Corporate Report

Clerk's Files

Originator's Files EC.10.ENV (2008)

DATE: April 14, 2009

TO: Chair and Members of Planning and Development Committee
Meeting Date: May 4, 2009

FROM: Edward R. Sajecki
Commissioner of Planning and Building

SUBJECT: **Natural Areas Survey 2008 Update**

RECOMMENDATION:

1. That the report titled "*Natural Areas Survey 2008 Update,* dated April 14, 2009, from the Commissioner of Planning and Building be received for information.

2. That the report titled "*Natural Areas Survey 2008 Update",* dated April 14, 2009, from the Commissioner of Planning and Building, be forwarded, by the City Clerk, to the Region of Peel, Conservation Halton, Credit Valley Conservation and Toronto and Region Conservation.

BACKGROUND:

The City of Mississauga's goals with respect to the natural environment, as stated in Mississauga Plan, are to protect and maintain significant natural heritage systems, promote an ecosystem approach to planning and be proactive in the management and protection of its natural areas and features. The City's objective is "to identify and promote the preservation, enhancement, remediation and restoration of the Natural Areas System".

The Natural Areas System consists of natural areas, residential woodlands, special management areas and linkages, having a total coverage of 2,675 hectares (6,610 acres) or approximately 9% of the total City area.

The Natural Areas System is based on the Natural Areas Survey (NAS) data base. The NAS data base includes detailed information on natural areas and residential woodlands, such as Provincial and Conservation Authority designations (Wetlands, Areas of Natural and Scientific Interest, Environmentally Sensitive Areas and Environmentally Significant Areas), Provincially significant flora and fauna species, and types of vegetation communities and their sizes. Information on natural area and residential woodland sites is also maintained in a series of fact sheets and detailed maps delineating vegetation communities, which are posted on the City's Environmental Planning webpage.

Each year, natural features in different quadrants of the City are reviewed to update the NAS data base with information on floristics, fauna, site condition, boundary changes and management needs. In 2008, Wards 1 and 2 were reviewed, as well as some additional natural areas throughout the City, where new information had been documented since the previous year's update. The project work for the NAS updates also includes the identification of potential sites for expanding the Natural Areas System. The selection of potential sites is based on the presence of native vegetation and location relative to the current Natural Areas System.

COMMENTS:

The study titled "Natural Areas Survey 2008 Update" (attached under separate cover), provides detailed scientific information on the condition of the natural areas surveyed and an overview of the changes to the City's Natural Areas System. The principal findings are summarized as follows:

- Natural areas identified in the NAS increased in 2008 by 89 hectares (219 acres) to 2,075 hectares (5,129 acres) or approximately 7.3% of the total City area. The increase is related to refining natural area boundaries and the addition of new natural areas proposed in the Natural Areas Survey 2007 Update report;

- The majority of natural areas (80.1%) are located within valley landform features where development is already restricted due to the presence of natural hazards such as flooding and erosion. Natural areas located on tableland landform features decreased from 16.4% in 1996 to 14.7 % in 2007 but increased to 15.1% in 2008. Since tableland natural areas contain distinct ecosystems

and since they account for such a small portion of natural areas, there is a need to continue to place a high priority on their protection and management. The proportion of natural areas associated with wetlands has remained more or less constant from 1996 with only a slight decrease from 5.0% to 4.8 % in 2008;

- Generally, the natural areas within the City that were surveyed in 2008 were in fair condition. Moderate disturbances associated with a few trails, limited dumping and some trampling, were noted; and

- There has been a continual increase in the proportion of non-native to native plant species in the natural areas surveyed between 1996 and 2008. Without active management, the invasion of species such as Norway Maple, Garlic Mustard, European Buckthorn, Purple Loosestrife and others will result in the loss of native plant species in a number of natural areas. In 2008, Giant Hogweed, a non-native species which has some associated human health risks related to the contact of skin with the sap of the plant, was noted for the first time in 3 natural areas (CL8, CL24, CL 31).

The report concludes that several trends have emerged based on the information collected over the past few years of updates that show a general decline in the quality, type and location of natural vegetation. This reinforces the need to protect, maintain and manage, and where possible restore, the remaining natural areas in the City.

The report also concludes that one positive trend is the naturalization projects undertaken by the City and that continued efforts to protect and increase the proportion of the City occupied by natural habitat will promote biodiversity and reinforce the goals and objectives of the natural areas program as set out in the original Natural Areas Survey (1996) study.

The report recommendations include the protection and management of natural areas to maintain or increase biodiversity through site specific conservation plans, community stewardship initiatives and a strategy to address non-native species.

The "Natural Areas Survey 2008 Update" report was received by the Environmental Advisory Committee (EAC) at its meeting on April 7, 2009. EAC noted the need for measures to protect the remaining natural areas which have zoning that may permit development.

Further, EAC recommends that an appropriate target number for increasing the area of the City's Natural Areas System be established. Staff informed EAC that a work plan to update the existing natural heritage strategy is being prepared. It is anticipated that the scope of work will include the identification of additional measures for the long term protection of natural areas and targets for enhancement of the City's Natural Areas System.

FINANCIAL IMPACT: Not Applicable.

CONCLUSION: The information from the annual NAS update is used to monitor and develop strategic and planning policies and to ensure that the Natural Heritage Policies and Schedule 3: Environmental Areas, in Mississauga Plan are current. The NAS information assists in the management of natural areas by facilitating decisions on appropriate uses, protection measures and priority for acquisition.

ATTACHMENTS: Under separate cover: Natural Areas Survey 2008 Update (Report)

Original Signed By:

Edward R. Sajecki
Commissioner of Planning and Building

Prepared By: Eva Kliwer, Policy Planner, City Wide Planning

City of Mississauga

Natural Areas Survey

2008 Update

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STUDY TEAM

North-South Environmental Inc.

Mirek Sharp	project manager, report editor
Nancy Falkenberg	fieldwork manager, fieldwork, database update, report author
Sarah Piett	fieldwork, database update, report author
Sarah Mainguy	fieldwork

City of Mississauga

Eva Kliwer	project supervisor
Nick Biskaris	digital map preparation, database update

EXECUTIVE SUMMARY

The intent of updating the Natural Areas Survey is to review the current status of natural areas and update information on flora, fauna, impacts, boundary changes and management needs. The Natural Areas Survey for the City of Mississauga (Geomatics 1996) identified one hundred and forty-four sites that represented the best remaining natural features in the City. Of these 144 sites, 141 were classified as natural areas (Significant Natural Sites, Natural Sites, or Natural Green Spaces), and three were classified as Residential Woodlands. Also identified were 55 Special Management Areas (SMAs) and 40 Linkages. With the completion of the 2008 update, the third round of reviews of the City Wards continues. In 2008 natural areas in Wards 1 and 2 were updated.

In 1996, the 141 natural areas comprised 7.10% of the total area of the City. The total number of natural areas decreased from 141 in 1996 to 136 in 2004 and has since increased to 138 in 2008. This decrease in the number of natural areas and alterations to natural sites equates to a loss of almost 159.3 ha from 1996 to 2006, however, since 2006 there has been an increase of 51.5 ha in 2007, followed by a further increase of 89.6 ha in 2008. This increase can be attributed to the inclusion of additional areas into the natural areas system in 2008. There has also been a reduction in the number of Special Management Areas and Linkages to 42 and 29, respectively.

The natural areas in the City have been grouped into three major landform types (valleyland, tableland, and wetland). In 2006, 80.1% of the natural areas were associated with valleylands and this has remained the same in 2008; overall, this proportion has increased from 78.3% in 1996. In contrast, tablelands only account for 15.12% of the natural areas in 2008. This represents a continued decrease from 16.4% in 1996. From a City-wide perspective, there were steady decreases from 1.16% in 1996 to 0.97% in 2002 of the land base represented in tableland natural areas. From 2002 until 2007 this proportion has remained relatively constant, however it has increased to 1.07% in 2008. 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 natural areas associated with wetlands has remained more or less constant from 1996 with only a slight decrease from 5.0% to 4.78% in 2008. The proportion of the City that is classified as wetland decreased marginally from 0.36% in 1996 to 0.33% in 2002, remained constant from 2002 to 2007, but increased to 0.34% in 2008.

Generally, the condition of natural areas within the City that were surveyed in 2008 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 2008 remained largely unchanged from previous studies. As indicated in all 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 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 ten 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) and wetland habitats. Development between 1996 and 2006 resulted in the total loss of 159.26 ha. In 2007 there was an increase of 51.5 ha, followed by an increase of 89.6 ha in 2008. Almost all of this increase was composed of valleylands, and in part the associated tablelands. One valleyland community, eleven woodland communities, four successional communities and five 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 and one successional 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. This is likely related to 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 2008 have involved leaving an area of un-mowed 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 at Jack Darling Park. In addition, storm water facilities such as Osprey Marsh Wetland off Osprey Boulevard have been constructed in such a way that they foster wildlife habitat, with gradually sloping edges, cattails plantings as well as other wetland plant 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.

1.0 INTRODUCTION

A Natural Areas Survey for the City of Mississauga was undertaken during 1995 and 1996 (Geomatics 1996) which identified 144 natural sites representing the best remaining natural features in the City. Of these natural sites, 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 areas 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 the 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 Survey database current, updates have been undertaken on an annual basis which focused on the areas that may be affected by these developments. In addition, approximately one fourth of the natural areas are reviewed annually, thus every four years all natural areas 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, Wards 3, 4 and 7 were updated in 2005, and Wards 8, 9 and 10 were updated in 2006. In 2007, the third round of updates began with a review of natural areas within Wards 5, 6 and 11. The third round of updates, comprising those natural areas in Wards 1 and 2, was updated in 2008 and is reported herein.

Over the course of the natural areas survey, 156 natural areas have been identified. However as of 2008, 13 sites have been removed from the natural areas survey (*i.e.* PC3, NE2, CM11, *etc.*), eight sites have been combined (MB8/ME8, CC1/MY1, CE12/SV12, and CL1/SD5), and two natural areas have been added (CM25 and ME13). The result is 138 natural areas and three residential woodlands.

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 on a yearly basis. The importance of the Natural Area Survey is that it serves to identify natural areas in the City that should be protected. However, the NAS also serves to document changes to natural areas over time and thus provides the means to assess the impacts of development within the surrounding landscape, and to identify those natural areas that are at most risk. 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 review of 54 natural areas located in Wards 1 and 2. Twenty-four sites were visited in an attempt to locate individual butternut trees (*Juglans cinerea*)

as part of the ongoing program to monitor their presence and health.

A background review was carried out comprising a careful analysis of digital aerial photographs (2007) and a review of reports (inventory reports, EIS, *etc*.) undertaken since the last update study that affected the natural areas reviewed for this survey. Field investigations were carried out at a total of 43 sites (Appendix 3).

2.2 Fieldwork

Visits were made to the 54 field sites included in the Natural Areas review for 2008. Natural areas CL8, CL13, CL15, CL17, CL22, CL39, CL42, CL52, ETO8, HO3, HO6, HO7, LV14, LV2, LV5, LV6, MI1, MI4, MI7, MI17, SD1, SD4, SD5, SD7, SH6, SP1, and SP3 did not receive a field visit because permission to access these sites was not provided, however, these sites generally received a road side visit or were visited by walking along public areas adjacent to the natural areas (*e.g.* streams). Landowner contact for natural areas in private ownership was undertaken by the City Planning and Building Department.

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 1 and 2 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 carry out breeding bird surveys, and a mid-summer visit to document summer flora, disturbances and any other 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 plant 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.

Breeding bird surveys were conducted in the early morning hours (05:00 to 10:00) between June 1 and July 10, 2008 for all of the natural areas in Wards 1 and 2 where road access was available. These surveys follow Breeding Bird Atlas protocol for collecting evidence of possible breeding birds. For most sites, the entire area was covered to detect bird species, but in sites where access was not granted, birds were recorded from as many nearby road access points as possible.

A review of the digital aerial photographs was also made to locate any potential amphibian habitat. An additional visit was made to those sites in the early spring, after 20:00, to locate potential habitat and to look and listen for the presence of any amphibian species. Amphibian surveys followed the Canadian Wildlife Service Marsh Monitoring protocol.

Butternut surveys were conducted in 24 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 Global Positioning System (GPS). 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 2008. Hard copies of species lists and field notes were provided under separate cover to the City.

The provincial rarity ranks for floral and faunal species were also reviewed to determine the need for updating. Provincial rarity status was based on Natural Heritage Information Centre (NHIC 2004) rankings and Species at Risk (Appendix 4). The natural areas summary table for the City has been updated with each survey to allow a comparison between natural areas in the City (see Table 1, page 6).

Floristic Quality Assessment

The Floristic Quality Assessment system allows for an objective, quantitative 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, especially in combination with other site characteristics and evaluation criteria.

The premise upon which the evaluation is based derives from the fundamental character of a region's flora, in particular the specific affinity of individual plant species for a specific habitat. Some plants exhibit conservative characteristics which permits them to 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 Ontario has been assigned a numerical value from 1 to 10 by a group of experts on the provincial flora (Oldham *et al*. 1995). 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. 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 the floral inventory of 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.

Areas with incomplete inventories (*i.e.,* fewer than 30 native species as this number of species is

not considered representative of the site), or ones where just rare plants were surveyed, may provide biased results. The Floristic Quality Assessment was not used for such areas. However, heavily disturbed areas where an inventory of 30 or fewer native species represents a relatively complete inventory were assessed. 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 2008.

Condition

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. 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, *etc.*), and few non-native flora species. A site in poor condition has many disturbances (*e.g.* trails, non-natives, garbage, *etc*.), and has a high percentage of non-native plants. A fair site is intermediate with respect to disturbance and has a medium ratio of native/non-native plants.

Recent disturbances, threats and management needs were noted where they changed from previous assessments between 1996 and 2008. Recommendations for the mitigation of real or potential impacts that resulted from recent developments including naturalization projects are provided.

2.4 Mapping

Boundary changes were determined by comparing the existing boundaries with recent development, as determined from aerial photography. This was accomplished using colour 2007 aerial photographs overlaid with the existing natural area boundaries provided by the City. The boundaries were revised on the aerial photographs to reflect any encroachment from recent development and subsequently field checked, to the extent possible based on access. Boundary delineation followed the approach used in the Natural Areas Survey (Geomatics 1996). Revisions were subsequently digitized using MicroStation GeoGraphics format by the City of Mississauga, Geographic Technology Services. 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 Mississauga. This table 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 2008 using the same categories. Some of the changes outlined in Appendix 5 are minor revisions while others are considered significant in the context of the natural areas program. These changes are noted by increases (↑) or decreases (↓) for each of the above noted categories, from year to year. 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); or
- the addition or deletion of a vegetation community.

Figure 1 (page 17) shows the location of natural areas, Special Management Areas (SMA), Residential Woodlands (RW), and Linkages. Any additions to the natural areas are proposed based on a visual inspection of the digital aerial photographs from the City and cursory site checks. Upon City approval, a field investigation would be completed the following field season. 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". However, Residential Woodlands, Special Management Areas, Linkages and any Proposed Additions, are identified.

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 found in Appendix 4. Credit Valley Conservation (CVC) bird species of conservation interest are listed in Appendix 3. Condition is explained in section 2.3. Abbreviations used in this table are as follows: n/a = not available. (see Appendix 5 for a summary of the changes). One-hundred and fifty-six natural areas are documented within this table. However, 13 sites have been removed from the natural areas survey, eight sites have been combined (MB8/ME8, CC1/MY1, CE12/SV12, and CL1/SD5), and two natural areas have been added (CM25 and ME13). The result is 138 natural areas and three residential woodlands.

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	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
SD1	Significant Natural Site		19.80	48.93	199	84	42.21%	39.72	3.70	6	1	14	114	7	2		6	Fair
SD4	Natural Site		24.53	60.61	106	24	22.64%	31.69	3.50	6		2	13				2	Fair
SD5	Significant Natural Site		10.17	25.13	97	24	24.74%	35.23	4.12	3	1	5	16	3	1		2	Good
CL52	Natural Site		8.93	22.07	73	43	58.90%	14.61	2.67	1	1		25	1	2		3	Poor
CL1	Significant Natural Site		3.35	8.28	109	25	22.94%	37.21	4.06	1		9	16	1	1		2	Good
CL9	Significant Natural Site	ESA,ANSI,wetland	45.78	113.12	519	171	32.95%	81.93	4.39	13	1	143	203	29	21	3	14	Good
CL8	Significant Natural Site	wetland	12.26	30.29	108	33	30.56%	30.60	3.53	8	1	12	30	10	1		5	Good
CL15	Natural Site		0.77	1.90	54	9	16.67%	25.79	3.84	1		3	12	3			1	Fair
CL16	Significant Natural Site		15.20	37.56	189	53	28.04	48.30	4.29	6	1	29	47	17			6	Fair - Poor
CL17	Residential Woodland		32.09	79.30	125	36	28.80%	23.95	4.45	1		24	19	2	4			n/a
CL13	Natural Site		6.18	15.27	135	77	57.04%	20.71	2.72	3		5	16	6			1	Poor
CL43	Natural Site		4.19	10.35	162	48	29.63%	43.27	4.05	2		19	20	2			1	Fair - Poor
CL42	Natural Site		8.20	20.26	124	37	29.84%	37.74	4.05	3		12	22	1			4	Fair - Poor
CL21	Significant Natural Site	ESA,wetland	9.87	24.39	165	47	28.48%	46.49	4.28	3	1	25	21	3	2		3	Fair - Poor
CL39	Significant Natural Site		12.81	31.65	302	93	30.79%	60.11	4.16	3		48	39	6	8		7	Fair
CL22	Significant Natural Site	ESA,ANSI	17.85	44.12	147	50	34.01%	38.58	3.92	1	1	13	9	1	6			Good
CL30	Significant Natural Site	ESA,ANSI	0.06	0.15	83	33	39.76%	27.86	3.94	1	1	20	1					Fair

