	silver maple forest	0.80	0.80	0.80	0.78	0.32	0.32	0.32	0.33	0.29	0.06	0.06	0.06	0.06	0.02	0.02	0.02	0.02	0.02
	<b>Totals</b>	<b>3.25</b>	<b>3.29</b>	<b>3.29</b>	<b>3.29</b>	<b>2.83</b>	<b>2.86</b>	<b>3.12</b>	<b>3.20</b>	<b>19.9</b>	<b>0.25</b>	<b>0.25</b>	<b>0.25</b>	<b>0.25</b>	<b>0.22</b>	<b>0.22</b>	<b>0.24</b>	<b>0.24</b>	<b>0.23</b>
	<b>Anthropogenic</b>																		
F	manicured	3.11	3.31	3.31	3.38	3.23	2.71	2.59	3.02	2.94	0.25	0.26	0.26	0.26	0.25	0.21	0.20	0.22	0.23
H	urban lake	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.33	0.32	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
I	wooded residential	10.81	11.07	10.56	10.51	10.51	10.51	10.55	10.90	10.50	0.86	0.86	0.82	0.81	0.81	0.81	0.81	0.81	0.81
T	plantation	0.93	0.95	0.95	0.96	0.92	0.93	1.00	1.05	1.01	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08
UU	black walnut grove	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	<b>Totals</b>	<b>15.17</b>	<b>15.66</b>	<b>15.15</b>	<b>15.18</b>	<b>14.99</b>	<b>14.47</b>	<b>14.46</b>	<b>15.31</b>	<b>14.77</b>	<b>1.2</b>	<b>1.21</b>	<b>1.17</b>	<b>1.17</b>	<b>1.16</b>	<b>1.12</b>	<b>1.12</b>	<b>1.14</b>	<b>1.14</b>
	<b>Other</b>																		
R	beach	0.10	0.09	0.10	0.10	0.10	0.10	0.12	0.13	0.12	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
S	tall grass prairie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
U	unknown	1.53	1.57	1.57	1.57	1.58	1.58	0.32	0.34	0.32	0.12	0.12	0.12	0.12	0.12	0.12	0.03	0.03	0.03
	<b>Totals</b>	<b>1.63</b>	<b>1.66</b>	<b>1.67</b>	<b>1.67</b>	<b>1.68</b>	<b>1.68</b>	<b>0.45</b>	<b>0.46</b>	<b>0.44</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.03</b>	<b>0.03</b>	<b>0.04</b>

**Appendix 10: Butternut Survey Summary**

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**Appendix 10. Butternut Survey Summary.**

Site	Results of 2006 Survey	Last Recorded Observation Prior to 2006 Survey	GPS Co-ordinates (NAD 83)
AW1	located in 2005 in good condition	NAS database 2000	06173881 4826568
CC1/MY1	not located MJ* 28/09/05	NAS database 1980	
CE12/SV12	not located MJ 22/07/05	duToit Associates Limited and Ecoplans Limited (1977)	
CE7	not located MJ 11/08/06	City of Mississauga (1976)	
CL16	located in 2005: 60cm, 50 cm, 45cm, 15cm dbh infected with canker; 80cm dbh almost dead	NAS database 1998, HBT AGRA Limited (1993)	0612831 4819960; 0612825 4819985
CL24	not located MJ 29/07/05	NAS database 1999	
CL26	not located MJ 29/07/05	NAS database 1995	
CL31	not located MJ 29/07/05; planted?	NAS database 2004	
CL52	not located MJ 29/07/05; planted?	NAS database 1995	
CL9	not located MJ 22/07/05	Macdonald (1970)	
CRR1	located in 2005: 35cm; 25cm; 35cm; 25cm; 15cm; all infected with canker	Ecologistics Limited (1979)	0601986 4831102; 0601961 4831139; 0601954 4831144 ; 0601939 4831138; 0601922 4831212
CRR10	not located MJ 17/08/06	NAS database 2001	
CRR3	not located MJ 13/10/05	NAS database 1998	
CRR5	no access in 2005	City of Mississauga (1976)	
CRR6	located in good condition	NAS database 1998	
CRR7	located in good condition	newly documented during 2005 update survey	0609300 4822010
CV12	located in 2005: 15cm dbh in good condition	Gore & Storrie Limited and R.E. Winter and Associates Limited (1994)	0611875 4827070
CV2	no access in 2005	NAS database 1995	
EM14	not located MJ 11/08/06	NAS database 1995	
EM2	not located MJ 11/08/06	NAS database 1995	

