



Bloomington Wetland

**Terrestrial Biological Inventory
and Assessment**

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

Report prepared by: Paul Prior, Fauna Biologist
Kelly Purves, Flora Biologist
Patricia Moleirinho, GIS Technologist

Reviewed by: Sue Hayes, Project Manager, Terrestrial Field
Inventories
Scott Jarvie, Manager, Watershed Monitoring and
Reporting Section

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1.0 Introduction

The Toronto and Region Conservation Authority (TRCA) visited Bloomington Wetland in the years 1996, 2001, and 2011 to conduct terrestrial biological inventories. Fauna were inventoried in 1996, vegetation communities, flora and fauna species were inventoried in 2001, and fauna were updated in 2011. The Bloomington Wetland study area is in York Region and spans across two different Towns; Town of Aurora on the north side of Bloomington Road and the Town of Richmond Hill to the south of Bloomington Road (Maps 1 and 2). The purpose of the work conducted by the TRCA is to *provide site-specific advice on management decisions*. In order to provide this advice, detailed field work was undertaken to *characterize the terrestrial natural heritage features* of Bloomington Wetland. Once characterized, the features can then be understood within the larger regional context of the Terrestrial Natural Heritage Program of the TRCA.

Data collected in 1996 by the Ontario Ministry of Natural Resources (OMNR) as part of the Provincially Significant Wetlands surveys are referenced throughout this report in addition to data collected by TRCA.

1.1 TRCA's Terrestrial Natural Heritage Program

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

In the late 1990s the TRCA initiated the Terrestrial Natural Heritage Program to address the loss of terrestrial biodiversity within the jurisdiction's nine watersheds. This work is based on two landscape-level indicators: the quality distribution of natural cover and the quantity of natural cover. The aim of the program is to create a conservation strategy that both protects elements of the natural system (vegetation communities, flora and fauna species) *before* they become rare and promotes greater ecological function of the natural system as a whole. This preventive approach is needed because by the time a community or species has become rare, irreversible damage has often already occurred. A healthy natural system capable of supporting regional



biodiversity in the long term is the goal of the Terrestrial Natural Heritage Systems Strategy by setting targets – both short- and long-term (100 years) – for the two landscape indicators in order to provide direction in planning at all scales (TRCA 2007a, TRCA 2007b).

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

Bloomington Wetland study area has actually retained most of its natural cover however it has been affected by the regional trend of continuous and incremental losses of natural cover and species. The large gap in natural cover that occurs between the ORM and Rouge Park (at the base of the watershed) has resulted from an even higher amount of cumulative loss. There is a great opportunity to improve the habitat at this site and thus help to increase habitat connections across the Rouge watershed and ORM natural systems.

2.0 Study Area Description

The Bloomington Wetland study area is mostly situated in the Town of Aurora with a smaller portion in Richmond Hill (south of Bloomington Road). It lies to the west of Highway 404, extending west as far as Leslie Street, north as far as the Westview Golf Course, and south to beyond Bloomington Road (Maps 1 and 2). The Canadian National Railway (CNR) runs a north-south track through the wetland. In 2011, fauna surveys were conducted across a 171 ha study area which does not perfectly match the area surveyed for fauna, flora and vegetation communities in the earlier, 2001 inventory. The main difference between the two years is the southern extension of the 2011 study area, covering habitat that extends 500 m to the south of the southern edge of the lower portion of the Bloomington Road wetland. This is not considered to be a significant difference since the lack of land-owner permission for this lower section meant that fauna points were only mapped from vantage points along the railway.

Bloomington Wetland is in the headwaters of the Rouge watershed on the Oak Ridges Moraine (ORM), in the southern portion of the Great Lakes - St. Lawrence floristic region, which is composed of mixed coniferous-deciduous forest. The surficial geology overlying the ORM is comprised almost entirely of depositional materials such as sand, till, gravel, and silt. The soils at the Bloomington Wetland study area are mainly composed of loam (Hoffman and Richards 1955). The terrain of the ORM varies throughout the Greater Toronto Area but a large portion is



characterized by a hummocky or hilly appearance, referred to as “kame and kettle” topography. The glacial drift formed the hills or kames and the dry depressions or glacial lakes are known as kettles or kettle lakes/wetlands. An excellent example of this topography occurs at Bloomington Wetland where much of the kettle wetlands consist of peat and muck organic deposits. The ORM is an area where natural cover and its associated natural functions have been maintained to an extent that is in stark contrast to much of the rest of the TRCA jurisdiction.

The entire study area is within the Provincially Significant White Rose-Preston Lake Wetland Complex; a complex that includes three other wetlands (White Rose, Simeon Forest, and Preston Lake Wetlands). Bloomington Wetland also contains the White Rose Bog and Forest Area of Natural and Scientific Interest (ANSI) and the study area itself is classified as an Environmentally Significant Area (ESA).

3.0 Inventory Methodology

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

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

3.1 Landscape Analysis

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

Base Mapping



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

Quality Distribution of Natural Cover

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

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

Table 1: Habitat patch quality, rank and species response

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

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



Quantity

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

3.2 Vegetation Community and Flora and Fauna Species

Vegetation community and flora and fauna species data were collected through field surveys. These surveys were done during the appropriate times of year to capture breeding status in the case of amphibians and birds, and during the optimal growing period of the various plant species and communities. Vegetation communities and flora species were surveyed by TRCA concurrently in 2001 (Table 2). The botanical data has been augmented with data from the OMNR, specifically ELC descriptions of the kettle bogs and some of the other sensitive wetlands and flora points, collected in 1996.