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	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
CL31	Significant Natural Site	ESA,ANSI	2.82	6.97	101	42	41.58%	26.30	3.42	1	1	2	10	1				Poor
CL24	Significant Natural Site	ESA,ANSI	8.08	19.97	257	69	26.85%	60.93	4.44	5	1	39	23	2	1		3	Good
CL26	Significant Natural Site		1.95	4.82	198	71	35.86%	38.78	3.44	1	1	21	21	7				Fair
PC1	Natural Site		1.07	2.64	143	71	49.65%	29.88	3.57	1	1	10	71	1			1	Poor
PC2	Natural Green Space		4.35	10.75	93	50	53.76%	18.74	3.31	1		6	11		1			Poor
PC3	Removed		0.00	0.00	11	3	27.27%	0.00	0.00	1								Removed
CRR9	Significant Natural Site	ESA,ANSI,wetland	26.10	64.49	50	18	36.00%	20.86	3.69	3		17	41	1	10	2	9	Fair
MI4	Residential Woodland		153.81	380.07	37	18	48.65%	9.45	3.57	1		1	13					Fair
MI1	Natural Site		6.83	16.88	68	42	61.76%	8.50	3.80	4			52	5			2	Fair
LV3	Natural Site		3.99	9.86	137	56	40.88%	33.22	3.69	5		6	37	3			4	Fair
LV4	Natural Site		3.09	7.64	111	60	54.05%	20.85	2.92	5		8	25	2			1	Poor
LV5	Natural Green Space		1.39	3.43	123	66	53.66%	24.27	3.21	1		11		2	2			Poor
LV2	Natural Site		2.14	5.29	40	13	32.50%	13.09	2.52	1			12	1			2	Poor
LV1	Significant Natural Site		15.41	38.08	127	48	37.80%	29.70	3.34	5	1	1	30	5			5	Fair
ETO8	Significant Natural Site		15.87	39.22	133	45	33.83%	37.09	3.95	4	1	7	32	6	1		5	Fair
LV14	Natural Site		2.34	5.78	51	24	47.06%	15.20	2.93	1			10				1	Poor
LV6	Natural Site		2.38	5.88	83	24	28.92%	29.94	3.90	1		5	9	1			1	Fair
LV7	Significant Natural Site	ESA,ANSI,wetland	21.84	53.97	339	110	32.45%	64.33	4.26	2	1	63	68	7	5	1	5	Good
ETO7	Significant Natural Site	ESA	31.09	76.82	145	53	36.55%	31.73	3.31	3		9	34	5	12	3	2	Fair
SP1	Natural Site		7.17	17.70	197	80	40.61%	39.57	3.66	5		17	42	8			4	Fair
SP3	Significant Natural Site		8.77	21.67	141	34	24.11%	40.99	3.96	5		11	16	2	1		2	Good
SH6	Natural Site		7.52	18.58	144	69	47.92%	29.33	3.39	4		4	13	3			1	Poor
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 Code	Classification	Designation	Area		Flora								Fauna					Condition
			(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
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
ER6	Significant Natural Site		1.29	3.19	59	26	44.07%	19.50	3.39	1	1		9	1			1	Poor
CRR6	Significant Natural Site	ESA,ANSI	137.55	339.75	302	97	32.12%	66.11	4.62	4	2	73	74	8	18	1	16	Good
CV1	Natural Site		1.65	4.09	61	25	40.98%	17.50	2.92	2			11	1				Fair
CV2	Residential Woodland		49.53	122.33	143	42	29.37%	41.29	4.11	1	1	10	17	4			3	Fair
CV12	Significant Natural Site		7.44	18.37	227	101	44.49%	39.73	3.54	4	1	17	17	2	1		3	Fair
CV10	Natural Site		5.05	12.47	85	37	43.53%	21.94	3.17	2		4	17	2			1	Poor
CV8	Natural Site		8.09	19.99	86	37	43.02%	18.52	2.65	5		3	17	3			1	Poor
ETO6	Significant Natural Site		11.36	28.06	7	5	71.43%	0.00	0.00	4		1	18	1			2	Poor
AW1	Significant Natural Site		7.52	18.57	88	34	38.64%	25.23	3.43	3	1	2	21	2			2	Poor
WB1	Natural Site		3.90	9.62	72	18	25.00%	28.85	3.93	5		1	15	2	1		2	Good - Fair
EM30	Natural Site		5.23	12.93	93	19	20.43%	33.83	3.93	5		8	12	8				Good
EM6	Natural Site		1.03	2.55	70	20	28.57%	27.01	3.82	1		1	7	1				Fair
EM2	Significant Natural Site		4.78	11.81	85	15	17.65%	32.99	3.94	1	1	1	12	1				Fair
EM10	Natural Site		3.82	9.43	70	21	30.00%	24.43	3.49	3			9	2	1		1	Fair
EM14	Significant Natural Site		9.38	23.16	94	42	44.68%	21.22	2.94	5	1		15	3	1		1	Fair
EM4	Significant Natural Site	ESA,ANSI	46.43	114.73	258	76	29.46%	57.15	4.24	9	2	36	70	7	6		5	Good - Fair
EM5	Natural Site		4.89	12.09	61	19	31.15%	23.15	3.57	2			6				1	Fair
EM21	Natural Site		0.84	2.08	51	10	19.61%	22.18	3.46	1			2	1				Fair
CR1	Significant Natural Site	ESA	5.67	14.00	111	33	29.73%	35.89	4.06	2		11	12	1				Fair
FV1	Natural Site		2.05	5.07	59	11	18.64%	23.82	3.44	1		2	8	1			1	Fair
FV3	Natural Site		6.35	15.67	108	44	40.74%	28.50	3.56	3			19	2			2	Fair
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 Code	Classification	Designation	Area		Flora								Fauna					Condition
			(ha)	(acres)	total	# non-native	% non-native	native FQI	native mean C	# veg comm	prov. sig. species	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
MY1	Significant Natural Site		13.45	33.23	165	54	32.73%	40.03	3.82	2	1	11	18	3		1	3	Fair
MY3	Natural Green Space		2.31	5.72	56	34	60.71%	11.09	2.36	1		1	12	1				Poor
AW4	Natural Site		11.60	28.64	54	33	61.11%	11.85	2.65	2		3	12					Poor
AW3	Natural Green Space		7.96	19.66	58	31	53.45%	14.90	2.92	2		1	18	1			2	Poor
ETO5	Significant Natural Site		7.83	19.34	83	46	55.42%	16.36	2.76	6		5	16	1			3	Poor
ETO4	Significant Natural Site	ESA	53.47	132.07	179	53	29.61%	45.36	4.09	4	1	18	45	4	5		9	Fair
RW5	Natural Site		2.39	5.92	75	37	49.33%	14.83	2.47	1		3	14	1			1	Poor
RW6	Natural Site		6.13	15.15	71	37	52.11%	14.61	2.67	1		2	23	1			5	Poor
RW4	Natural Site		1.22	3.01	52	8	15.38%	27.14	4.09	2			8	1				Fair
RW1	Significant Natural Site		2.11	5.21	77	18	23.38%	34.11	4.44	1		3	1	1				Fair
RW2	Natural Green Space		3.84	9.50	57	31	54.39%	16.67	3.27	1			15	1			2	Poor
CM7	Significant Natural Site		11.17	27.58	92	18	19.57%	35.57	4.14	3		3	22	3	5	1	2	Good
CM9	Natural Site		3.91	9.67	78	14	17.95%	31.00	3.88	4		5	13	2	3		1	Good
CM11	Removed		0.00	0.00	22	1	4.55%	18.33	4.00	1			1					Removed
CM12	Natural Site		6.05	14.95	87	17	19.54%	31.79	3.80	1		3	19	5	8		1	Good
CM17	Removed		0.00	0.00	25	4	16.00%	16.80	3.67	1			5					Removed
CM13	Removed		0.00	0.00	37	14	37.84%	16.26	3.39	1			1	1				Removed
CM25	Natural Green Space		0.70	1.72	24	11	45.83%	5.27	1.46	2		1	7		1		2	Fair - Poor
CE7	Significant Natural Site		9.33	23.04	109	33	30.28%	35.67	4.09	2	1	7	8	1	7			Good
CE9	Natural Site		5.04	12.44	96	28	29.17%	33.71	4.09	5		7	14	2				Fair
CE10	Significant Natural Site		18.68	46.14	132	28	21.21%	42.18	4.14	3	1	16	17	3	2			Good - Fair
CE5	Natural Green Space		4.27	10.55	34	19	55.88%	5.42	1.40	1			8					Poor
CE1	Natural Green Space		16.84	41.60	85	25	29.41%	23.85	4.15	3			13	1	5		2	Poor

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	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
CE12	Significant Natural Site		19.83	48.97	134	57	42.54%	29.06	3.31	2	1	9	24	6	1			Fair
CRR5	Significant Natural Site		28.27	69.86	82	35	42.68%	22.17	3.23	2	1	3	33	3	2	1	2	Fair
CRR4	Significant Natural Site	ESA,ANSI	23.63	58.39	94	41	43.62%	24.08	3.31	4		10	31	4	7	2	5	Good
SV12	Significant Natural Site		2.34	5.77	97	42	43.30%	22.52	3.04	1	1	1	14	3	1			Fair
SV10	Natural Green Space		4.24	10.47	65	29	44.62%	17.00	2.83	1			12		1			Poor
SV1	Significant Natural Site		5.67	14.00	117	31	26.50%	36.99	3.99	2	1	5	16	2				Fair
CRR3	Significant Natural Site		74.64	184.36	92	31	33.70%	27.86	3.57	4	1	3	41	5	8	1	7	Fair
CRR2	Significant Natural Site	ESA,ANSI	98.30	242.80	183	66	36.07%	40.19	3.72	12		14	52	9	11		11	Good
EC22	Natural Site		1.54	3.80	79	9	11.39%	31.67	3.79	1		6	10	2				Fair - Poor
EC10	Removed		0.00	0.00	46	10	21.74%	21.83	3.64	2			2					Removed
EC13	Significant Natural Site	wetland	4.85	11.98	194	35	18.04%	54.64	4.33	4		71	88	6	11		13	Excellent
EC1	Removed	ESA,wetland	0.00	0.00	10	4	40.00%	4.90	2.00	1			5		2			Removed
HO1	Natural Site		1.21	2.99	40	10	25.00%	20.08	3.67	1			8	1				Fair - Poor
HO2	Removed		0.00	0.00	24	3	12.50%	18.77	4.10	2			3					Removed
HO3	Natural Site		24.65	60.91	111	36	32.43%	30.83	3.56	3		7	29	4				Fair
HO6	Natural Green Space		14.75	36.45	73	37	50.68%	16.63	2.77	1		4	21	3				Poor
HO7	Natural Site		2.52	6.23	123	42	34.15%	33.78	3.75	2		7	18	1				Fair - Poor
HO9	Significant Natural Site	ESA	12.76	31.52	229	66	28.82%	52.57	4.12	1	1	26	19	2	1			Good - Fair
NE4	Natural Site		13.15	32.47	134	27	20.15%	39.15	3.79	6		16	24				4	Excellent
NE3	Natural Green Space		2.85	7.04	59	26	44.07%	12.19	2.12	2			15	2			3	Poor
NE2	Removed		0.00	0.00	55	10	18.18%	28.17	4.20	1			5					Removed
NE1	Natural Green Space		1.07	2.65	70	27	38.57%	20.28	3.09	1		2	7	1			2	Fair
NE6	Significant Natural Site		1.42	3.51	101	33	32.67%	28.50	3.46	2	1	2	15	3				Good - Fair

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	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
NE5	Natural Green Space		12.95	31.99	47	27	57.45%	7.33	2.44	1			17				4	Poor
NE7	Natural Green Space		2.66	6.57	38	25	65.79%	6.93	1.92	1			5	2				Poor
ETO3	Significant Natural Site		97.14	240.04	403	165	40.94%	56.44	3.66	5	2	59	34	8	5		3	Fair - Poor
NE8	Natural Site		3.75	9.26	28	17	60.71%	6.93	2.09	1		3						Poor
NE10	Natural Site		9.01	22.25	55	29	52.73%	10.59	2.08	1		3	13					Poor
NE11	Natural Site		6.26	15.46	52	28	53.85%	11.02	2.25	1		6						Poor
NE12	Natural Site		7.05	17.41	59	26	44.07%	14.45	2.25	1		5	9					Poor
ETO2	Significant Natural Site		14.16	34.97	65	30	46.15%	14.27	2.41	1		5	9	1				Poor
ETO1	Significant Natural Site		11.18	27.61	94	41	43.62%	21.28	2.92	4		8	16	2				Fair - Poor
NE9	Significant Natural Site		51.09	126.25	227	88	38.77%	41.37	3.52	4	1	33	42	7	7		6	Fair
LS1	Significant Natural Site	wetland	26.39	65.17	145	59	40.69%	32.35	3.49	3		10	10	1			1	Good - Poor
LS2	Natural Site		1.03	2.55	59	17	28.81%	24.53	3.79	1			5	1				Poor
LS3	Natural Site		3.00	7.40	113	40	35.40%	29.38	3.44	3		4	6	1	2		1	Fair
ME10	Significant Natural Site		3.39	8.38	73	18	24.66%	27.91	3.76	1	1	3	7	1			1	Fair
ME12	Significant Natural Site		2.90	7.16	87	49	56.32%	16.60	2.73	1		1	15	2	7	1		Poor
ME11	Natural Green Space		4.36	10.78	83	45	54.22%	14.79	2.70	1		5	17	4	4		1	Fair - Poor
ME13	Natural Site		1.42	3.51	25	6	24.00%	18.58	4.26	1			3					Fair - Poor
ME9	Natural Site		2.26	5.58	64	15	23.44%	30.14	4.31	1		4	4	1				Good
ME8	Significant Natural Site		5.82	14.38	93	24	25.81%	32.02	3.86	1	1	4	15	3	4			Fair
MB9	Natural Site		6.60	16.31	88	42	47.73%	19.76	2.91	1		9	17	1	2			Poor
MB7	Natural Green Space		10.23	25.27	43	24	55.81%	7.99	1.83	1			12				1	Poor
MB8	Significant Natural Site		9.86	24.35	93	24	25.81%	32.02	3.86	2	1	4	15	3	4			Fair

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	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
MB3	Natural Green Space		5.38	13.28	34	19	55.88%	5.94	1.53	1			12	1	1		1	Fair
MB5	Removed		0.00	0.00	42	5	11.90%	23.67	3.89	1								Removed
MB4	Natural Site		1.77	4.36	40	11	27.50%	19.31	3.59	1			8				1	Poor
MB6	Significant Natural Site		23.56	58.20	141	39	27.66%	35.65	3.53	2		13	27	7	2		7	Good
MB2	Natural Site		1.34	3.31	50	6	12.00%	25.63	3.86	1		1	7				1	Poor
MB1	Natural Site		0.77	1.89	34	6	17.65%	22.87	4.32	1			1					Fair
MV19	Significant Natural Site		27.46	67.85	262	82	31.30%	54.93	4.09	6		41	37	6	5			Good
CRR1	Significant Natural Site	ESA, wetland	74.61	184.36	297	109	36.70%	51.77	3.78	10	1	42	53	10	8		4	Fair
MV18	Natural Site		2.84	7.01	39	13	33.33%	7.07	2.50	2		1	15				2	Fair
MV2	Significant Natural Site	ESA,ANSI	89.55	221.28	264	93	35.23%	52.00	3.98	5	1	32	70	15	5	1	14	Good - Fair
MV3	Removed		0.00	0.00	57	17	29.82%	23.40	3.70	1			6	2				Removed
MV12	Natural Site		8.18	20.20	148	46	31.08%	38.91	3.85	2		10	14	5	3			Fair
MV14	Removed		0.00	0.00				0.00	0.00	1								Removed
MV11	Natural Site		2.90	7.17	48	15	31.25%	22.28	3.88	1		5	7					Fair
MV15	Natural Site		9.67	23.88	77	35	45.45%	19.44	3.00	2		2	23	2				Poor
GT1	Removed		0.00	0.00	41	10	24.39%	18.50	3.32	1			2					Removed
GT2	Natural Site		6.80	16.80	76	12	15.79%	32.13	4.02	6		8	21	3	1			Good
GT3	Natural Site		1.81	4.47	71	26	36.62%	20.58	3.07	2		2	6					Fair
GT4	Removed		0.00	0.00	206	56	27.18%	51.03	4.17	1	1		22	4	1			Removed
MA1	Natural Site		31.70	78.33	106	55	51.89%	19.20	2.77	1		8	19	1				Poor
SD7	Significant Natural Site		3.81	9.41	136	74	54.41%	23.30	2.98	3	1	8	57	2			1	Poor
MI17	Significant Natural Site		6.24	15.42	167	54	32.34%	43.56	4.10	2		16	23	9	3		3	Fair

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	local sig. species	# birds	# mammals	# reptiles & amphibians	prov. sig. species	CVC	
MI7	Significant Natural Site		5.52	13.64	125	39	31.20%	39.90	4.30	2	1	7	18	4			2	Poor
CV6	Natural Site		2.71	6.69	75	16	21.33%	26.17	3.41	1		3	11	1			2	Fair
CRR10	Significant Natural Site	ESA,ANSI	61.78	152.60	384	131	34.11%	69.21	4.36	9	2	75	90	12	11	1	27	Good
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
ER7	Natural Site		3.15	7.78	77	29	37.66%	21.00	3.06	3		4	13	1			1	Poor

Table 2: Legend for Natural Area Framework for the City of Mississauga
(arranged by Planning District with several natural sites listed twice or more because these areas span two or more planning districts).