Site	Results of 2006 Survey	Last Recorded Observation Prior to 2006 Survey	GPS Co-ordinates (NAD 83)
EM4	not located MJ 17/08/06	NAS database 1995	
ER6	not located MJ 19/10/05	NAS database 2000	
ETO3	no access in 2005	Weber (1980)	
ETO4	located in 2005 in good condition	NAS database 1995	0611361 4834140
HO9	not located MJ 12/10/05	NAS database 1978	
LV1	located in 2005: 30cm, 10 cm dbh infected with canker	NAS database 1995	0617388 4826569
LV7	not located MJ 13/10/05	NAS database 1999	
MB8/ME8	not located MJ 05/09/06	NAS database 1995	
ME10	not located MJ 24/08/06	MJ 25/07/01, MJ/CZ 15/06/95	
MI7	no access in 2005	NAS database 1999	
MV2	not located MJ 12/10/05	Gartner Lee Limited (1994)	
NE6	Not located MJ 07/09/06	NAS database 1995	
NE9	located in 2005: 2 dead trees possibly butternut	NAS database 2002	0610715 4840455
SD1	not located MJ 29/07/05	Dougan & Associates (2003)	
SD7	located in 2005: 45cm dbh infected with canker	NAS database 1999	0611951 4816431
SV1	not located MJ 22/07/05	City of Mississauga (1976)	

\*Observations made by Mary Ann Johnson

**Appendix 11: Provincially Significant Native Flora Species**

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**Appendix 11. Provincially significant native flora species.**

These species are also documented for the City of Mississauga. Provincial rarity status follows (NHIC 2004). Rarity ranks are defined in Appendix 4).

Scientific Name	Common Name	G Rank	S Rank	MNR	COSEWIC	Reg Rank	Location
<i>Astragalus neglectus</i> (Torr. & A. Gray) E. Sheld.	Coopers Milkvetch	G4	S3			1	CRR6
<i>Aureolaria flava</i> (L.) Farw.	Yellow False-foxglove	G5	S3			1	CRR7
<i>Carex amphibola</i> Steud.	Narrow-leaved Sedge	G5	S2			1	CRR6
<i>Carex gracilescens</i> Steud.	Slender Wood Sedge	G5?	S3			1	CRR8
<i>Juglans cinerea</i> L.	Butternut	G3G4	S3?	END	END	3	34 natural areas
<i>Mertensia virginica</i> (L.) Pers. ex Link	Bluebells	G5	S3			1	Clarkson-Lorne Park
<i>Muhlenbergia sylvatica</i> (Torr.) Torr. ex A. Gray var. <i>sylvatica</i>	Woodland Satin Grass	G5	S2			1	EM4, ETO3
<i>Oenothera clelandii</i> W. Dietr., Raven & W.L. Wagner	Clelands Evening-primrose	G3G5	S1			1	Clarkson-Lorne Park
<i>Panax quinquefolius</i> L.	American Ginseng	G3G4	S2		END	2	mentioned in Peel Flora
<i>Potentilla paradoxa</i> Nutt.	Bushy Cinquefoil	G5	S3			1	Lake Ontario shoreline

**Appendix 12: Updated CVC Bird Species of Conservation Interest**

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**Appendix 12: Updated CVC Bird Species of Conservation Interest.**

Updated list of Credit River Watershed birds of conservation interest documented for the City of Mississauga including migrant and wintering species listed alphabetically by common name. An asterisk indicates an historical record. Rarity status follows (NHIC 2006). Rarity ranks are defined in Appendix 4. The city wide notation applies to birds which have been found in more than ten locations within the city.

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Breeding Status	Location
Acadian flycatcher	<i>Empidonax vireescens</i>	G5	S2B,SZN	END	END	migrant	CL9
alder flycatcher	<i>Empidonax alnorum</i>	G5	S5B,SZN			possible	CRR10
American bittern	<i>Botaurus lentiginosus</i>	G4	S4B,SZN			possible	CRR9
American black duck	<i>Anas rubripes</i>	G5	S5B,SZN			possible	ETO8
American coot	<i>Fulica americana</i>	G5	S4B,SZN	NAR	NAR	migrant	CL9
American redstart	<i>Setophaga ruticilla</i>	G5	S5B,SZN			probable	CL16, CRR6, MB6
bank swallow	<i>Riparia riparia</i>	G5	S5B,SZN			possible	CRR8, ETO4
barn swallow	<i>Hirundo rustica</i>	G5	S5B,SZN			confirmed	city wide
barred owl	<i>Strix varia</i>	G5	S4S5			migrant	CL9
belted kingfisher	<i>Ceryle alcyon</i>	G5	S5B,SZN			probable	CL9, Credit River, MV2, ETO4, ETO5, CRR7, CRR8
black tern	<i>Chlidonias niger</i>	G4	S3B,SZN	NAR	SC	migrant	CL9
black-and-white warbler	<i>Mniotilta varia</i>	G5	S5B,SZN			migrant	CL39, CL9, CRR10, EC13, EM4, LV7, MV2, PC1, SDI
blackburnian warbler	<i>Dendroica fusca</i>	G5	S5B,SZN			migrant	CL9, CRR10, EM4, CRR6, LV7
black-crowned night-heron	<i>Nycticorax nycticorax</i>	G5	S3B,SZN			probable	Credit River, Etobicoke Creek, ETO7
black-throated blue warbler	<i>Dendroica caerulescens</i>	G5	S5B,SZN			migrant	CL9, CRR10, EC13, EM4, LV7, SD1
black-throated green warbler	<i>Dendroica virens</i>	G5	S5B,SZN			migrant	CL9, CM12, CRR10, CRR6, EM4, MV2, SD1
blue-gray gnatcatcher	<i>Poliophtila caerulea</i>	G5	S4B,SZN			possible	CL9, CRR6, CRR10, CRR6, LV7, PC1, SD1
blue-winged warbler	<i>Vermivora pinus</i>	G5	S4B,SZN			migrant	CL9
bobolink	<i>Dolichonyx oryzivorus</i>	G5	S4B,SZN			probable	CRR2, EC13, MV2

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Breeding Status	Location
broad-winged hawk	<i>Buteo platypterus</i>	G5	S5B,SZN			migrant	CL9
brown creeper	<i>Certhia americana</i>	G5	S5B,SZN			probable	LV7
brown thrasher	<i>Toxostoma rufum</i>	G5	S5B,SZN			probable	CL16, CRR10, EC13, SD4, CRR6
Canada warbler	<i>Wilsonia canadensis</i>	G5	S5B,SZN			possible	CL8, CRR3
Carolina wren	<i>Thryothorus ludovicianus</i>	G5	S3S4			probable	CL9, Credit River, LV3, MI7, SD1, CRR6, CRR10
Caspian tern	<i>Sterna caspia</i>	G5	S3B,SZN	NAR	NAR	migrant	CL9, PC1
chestnut-sided warbler	<i>Dendroica pensylvanica</i>	G5	S5B,SZN			possible	CL39
chimney swift	<i>Chaetura pelagica</i>	G5	S5B,SZN			probable	AW3, CL42, Credit River, Etobicoke Creek, LV7, SP3, CRR7, CRR10
clay-colored sparrow	<i>Spizella pallida</i>	G5	S4B,SZN			probable	EC13
cliff swallow	<i>Petrochelidon pyrrhonota</i>	G5	S5B,SZN			possible	CRR10, CRR2, ETO4, RW6
common grackle	<i>Quiscalus quiscula</i>	G5	S5B,SZN			probable	city wide
common merganser	<i>Mergus merganser</i>	G5	S5B,SZN			possible	CRR8
common moorhen	<i>Gallinula chloropus</i>	G5	S4B,SZN			migrant	CL9
common nighthawk	<i>Chordeiles minor</i>	G5	S4B,SZN			possible	SD1
common snipe	<i>Gallinago gallinago</i>	G5	S5B,SZN			migrant	EC13
common tern	<i>Sterna hirundo</i>	G5	S4B,SZN	NAR	NAR	migrant	Lake Ontario shoreline
Connecticut warbler	<i>Oporornis agilis</i>	G4	S4B,SZN			migrant	CL9
Coopers hawk	<i>Accipiter cooperii</i>	G5	S4B,SZN	NAR	NAR	probable	ETO4, SD1, LS1, EM30
dark-eyed junco	<i>Junco hyemalis</i>	G5	S5B,SZN			wintering	city wide
eastern kingbird	<i>Tyrannus tyrannus</i>	G5	S5B,SZN			probable	city wide
eastern meadowlark	<i>Sturnella magna</i>	G5	S5B,SZN			probable	CRR2, EC13
eastern towhee	<i>Pipilo erythrophthalmus</i>	G5	S4B,SZN			possible	CRR1, EC13
eastern wood-pewee	<i>Contopus virens</i>	G5	S5B,SZN			probable	city wide
evening grosbeak	<i>Coccothraustes vespertinus</i>	G5	S5B,SZN			migrant	MI1, CL9
gadwall	<i>Anas strepera</i>	G5	S4B,SZN			migrant	Lake Ontario shoreline