SOUTHDOWN
SD1
SD4
SD5 (Meadowwood)
SD7 (Lakeside)

CLARKSON-LORNE PARK
CL52 (Meadowwood)
CL1 (Meadowwood)
CL9 (Rattray Marsh)
CL8
CL15
CL16 (Jack Darling Park)
CL17 (Lorne Park Estates)
CL13
CL43
CL42
CL21 (Birch Glen)
CL39 (Whiteoaks)
CL22
CL30 (Lorne Park Prairie)
CL31 (Lornewood Creek Trail)
CL24 (Tecumseh)
CL26
CRR9 (Credit River Flats)

PORT CREDIT
PC1 (Rhododendron Gardens)
PC2 (Port Credit Memorial)

MINEOLA
CRR9 (Credit River Flats)
MI4
MI1
MI17 (Mary Fix)
M17

LAKEVIEW
LV3 (Adamson Estate)
LV4 (Helen Molasy Memorial)
LV5
LV2
LV1
ETO8
LV14 (Lakeview Golf Course)
LV6
LV7 (Cawthra Woods)
ETO7

SHERIDAN PARK
SP1
SP3

SHERIDAN
SH6
CRR7
CRR8

ERINDALE
CRR7
CRR8
ER6
CRR6
ER7

COOKSVILLE
CV1 (Iroquois Flats)
CV2
CV12 (Richard Jones)
CV10
CV8 (Camilla)
CV6 (Stillmeadow)

DIXIE
ETO7
ETO6
AW1 (Willowcreek)

WESTERN BUSINESS PARK
WB1 (Erin Mills Twin Arena

ERIN MILLS
EM30 (Tom Chater Memorial)
EM6 (King's Masting)
EM2 (South Common)
EM10
EM14
EM4
EM5 (Glen Erin Trail)
EM21 (R.F.C. Mortensen)
CRR10

CREDITVIEW
CR1

FAIRVIEW
FV1
FV3

CITY CENTRE
CC1 (Bishopstoke Walk)

MISSISSAUGA VALLEY
MY1 (Mississauga Valley)
MY3 (Stonebrook)

APPLEWOOD
AW1 (Willowcreek)
AW4 (Applewood Hills)
AW3 (Applewood Hills)
ETO5
ETO6

Table 2 continued…

RATHWOOD
ETO4
RW5 (Applewood Hills)
RW6 (Applewood Hills)
RW4 (Rathwood District)
RW1
RW2 (Woodington Green)

CHURCHILL MEADOWS
CM7
CM9
CM12
CM25

CENTRAL ERIN MILLS
CE7 (Sugar Maple Woods)
CE9 (Quenippenon Meadows
CE10 (Erin Wood)
CE5
CE1 (Woodland Chase Trail)
CE12 (Bonnie Brae)
CRR5
CRR4
CRR11

STREETSVILLE
SV12 (Bonnie Brae)
SV10
CRR4
SV1 (Turney Woods)
CRR3
CRR2

EAST CREDIT
CRR5
CRR4
CRR3
CRR2
EC22
EC13
CRR11

HURONTARIO
HO1
HO3 (Staghorn Woods)
HO6
HO7
HO9 (Britannia Woods)

NORTHEAST
NE4
NE3
NE1
NE6
NE5
NE7
ETO4
ETO3
NE8
NE10
NE11
NE12
ETO2
ETO1
NE9 (Wildwood)

LISGAR
LS1 (Lisgar Meadow Brook)
LS2
LS3 (Trelawny Woods)

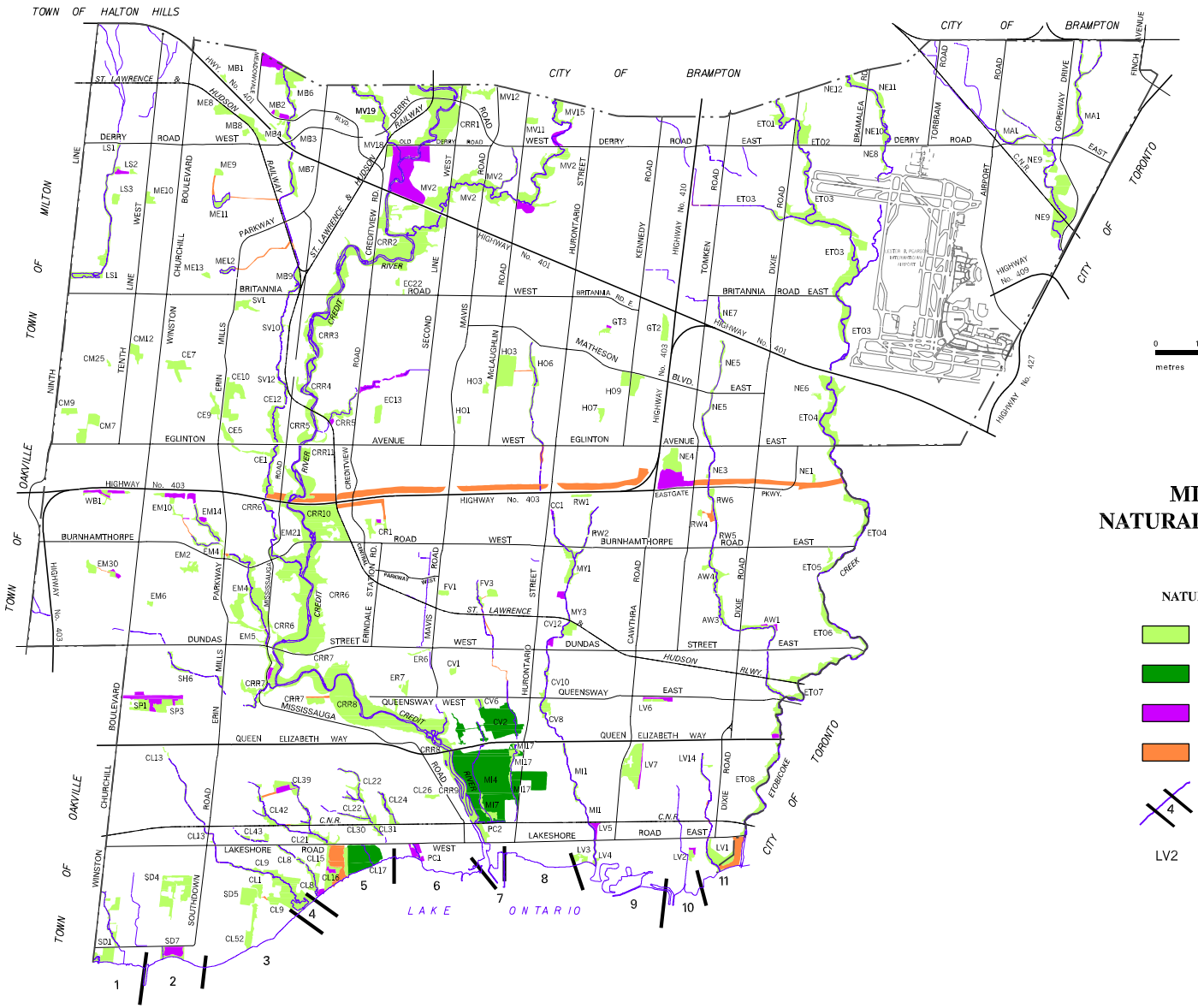
MEADOWVALE
ME10 (Eden Woods)
ME12 (Lake Wabukayne)
ME11 (Lake Aquitaine)
ME9 (Maplewood)
ME8 (Windrush Woods)
ME13

MEADOWVALE BUSINESS PARK
MB9
MB7 (Mullet Creek)
MB8
MB3
MB4
MB6 (Totoredaca)
MB2
MB1

MEADOWVALE VILLAGE
MV19
CRR1 (Meadowvale C.A.)
MV18
MV2
MV12
MV11
MV15
CRR2

GATEWAY
GT3
GT2

MALTON
MAI



MISSISSAUGA NATURAL AREAS SURVEY

FIGURE 1
NATURAL AREAS SYSTEM

- Natural Area
- Residential Woodland
- Special Management Area
- Linkage
- 4 — Shoreline Reach Number
- LV2 — Natural Area Name

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2008

3.1 Discussion of Proposed Additions

Twenty additions to existing natural areas and two new natural areas proposed in 2007 were approved by the City and were reviewed in the 2008 field survey. These potential additions were previously SMAs or Linkages; greater than minor changes to the boundaries of natural areas. The additional areas have been added to existing natural areas in 2008, and two new natural areas (CM25 and ME13) have been added to the NAS (Table 3). The classification for each additional area was determined based on the current function and contribution it provides to the natural area.

Table 3: Additions to the Mississauga Natural Areas System.

Proposed Addition	Natural Area	NAS Category	Natural Area Classification
CM25	CM25	Natural Area	Natural Green Space
CRR1ADD20	CRR1	Natural Area	Significant Natural Site
CRR4ADD17	CRR4	Natural Area	Significant Natural Site
CRR5ADD4	CRR5	Special Management Area	-
ETO3ADD11	ETO3	Natural Area	Significant Natural Site
ETO3ADD13	ETO3	Natural Area	Significant Natural Site
HO3ADD12	HO3	Natural Area	Natural Site
HO6ADD19	HO6	Natural Area	Natural Green Space
HO7ADD14	HO7	Natural Area	Natural Site
MA1ADD15	MA1	Natural Area	Natural Site
MA1ADD16	MA1	Natural Area	Natural Site
ME13	ME13	Natural Area	Natural Site
MV2ADD2	MV2	Natural Area	Natural Green Space
MV2ADD4	MV2	Natural Area	Natural Green Space
MV2ADD5	MV2	Special Management Area	-
MV2ADD6	MV2	Natural Area	Natural Green Space
MV2ADD7	MV2	Natural Area	Natural Green Space
MV2ADD8	MV2	Natural Area	Natural Green Space
MV2ADD9	MV2	Natural Area	Natural Green Space
MV2ADD10	MV2	Natural Area	Natural Green Space
MV19ADD18	MV19	Natural Area	Natural Site
NE9ADD1	NE9	Natural Area	Natural Green Space

3.2 Summary of Changes

Overall, the number of natural areas decreased from 141 in 1996 to 136 in 2004. In 2008, the number of natural areas has increased to 138 because of the addition of ME13 and CM25 as a part of the NAS. CM25 was classified as a natural green space, ME13 a natural site.

Figure 2 illustrates the overall change between 1996 and 2008 in the proportion of the City occupied by the three types of natural area. A detailed summary of the changes to natural area

classifications between 1996 and 2008 is provided in Appendix 6. The City of Mississauga encompasses 29,269.0 ha. Overall, there has been a decline in the total proportion of natural areas identified within the City from 7.10% (2329.14 ha) in 1996 to 7.05% (2311.31 ha) in 2008. This decline occurred prior to 2008; for example the total proportion of natural areas identified within the City decreased to a low of 6.62% (2175.42 ha) in 2005. In 2008, there has been an increase of 0.35% (89.60 ha) of natural area within the City from 2007. This change was due primarily to increases in SNS in 2008. Areas classified as SNS now total 1649.62 ha, representing 5.64% of the City occupied by the Natural Areas System (Figure 2; Appendix 6). These increases are related to refining natural area boundaries.

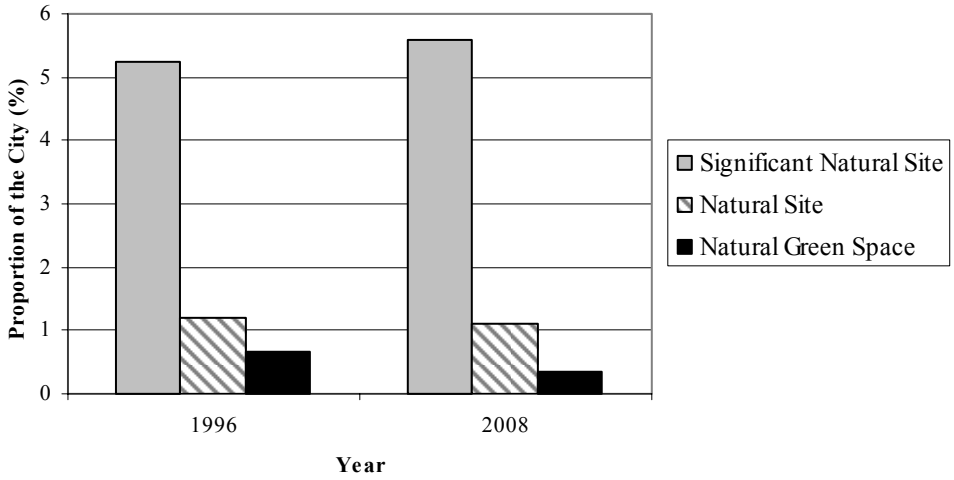

Figure 2: The proportion of the City occupied by natural areas, by each natural area classification in 1996 and 2008 (see Appendix 6 for a complete summary).

The proportion of the City occupied by NS has decreased from 1.2% (349.92 ha) in 1996 to 1.11% (326.11 ha) in 2008; however, there was an increase of 0.08% (25.95 ha) from 2007 to 2008. This increase is related to the addition of ME13 as a NS as well as the addition of substantial additional area to HO3, HO7, MA1, and MV19 in 2008. The proportion of NS has fluctuated over the last 11 years increasing to a high of 1.56% (456.57 ha) in 2000, but has decreased by 0.45% which equates to an overall loss of 130.46 ha within this classification.

Presently, NGS constitutes 4.33% (100.15 ha) of the Natural Areas System, this is a decrease of 4.67% (96.9 ha) from 1996, and primarily reflects the transition of natural areas to other classifications (*e.g.*, 5 sites transitioned from NGS to NS in 2007). This change also reflects a decrease of 0.33% since 1996 in the proportion of the City identified as NGS (Figure 2; Appendix 6).

In 2008, 42 Special Management Areas were identified; this is a decrease of 13 SMAs from 1996. The total number of Linkages is 29 and this is an overall decrease of 11 from 1996. As of 2008, eight SMAs are now classified as natural areas and included within the adjacent natural areas. Similarly, 4 Linkages are now classified as natural areas and included with the natural area adjacent.

The overall change to the three major landform types (valleyland, tableland, and wetland) in the City between 1996 and 2008 are presented in Figure 3 (also see Appendix 7). Figure 3 illustrates that the majority of the Natural Areas System in 2008, 80.10% (1656.95 ha), is still associated with valleylands. This proportion has increased by 1.88% (30.65 ha) since 1996. This is mainly due to an increase of 7 sites since the inception of this study. In contrast, tablelands only account for 15.12% (312.81 ha) of the natural areas system in 2008 (Figure 3); a decrease from 16.40% (339.9 ha) in 1996. This is largely owing to a loss of 8 tableland sites from 1996 to 2002. However, three tableland sites were added in 2008. From a City-wide perspective, there were steady decreases in the proportion of tableland natural areas from 1.16% (339.9 ha) in 1996 to 0.97% (285.2 ha) in 2002. In 2006 this proportion had increased slightly to 0.98% (287.03 ha) and has increased further to 1.07% (312.81 ha) in 2008.

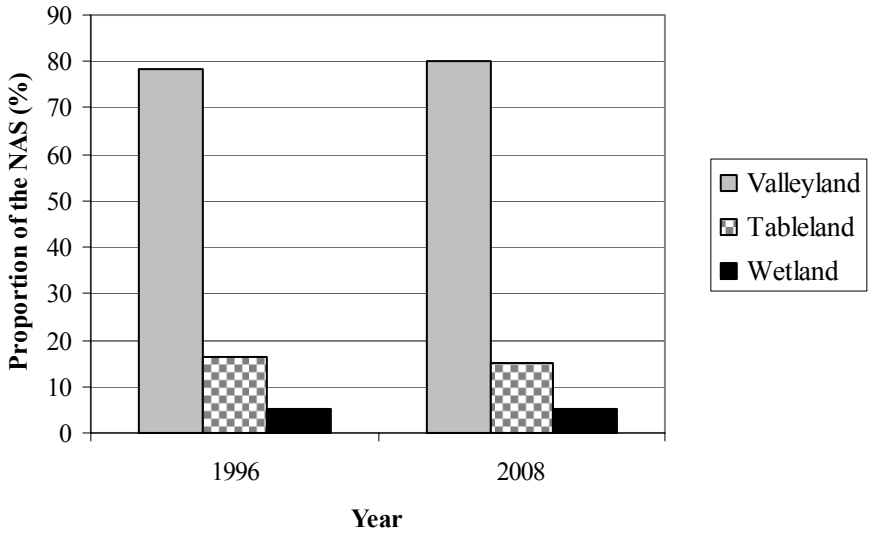

Figure 3: The proportion of the Natural Areas System contributed by landform type in 1996 and 2008 (see Appendix 7 for a complete summary).

Natural areas that occur on tableland (primarily wooded areas) 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 declined slightly from 5.0% (103.7 ha) in 1996 to 4.78 (98.86 ha) in 2008 (Figure 3; Appendix 7). The proportion wetlands expressed as a proportion of the entire City also decreased marginally from 0.36% in 1996 to 0.34% in 2008 (Figure 3; Appendix 7).

The mean size of natural areas in all three landscape types has been decreasing since 1996 due to

the incremental removal of portions of natural areas for development (Appendix 7). The exception to this is the mean size of wetlands which increased between 2001 and 2002 with the removal of EC1 which was smaller than the average wetland size. Currently the mean size of wetlands is 19.77 ha. Tableland natural areas are generally very small (mean size of 5.69 ha or 14.05 a.) when compared to the valleyland areas (mean size of 20.71 ha or 51.15 a.) in 2008.

4.0 NATURAL ENVIRONMENT OVERVIEW

4.1 Vegetation Communities

The 49 vegetation communities described for the City (Appendices 8 and 9) were compared between 1996 and 2008 (Figure 4). As the NAS study pre-dated the provincial ELC, the original community classification did not conform to ELC standards. A list of vegetation communities in the City and their approximate corresponding ELC vegetation community classifications were provided by North-South Environmental (2000), Appendix 5. However, to facilitate the comparison of vegetation communities between the 1996 study and updates, the original City designations are used in this report.

The vegetation communities have been grouped into six broad categories: 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 any 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 within the vegetation community categories between 1996 and 2008. Between 2007 and 2008 there were increases in the proportion of the City occupied by valleylands (0.05%), successional habitat (0.16%), woodlands (0.06%), and wetlands (0.02%) (Figure 4). These increases are largely due to the addition of two new natural areas (ME13 and CM25) and the inclusion of additional areas to existing natural areas. There were no changes in the proportion of anthropogenic and other between 2007 and 2008.

Between 1996 and 2008, there have been decreases in the proportion of valleylands in the City of 0.27% (70.59 ha), a decrease in "other" communities of 0.09% (27.59 ha), and a decrease in anthropogenic communities (in the natural areas system) of 0.07% (21.12 ha). In contrast, there are increases in the proportion of woodlands within in the City of 0.06% (14.7 ha) and increases in successional communities of 0.30% (87.94 ha). The current proportion of wetlands within the City is the same as in 1996 at 0.25% (75.43 ha) (Appendix 9).

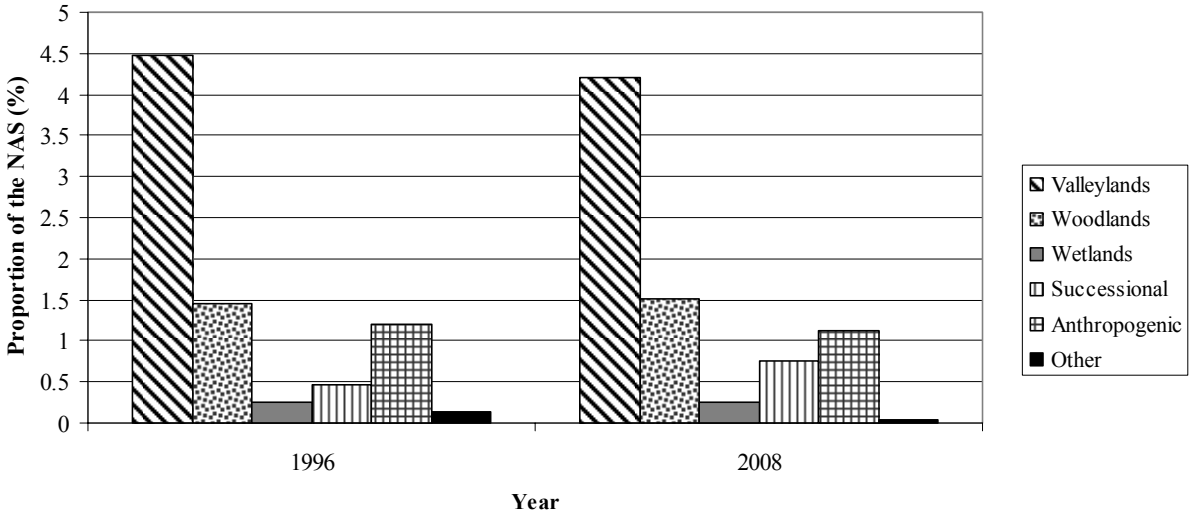

Figure 4: The proportion of NAS vegetation communities in the City in 1996 and 2008.

Valleylands

The Valleylands category includes ten 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 (Appendix 8). In 2008, the valleylands category comprised 4.20% (1231.18 ha) of the total City area (Figure 4). There was a decrease of over 86 ha between 1996 and 2006, however, in 2008 there was an increase of 16.28 ha (Table 4). This reflects increases in the following vegetation communities: wooded slope (A), floodplain (B), wooded non-native valleylands (J), and open with open slopes (K) (Appendix 8). 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. One vegetation community in this category, open with manicured slopes valleylands (N), is considered uncommon in the City, occupying less than 1% of the total area of natural areas.

Table 4: Changes to the area of vegetation communities 1996-2008.