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Breeding Status	Location
golden-crowned kinglet	<i>Regulus satrapa</i>	G5	S5B,SZN			migrant	CL9, EC13, EM4, LV3, PC1, SD1, SD7
golden-winged warbler	<i>Vermivora chrysoptera</i>	G4	S4B,SZN			migrant	CL9, CRR10
grasshopper sparrow	<i>Ammodramus savannarum</i>	G5	S4B,SZN			confirmed	ETO3
gray catbird	<i>Dumetella carolinensis</i>	G5	S5B,SZN			probable	city wide
great blue heron	<i>Ardea herodias</i>	G5	S5B,SZN			possible	CRR10, CRR11
green-winged teal	<i>Anas crecca</i>	G5	S4B,SZN			probable	EC13
hairy woodpecker	<i>Picoides villosus</i>	G5	S5			probable	CL9, Credit River, LV3, LV7, CRR6, CRR7, CRR8, CRR10, MB6
herring gull	<i>Larus argentatus</i>	G5	S5B,SZN			probable	CL9
hooded merganser	<i>Lophodytes cucullatus</i>	G5	S5B,SZN			possible	Lake Ontario shoreline
horned lark	<i>Eremophila alpestris</i>	G5	S5B,SZN			probable	EC13, MV2
killdeer	<i>Charadrius vociferus</i>	G5	S5B,SZN			probable	city wide
least bittern	<i>Ixobrychus exilis</i>	G5	S3B,SZN	THR	THR	migrant	CL9
least flycatcher	<i>Empidonax minimus</i>	G5	S5B,SZN			possible	CRR10, CRR2, CRR9
loggerhead shrike	<i>Lanius ludovicianus</i>	G5	S2B,SZN	END	END	migrant	CL9
magnolia warbler	<i>Dendroica magnolia</i>	G5	S5B,SZN			possible	CRR10
marsh wren	<i>Cistothorus palustris</i>	G5	S5B,SZN			possible	CL9
mourning warbler	<i>Oporornis philadelphia</i>	G5	S5B,SZN			possible	CL9, CRR10, CRR3, CRR7
Nashville warbler	<i>Vermivora ruficapilla</i>	G5	S5B,SZN			migrant	5 sites
northern goshawk	<i>Accipiter gentilis</i>	G5	S4	NAR	NAR	probable	CRR3
northern harrier	<i>Circus cyaneus</i>	G5	S4B,SZN	NAR	NAR	probable	ETO3
northern mockingbird	<i>Mimus polyglottos</i>	G5	S4B,SZN			possible	CL21, LV1, MV2, NE1
northern saw-whet owl	<i>Aegolius acadicus</i>	G5	S4B,SZN			wintering	HO9, MI1
northern waterthrush	<i>Seiurus noveboracensis</i>	G5	S5B,SZN			migrant	CL9, CRR10, EC13, EM4
orchard oriole	<i>Icterus spurius</i>	G5	SZB,SZN			migrant	EC13
osprey	<i>Pandion haliaetus</i>	G5	S4B,SZN			migrant	CL9, CRR1, EC13, LS1