Vegetation Community Category	(1996 – 2008)		(2007 – 2008)		Reason For Change (2007 - 2008)
	hectares	acres	hectares	acres	
Valleylands	-86.87	- 214.66	+ 16.28	+ 40.23	Addition to natural areas, boundary and community adjustments to natural areas: CRR1, CRR5, CRR9, HO6, MV2, MV19, MA1, SD1, ETO7 and ETO8.
Woodlands	- 1.60	- 3.95	+ 16.30	+ 40.28	Addition of natural area ME13, and boundary and community adjustments to natural areas: CL9, CL16, H03, LV3, LV6, LV7, MI17, MV2, and SD4.
Successional	+ 40.56	+ 100.23	+ 47.38	+ 117.08	Addition of natural areas, boundary and community adjustments to natural areas: CL8, CL9, CL16, CL24, CL39, CRR1, HO3, HO7, LV1, LV4, MV2, MV19, NE9, SD4, SD5 and SP3.

Vegetation Community Category	(1996 – 2008)		(2007 – 2008)		Reason For Change (2007 - 2008)
	hectares	acres	hectares	acres	
Wetland	- 5.91	- 14.60	+ 5.57	+ 12.76	Addition of natural area CM25, addition to natural areas, boundary and community adjustments to natural areas: MV19, NE9, SP3, CL8, CL9, CL42, and CRR9.
Anthropogenic	- 21.66	- 53.53	+ 0.54	+ 1.33	Revision of community boundaries at several sites due to naturalization of plant community edges, and revisions based on property boundaries.
Other	- 27.96	- 69.09	+ 0.37	+ 0.91	Addition to natural areas, boundary and community adjustments to natural areas: SD1, SD5, SD7, CL8, CL9, CL30, LV3, and LV4.

Wooded slope communities within valleylands (A) have decreased in area between 1996 and 2007 by 13.83 ha, and in 2008 there was a slight increase of 1.98 ha (Appendix 8). Lands identified as floodplain (B) decreased by 71.33 ha between 1996 and 2006, but increased by 19.47 ha between 2006 and 2007. There has been a steady increase in the amount of wooded non-native valleylands (J) from 1996 to 2008, with and increase of 27.05 ha. There was a steady decline in the amount of open slopes valleylands (K) between 1996 and 2006 with an overall decrease of 36.35 ha, however, in contrast there was an increase of 15.61 ha between 2007 and 2008. These increases are primarily attributable to additions of natural areas, revisions of natural area boundaries due to naturalization of plant community edges, and revisions based on property boundaries. Overall, there was an increase in valleyland area between 2007 and 2008.

Woodlands

Woodlands include twenty vegetation communities, all of which occur outside of valleylands, although they may contain intermittent woodland streams. The bur oak - American beech forest (QQ) community no longer occurs in the natural areas system due to its removal as a result of development. The bur oak - black walnut forest (WW) community had also been removed due to development, however, in 2008 several small bur oak – black walnut forests were identified in CRR2 and ETO1, and these total 3.27 ha (Appendix 8). Overall, there was an increase of 14.70 ha in woodland communities between 1996 and 2008. This reflects small increases in 14 of the 20 woodland communities while the other six woodland communities had no changes in area between 2007 and 2008. The changes reflect the addition of ME13, the addition of natural areas, natural area boundary revisions due to the naturalization of plant community edges, and revisions based on property boundaries. Eleven of the vegetation communities in this category are considered uncommon in the City, each occupying less than 1% of the total area of natural areas or containing an uncommon "working-group". Six of these eleven communities can also be considered "at risk" in the City, each being 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). Three of these vegetation communities: GG, LL and MM are found only within natural area EM4 (Erin Mills). Vegetation community II is located at MB4 (Meadowvale

Business Park), vegetation community PP is located at GT3 (Gateway), and vegetation community VV is found within natural area LV6 (Lakeview).

There is an emphasis on the protection and management of the remaining woodland vegetation communities, and this has resulted in an increase of 16.30 ha of woodlands between 2007 and 2008. The pressures associated with development adjacent to natural areas will continue to stress the remaining vegetation communities (see section 5.0 for a discussion of disturbances related to development), and so efforts should be made to direct development away from natural areas.

Successional

The successional category is composed of six vegetation communities (Appendix 8). This category increased in size by 40.56 ha between 1996 and 2008 (Table 4) and the increase of 47.38 ha in 2008 is consistent with this trend. These increases are largely related to increases in the old field (C) communities. Even though successional vegetation communities continue to increase in overall area, this category comprises only 0.76 % 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 8). One of these four communities, birch forest (XX), can also be considered "at risk" in the City, as it is represented in only one natural area.

Overall, the small 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 (Appendices 8). Between 1996 and 2008 this category decreased in size by 5.91 ha, however, between 2007 and 2008 there was an increase of 5.57 ha. This increase is reflected in the addition of the natural area CM25 which includes a cattail marsh and open water, as well as boundary and community adjustments to natural areas: MV19, NE9, SP3, CL8, CL9, CL42, and CRR9. Wetlands comprise only 0.25% (75.43 ha) of the total City area (Appendix 9; Figure 4). Five of the six vegetation communities in this category continue to be considered uncommon in the City occupying approximately 1% of the total area of natural areas, and vegetation community V (cattail marsh) represents only 1.24% of the total area of natural areas.

Despite their small size, wetland communities tend to contribute a disproportionately high amount of biodiversity to the City. A large number of 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

permanent conversion of the vegetation community from wetland to upland. These areas are especially important for amphibian species which can be key indicators of habitat quality.

Anthropogenic

The anthropogenic category is composed of five vegetation communities (Appendices 8). This category decreased in area between 1996 and 2007 by 21.66 ha, however, there was a slight increase of 0.54 ha between 2007 and 2008. Anthropogenic lands, as identified within the NAS, currently comprise 1.13% (331.89 ha) of the total City area (Table 4; Figure 4). Historic decreases in this category are primarily due to revisions to natural area boundaries related to the naturalization of plant community edges and revisions based on property boundaries. Overall, anthropogenic lands in the NAS still represent more than the amount of land occupied by wetlands (0.25%) and successional (0.76%) communities combined. "Wooded residential" (I) is still considered to be one of the largest communities in the City, though there was a slight decrease of 1.71 ha between 2007 and 2008 due to development. The community "manicured" (F) continues to decrease in size, the reduction being 0.19 ha between 2007 and 2008.

Other

The "other" category is composed of three vegetation communities (Appendices 8): beach (R), tall grass prairie (S) and unknown (U). This category has had an overall decrease in area of 27.96 ha between 1996 and 2007, but there was a slight increase of 0.37 ha between 2007 and 2008 (Table 4). The change reflects an increase of 0.36 ha in the unknown vegetation community. The "other" category still represents only 0.04 % of the total City area (Table 4; Figure 4) as in 2007. The communities identified in this category are only found in the following natural areas SD1, SD5, SD7, CL8, CL9, CL30, LV3, and LV4.

4.2 Flora

The total number of flora species in the City of Mississauga stands at 1138. There are 681 native species in Mississauga (60% of the flora) and non-natives number 457 (40% of the flora). Thirteen flora species were added to the plant list this year; seven native species and six non-native species (Table 5). These species were located in the following natural areas: CL8, CL9, CL13, CL16, CL24, CL31, LV4, and LV5. All of the native species are considered to be rare within the City (known from 3 or fewer locations). Of the 681 native species known from the Mississauga flora, 36 (5%) are considered extirpated, 408 (60%) 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).

Table 5: Flora species added to the City of Mississauga flora list in 2008.

	Common Name	Latin Name	NAS Site
	cockspur hawthorn	*Crataegus crus-galli*	LV5
	cuckoo flower	*Cardamine pratensis*	CL16
*	downy willow herb	*Epilobium strictum*	LV5
	foxglove beardtongue	*Penstemon digitalis*	LV4 and LV5
	fragrant sumac	*Rhus aromatica*	CL16

Common Name		Latin Name	NAS Site
*	giant hogweed	*Heracleum mantegazzianum*	CL8, CL24, and CL31
	great St. John's-wort	*Hypericum ascyron*	CL16
*	hedge maple	*Acer campestre*	CL13
	mountain ash	*Sorbus americana*	LV5
*	northern snowberry	*Symphoricarpos occidentalis*	LV5
	slender naiad	*Najas flexilis*	CL9
*	wild marjoram	*Origanum vulgare*	CL13
*	wild radish	*Raphanaus raphanistrum*	LV5

* indicates a non-native species

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. Butternut was listed as Endangered because it is rapidly declining throughout its entire North American range as a result of infections by a fungus, butternut canker (*Sirococcus clavigignenti-juglandacearum*). A number of the butternut records for the City's natural areas date prior to 1984 (are older than 20 years old). The current health and presence of some of these individual trees is unknown. In 2008, surveys for butternut were conducted at 24 natural areas where access was available. Butternut trees were observed in 4 natural areas (Appendix 10). Any sighting on or prior to 1995 that does not have butternut located with the GPS coordinate has been removed from Appendix 10. Table 6 lists the locations where butternut has not been found since 1995. There were no additional plants designated as provincially rare in 2008, this remains unchanged from 2004 (Appendix 11).

Table 6: Natural areas where butternut has not been located since 1995.

Natural Area	Date of Record
CC1/MY1	1980
CE12/SV12	1977
CE7	1976
CL26	1995
CL52	1995
CL9	1970
CRR5	1976
CV2	1995
EM2	1995
EM4	1995
EM14	1995
ETO3	1980
HO9	1978

Natural Area	Date of Record
MB8/ME8	1995
MV2	1994
NE6	1995
SV1	1976

4.3 Floristic Quality Assessment

The Floristic Quality Index (FQI) and native mean coefficients were re-calculated for the 54 natural areas based on field data collected in 2008. Table 2 (page 14) provides the FQIs and native mean coefficients for all natural areas that were assessed, and changes are summarized 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). In 1996, 107 of the 144 natural sites were assessed using the FQA. FQIs ranged from 2.68 to 80.10 and the native mean coefficients ranged from 1.20 to 4.82. In 2008, a total of 136 of the 138 natural areas and all three residential woodlands have been assessed using the FQA, based on data collected during a field visit or roadside visit. The current FQI values range from 5.27 to 81.93 and the native mean coefficients range from 1.40 to 5.17. High, medium and low values are defined in section 2.3 (page 4).

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). In 2008, this is still the case for both the native mean coefficient and the FQI. In terms of the native mean coefficient, 61 natural areas have been assessed as having a medium native mean coefficient, 45 as low, and 32 as high. In terms of the FQI, 79 natural areas are assessed as having low FQIs, 34 as medium and 25 with a high FQI. Lower native mean coefficients indicate an increase in the presence of species characteristic of disturbed environments, and a commensurate decrease in the proportion of plant species that indicate high quality habitat. Species with low coefficients tend to occur in a wide range of habitats and are less susceptible to disturbance. In contrast, plant species with high coefficients tend to be conservative in their habitat requirements (see section 2.3). The increase in the mean CC within the high category, from 4.82 in 1996 to 5.17 in 2008, suggests a slight decrease in disturbance in at least some of Mississauga's natural areas. In addition, FQI values have increased at 29 sites in 2008. Overall, these increases were minor and the increase at 20 natural areas, ranging between 2 to 7 points, may be a result of more thorough inventory. This trend also occurred in 2007 at over 15 natural areas. Continued monitoring of the natural areas over time will show whether this is a positive trend or an anomaly for 2007 and 2008.

4.4 Fauna

No new species were added to the fauna list for the City of Mississauga through field work conducted in 2008 or the literature reviewed. The 2008 breeding bird surveys conducted in natural areas in Wards 1 and 2 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 (Credit Valley Conservation updated) (Appendix 12). Highlights included extensive riparian areas with connected table land forest, such as the Credit River (CRR9), Etobicoke Creek (ETO7 and ETO8), and select sites in the Clarkson-Lorne Park area (CL16 and CL17). These sites sustained the highest number of "possible" breeding bird species of any areas surveyed in 2008, 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, blue-gray gnatcatcher, white-breasted nuthatch).

Species dependent on certain specific microhabitats (for example species that depend on high bluffs such as bank swallow, rough-winged swallow, cliff swallow) were typically found along the Credit River, Etobicoke Creek and larger creek valleys. The most common Credit Valley Conservation Species of Concern were the mid-to late-successional species (of shrubby cultural meadows and young forest): common grackle and gray catbird. This is not because there is abundant cultural meadow and young forest (early successional types are not common in Mississauga), but because of the narrow bands of riparian vegetation along the smaller creek valleys contain many elements common to successional areas, such as shrubs and young trees. These communities likely persist because of the high level of disturbance and high light levels present there. Marsh area-sensitive species such as rails, pied-billed grebes and American coots are very rare in Mississauga (the only recent record was a Virginia rail in CRR9 in 2004). However, pine warbler, blue-gray gnatcatcher, and white-breasted nuthatch, 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 (hawks, falcons, *etc*.) are more common along the Credit River, Etobicoke Creek and larger creek valleys than in other parts of Mississauga, reflecting the larger number of open natural areas to support a forage base. Red-tailed hawk was noted at 3 forested sites in 2008: SD1, MV2, and HO3. Cooper's hawk was noted in one area (CL39), a larger woodlot contiguous to Birchwood Creek. Cooper's hawk nest and forage in forests, and though birds are usually reported as their main prey, one family group was observed hunting black squirrels in 2006 (MB6). As documented by the recent Ontario Breeding Bird Atlas (Cadman et al. 2008), Cooper's hawks are becoming much more common in Mississauga forests, and 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.

Provincial rarity ranks for some fauna species reported in the City of Mississauga have changed since 2004, as a result of status changes from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Appendix 13). Red-shouldered hawk has been up-listed from a Species of Special Concern to a species Not at Risk. Golden-winged warbler has been designated as Threatened. Status in Ontario has also been changed 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 2007 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 nests on a building (the Mississauga Executive Centre complex) adjacent to CC1. This species has been monitored intensively during the breeding season since 2002. This site was not surveyed in 2008, but the Peregrine Falcon Foundation monitoring site indicated that four eggs hatched and two fledglings survived in 2008 (www.peregrine-foundation.ca/tops/missmec.html).

There has been no change to the status of Credit Valley Conservation species of conservation interest (Credit Valley Conservation updated). 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 early forest breeding amphibians that require vernal pools: spring peepers and wood frogs. 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 and dry out slowly over the summer. However, the water in the ponds needs to persist long enough to allow amphibian larvae to transform into adults, generally around mid-July. This habitat is very rare in Mississauga. No woodland frog species were heard in Wards 1 and 2 during 2008. The following sites, where habitat appeared potentially suitable for woodland frogs, were surveyed for amphibians in 2008: CL9, CL22, CM25, CRR1, MV2, and MV19. Frogs were noted at natural areas CL9, CRR1, MV2, and NE9.

Gray tree frogs, which vocalize later than spring peepers, have been heard in the past at CL9 (1976), CRR1 (2001), and CRR9 (1939) but none were heard in 2008. Western chorus frogs were heard in 2008, at natural area CL9. 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 can use storm water ponds for breeding, will likely persist in Mississauga. This species was heard at MV2 in 2008. American toads and leopard frogs are still extant in several locations, as they can use a number of upland and wetland habitats for foraging and breeding. American toads were heard at sites CL1, CL9, CL22, CL52, CRR1, MV19, MV2, and NE9. Bullfrogs require extensive emergent vegetation and deeper water, 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 in 2008.

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 update report.

5.0 NATURAL AREA CLASSIFICATION SCHEME

In 2004, the criteria for classifying the natural areas were updated (section 3.2, North-South Environmental 2004). No updates to the classification scheme are proposed in 2008, and thus the 2004 criteria are considered up to date. These 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 2008 continue to be in fair condition (see Table 1 and Appendix 5). Natural areas evaluated as in fair condition have moderate disturbances (*e.g.*, 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 2008 remained largely unchanged from previous studies.

Spring surveys in natural areas in Wards 1 and 2 identified the presence of several spring ephemeral plant species primarily in areas in fair to good condition, and those areas with contiguous habitat (*e.g.*, the Credit River). Similar results were found in the spring of 2005, 2006, and 2007 in natural areas in Wards 3, 4 and 7, Wards 8, 9 and 10, and Wards 5, 6, and 11, respectively. 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 many of the natural areas in the City.

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 the uncontrolled human use of natural areas following development in adjacent sites. 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 and humus, reduction of 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.

Encroachment into a woodland edge can result in a number of indirect impacts that can degrade the woodland. Woodland edges act as an interface between the interior forest conditions and the open areas outside the woodland. These natural edges function to support dense shrub growth and tree foliage, which is often thicker at least on the outside edge. Edge trees are generally more resilient to blow-down, as a result of having grown to maturity in the more exposed edge environment. When the edge is disturbed or removed, the edge microclimate changes, resulting in elevated temperatures, higher light levels, greater wind penetration, decreased humidity, *etc*. This can initiate a chain of events including soil desiccation, change in soil microfauna, and changes to food webs, nutrient cycles and decomposition cycles. This in turn can effect vegetation composition by making the habitat more suitable for species of open conditions (usually non-native), and less suitable for native woodland plant species, as well as impacting birds and other wildlife. The 'new" edge created when only part of a woodland is removed, is also more susceptible to windthrow.

6.3 Development

Direct impacts from development continue to impact natural areas, including the removal of portions, as well as entire natural areas. These impacts can include: construction of a new residential subdivision, industrial complexes, infill construction, or the expansion of an industrial or commercial parking lot.

In 2008, only 1 of the 54 natural areas surveyed decreased in overall size due to development. This may result in some of the indirect impacts associate with changes to edge habitats discussed in section 6.2.

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 2008 (see Appendix 5). Of the 53 natural areas which had been previously inventoried, only 2 areas had a decrease in the proportion of non-native plants, LV6 and LV7, and these were decreases were less than 1%, and may reflect them being missed in inventory rather than actual changes. 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 other non-native plant species will result in a continued loss of native plant species in natural areas. There are also some human health and/or safety issues associate with the giant hogweed (*Heracleum mantegazzianum*) which we reported for the first time in Mississauga in 2008 (see Section 4.2). Giant hogweed is a non-native species introduced from Europe and has been noted at three natural areas within the City in 2008 (Table 5). This plant is a human health risk because it exudes a clear watery sap containing photosensitizing agents which in combination with daylight cause skin in contact with the sap to burn. It is recommended that this species be made a priority for removal from sites CL8, CL24 and CL31. 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.

Naturalization projects initiated at a number of natural areas has typically involved leaving an area of un-mowed grass to regenerate naturally. While the size of the natural area increases as a result of this regeneration, this strategy also provides habitat for invasive plants such as purple loosestrife (*Lythrum salicaria*) and dog-strangling vine (*Cynanchum rossicum*) (Toronto Region Conservation Authority 2008). 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 another common vector for the introduction of non-native plants to natural areas. This was present at several of the residential areas visited during this update.

7.0 CONCLUSIONS

After over ten years of update surveys covering the entire City several trends have emerged. First, there has been a general decrease in the quality of vegetation as indicated by an increase in the number of natural areas with decreasing native mean coefficients (section 4.3; appendix 5). However, the increase in the mean CC within the high category, from 4.82 in 1996 to 5.17 in 2008, suggests that several natural areas are less disturbed than in previous years allowing native species indicative of higher quality habitats to establish or expand their populations. There is an overall increase in FQI values although this has not resulted in a shift toward higher FQI categories (*i.e.*, low to medium, medium to high, *etc.*). The increases in FQI values may be a result of more thorough inventories. Continued monitoring of the natural areas over time will show whether these changes are a positive trend or an anomaly. Second, there has been a decrease in the amount of tableland (woodland and successional categories) and wetland habitats (section 3.1). Development between 1996 and 2008 has resulted in the total loss of approximately 105 ha 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 (section 4.1). One valleyland community, eleven woodland communities, four successional communities and five wetland vegetation communities are uncommon in the City (Appendix 9). Of these, six of the woodland communities and one successional community are "at risk" in the City, occurring in only one natural area each.

An overall trend continues to be a shift in the quality of vegetation within natural areas, likely as a result of increased human disturbance and changes in hydrology resulting from development. There has been a consequent decline in the diversity of fauna, particularly in amphibian species. These trends reinforce the need to maintain and manage (and where possible restore) the remaining natural areas in the City. In particular, tableland natural areas (including woodlands, wetlands and successional vegetation communities) which 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 2008 have involved leaving an area of un-mowed grass adjacent to a watercourse or woodlot feature to regenerate naturally and this has

resulted in the increase of just over 2 ha of tableland at those sites inventoried in 2008. 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 would more likely result in a healthy natural area with a diversity of native plant and animal species such as at Jack Darling Park.

Continued efforts to protect and increase the proportion of the City occupied by natural habitat will promote biodiversity and reinforce the goals and objectives of the Natural Areas Program as set out in the original NAS report (Geomatics 1996).

8.0 RECOMMENDATIONS

1. All of the remaining natural areas in the City should be protected from development and managed to maintain or increase biodiversity. Of particular importance is the protection and subsequent management of all woodlands, wetlands and successional habitats wherever possible. Protection of wetlands in close proximity to forested and cultural habitats is particularly important for both plant and wildlife.

2. It is recommended that the City initiate Conservation Plans for natural areas. Consideration should be given to prioritize natural areas based on significance, representation, size and condition, and those of greatest value. 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). Restoration initiatives could be started on two or three natural areas for a period of two to three years, and natural areas could then be dealt with on a rotational basis that focuses on those natural areas at greatest risk.

3. 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 in Cawthra Woods (LV7) offer a good example of what can be achieved.

4. A City-wide strategy should be developed to address non-native species and develop management initiatives to address the most invasive exotic species. Such a study should include an assessment of the feasibility of managing some aggressive exotics. In particular, the discovery of giant hogweed in 2008 posed potential human health risks and a programme to control or eliminate this species should be considered. Other species that are a high priority are Norway maple, garlic mustard, purple loosestrife, dog-strangling vine, white poplar (*Populus alba*), Japanese knotweed (*Polygonum cuspidatum*) and white mulberry (*Morus alba*). At a minimum the City should 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.

5. 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.

6. 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.

7. 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.

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Appendix 1: Natural Area Classification Scheme

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 criterion 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 ≥ 40.00
- areas with a mean floristic coefficient of ≥ 4.50
- woodlands ≥ 10ha (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 < 700m)
- woodlands that support old-growth trees (≥ 100 years old)
- wetlands ≥ 2ha (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 ≥ 2ha (5 acres) but < 10ha (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

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.

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261 EcoTec Environmental Consultants Inc. 2007. Tree Inventory and Avian Assessment CP Rail Right of Way at Bridge 19.9 Galt, Streetsville, Ontario.

262 Beacon Environmental. Uptown Mississauga: Hurontario and Eglinton Scoped Environmental Impact Study. Prepared for Pinnacle International (Ontario) Limited.

263 Philip van Wassenaer. Urban Forest Innovations Inc. 2008. Tree Preservation/Arborist Report for 2182 Gordon Drive, Mississauga, Ontario. Prepared for Marta Vodinelic.

264 North-South Environmental Inc. 2008. Tree survey for Part of Block E (1459 Stavebank Road), Registered Plan B-09, City of Mississauga.

265 Ecoplans Limited. 2007. Environmental Impact Statement. 2725 Speakman Drive.

266 Gray Owl Environmental Inc. 2008. Environmental Impact Statement for 2225 Dundas Street East, Mississauga, Ontario.

267 Dougan & Associates. 2007 (October 15). Scoped Environmental Impact Study for Thorny Brae Place, Part of Lot 3 & 5, Range 5 (N. of Dundas Street, Mississauga, Ontario.

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Appendix 3: Fieldwork Identified and Date Completed

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	Site Status	Reason for Field Visit (based on review of aerial photography and literature)	Ownership	Field Visit		Date
				Type	Timing	
Major Development within Natural Areas						
SP1		Office Complex development at northeast corner of natural area	private	road side visit	breeding birds	02/07/08
					spring flora	02/07/08
Minor Development within Natural Areas						
MI4		Residential development	private	road side visit	breeding birds	05/06/08
HO7	NS	Development proposal (Environmental Impact Study) adjacent to linkage south of HO7	parkland	road side visit	breeding birds	25/06/08
					spring flora	25/06/08
					summer flora	22/08/08
Additional Natural Areas						
CM25	NGS	Review of flora and fauna in 2006 when site was first proposed for addition to NAS.	parkland	field work	flora	07/07/06
					breeding birds	29/06/06
					amphibians	29/06/06
ME13	NS	Review of flora and fauna in 2006 when site was first proposed for addition to NAS.	parkland	fieldwork	flora	24/08/06
					breeding birds	01/06/06
Additions to Natural Areas						
HO6	NGS	Linkage and small natural areas added	private/ greenbelt	road side visit	breeding birds	25/06/08
					spring flora	25/06/08
					summer flora	22/08/08

Natural Area	Site Status	Reason for Field Visit (based on review of aerial photography and literature)	Ownership	Field Visit		Date
				Type	Timing	
CRR4	SNS	Addition of natural area and review of site boundaries.	parkland	field work	breeding birds	25/06/08
					spring flora	25/06/08
					summer flora	22/08/08
CRR5		Additional of small natural area. Search for butternut.	parkland	field work	breeding birds	25/06/08
					spring flora	25/06/08
					summer flora	22/08/08
					butternut	22/08/08
ET03		Addition of Parkland and Special Management Area.	parkland	field work	flora	26/08/08
					butternut	26/08/08
HO3		Addition of Special Management Area. Search for butternut.	parkland /private	field work/ road side visit	breeding birds	25/06/08
					spring flora	25/06/08
					summer flora	22/08/08
MA1	NS	Addition of Linkage.	greenbelt	field work	breeding birds	04/07/08
					flora	26/08/08
MV2	SNS (ESA, ANSI)	Addition of Special Management Areas.	greenbelt	field work	breeding birds	25/06/08
					amphibians	24/04/08
					spring flora	25/06/08
					summer flora	22/08/08
					butternut	22/08/08
MV19	SNS	Addition of Parkland and Linkage.	parkland	fieldwork	amphibians	24/04/08
					breeding birds	04/07/08
					spring flora	04/07/08
					summer flora	26/08/08

Natural Area	Site Status	Reason for Field Visit (based on review of aerial photography and literature)	Ownership	Field Visit		Date
				Type	Timing	
NE9	SNS	Addition of Linkage and TRCA natural area. Search for butternut.	parkland	fieldwork	breeding birds	04/07/08
					spring flora	24/04/08
					summer flora	04/07/08
					butternut	26/08/08
No changes						
CL8	SNS	Minor boundary revisions.	private/greenbelt	road side visit	breeding birds	27/06/08
					spring flora	27/06/08
					summer flora	11/10/08
CL9	SNS	Minor boundary revisions. Juglans found.	parkland	field work	breeding birds	27/06/08
					spring flora	27/06/08
					summer flora	27/06/08
					amphibians	20/04/08
					butternut	Ref. 273
CL16	SNS	Minor boundary revisions.	parkland	field work	breeding birds	03/07/08
					spring flora	03/07/08
					summer flora	03/07/08
					butternut	03/07/08
CL21	SNS	Minor boundary revisions. Search for butternut.	greenbelt	field work	breeding birds	04/07/08
					spring flora	03 and 04/07/08
					summer flora	31/07/08
					butternut	04/07/08
CL26	SNS	Minor boundary revisions.	parkland	field work	breeding birds	03/07/08
					spring flora	03/07/08
					summer flora	11/10/08
					butternut	11/10/08

Natural Area	Site Status	Reason for Field Visit (based on review of aerial photography and literature)	Ownership	Field Visit		Date
				Type	Timing	
CL30	SNS	Minor boundary revisions.	parkland	field work	breeding birds	03/07/08
					spring flora	03/07/08
					summer flora	11/10/08
CRR1	SNS	Boundary review. Search for butternut.	parkland	field work	breeding birds	04/07/08
					amphibians	24/04/08
					spring flora	04/07/08
					summer flora	26/08/08
					butternut	26/08/08
SH6	NS	Minor boundary revisions.	parkland/private	field work/road side visit	breeding birds	03/07/08
					spring flora	03/07/08
					summer flora	30/07/08
SP3	SNS	Minor boundary revisions.	private	road side visit	breeding birds	02/07/08
					spring flora	02/07/08
MI1	SNS	Minor boundary revisions.	private/greenbelt	road side visit	breeding birds	05/06/08
					spring flora	05/06/08
					summer flora	05/06/08
CL22	SNS	Minor boundary revisions.	private	road side visit	breeding birds	02/07/08
					spring flora	02/07/08
					amphibians	22/04/08
CL39	SNS	Minor boundary revisions.	parkland/private	field work/ road side visit	breeding birds	02/07/08
					spring flora	02/07/08
					summer flora	06/08/08
CL42	NS	Minor boundary revisions.	greenbelt/private	road side visit	breeding birds	02/07/08
					spring flora	02/07/08
					summer flora	02/07/08

Natural Area	Site Status	Reason for Field Visit (based on review of aerial photography and literature)	Ownership	Field Visit		Date
				Type	Timing	
CL43	NS	Minor boundary revisions.	parkland/greenbelt	field work	breeding birds	04/07/08
					spring flora	04/07/08
					summer flora	31/07/08, 06/08/08
SD4	NS	Minor boundary revisions.	private	no access	-	-
MI7	SNS	Minor boundary revisions.	private	road side visit	breeding birds	05/06/08
CL1	SNS	Minor boundary revisions.	parkland	field work	breeding birds	30/07/08
					spring flora	30/07/08
					summer flora	30/07/08
CL13	NS	Minor boundary revisions.	greenbelt/private	road side visit	breeding birds	02/07/08
					spring flora	02/07/08
					summer flora	31/07/08
CL15	NS	Minor boundary revisions.	private	road side visit	breeding birds	27/06/08
CL17	RW	Minor boundary revisions.	private	road side visit	breeding birds	03/07/08
					spring flora	03/07/08
					summer flora	03/07/08
CL24	SNS	Minor boundary revisions.	greenbelt	field work	breeding birds	04/07/08
					spring flora	04/07/08
					summer flora	10/11/08
					butternut	10/11/08
CL31	SNS	Minor boundary revisions.	greenbelt	field work	breeding birds	02/07/08
					spring flora	02/07/08
					summer flora	11/10/08
					butternut	11/10/08
CL52	NS	Minor boundary revisions.	Petro Canada	no access	-	-

Natural Area	Site Status	Reason for Field Visit (based on review of aerial photography and literature)	Ownership	Field Visit		Date
				Type	Timing	
CRR9	SNS	Minor boundary revisions.	parkland	field work	breeding birds	03/07/08
					flora	03/07/08
ETO8	SNS	Minor boundary revisions.	private/parkland	field work/ road side visit	breeding birds	02 and 04/07/08
					spring flora	02/07/08
					summer flora	02/07/08
					butternut	02/07/08
LV14	NS	Minor boundary revisions.	private	no access	-	-
LV2	NS	Minor boundary revisions.	private	no access	-	-
LV3	NS	Minor boundary revisions.	parkland	field work	breeding birds	05/06/08
					spring flora	05/06/08
					summer flora	01/08/08
LV4	NS	Minor boundary revisions.	greenbelt	field work	breeding birds	05/06/08
					spring flora	05/06/08
					summer flora	01/08/08
LV5	NGS	Minor boundary revisions.	private	no access	-	-
LV6	NS	Minor boundary revisions.	private	road side visit	breeding birds	05/06/08
					spring flora	05/06/08
					summer flora	05/06/08
LV7	SNS	Minor boundary revisions.	parkland	field work	breeding birds	02/07/08
					spring flora	-
					summer flora	11/10/08
					butternut	11/10/08
MI17	SNS	Minor boundary revisions.	parkland/private	field work/ road side visit	breeding birds	05/06/08
					spring flora	05/06/08
					summer flora	05/06/08

Natural Area	Site Status	Reason for Field Visit (based on review of aerial photography and literature)	Ownership	Field Visit		Site Status
				Type	Timing	
PC1	NS	Minor boundary revisions. Search for butternut.	parkland	field work	breeding birds	03/07/08
					spring flora	03/07/08
					summer flora	01/08/08
					butternut	01/08/08
PC2	NGS	Minor boundary revisions.	parkland	field work	breeding birds	05/06/08
					spring flora	05/06/08
					summer flora	01/08/08
SD5	SNS	Minor boundary revisions.	Petro Canada	road side visit	breeding birds	27/06/08
					spring flora	27/06/08
					summer flora	27/06/08
					butternut	Ref. 272
ET07	SNS	Minor boundary revisions.	greenbelt	field work	breeding birds	23/06/08
					summer flora	23/06/08
LV1	SNS	Minor boundary revisions.	parkland	field work	breeding birds	23/06/08
					spring flora	23/06/08
					summer flora	11/10/08
					butternut	11/10/08
SD1	SNS	Minor boundary revisions.	private	road side visit	breeding birds	27/06/08
					spring flora	27/06/08
					summer flora	06/08/08
					butternut	06/08/08
SD7	SNS	Minor boundary revisions.	parkland/private	field work/ road side visit	breeding birds	27/06/08
					spring flora	27/06/08
					summer flora	30/07/08
					butternut	30/07/08

Appendix 4: Rarity Status Definitions

Appendix 4: Rarity Status Definitions

The following six rarity ranks follow the Natural Heritage Information Centre (NHIC 2004).

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 imperilled 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 2008)

Appendix 5: Changes in Natural Areas Updated (1996 to 2008)

Changes within natural areas evaluated in 2008. All changes between 1996 and 2008 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	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	# reptiles & amphibians	prov. sig. species	CVC	
SP1	96	NS		9.05	22.36	108	27 (24.3%)	33.99	3.80	5	0	11	4	1	0	0	0	Fair
	98																	
	99																	
	00																	
	01																	
	02			↓7.17	↓17.7	↑185	↑73 (39.46%)	↓38.65	↓3.65			↑16	↑20					
	04					↑194	↑77 (39.69%)	↑39.57	↑3.66			↑17	↑27	↑7			↑4	
	08					↑197	↑80 (40.61)						↑42	↑8				
SP3	96	SNS	ANSI	8.84	21.84	134	30 (21.8%)	41.09	4.05	5	0	11	5	2	1	0	0	Good
	98		↓															
	99																	
	00																	
	01																	
	02																	
	04			↓8.54	↓21.09								↑13				↑2	
	08			↑8.77	↑21.67	↑141	↑34 (24.11%)	↓40.99	↓3.96			↑17	↑42	↑8			↑4	

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
MI1	96	NS		6.31	15.59	9	4 (44.44%)	n/a	n/a	1	0	0	0	0	0	0	0	Fair
	98																	
	99																	
	00																	
	01			↓5.63	↓13.91	↑16	↑5 (31.25%)			↑2			↑50					
	02																	
	04			↑5.64	↑13.94	↑57	↑36 (63.16%)			↑4			↑51	↑2			↑2	
	08			↑6.83	↑16.88	↑68	↑42 (61.76%)	8.50	3.80				↑52	↑5				
MI4	96	RW		165.14	407.9	97	27 (24.7%)	n/a	n/a	1	0	5	0	0	3	0	0	Fair
	98					↑134	↑41 (30.6%)					↑14	↑2					
	99			↓153.28	↓378.6	↓28						↓1	↓0	↓0	↓0			
	00																	
	01																	
	02																	
	04			↑154.31	↑381.15		↓16 (57.14%)											
	08			↓153.81	↓380.07	↑37	↑18 (48.65%)						↑13					
MI7	96																	
	98																	
	99	SNS		5.95	14.69	125	39 (31.2%)	39.90	4.30	2		7	1	5				Poor
	00																	
	01																	
	02																	
	04			↓4.98	↓9.41						↑1		↑10	↓4			↑2	
	08												↑18					

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
MI17	96																	
	98																	
	99	NS		6.04	14.92	145	45 (31.0%)	42.20	4.22	2	0	15	6	2	3	0	0	Fair
	00	↑SNS					↓44 (30.34%)						↓5					
	01																	
	02																	
	04			↓5.98	↓14.77	↑167	↑54 (32.34%)	↑43.56	↓4.10			↑16	↑19	↑8			↑3	
	08			↑6.24	↑15.42								↑23	↑9				
CL1	96	SNS		3.59	8.86	38	4 (10.5%)	28.13	4.82	1	0	2	2	0	0	0	0	Good
	98																	
	99					↑48	↑7 (14.6%)	↑28.74	↓4.49			↑3	↑3	↑1				
	00																	
	01																	
	02																	
	04					↑80	↑17 (21.25%)	↑34.65	↓4.37			↑5	↑14		↑1		↑2	
	08			↓3.35	↓8.28	↑109	↑25(22.94%)	↑37.21	↓4.06			↑9	↑16					
CL8	96	SNS	wetland	11.28	27.86	48	9 (18.8%)	19.86	3.18	7	0	2	13	10	1	0	0	Good
	98					↑57	↑10 (17.5%)	↑ 21.73	↑ 3.17			↑4						
	99					↑ 73	↑20 (27.4%)	↑22.94	↑ 3.15	↑8		↑5	↑14					
	00																	
	01																	
	02																	
	04					↑85	↑24 (28.24%)	↑24.58				↑6	↑28				↑5	
	08			↑12.26	↑30.29	↑108	↑33(30.56%)	↑30.60	↑3.53		↑1	↑12	↑30					

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
CL9	96	SNS	ESA,ANSI,wetland	46.89	115.82	491	156 (31.40%)	80.10	4.38	13	2	125	200	23	22	1	0	Good
	98					↑496	↑161 (32.30%)				↓0	↑132						
	99					↓495		↓79.83	↓4.37			↓131						
	00			↓46.81	↓115.63						↑1	↓130		↓22	↓21	↓0	↑8	
	01					↑496	↓159 (32.06%)	↑79.86	↓4.35			↑133						
	02							↑80.10	↑4.36							↑1		
	04			↓45.62	↓112.68	↑501	↑163 (32.53%)	↑80.30	↑4.37				↑203			↑3	↑14	
	08			↑45.78	↑113.12	↑519	↑171(32.95%)	↑81.93	↑4.39			↑143		↑29				
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	↑20.79	↑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	
	08			↓6.18	↓15.27	↑135	↑77(57.04%)	↑20.71	↑2.77			↑5	↑16	↑5				
CL15	96	NS		0.83	2.05	44	9 (18.2%)	24.51	4.14	1	0	3	2	2	0	0	0	Fair
	98																	
	99					↑ 46	↑10 (21.7%)	↓22.12	↑4.17									
	00																	
	01																	
	02																	
	04					↑54	↓9 (16.67%)	↑25.79	↓3.84				↑10	↑3			↑1	
	08			↓0.77	↓1.90								↑12					