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Breeding Status	Location
ovenbird	<i>Seiurus aurocapillus</i>	G5	S5B,SZN			possible	CRR10
peregrine falcon	<i>Falco peregrinus anatum</i>	G4T3	S2S3B,SZN	END	END-R	confirmed	CC1/MY1
pie-billed grebe	<i>Podilymbus podiceps</i>	G5	S4B,SZN			migrant	Lake Ontario shoreline
pileated woodpecker	<i>Dryocopus pileatus</i>	G5	S4S5			probable	CL1, CRR10, CRR8, MV18, SD5, CRR6
pine siskin	<i>Carduelis pinus</i>	G5	S5B,SZN			migrant	CL9
pine warbler	<i>Dendroica pinus</i>	G5	S5B,SZN			probable	CL39, CRR10, CRR6, CRR7, CRR8, CV2, CV6, MI17, EM4
purple finch	<i>Carpodacus purpureus</i>	G5	S5B,SZN			possible	CRR10
purple martin	<i>Progne subis</i>	G5	S4B,SZN			possible	CL42, CL9
red-breasted nuthatch	<i>Sitta canadensis</i>	G5	S5B,SZN			probable	CL24, CL39, CRR10, CRR6, CRR7, CRR8, CV2, CV6, MI17, EM4
red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	G5	S3B,SZN	SC	SC	possible	CRR10
red-shouldered hawk	<i>Buteo lineatus</i>	G5	S4B,SZN	SC	SC	confirmed	LV7*, MV2
ruffed grouse	<i>Bonasa umbellus</i>	G5	S5			possible	CL9
savannah sparrow	<i>Passerculus sandwichensis</i>	G5	S5B,SZN			probable	CRR10, CRR2, EC13, MV2, NE1, NE9, SP1, CM25, WB1, LS1
scarlet tanager	<i>Piranga olivacea</i>	G5	S5B,SZN			possible	CRR10, MB6
sharp-shinned hawk	<i>Accipiter striatus</i>	G5	S5B,SZN	NAR	NIAC	possible	SD1
short-eared owl	<i>Asio flammeus</i>	G5	S3S4B,SZN	SC	SC	migrant	CL9
turkey vulture	<i>Cathartes aura</i>	G5	S4B,SZN			migrant	CL9, CM7, CRR1, CRR8, EC13, LV7, MV2
upland sandpiper	<i>Bartramia longicauda</i>	G5	S4B,SZN			confirmed	ETO3
veery	<i>Catharus fuscescens</i>	G5	S4B,SZN			migrant	CL9, CRR10, HO9, LV7
vesper sparrow	<i>Poocetes gramineus</i>	G5	S4B,SZN			probable	EC13, MV2
white-throated sparrow	<i>Zonotrichia albicollis</i>	G5	S5B,SZN			migrant	CL9, CRR6, EC13, EM4, HO3, MV2, PC1, LV7, CRR10, SD7, MB6 (possible)

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Breeding Status	Location
winter wren	<i>Troglodytes troglodytes</i>	G5	S5B,SZN			probable	CL16, CRR10, CRR6
wood thrush	<i>Hylocichla mustelina</i>	G5	S5B,SZN			probable	CL9, CRR10, CRR7, CRR8, ETO8, MV2, NE9, CL16, MB6
yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	G5	S5B,SZN			probable	CL16
yellow-billed cuckoo	<i>Coccyzus americanus</i>	G5	S4B,SZN			possible	CL8, CL9, NE4, CRR6
yellow-rumped warbler	<i>Dendroica coronata</i>	G5	S5B,SZN			migrant	city wide

**Appendix 13: Updated Provincial Fauna Rarity**

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**Appendix 13. Updated provincially significant native fauna species.**

These species are also documented for the City of Mississauga, and include migrant and wintering bird species. Rarity status follows (NHIC 2004). Rarity ranks are defined in Appendix 4 of the Natural Areas Survey (Geomatics 1996).