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
CL16	96	NS		8.52	21.04	119	33 (26.9%)	37.63	4.06	5	0	11	37	16	0	0	0	Fair-Poor
	98					↑134	↑ 42 (30.6%)	↑38.47	↓4.01			↑13	↑38	↑17				
	99					↑138	↑ 46 (33.3%)	↓37.95	↓3.96			↑14						
	00					↑147	↓44 (29.93%)										↑5	
	01																	
	02																	
	04	↑SNS		↑11.79	↑29.12	↑161	↑49 (30.43%)	↑39.02	↓3.84	↑6	↑1	↑15	↑42				↑6	
	08			↑15.20	↑37.56	↑189	↑53 (28.04%)	↑48.30	↑4.29			↑29	↑47					
CL17	96	RW		33.28	82.20	71	13 (18.6%)	0.00	0.00	1	0	17	0	0	4	0	0	n/a
	98											↑18						
	99			↑33.48	↑82.70													
	00					↑73	↑15 (20.55%)					↑19						
	01																	
	02																	
	04			↓33.28	↓82.21													
	08			↓32.09	↓79.30	↑125	↑36(28.80%)	↑23.95	↑4.45			↑24	↑19	↑2				
CL21	96	SNS	ESA,ANSI,wetland	9.36	23.12	97	22 (21.6%)	38.91	4.49	3	0	18	2	0	1	0	0	Fair
	98		↓ESA,wetland									↑20						
	99																	↓Fair-Poor
	00																	
	01																	
	02																	
	04			↓9.05	↓22.34	↑112	↑23 (20.54%)	↑41.23	↓4.37				↑17	↑3			↑3	
	08			↑9.87	↑24.39	↑165	↑47(28.48%	↑46.49	↓4.28		↑1	↑25	↑21		↑2			

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
CL22	96	SNS	ESA,ANSI	17.85	44.09	131	45 (34.4%)	37.74	4.07	1	2	13	2	1	6	0	0	Good
	98										↓1	↑15						
	99			↓17.78	↓43.92													
	00																	
	01																	
	02																	
	04			↓17.75	↓43.84	↑134	↑46 (34.33%)	↓37.31	↓3.98			↓13						
	08			↑17.85	↑44.12	↑147	↑50(34.01%)	↑38.58	↑3.92				↑9					
CL24	96	SNS		7.8	19.27	213	51 (23.0%)	58.06	4.56	3	0	31	6	1	0	0	0	Good
	98		↑ESA, ANSI			↑216						↑36						
	99					↑235	↑62 (26.4%)	↑59.23	↓4.50	↑4		↑37	↑10					
	00																	
	01																	
	02																	
	04			↓7.76	↓19.16	↑245	↑65 (26.53%)	↑59.89	↓4.46	↑5	↑1	↓36	↑20		↑1		↑3	
	08			↑8.08	↑19.97	↑257	↑69(26.85%)	↑60.93	↓4.44			↑39	↑23	↑2				
CL26	96	NS		4.34	10.72	157	58 (35.70%)	31.66	3.18	2	0	14	5	2	0	0	0	Fair
	98											↑15						
	99			↑4.76	↑11.75	↑178	↑68 (38.20%)	↑34.52	↑3.29			↑18	↑18	↑7				
	00																	
	01			↓2.01	↓4.96		↑65 (36.52%)	↑34.05	↓3.20	↓1		↓17						
	02																	
	04	↑SNS		↓1.97	↓4.86	↑189	↑70 (37.04%)	↑36.03	↑3.30		↑1		↑19					
	08			↓1.95	↓4.82	↑198	↑71(35.86%)	↑38.78	↑3.44			↑21	↑21					

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
CL30	96	SNS	ESA,ANSI	0.06	0.14	24	8 (33.30%)	0.00	0.00	1	2	11	0	0	0	0	0	Poor
	98					↑46	↑16 (34.80%)	↑25.56	↑4.67		↓1							↑Fair-Poor
	99					↑51	↑18 (35.30%)	↓25.29	↓4.58			↑14						↑Fair
	00					↑80	↑31 (38.75%)	↑28.00	↓4.00			↑20						
	01					↑81		↑27.72	↓3.92									
	04					↑83	↑33 (39.76%)	↑27.86	↑3.94				↑1					
	08					↑85	↑35 (41.18%)						↑3					
CL31	96	SNS	ESA,ANSI	2.78	6.87	50	26 (50.0%)	0.00	0.00	1	0	2	1	0	0	0	0	Poor
	98																	
	99			↓2.61	↓6.45	↑59		↑19.32	↑3.36				↑4					
	00																	
	01																	
	02																	
	04			↓2.55	↓6.29	↑82	↑34 (41.46%)	↑23.09	↓3.33			↑3		↑1				
	08			↑2.82	↑6.97	↑101	↑42(41.58%)	↑26.30	↑3.42		↑1	↓2	↑10					
CL39	96	SNS		12.98	32.06	245	69 (28.0%)	54.51	4.13	2	0	41	6	2	8	0	0	Fair
	98					↑250	↑72 (28.4%)	↑54.72	↓4.10			↓40	↑22	↑5				
	99			↓12.90	↓31.87	↑265	↑79 (29.8%)	↑56.46	↑4.14			↑43	↑25					
	00																	
	01																	
	02																	
	04			↓12.59	↓31.10	↑271		↑57.23	↓4.13				↑39	↑6			↑7	
	08			↑12.81	↑31.65	↑302	↑93(30.79%)	↑60.11	↑4.16	↑3	↑1	↑48						

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
CL42	96	NS		8.87	21.91	103	28 (27.2%)	35.80	4.13	3	0	9	4	1	0	0	0	Fair-Poor
	98																	
	99			↑8.88	↑21.93	↑115	↑34 (29.6%)	↑37.33	↑4.15			↑12						
	00																	
	01																	
	02																	
	04			↓8.31	↓20.54	↑119		↓37.31	↓4.05				↑18				↑4	
	08			↓8.20	↓20.26	↑124	↑37(29.84%)	↑37.74					↑22					
CL43	96	NS		4.16	10.28	68	11 (16.2%)	29.27	3.88	2	0	5	5	1	0	0	0	Fair
	98																	
	99			↓4.14	↓10.24													
	00																	
	01																	
	02																	
	04			↑4.16	↑10.27	↑87	↑18 (20.69%)	↑31.18	↓3.75			↑6	↑14	↑2			↑1	↓Fair-Poor
	08			↑4.19	↑10.35	↑162	↑48(29.63%)	↑43.27	↑4.05			↑19	↑20					
CL52	96	NGS		6.67	16.47	34	18 (52.9%)	12.75	3.19	1	0	0	10	1	0	0	0	Poor
	98																	
	99			↑6.69	↑16.53	↑44	↑24 (54.5%)	↑15.21	↑3.40				↑11		↑2			
	00																	
	01																	
	02																	
	04	↑NS				↑73	↑43 (58.90%)	↓14.61	↓2.67				↑25				↑3	
	08	↑SNS		↑8.93	↑22.07						↑1							

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
SH6	96	NS		6.85	16.92	70	32 (46.4%)	21.37	3.51	2	0	1	4	0	0	0	0	Poor
	98																	
	99			↓6.44	↓15.91	↑80	↑38 (47.5%)	↑23.30	↑3.60			↑2	↑6	↑1				
	00																	
	01																	
	02																	
	04			↓6.28	↓15.51	↑104	↑49 (47.12%)	↑24.68	↓3.33	↑4			↑12	↑3			↑1	
	08			↑7.52	↑18.58	↑144	↑69(47.92%)	↑29.33	↑3.39			↑4	↑13					
SD1	96	NS		19.5	48.16	96	27 (28.1%)	30.22	3.64	5	0	4	13	4	2	0	0	Fair
	98																	
	99			↓19.35	↓47.78													
	00																	
	01																	
	02																	
	04			↑19.55	↑48.28	↑170	↑67 (39.41%)	↑35.96	↓3.54	↑6	↑1	↑10	↑113	↑7			↑6	
	08			↑19.80	↑48.93	↑199	↑84(42.21%)	↑39.72	↑3.70			↑14	↑114					
SD4	96	NS		26.58	65.65	65	16 (24.6%)	26.14	3.73	1	0	2	0	0	0	0	0	n/a
	98																	
	99																	
	00																	
	01																	
	02																	
	04			↓23.66	↓58.45	↑106	↑24 (22.64%)	↑31.69	↓3.50	↑6			↑13				↑2	Fair
	08			↑24.53	↑60.61													

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
SD5	96	SNS		10.14	25.05	38	4 (10.5%)	28.13	4.82	2	0	2	2	0	0	0	0	Good
	98																	
	99					↑48	↑ 7 (14.6%)	↑ 28.74	↓4.49			↑3	↑3	↑ 1				
	00																	
	01																	
	02																	
	04					↑80	↑17 (21.25%)	↑34.65	↓4.37	↑3		↑5	↑14		↑1		↑2	
	08			↑10.17	↑25.13	↑97	↑24 (24.74%)	↑35.23	↓4.12		↑1		↑16	↑3				
SD7	96																	
	98																	
	99	NGS		2.01	4.97	34	16 (47.1%)			2				1				Poor
	00																	
	01																	
	02																	
	04	↑SNS		↑3.81	↑9.41	↑94	↑49 (52.13%)	↑18.84	↑2.84	↑3	↑1	↑5	↑54				↑1	
	08					↑136	↑74(54.41%)	↑23.30	↑2.98			↑8	↑57	↑2				
CRR9	96	SNS	ESA,ANSI,wetland	25.63	63.30	37	14 (37.84%)	17.10	3.57	3	0	12	10	1	13	0	0	Fair
	98																	
	99																	
	00																	
	01					↑45	↑15 (33.33%)	↑21.00	↑3.83			↑16	↑27		↑10		↑6	
	02																	
	04					↑49	↑17 (34.69%)	↓20.86	↓3.69			↑17	↑40			↑2	↑9	
	08			↑26.10	↑64.49	↑50	↑18 (36.00%)						↑41					

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
ETO7	96	SNS	ESA	27.18	67.13	84	35(39.3%)	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									
	08			↓31.90	↓76.82	↑145	↑53(36.55%)	↑31.73	↑3.31	↑3		↑9	↑34	↑5	↑12		↑2	
ETO8	96	SNS		16.67	41.17	85	34 (37.6%)	26.05	3.65	3	0	3	2	4	1	0	0	Fair
	98																	
	99																	
	00																	
	01																	
	02																	
	04					↑101	↑37 (36.63%)	↑29.21		↑4		↑4	↑26	↑6			↑5	
	08			↓15.87	↓39.22	↑133	↑45 (33.83%)	↑37.09	↑3.95		↑1	↑7	↑32					
LV1	96	SNS		14.03	34.65	82	34 (40.2%)	23.09	3.33	4	1	0	8	0	0	0	0	Fair
	98	↓NS				↑83					↓0							
	99			↑14.22	↑35.12	↑93	↑38 (40.9%)	↑24.54	↓3.31	↑5		↑1						
	00																	
	01																	
	02																	
	04	↑SNS				↑123	↑46 (37.40%)	↑29.74	↑3.39		↑1		↑27	↑2			↑5	
	08			↑15.41	↑38.08	↑127	↑48 (37.80%)	↓29.70	↓3.34				↑30	↑5				

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
LV2	96	NS		2.09	5.16	26	11 (38.5%)	11.62	3.00	1	0	0	3	0	0	0	0	Poor
	98																	
	99																	
	00																	
	01																	
	02																	
	04					↑40	↑13 (32.50%)	↑13.09	↓2.52				↑12	↑1			↑2	
	08			↑2.14	↑5.29													
LV3	96	NS		3.54	8.74	80	34 (40.0%)	24.33	3.59	3	0	0	18	2	0	0	0	Fair
	98																	
	99			↑3.55	↑8.76	↑83	↑34 (41.0%)	↑25.43	↑3.63			↑1	↑20	↑3				
	00																	
	01																	
	02																	
	04			↓3.54	↓8.75	↑94	↑36 (38.30%)	↑28.23	↑3.71	↑5			↑34				↑4	
	08			↑3.99	↑9.86	↑137	↑56 (40.88%)	↑33.22	↓3.69			↑6	↑37					
LV4	96	NGS		0.95	2.35	n/a	n/a	0.00	0.00	1	0	0	0	0	0	0	0	Poor
	98																	
	99	↑NS		↑1.09	↑2.68	↑44	↑26 (59.1%)	↑10.61	↑2.50			↑2	↑5					
	00																	
	01																	
	02																	
	04			↑2.31	↑5.70	↑51	↑27 (52.94%)	↑11.29	↓2.30	↑5			↑20	↑1			↑1	
	08			↑3.09	↑7.64	↑111	↑60 (54.05%)	↑20.85	↑2.92			↑8	↑25	↑2				

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
LV5	96	NGS		1.09	2.69	0	0	0	0	1	0	0	0	0	0	0	0	Poor
	98																	
	99			↓0.95	↓2.34													
	00																	
	01																	
	02																	
	04			↑1.12	↑2.77													
	08			↑1.39	↑3.43	↑123	↑66 (53.66%)	↑24.27	↑3.21			↑11		↑2	↑2			
LV6	96	NS		2.02	4.99	61	19 (29.5%)	24.38	3.76	1	0	3	0	0	0	0	0	Fair
	98																	
	99			↑2.03	↑5.01	↑64	↑20 (31.3%)	↑25.48	↑3.84			↑4	↑1	↑1				
	00																	
	01																	
	02																	
	04					↑82	↑24 (29.27%)	↑29.41	↑3.86				↑7				↑1	
	08			↑2.38	↑5.88	↑83	↓24 (28.92%)	↑29.94	↑3.90			↑5	↑9					
LV7	96	SNS	ESA,ANSI	21.56	53.25	292	101 (33.9%)	57.67	4.17	2	0	46	65	6	3	1	0	Good
	98					↑300	↑103 (34.0%)	↑58.71	↑4.18			↑49	↑68	↑7	↑5			
	99		↑ESA,ANSI,wetland			↑331	↑110 (33.2%)	↑62.84	↑4.25			↑60						
	00						↓107 (32.33%)					↑61	↓67				↑3	
	01																	
	02						↑108 (32.63%)	↑62.88	↓4.21									
	04					↑336	↑110 (32.74%)	↑63.66	↑4.23		↑1	↑62	↑68				↑5	
	08			↑21.84	↑53.97	↑339	↓110 (32.45%)	↑64.33	↑4.26			↑63						

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
LV14	96	NGS		1.95	4.82	35	17 (45.7%)	13.67	3.22	1	0	0	0	0	0	0	0	Poor
	98																	
	99					↑40		↑13.76	↓3.16				↑1					
	00																	
	01																	
	02																	
	04	↑NS		↓1.86	↓4.59	↑51	↑24 (47.06%)	↑15.20	↓2.93				↑10				↑1	
	08			↑2.34	↑5.78													
PC1	96	NS		1.09	2.69	87	39 (44.8%)	26.56	3.83	1	0	9	68	1	0	0	0	Poor
	98																	
	99					↑92	↑44 (47.8%)					↓6						
	00																	
	01																	
	02																	
	04			↓1.03	↓2.54	↑101	↑49 (48.51%)	↓25.17	↓3.56			↑7	↑69				↑1	
	08			↑1.07	↑2.64	↑143	↑71 (49.65%)	↑29.88	↑3.57		↑1	↑10	↑71					
PC2	96	NGS		4.37	10.79	0	0	0	0	1	0	0	0	0	0	0	0	Poor
	98																	
	99					↑18	↑10 (55.6%)						↑5					
	00																	
	01																	
	02																	
	04					↑26	↑15 (57.69%)								↑1			
	08			↓4.35	↓10.75	↑93	↑50 (53.76%)	↑18.74	↑3.31			↑6	↑11					

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
CRR1	96	SNS	ESA,ANSI	71.40	176.36	41	12 (26.80%)	0.00	0.00	5		2	2	2	1			Fair
	98		↓ESA			↑76	↑23 (30.26%)	↑26.65	↑3.66			↑4	↑6					
	99																	
	00																	
	01							↓25.55	↓3.51				↑29	↑4	↑7		↑4	
	02					↑249	↑82 (32.93%)	↑48.66	↑3.77			↑37						
	04		↑ESA, wetland	↓69.82	↓172.45	↑252		↑49.07	↓3.76	↑10	↑1			↑5				
	05			↑69.83	↑172.48	↑266	↑89 (33.46%)	↑49.97				↑38	↑50	↑7	↑8			
	06																	
	07			↑73.39	↑181.27	↑294	↑107 (36.39%)	↑51.46				↑41	↑53	↑9				
	08			↑74.61	↑184.36	↑297	↑109 (36.70%)	↑51.77	↑3.78			↑42		↑10				
CRR4	96	SNS	ESA,ANSI	24.69	60.97	11	2 (18.18%)			3		1			7			Good
	98																	
	99																	
	00																	
	01			↓21.17	↓52.29								19	3		1	5	
	02					↑54	↑22 (40.74%)	18.07	3.19	↑4		↑6	↑22			↑2		
	04																	
	05																	
	06																	
	07			↑22.99	↑56.78								↑28					
	08			↑23.63	↑58.39	↑94	↑41 (43.62%)	↑24.08	↑3.31			↑10	↑31	↑4				

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
CRR5	96																	Good
	98	SNS		21.22	52.41	64	27(42.20%)	21.37	3.51	2			5		5			Fair
	99																	
	00																	
	01			↑24.74	↑61.10		↓26(40.63%)	↓21.09	↓3.42				↑15	2	↓2		2	
	02																	
	04																	
	05																	
	06																	
	07			↑28.27	↑69.83						↑1		↑27	↑3		↑1	2	
	08					↑82	↑35 (42.68%)	↑22.17	↓3.23			↑3	↑33					
ETO3	96	SNS		134.93	333.28	405	169 (41.2%)	57.09	3.72	4	2	60	7	5	5	0	0	Fair
	98			↑112.22	↑277.29	↑406					↓1	↑61						↓Fair-Poor
	99					↓400	↓167(41.8%)	↓56.47	↓3.7			↓58						
	00																	
	01																	
	02			↓78.87	↓194.81		↓164 (41.00%)	↓56.35	↓3.67			↑59						
	04																	
	05																	
	06																	
	07			↑87.35	↑215.75			↓56.15	↓3.66		↑2		↑34	↑8			↑3	
	08			↑97.14	↑240.04	↑403	↑165 (40.94%)	↑56.44		↑5								