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Historical	Notes
<b>Birds</b>							
red-necked grebe	<i>Podiceps grisegena</i>	G5	S3B,SZN	NAR	NAR		migrant
horned grebe	<i>Podiceps auritus</i>	G5	S1B,SZN		DD		migrant
red-throated loon	<i>Gavia stellata</i>	G5	S1S2B,SZN				migrant
great black-backed gull	<i>Larus marinus</i>	G5	S2B,SZN				wintering
Caspian tern	<i>Sterna caspia</i>	G5	S3B,SZN	NAR	NAR		migrant
Arctic tern	<i>Sterna paradisaea</i>	G5	S2S3B, SZN				accidental
black tern	<i>Chlidonias niger</i>	G4	S3B,SZN	NAR	SC		migrant
redhead	<i>Aythya americana</i>	G5	S2B,SZN				migrant
canvasback	<i>Aythya valisineria</i>	G5	S1B,S2N				wintering
greater scaup	<i>Aythya marila</i>	G5	S2B,SZN				wintering
bufflehead	<i>Bucephala albeola</i>	G5	S3B,SZN				wintering
long-tailed duck	<i>Clangula hyemalis</i>	G5	S2S3B,SZN				wintering
white-winged scoter	<i>Melanitta fusca</i>	G5	S1S2B,SZN				migrant
surf scoter	<i>Melanitta perspicillata</i>	G5	S1B, SZN				migrant
ruddy duck	<i>Oxyura jamaicensis</i>	G5	S2B,SZN				migrant
king eider	<i>Somateria spectabilis</i>	G5	S1B,SZN				migrant
tundra swan	<i>Cygnus columbianus</i>	G5	S3B,SZN				migrant
least bittern	<i>Ixobrychus exilis</i>	G5	S3B,SZN	THR	THR		migrant
great egret	<i>Casmerodius albus</i>	G5	S2B,SZN				migrant
black-crowned night-heron	<i>Nycticorax nycticorax</i>	G5	S3B,SZN				CRR4, ETO7, CRR9

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Historical	Notes
Wilson's phalarope	<i>Phalaropus tricolor</i>	G5	S3B,SZN			Yes	migrant
short-billed dowitcher	<i>Limnodromus griseus</i>	G5	S2S3B,SZN				migrant
stilt sandpiper	<i>Calidris himantopus</i>	G5	S2S3B,SZN				migrant
dunlin	<i>Calidris alpina</i>	G5	S3B,SZN				migrant
short-eared owl	<i>Asio flammeus</i>	G5	S3S4B,SZN	SC	SC		migrant
red-shouldered hawk	<i>Buteo lineatus</i>	G5	S4B,SZN	SC	SC		MV2, LV7
rough-legged hawk	<i>Buteo lagopus</i>	G5	S1B,SZN	NAR	NAR		wintering
peregrine falcon	<i>Falco peregrinus anatum</i>	G4T3	S2S3B,SZN	THR	END-R		migrant
red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	G5	S3B,SZN	SC	SC		CRR10
Acadian flycatcher	<i>Empidonax vireescens</i>	G5	S2B,SZN	END	END		migrant
northern shrike	<i>Lanius excubitor</i>	G5	S2S3B,SZN				wintering
loggerhead shrike	<i>Lanius ludovicianus</i>	G5	S2B,SZN	END	END		migrant
yellow-breasted chat	<i>Icteria virens</i>	G5	S2S3B,SZN	SC	SC	Yes	HO9
prothonotary warbler	<i>Protonotaria citrea</i>	G5	S1S2B,SZN	END	END		migrant
<b>Reptiles and Amphibians</b>							
Jefferson/blue-spotted salamander complex	<i>Ambystoma jeffersonianum</i>	G4	S2	THR	THR		LV7, CRR6
Blanding's turtle	<i>Emydoidea blandingi</i>	G4	S3		THR		CL9
wood turtle	<i>Clemmys insculpta</i>	G4	S2	END	SC	Yes	ETO7
common map turtle	<i>Graptemys geographica</i>	G5	S3	SC	SC		CL9, CRR9, CRR8
eastern hognose snake	<i>Heterodon platirhinus</i>	G5	S3	THR	THR	Yes	CL9
eastern milk snake	<i>Lampropeltis triangulum triangulum</i>	G5	S3	SC	SC		CL9, CM7, CRR3, CRR4, CRR5, CRR7, CRR9, ETO4, ETO7, ME12
ribbon snake	<i>Thamnophis sauritus</i>	G5	S3	SC	SC		unknown

**Appendix 14: Amphiban Surveys for 2006**

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## Appendix 14: Amphibians Surveys for 2006.