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
HO3	96	NS		14.41	35.59	49	9 (18.4%)	25.61	4.06	3			11	2				Fair
	98					↑56	↑11 (19.6%)	↑25.79	↓3.84				↑12					
	99																	
	00																	
	01																	
	02					↑60		↑26.43	↓3.78				↑13					
	04																	
	05																	
	06																	
	07			↑15.04	↑37.15	↑73	↑14(19.18%)	↑28.38	↓3.69			1	↑28	↑4				
	08			↑24.65	↑60.91	↑111	↑36 (32.43%)	↑30.83	↓3.56			↑7	↑29					
HO6	96	NGS		8.50	21.00					1								Poor
	98																	
	99																	
	00																	
	01																	
	02																	
	04																	
	05																	
	06																	
	07					41	21(51.22%)	9.84	2.20	1		1	21	1				
	08			↑14.75	↑36.45	↑73	↑37 (50.68%)	↑16.63	↑2.77			↑4		↑3				

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
HO7	96	NS		4.09	10.1	54	10 (16.7%)	26.53	4	3		4						Fair
	98			↓2.11	↓5.21	↑59			↓3.78	↓2			2					↓Fair-Poor
	99					↑72	↑16 (22.2%)	↑29.13	↓3.89				↑6					
	00																	
	01																	
	02			↓1.07	↓2.65	↑80	↑17 (21.25%)	↑30.62					↑8	1				
	04																	
	05																	
	06																	
	07			↑1.36	↑3.36	↑84	↑18 (21.43%)	↑31.39	↓3.86			↓3	↑15					
	08			↑2.52	↑6.23	↑123	↑42 (34.15%)	↑33.78	↓3.75			↑7	↑18					
MA1	96	NGS		25.79	63.70					1								Poor
	98	NS		↓24.06	↓59.45	50	25 (50.0%)	14.00	2.80			3	2					
	99																	
	00																	
	01																	
	02					↑61	↑31 (50.82%)	↑15.34					↑4					
	04																	
	05																	
	06																	
	07			↑24.42	↑60.32	↑83	↑45 (54.22%)	↑15.89	↓2.69				↑19					
	08			↑31.70	↑78.33	↑106	↑55 (51.89%)	↑19.20	↑2.77			↑8						

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
MV2	96	SNS	ESA,ANSI	80.18	198.04	200	60 (29.50%)	46.99	3.97	4	1	20	58	10	2			Good - Fair
	98			↓78.38	↓193.61	↑215	↑69 (31.60%)	↑47.59	↓3.94				↑59	↑12		1		
	99																	
	00						↓68 (31.63%)					↓19					6	
	01							↓47.01	↓3.88				↑67	↑15	↑4		↑14	
	02			↓60.55	↓149.57	↑218	↑71 (32.57%)	↑47.33	↑3.90	↑5								
	04																	
	05																	
	06																	
	07			↑61.78	↑152.59	↑248	↑83(33.47%)	↑50.68	↑3.95			↑27	↑70		↑5			
	08			↑89.55	↑221.28	↑264	↑93 (35.23%)	↑52.00	↑3.98			↑32						
MV19	96	SNS		26.3	64.96	196	50 (25.0%)	50.48	4.18	3		31	13	6	3			Excellent
	98			↓22.66	↓55.99	↑202	↑53 (25.7%)	↑51.04				↓29	↑14					↓Good
	99					↑207		↑52.06	↑4.19			↑30	↑20		↑4			
	00																	
	01																	
	02			↑22.93	↑56.64	↑212	↑56 (26.42%)	↓51.80	↓4.15	↑5		↑31	↑23					
	04																	
	05																	
	06																	
	07			↑23.92	↑59.08	↑238	↑65(27.31%)	↑53.90	↓4.10	↓6		↑36	↑35		↑5			
	08			↑27.46	↑67.85	↑262	↑82 (31.30%)	↑54.93	↑4.09			↑41	↑37					

Site	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	# reptiles & amphibians	prov. sig. species	CVC	
NE9	96	NS		45.21	111.67	46	24 (50.0%)			4		1	5					Fair
	98			↓43.66	↓107.88	↑67	↑27 (40.3%)	↑20.55	↑3.25			↑5	↑12	↑1	↑1			
	99																	
	00																	
	01																	
	02			↑44.47	↑109.84	↑194	↑76 (39.18%)	↑37.74	↑3.47			↑27	↑38	↑3	↑4		↑5	
	04	↑SNS		↑46.00	↑113.66	↑197	↑78 (39.59%)				1		↑39					
	05																	
	06																	
	07			↑47.65	↑123.80	↑224	↑87(38.84%)	↑40.56	↑3.48			↑31	↑42	↑7	↑5		↑6	
	08			↑51.09	↑126.25	↑227	↑88 (38.77%)	↑41.37	↑3.52			↑33			↑7			
NE11	96	NGS		6.07	14.99					1								Poor
	98			↓5.72	↓14.13													
	99																	
	00																	
	01																	
	02			↓5.63	↓13.90													
	04																	
	05																	
	06																	
	07	↑NS		↑6.26	↑15.46	52	28(53.85%)	11.02	2.25			6						
	08																	
CM25	06	NGS		0.70	1.73	24	11 (45.83%)	5.27	1.46	2		1	7		1		2	
	07																	
	08																	
ME13	06	NS		1.42	3.51	25	6 (24.00%)	18.58	4.26	1			3					
	07																	
	08																	

Appendix 6: Comparison of Classifications (1996 to 2008)

Appendix 6: Comparison of Natural Area Classifications (1996 to 2008)

Comparison Categories	Year	Classification				TOTAL
		Significant Natural Site (SNS)	Natural Site (NS)	Natural Green Space (NGS)	Residential Woodland (RW)	
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	21	3	139
	2007	62	58	16	3	139
	2008	62	59	17	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	122.65	237.13	2169.88
	2007	1591.47	300.16	92.95	237.13	2221.71
	2008	1649.62	326.11	100.15	235.43	2311.31
Proportion of Natural Areas System	1996	74%	17%	9%	-	-
	1998	70%	21%	9%	-	-
	1999	70%	22%	8%	-	-
	2000	70%	23%	7%	-	-
	2001	71%	22%	7%	-	-
	2002	71%	22%	7%	-	-
	2004	71%	12%	6%	-	-
	2005	71%	14%	4%	-	-
	2006	71%	12%	6%	-	-
	2007	65.3%	12%	3.8%	-	-
	2008	71.37%	14.11%	4.33%	-	-

Comparison Categories	Year	Classification				TOTAL
		Significant Natural Site (SNS)	Natural Site (NS)	Natural Green Space (NGS)	Residential Woodland (RW)	
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	5.27%	0.92%	0.42%	-	6.61%
	2007	5.44%	1.03%	0.32%	-	6.76%
	2008	5.64%	1.11%	0.34%	-	7.34%

Appendix 7: Comparison of Major Landform Types (1996 to 2008)

Appendix 7: Comparison of Major Landform Types (1996 and 2008)

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	52	5	134
	2007	80	53	5	138
	2008	80	55	5	140
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	287.03	95.97	1925.49
	2007	1590.35	290.54	96.43	1977.32
	2008	1656.95	312.81	98.86	2068.62
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	19.28	5.4	19.20	-
	2007	19.88	5.48	19.29	-
	2008	20.71	5.69	19.77	-

Comparison Categories	Year	Landform Type			
		valleylands and associated tablelands	tablelands	wetlands and associated valleylands	TOTAL
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%
	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	80.11%	14.91%	4.98%	100%
	2007	80.43%	14.69%	4.88%	100%
	2008	80.10%	15.12%	4.78%	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%	0.98%	0.33%	6.58%
	2007	5.43%	0.99%	0.33%	6.76%
	2008	5.66%	1.07%	0.34%	7.07%

Note: The number of sites (140) does not include one small natural area that did not readily fall into the three landform categories. The residential woodlands are also omitted from this analysis. Consequently, figures differ slightly from those provided elsewhere in the report.

Appendix 8: Comparison of Community Size (1996 to 2008)

Appendix 8: Comparison of Community Size (1996 to 2008).

A comparison of the area (in hectares) of vegetation communities mapped for the City of Mississauga from 1996 to 2008 (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	2007	2008	1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008
	Valleylands																						
A	wooded slope	19	20	20	20	22	22	22	21	22	22	22	347.36	348.54	348.72	340.69	347.85	341.65	335.38	328.13	327.34	341.17	343.15
B	floodplain	22	21	21	21	23	23	23	24	24	23	23	458.42	426.21	426.10	426.10	426.32	393.50	390.48	387.52	387.09	400.75	406.56
DD	sugar maple-American beech forest	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	2.48	2.48	2.48
G	golf course	4	4	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	100.17	99.81
J	wooded non-native valleylands	18	18	20	20	22	22	24	27	28	28	28	93.43	94.36	100.27	100.22	109.09	109.09	115.56	119.76	115.17	117.10	120.48
K	open with open slopes valleylands	31	32	33	33	33	33	33	33	35	34	34	229.02	210.58	217.50	217.62	215.34	197.49	196.47	192.81	195.06	192.67	208.28
L	wooded native valleylands	5	5	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	33.32	33.99
M	open with wooded slopes valleylands	2	2	2	2	1	1	1	0	0	0	0	5.26	5.25	5.25	5.25	0.82	0.82	0.82	0.00	0.00	0.00	0.00
N	open with manicured slopes valleylands	2	2	3	2	2	2	2	2	2	2	2	22.16	22.15	22.15	22.15	22.15	22.15	22.15	16.65	16.43	16.43	16.43
O	manicured with wooded slopes valleylands	1	1	1	1	0	0	0	0	0	0	0	5.17	5.17	5.17	5.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Totals												***1301.77***	***1253.23***	***1265.99***	***1257.98***	***1261.35***	***1203.0***	***1194.08***	***1177.48***	***1177.06***	***1214.90***	***1231.18***
	Woodlands																						
BB	red ash-American elm forest	14	15	15	15	16	16	18	18	18	18	17	35.32	35.61	37.35	37.16	36.40	36.40	48.14	47.83	47.87	47.79	52.61
CC	sugar maple forest	7	7	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	11.09	11.09
DD	sugar maple-American beech forest	15	16	16	17	16	16	16	16	16	17	17	108.35	102.44	100.07	100.07	95.15	97.23	93.06	93.08	92.13	95.68	96.57
EE	sugar maple-white ash forest	9	9	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	62.42	63.02
FF	sugar maple-red oak forest	10	10	10	9	9	9	10	10	10	10	10	42.48	44.96	44.96	43.12	42.76	42.70	43.44	43.45	42.87	44.72	44.89
GG	sugar maple-eastern hemlock forest	1	1	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	16.00	17.99
II	sugar maple-black cherry forest	1	1	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	1.77	1.77
KK	sugar maple-American beech-red oak forest	5	5	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	28.93	28.93
LL	sugar maple-American beech-eastern hemlock forest	1	1	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	4.26	6.21
MM	white pine-eastern hemlock-sugar maple forest	1	1	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	5.82	6.00
NN	eastern hemlock forest	3	3	3	3	3	4	4	4	4	4	4	4.09	4.11	4.11	4.11	4.11	5.20	5.20	5.20	5.20	5.20	5.42
OO	red maple-red oak forest	5	6	6	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	29.89	30.53

Code	Vegetation Community	# Occurrences											Area (hectares)										
		1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008	1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008
PP	American beech forest	1	1	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	1.81	1.81
QQ	bur oak-American beech forest	1	1	1	1	0	0	0	0	0	0	0	2.24	2.24	2.24	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RR	oak-ash forest	8	9	9	10	10	9	9	9	9	9	9	28.61	28.57	24.75	27.34	27.34	24.23	23.94	23.88	23.60	26.24	26.83
SS	oak-hickory forest	5	7	7	7	7	8	8	8	8	8	8	24.20	23.56	23.55	23.31	22.58	27.22	26.92	26.65	27.37	28.33	28.51
TT	ash-hickory forest	3	3	3	3	3	3	4	4	4	4	4	6.94	6.68	6.68	6.68	6.21	6.21	8.88	8.88	8.77	8.50	8.50
VV	black cherry-eastern hemlock-white ash forest	1	1	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	2.03	2.38
WW	bur oak-black walnut forest	1	1	1	1	0	0	0	0	0	0	2	0.90	0.90	0.90	0.90	0.00	0.00	0.00	0.00	0.00	0.00	3.27
ZZ	oak-white pine forest	0	0	2	2	2	2	2	2	2	2	2	0	0	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.80
	Totals												***424.43***	***417.89***	***414.87***	***414.73***	***403.81***	***406.32***	***416.07***	***416.17***	***415.92***	***422.83***	***439.13***
	Successional																						
C	old field	26	27	27	27	32	36	40	41	43	42	44	88.45	95.33	95.33	95.30	97.75	109.12	116.24	113.09	115.16	116.09	167.08
D	hedgerow	5	5	4	4	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	5.61	5.62
E	early successional forest	9	10	10	10	7	9	12	16	17	16	16	21.68	14.66	14.66	12.82	7.68	11.12	24.33	33.18	33.28	32.41	32.23
P	hawthorn thicket	4	4	4	4	4	5	5	4	5	4	4	14.54	14.35	14.35	14.35	14.35	14.57	14.36	13.80	14.36	14.36	14.47
XX	birch forest	1	1	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	0.46	0.46
YY	poplar forest	1	2	2	2	2	2	4	4	4	4	4	2.37	1.69	1.69	1.69	1.69	1.69	3.11	3.11	3.11	3.11	3.26
	Totals												***135.18***	***133.5***	***133.44***	***131.56***	***127.39***	***142.41***	***163.96***	***169.10***	***171.82***	***175.74***	***223.12***
	Wetland																						
AA	silver maple forest	5	5	5	5	3	3	3	3	3	3	3	18.59	18.14	18.14	17.58	7.24	7.24	7.24	7.24	6.57	6.57	6.61
V	cattail marsh	13	14	14	14	15	16	16	17	17	17	17	27.73	26.99	26.99	26.99	27.07	27.21	27.10	26.18	26.17	26.72	28.06
W	open water marsh	6	6	6	6	7	7	8	8	8	8	8	22.70	22.70	22.70	22.70	22.56	22.56	21.29	21.29	21.55	21.55	21.00
X	willow-buttonbush swamp thicket	1	1	1	1	1	1	1	1	2	2	2	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.97	3.00	3.00
Y	wet meadow	1	3	3	3	3	4	5	5	5	5	6	3.43	3.72	3.72	3.72	3.72	4.23	10.91	10.91	10.88	10.93	15.67
Z	willow-ash forest	2	2	2	2	2	2	3	3	3	3	3	0.55	0.56	0.56	0.56	0.56	0.56	1.15	1.15	1.09	1.09	1.09
	Totals												***75.77***	***74.88***	***74.88***	***74.32***	***63.92***	***64.56***	***70.46***	***69.54***	***69.60***	***69.86***	***75.43***
	Anthropogenic																						
F	manicured	11	11	11	12	13	12	16	18	19	19	19	72.41	75.16	75.16	76.28	72.99	61.25	58.52	65.67	66.49	63.75	63.56
H	urban lake	2	2	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	7.26	7.26
I	wooded residential	3	3	3	3	3	3	3	3	3	3	3	251.59	251.59	239.93	237.43	237.43	237.43	238.26	237.13	237.13	237.13	235.42

Code	Vegetation Community	# Occurrences											Area (hectares)										
		1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008	1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008
T	plantation	11	11	11	13	12	13	14	15	15	15	15	21.58	21.57	21.60	21.73	20.80	20.92	22.67	22.80	22.88	23.13	25.57
UU	black walnut grove	1	1	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	0.08	0.08
	Totals												***353.01***	***355.75***	***344.12***	***342.87***	***338.65***	***327.03***	***326.79***	***333.02***	***333.84***	***331.35***	***331.89***
	Other																						
R	beach	3	3	4	4	4	4	6	6	6	6	6	2.36	1.96	2.18	2.18	2.18	2.18	2.72	2.72	2.72	2.72	2.73
S	tall grass prairie	1	1	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	0.06	0.06
U	unknown	5	3	3	3	3	3	1	1	1	1	1	35.65	35.64	35.68	35.68	35.68	35.68	7.33	7.33	7.33	7.33	7.69
	Totals												***38.07***	***37.66***	***37.92***	***37.92***	***37.92***	***37.92***	***10.11***	***10.11***	***10.11***	***10.11***	***10.48***

Appendix 9: Summary Of Changes In The Proportion Of Communities In The NAS **(1996 to 2008)**

Appendix 9: Summary of Changes in the Proportion of Communities in the NAS (1996 to 2008).
A comparison of the proportion of the vegetation communities within the Natural Areas System and the City of Mississauga from 1996 to 2008 (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 Area (%)											Proportion of City Area (%)										
		1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008	1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008
	Valleylands																						
A	wooded slope	14.92	15.33	15.4	15.08	15.40	15.12	14.84	15.08	14.49	15.12	15.19	1.19	15.33	15.35	1.16	1.19	1.17	1.15	1.12	1.12	1.17	1.17
B	floodplain	19.69	18.75	18.8	18.86	18.87	17.42	17.28	17.81	17.13	17.74	17.99	1.57	18.75	18.76	1.46	1.46	1.34	1.33	1.32	1.32	1.37	1.39
G	golf course	4.35	4.45	4.45	4.48	4.48	4.41	4.41	4.56	4.43	4.43	4.42	0.35	4.45	4.45	0.35	0.35	0.34	0.34	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	5.18	5.33	0.32	4.15	4.42	0.34	0.37	0.37	0.39	0.41	0.39	0.40	0.41
K	open with open slopes valleylands	9.84	9.26	9.58	9.63	9.53	8.74	8.70	8.86	8.63	8.53	9.22	0.78	9.26	9.58	0.74	0.74	0.67	0.67	0.66	0.67	0.66	0.71
L	wooded native valleylands	1.71	1.75	1.75	1.75	1.71	1.71	1.48	1.53	1.47	1.47	1.50	0.14	1.75	1.75	0.14	0.13	0.13	0.11	0.11	0.11	0.11	0.12
M	open with wooded slopes valleylands	0.23	0.23	0.23	0.23	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.02	0.23	0.23	0.02	0.00	0.00	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	0.73	0.73	0.08	0.97	0.97	0.08	0.08	0.08	0.08	0.06	0.06	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	0.00	0.00	0.02	0.23	0.23	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Totals	***55.92***	***55.12***	***55.74***	***55.68***	***55.83***	***53.25***	***52.93***	***54.13***	***51.98***	***53.68***	***54.38***	***4.47***	***55.12***	***55.74***	***4.30***	***4.31***	***4.11***	***4.08***	***4.02***	***4.01***	***4.15***	***4.20***
	Woodlands																						
BB	red ash-American elm forest	1.52	1.57	1.64	1.64	1.61	1.61	2.13	2.20	2.12	2.12	2.33	0.12	1.57	1.64	0.13	0.12	0.12	0.16	0.16	0.16	0.16	0.18
CC	sugar maple forest	0.64	0.58	0.58	0.58	0.58	0.51	0.51	0.51	0.49	0.49	0.49	0.05	0.58	0.58	0.04	0.04	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	4.08	4.23	4.27	0.37	4.51	4.41	0.34	0.33	0.33	0.32	0.32	0.31	0.33	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	2.76	2.79	0.22	2.74	2.74	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22
FF	sugar maple-red oak forest	1.82	1.98	1.98	1.91	1.89	1.89	1.92	2.00	1.90	1.98	1.99	0.15	1.98	1.98	0.15	0.15	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	0.71	0.80	0.05	0.71	0.71	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06

Code	Vegetation Community	Proportion of Natural Area (%)											Proportion of City Area (%)										
		1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008	1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008
II	sugar maple-black cherry forest	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.01	0.08	0.08	0.01	0.01	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	1.28	1.28	0.10	1.30	1.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
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	0.19	0.27	0.02	0.20	0.19	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02
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	0.26	0.27	0.02	0.30	0.25	0.02	0.02	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	0.23	0.24	0.01	0.18	0.18	0.01	0.01	0.02	0.02	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	1.32	1.35	0.10	1.33	1.33	0.10	0.10	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	0.11	0.08	0.08	0.01	0.11	0.11	0.01	0.01	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	0.00	0.00	0.01	0.10	0.10	0.01	0.00	0.00	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	1.16	1.19	0.10	1.26	1.09	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.09
SS	oak-hickory forest	1.04	1.04	1.04	1.03	1.00	1.20	1.19	1.23	1.21	1.25	1.26	0.08	1.04	1.04	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10
TT	ash-hickory forest	0.30	0.29	0.29	0.30	0.27	0.27	0.39	0.41	0.39	0.38	0.38	0.02	0.29	0.29	0.02	0.02	0.02	0.03	0.03	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	0.09	0.11	0.01	0.09	0.09	0.01	0.01	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	0.14	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
ZZ	oak-white pine forest	0.00	0.00	0.1	0.10	0.10	0.10	0.10	0.11	0.10	0.10	0.12	0.00	0.00	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Totals	***18.25***	***18.41***	***18.25***	***18.36***	***17.87***	***17.98***	***18.42***	***19.13***	***19.04***	***18.71***	***19.44***	***1.45***	***18.41***	***18.25***	***1.42***	***1.38***	***1.39***	***1.42***	***1.42***	***1.41***	***1.45***	***1.51***
	Successional																						
C	old field	3.80	4.19	4.19	4.22	4.33	4.83	5.14	5.20	5.10	5.14	7.39	0.30	0.33	0.33	0.33	0.33	0.37	0.40	0.39	0.39	0.40	0.57
D	hedgerow	0.33	0.31	0.31	0.31	0.24	0.24	0.24	0.25	0.24	0.25	0.25	0.03	0.02	0.02	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	1.43	1.43	0.07	0.05	0.05	0.04	0.03	0.04	0.08	0.11	0.11	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	0.64	0.64	0.05	0.05	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	0.02	0.02	0.00	0.00	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	0.14	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Code	Vegetation Community	Proportion of Natural Area (%)											Proportion of City Area (%)										
		1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008	1996	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008
	Totals	***5.8***	***5.87***	***5.87***	***5.82***	***5.64***	***6.30***	***7.26***	***7.77***	***7.61***	***7.78***	***9.87***	***0.46***	***0.46***	***0.46***	***0.46***	***0.44***	***0.49***	***0.56***	***0.58***	***0.58***	***0.60***	***0.76***
	Wetland																						
AA	silver maple forest	0.80	0.80	0.80	0.78	0.32	0.32	0.32	0.33	0.29	0.29	0.29	0.06	0.06	0.06	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02
V	cattail marsh	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.16	1.18	1.24	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10
W	open water marsh	0.97	1.00	1.00	1.00	1.00	1.00	0.94	0.98	0.95	0.95	0.93	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	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	0.13	0.13	0.01	0.01	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	0.48	0.69	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.04	0.04	0.04	0.05
Z	willow-ash forest	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.00	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Totals	***3.25***	***3.29***	***3.29***	***3.29***	***2.83***	***2.86***	***3.12***	***3.20***	***19.9***	***3.08***	***3.33***	***0.25***	***0.25***	***0.25***	***0.25***	***0.22***	***0.22***	***0.24***	***0.24***	***0.23***	***0.23***	***0.25***
	Anthropogenic																						
F	manicured	3.11	3.31	3.31	3.38	3.23	2.71	2.59	3.02	2.94	2.82	2.81	0.25	0.26	0.26	0.26	0.25	0.21	0.20	0.22	0.23	0.22	0.22
H	urban lake	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.33	0.32	0.32	0.32	0.02	0.02	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	10.50	10.42	0.86	0.86	0.82	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.80
T	plantation	0.93	0.95	0.95	0.96	0.92	0.93	1.00	1.05	1.01	1.02	1.13	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09
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	0.00	0.00	0.00	0.00
	Totals	***15.17***	***15.66***	***15.15***	***15.18***	***14.99***	***14.47***	***14.46***	***15.31***	***14.77***	***14.66***	***14.68***	***1.2***	***1.21***	***1.17***	***1.17***	***1.16***	***1.12***	***1.12***	***1.14***	***1.14***	***1.13***	***1.13***
	Other																						
R	beach	0.10	0.09	0.10	0.10	0.10	0.10	0.12	0.13	0.12	0.12	0.12	0.01	0.01	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	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	0.32	0.34	0.12	0.12	0.12	0.12	0.12	0.12	0.03	0.03	0.03	0.03	0.03
	Totals	***1.63***	***1.66***	***1.67***	***1.67***	***1.68***	***1.68***	***0.45***	***0.46***	***0.44***	***0.44***	***0.46***	***0.13***	***0.13***	***0.13***	***0.13***	***0.13***	***0.13***	**0.03**	***0.03***	***0.04***	***0.04***	***0.04***

Appendix 10: Butternut Survey Summary

Appendix 10. Butternut Survey Summary.

Site	Results of 2008 Survey	Last Recorded Observation Prior to 2008 Survey	GPS Co-ordinates (NAD 83)
AW1	None located	NAS database 2005	06173881 4826568
CL9	Ref. 272 (CVC 2007)	Macdonald 1970	
CL16	None located	NAS database 2005; NAS database 1998, HBT AGRA Limited (1993)	0612831 4819960; 0612825 4819985: 60cm, 50 cm, 45cm, 15cm dbh infected with canker; 80cm dbh almost dead
CL21	SKM 04/07/08	Not previously recorded	0611852 4820258, 0611821 4820270 (possible hybrid)
CL24	None located	NAS database 1999	
CL31	None located	NAS database 2004	
CRR1	None located	Ecologistics Limited (1979)	0601986 4831102; 0601961 4831139; 0601954 4831144 ; 0601939 4831138; 0601922 4831212; in 2005: 35cm; 25cm; 35cm; 25cm; 15cm; all infected with canker
CRR10	None located	NAS database 2001	
CRR3	None located	NAS database 1998	
CRR6	None located	NAS database 2006	
CRR7	None located	newly documented during 2005 update survey	0609300 4822010
CV12	None located	Gore & Storrie Limited and R.E. Winter and Associates Limited (1994)	0611875 4827070: : 15cm dbh in good condition
ER6	None located	NAS database 2000	
ETO4	None located	NAS database 2005	0611361 4834140
ETO8	SKM 04/07/08	Not previously recorded	0616694 4828175, 0617001 4827912, 061707 4827827, 0617069 4827742
LV1	None located	NAS database 1995	0617388 4826569: 30cm, 10 cm dbh infected with canker
LV7	None located	NAS database 1999	

Site	Results of 2008 Survey	Last Recorded Observation Prior to 2008 Survey	GPS Co-ordinates (NAD 83)
ME10	None located	MJ 25/07/01, MJ/CZ 15/06/95	
MI7	No access in 2008	NAS database 1999	-
NE9	None located	NAS database 2002	0610715 4840455
SD1	None located	Dougan & Associates (2003)	-
SD5	Ref. 272 (CVC 2007)	Ref. 257	-
PC1	SP 01/08/08	Not previously recorded	0613352 4821815
SD7	SP 30/07/08	NAS 2005; NAS database 1999	0611951 4816431: 45cm dbh infected with canker

Appendix 11: Provincially Significant Native Flora Species

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) of the Natural Areas Survey.

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

Appendix 12: Updated CVC Bird Species of Conservation Interest

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 2004). Rarity ranks are defined in Appendix 4 of the Natural Areas Survey. 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	*Empidonax virescens*	G5	S2B,SZN	END	END	migrant	CL9
alder flycatcher	*Empidonax alnorum*	G5	S5B,SZN			possible	CRR1, CRR10, EC13
American bittern	*Botaurus lentiginosus*	G4	S4B,SZN			possible	CL9, CRR9, EC13
American black duck	*Anas rubripes*	G5	S5B,SZN			possible	CL9, EC13, ETO8, PC1, SD1, SD7
American coot	*Fulica americana*	G5	S4B,SZN	NAR	NAR	migrant	CL9, SD7
American redstart	*Setophaga ruticilla*	G5	S5B,SZN			probable	city wide
bank swallow	*Riparia riparia*	G5	S5B,SZN			possible	city wide
barn swallow	*Hirundo rustica*	G5	S5B,SZN			confirmed	city wide
barred owl	*Strix varia*	G5	S4S5			migrant	CL9
belted kingfisher	*Ceryle alcyon*	G5	S5B,SZN			probable	city wide
black tern	*Chlidonias niger*	G4	S3B,SZN	NAR	SC	migrant	CL9
black-and-white warbler	*Mniotilta varia*	G5	S5B,SZN			migrant	city wide
blackburnian warbler	*Dendroica fusca*	G5	S5B,SZN			migrant	CL9, CRR10, EM4, CRR6, LV7
black-crowned night-heron	*Nycticorax nycticorax*	G5	S3B,SZN			probable	CL16, CL8, CL9, CRR4, CRR9, Credit River, Etobicoke Creek, ETO7, LV3, LV4, NE9, SD1
black-throated blue warbler	*Dendroica caerulescens*	G5	S5B,SZN			migrant	CL9, CRR10, EC13, EM4, LV7, SD1
black-throated green warbler	*Dendroica virens*	G5	S5B,SZN			migrant	CL9, CM12, CRR10, CRR6, EM4, ETO7, LV3, MI7, MV2, SD1
blue-gray gnatcatcher	*Polioptila caerulea*	G5	S4B,SZN			possible	CL9, CRR6, CRR10, LV7, PC1, SD1
blue-winged warbler	*Vermivora pinus*	G5	S4B,SZN			migrant	CL9
bobolink	*Dolichonyx oryzivorus*	G5	S4B,SZN			probable	CRR2, EC13, MV2

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Breeding Status	Location
broad-winged hawk	*Buteo platypterus*	G5	S5B,SZN			migrant	CL9
brown creeper	*Certhia americana*	G5	S5B,SZN			probable	LV7
brown thrasher	*Toxostoma rufum*	G5	S5B,SZN			probable	CL16, CRR10, EC13, SD4, CRR6
Canada warbler	*Wilsonia canadensis*	G5	S5B,SZN			possible	CL8, CRR3
Carolina wren	*Thryothorus ludovicianus*	G5	S3S4			probable	CL9, Credit River, LV3, MI7, SD1, CRR6, CRR10
Caspian tern	*Sterna caspia*	G5	S3B,SZN	NAR	NAR	migrant	CL9, PC1
chestnut-sided warbler	*Dendroica pensylvanica*	G5	S5B,SZN			possible	CL39
chimney swift	*Chaetura pelagica*	G5	S5B,SZN			probable	AW3, CL42, Credit River, Etobicoke Creek, LV7, SP3, CRR7, CRR10, CV12
clay-colored sparrow	*Spizella pallida*	G5	S4B,SZN			probable	EC13
cliff swallow	*Petrochelidon pyrrhonota*	G5	S5B,SZN			possible	CRR10, CRR2, ETO4, RW6
common grackle	*Quiscalus quiscula*	G5	S5B,SZN			probable	city wide
common merganser	*Mergus merganser*	G5	S5B,SZN			possible	CRR8, SD1
common moorhen	*Gallinula chloropus*	G5	S4B,SZN			migrant	CL9
common nighthawk	*Chordeiles minor*	G5	S4B,SZN			possible	SD1
common snipe	*Gallinago gallinago*	G5	S5B,SZN			migrant	EC13
common tern	*Sterna hirundo*	G5	S4B,SZN	NAR	NAR	migrant	Lake Ontario shoreline
Connecticut warbler	*Oporornis agilis*	G4	S4B,SZN			migrant	CL9
Coopers hawk	*Accipiter cooperii*	G5	S4B,SZN	NAR	NAR	probable	ETO4, SD1, LS1, EM30
dark-eyed junco	*Junco hyemalis*	G5	S5B,SZN			wintering	city wide
eastern kingbird	*Tyrannus tyrannus*	G5	S5B,SZN			probable	city wide
eastern meadowlark	*Sturnella magna*	G5	S5B,SZN			probable	CRR2, EC13
eastern towhee	*Pipilo erythrophthalmus*	G5	S4B,SZN			possible	CRR1, EC13
eastern wood-pewee	*Contopus virens*	G5	S5B,SZN			probable	city wide
evening grosbeak	*Coccothraustes vespertinus*	G5	S5B,SZN			migrant	MI1, CL9

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

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Breeding Status	Location
ovenbird	*Seiurus aurocapillus*	G5	S5B,SZN			possible	CRR10
peregrine falcon	*Falco peregrinus anatum*	G4T3	S2S3B,SZN	END	END-R	confirmed	CC1/MY1
pied-billed grebe	*Podilymbus podiceps*	G5	S4B,SZN			migrant	Lake Ontario shoreline
pileated woodpecker	*Dryocopus pileatus*	G5	S4S5			probable	CL1, CRR10, CRR8, MV18, SD5, CRR6
pine siskin	*Carduelis pinus*	G5	S5B,SZN			migrant	CL9
pine warbler	*Dendroica pinus*	G5	S5B,SZN			probable	CL39, CRR10, CRR6, CRR7, CRR8, CV2, CV6, MI17, EM4
purple finch	*Carpodacus purpureus*	G5	S5B,SZN			possible	CRR10
purple martin	*Progne subis*	G5	S4B,SZN			possible	CL42, CL9
red-breasted nuthatch	*Sitta canadensis*	G5	S5B,SZN			probable	city wide
red-headed woodpecker	*Melanerpes erythrocephalus*	G5	S3B,SZN	SC	SC	possible	CRR10
red-shouldered hawk	*Buteo lineatus*	G5	S4B,SZN	NAR	NAR	confirmed	LV7*, MV2
ruffed grouse	*Bonasa umbellus*	G5	S5			possible	CL9
savannah sparrow	*Passerculus sandwichensis*	G5	S5B,SZN			probable	CRR10, CRR2, EC13, MV2, NE1, NE9, SP1, CM25, WB1, LS1
scarlet tanager	*Piranga olivacea*	G5	S5B,SZN			possible	CRR10, MB6
sharp-shinned hawk	*Accipiter striatus*	G5	S5B,SZN	NAR	NIAC	possible	SD1
short-eared owl	*Asio flammeus*	G5	S3S4B,SZN	SC	SC	migrant	CL9
turkey vulture	*Cathartes aura*	G5	S4B,SZN			migrant	CL9, CM7, CRR1, CRR8, EC13, LV7, MV2
upland sandpiper	*Bartramia longicauda*	G5	S4B,SZN			confirmed	ETO3
veery	*Catharus fuscescens*	G5	S4B,SZN			migrant	CL9, CRR10, HO9, LV7
vesper sparrow	*Pooecetes gramineus*	G5	S4B,SZN			probable	EC13, MV2
white-throated sparrow	*Zonotrichia albicollis*	G5	S5B,SZN			migrant	CL9, CRR6, EC13, EM4, HO3, MV2, PC1, LV7, CRR10, SD7, MB6 (possible)
winter wren	*Troglodytes troglodytes*	G5	S5B,SZN			probable	CL16, CRR10, CRR6

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

Appendix 13: Updated Provincial Fauna Rarity

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) and are defined in Appendix 4 of the Natural Areas Survey.

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

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Historical	Notes
black-crowned night-heron	*Nycticorax nycticorax*	G5	S3B,SZN				CRR4, ETO7, CRR9, LV4
Wilsons phalarope	*Phalaropus tricolor*	G5	S3B,SZN			Yes	migrant
short-billed dowitcher	*Limnodromus griseus*	G5	S2S3B,SZN				migrant
stilt sandpiper	*Calidris himantopus*	G5	S2S3B,SZN				migrant
dunlin	*Calidris alpina*	G5	S3B,SZN				migrant
short-eared owl	*Asio flammeus*	G5	S3S4B,SZN	SC	SC		migrant
rough-legged hawk	*Buteo lagopus*	G5	S1B,SZN	NAR	NAR		wintering
peregrine falcon	*Falco peregrinus anatum*	G4T3	S2S3B,SZN	THR	END-R		migrant
red-headed woodpecker	*Melanerpes erythrocephalus*	G5	S3B,SZN	SC	SC		CRR10
Acadian flycatcher	*Empidonax virescens*	G5	S2B,SZN	END	END		migrant
northern shrike	*Lanius excubitor*	G5	S2S3B,SZN				wintering
loggerhead shrike	*Lanius ludovicianus*	G5	S2B,SZN	END	END		migrant
yellow-breasted chat	*Icteria virens*	G5	S2S3B,SZN	SC	SC	Yes	HO9
prothonotary warbler	*Protonotaria citrea*	G5	S1S2B,SZN	END	END		migrant
Reptiles and Amphibians							
Jefferson/blue-spotted salamander complex	*Ambystoma jeffersonianum*	G4	S2	THR	THR		LV7, CRR6
Blanding's turtle	*Emydoidea blandingi*	G4	S3		THR		CL9
wood turtle	*Clemmys insculpta*	G4	S2	END	SC	Yes	ETO7
common map turtle	*Graptemys geographica*	G5	S3	SC	SC		CL9, CRR9, CRR8
eastern hognose snake	*Heterodon platirhinos*	G5	S3	THR	THR	Yes	CL9
eastern milk snake	*Lampropeltis triangulum triangulum*	G5	S3	SC	SC		CL9, CM7, CRR3, CRR4, CRR5, CRR7, CRR9, ETO4, ETO7, ME12
ribbon snake	*Thamnophis sauritus*	G5	S3	SC	SC		unknown

Appendix 14: Amphibian Surveys for 2008

Appendix 14: Rarity status follows (NHIC 2004) and are defined in Appendix 4 of the Natural Areas Survey.

Common Name	Scientific Name	G Rank	S Rank	COSEWIC	MNR	Location
American toad	*Bufo americanus*	G4	S2	THR	THR	CL1, CL9, CL22, CL52, CRR1, MV19, MV2, NE9
Green frog	*Rana clamitans*	G5	S5			MV2
Western chorus frog	*Pseudacris triseriata*	G5	S4	NAR	NAR	CL9
Spring peeper	*Pseudacris crucifer crucifer*	G5	S5			CL9
Northern leopard frog	*Rana pipiens*	G5	S5			CRR1, NE9
Eastern redback salamander	*Plethodon cinerus*	G5	S5			ETO7