Date/Weather	NAS	Species	Observations
<b>March 11<sup>th</sup>, 2100</b> - approximately 4 - 8° C, warm weather after rain on March 9 <sup>th</sup> and 10 <sup>th</sup>	CRR10, CRR6	None found	- soils frozen - pond in CRR6 open (Erindale pond) - ponds in CRR10 completely frozen
<b>March 13<sup>th</sup>, 2100</b> + 15° C after rain on March 11 and 12			- soils thawed at edge of pond - some ice at bottom of pond
<b>March 26<sup>th</sup>, 2100</b> + 4° C rain mixed with snow (March 24 and 25)			- pond in CRR6 completely open - soils only slightly frozen
<b>March 31<sup>st</sup>, 2100</b> + 10 - 15° C all week, rain in pm	CRR10	- 15 spotted salamander ( <i>Ambystoma maculatum</i> ) on Zaichuk Terrace	- seen at Mississauga Garden Park site (north of Burnhamthorpe) - pond is very small, 3 x 5 m but very deep (>50 cm) and is full of small woody debris and algae
	CM25	- 4 <i>A. maculatum</i> - 1 cluster of spermatophores (10 total)	- pond east of 10 <sup>th</sup> Line - pond is 20 x 30 m, approximately 60 cm deep
<b>April 4<sup>th</sup>, 2100</b> + 0 - 2° C	CRR6	- 3 adult Jefferson salamander ( <i>A. jeffersonianum</i> x) (on basis of morph only) - 4 clusters of ~10 spermatophores - no frogs heard	- found at southern and deepest end of pond - pond is 20-30 m long, approximately 40-50 cm deep at south end only, and approximately 20 cm at north end
<b>April 6<sup>th</sup>, 2100</b> + 10° C	CRR6, CRR10, CM25, EM30	- 1 adult, male <i>A. jeffersonianum</i> x (identification by morph only), - 1 <i>A. maculatum</i> egg mass noted in pond on Zaichuk Terrace (CRR10) - no frogs heard	- additional inspection to recheck salamander presence and numbers - EM30 pond is approximately 20 x 30 m, 10-30 cm deep, buttonbush swamp
<b>April 7<sup>th</sup>, 2100</b> + 4° C, rain during day	CRR6	- 5 <i>A. maculatum</i> - 1 female wood duck in east portion of Principal's Pond - no frogs heard	- pond is ~ 1 m deep, very cold, abundant twigs and leaf litter suspended in water

Date/Weather	NAS	Species	Observations
April 13 <sup>th</sup> , 1300 + 15° C	CRR6	- <i>A. maculatum</i> found under log at north end of Erindale Pond - 3 eastern redback salamanders ( <i>Plethodon cinereus</i> ) found under logs around pond, egg clusters also found	- daytime visit with CVC to put out coverboards
April 18 <sup>th</sup> , 2000 + 15° C	CRR6, CRR10	- no frogs heard	
April 18 <sup>th</sup> + 15° C	ME12, ME11, CM9, CRR7	- no frogs heard at ME12 or ME11 - no frogs heard at CRR7 - chorus frogs code 2, 1 leopard frog, 1 American toad at CM9 - 1 spring peeper at pond in woodlot east of 10 <sup>th</sup> line; CM25 - no frogs in schoolyard pond to west of 10 <sup>th</sup> Line (note that green frogs heard later in the year during the bird surveys)	- checked ponds at Lake Waubukayne (ME12), Lake Aquitaine (ME11), CM9, ponds off 10 <sup>th</sup> Line, CRR7
April 27 <sup>th</sup> + 6° C	LS1	- no frogs heard	

Note: reference pond for frog surveys in Aberfoyle, Ontario: spring peepers were heard in this pond on all frog survey nights