Vegetation community designations were based on the Ecological Land Classification (ELC) and determined to the level of vegetation type (Lee *et al.* 1998). Community boundaries were outlined onto printouts of 1999 digital ortho-rectified photographs (ortho-photos) to a scale of 1:2000 and then digitized in ArcView. Flora regional species of concern (species ranked L1 to L3) were mapped as point data with approximate number of individuals seen. A list of all other species observed was documented for the site.

The most complete recent fauna survey of Bloomington Wetland was conducted by the TRCA in April, June and July of 2011. Inventories conducted by the TRCA in 1996 and 2001 pre-date the threshold (as set by TRCA's fauna data protocol) for inclusion into formal site checklists; these archival records are referenced throughout this report but are not included in any calculations of fauna totals. The spring surveys searched primarily for frog species of regional concern but recorded incidentally the presence of any early-spring nocturnal bird species (owls and American woodcocks, *Scolopax minor*). More extensive frog surveys were conducted by AECOM in 2005 as part of their Environmental Impact Assessment report for York Region (AECOM, 2011); results from this study are referenced in this document but survey effort has not been included in the totals given in Table 2.

Surveys in June and July were concerned primarily with the mapping of breeding bird species of regional concern. As per the TRCA data collection protocol breeding bird surveys were carried out by visiting all parts of the study area at least twice during the breeding season (last week of May to mid-July) to determine the breeding status of each mapped point. The methodology for identifying confirmed and possible breeding birds follows Cadman *et al.* (2007). All initial visits were completed by the end of the third week of June. The field-season is to be organized so that by late



June only repeat visits are being conducted. It is imperative that any visit made in the first half of June is subsequently validated by a second visit later in the season. Fauna regional species of concern (species ranked L1 to L3) were mapped as point data with each point representing a possible breeding bird.

Table 2. Schedule of TRCA biological surveys at Bloomington Wetland

Survey Item	Survey Dates	Survey Effort (hours)
Patch / Landscape	2007/2008 Ortho-rectified photos used	21 hours
Vegetation Communities and Flora Species	May 16 th , 18 th , June 18 th , 21 st , 25 th , 2001	35 hours
Frogs and Nocturnal Spring Birds	10 th and 13 th April, 2011.	3 hours
Breeding Songbirds	17 th June and 5 th July, 2011.	10.5 hours

4.0 Results and Discussion

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

4.1 Regional Context

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

At the regional level, analysis of habitat patches shows that the present average patch quality for the entire TRCA jurisdiction is “fair” (L3). Thus the existing natural system stands below the quality target for the region (L2, “good”) which requires 30% forest and wetland cover. Furthermore the existing natural cover has a very unbalanced distribution, with large patches of forest and wetland cover restricted largely to the northern half of the TRCA jurisdiction, especially on the Oak Ridges Moraine (ORM) (Map 3). The distribution of fauna species of concern is similarly distributed with a bias to the northern part of the jurisdiction; fauna species of regional concern are generally absent from the urban matrix (see Map 4). The regional picture, being the result of a long history of land use changes, confirms that *all* site-based decisions contribute to the condition of a region.

Only in the Rouge watershed and the neighbouring Duffins watershed does the distribution of natural cover differ markedly from the regional average. In the Rouge watershed, the majority of forest cover is situated south of Steeles Avenue; a result of the long period of protection afforded



the lower Rouge watershed by the creation of the Rouge Park. Bloomington Wetland study area is another spot of higher density natural cover that would ideally, in the future be strongly connected with Rouge Park through a watershed-wide natural system.

4.2 Quantity of Natural Cover

The area of the Rouge River watershed is approximately 33,288 ha with 22% natural cover, including 4,010 ha as forest (12%), 2,841 ha as meadow (9%) and 243 ha as wetland (<1%). There are 132 ha of natural cover at Bloomington Wetland study area (Appendix 1). The natural cover includes approximately 56 ha of forest (12 ha of which is plantation), 2 ha of successional, 37 ha of wetland (including 1 ha of kettle bog and 23 ha of treed or shrub swamp), 4 ha aquatic and 34 ha of meadow. Bloomington Wetland contains about 1.5% of the total natural cover in the Rouge watershed.

4.3 Habitat Patch Findings for Bloomington Wetland

The following details the study area according to the natural system indicator *quality distribution* used in designing the Terrestrial Natural Heritage System Strategy. The results for quality distribution are reported below under the headings of habitat patch size and shape, matrix influence and total score. Analysis was based on 2007-2008 ortho-photos.

Habitat Patch Size and Shape

The Bloomington Wetland study area consists of a mosaic of upland forest and wetland habitats. The majority of forest patches score “fair” for size (Map 5) and mainly “poor” and “very poor” for shape, with wetlands scoring “fair” and “good” for size and shape. The largest continuous forest patch is 33 ha. The most extensive wetland habitat patch (located south of Bloomington Road) covers about 10 ha.

Habitat Patch Matrix Influence

Analysis based on the 2007/08 ortho-photos shows that almost the entire habitat in the study area is ranked as “good” for matrix influence (i.e. scores four out of a possible five points, see Maps 7 and 8) despite the proximity of the heavily used Hwy 404 and Bloomington Road. This score is as expected given the rural setting, with a mix of natural and agricultural land-types in the vicinity.

The TRCA measures matrix influence at the landscape level by assigning set values; positive, neutral and negative, to the type of landscape use occurring within 2 km of the subject site. It is important, however, to also understand and consider the matrix influence that occurs at the site and patch level. Such influences include those transferred to an otherwise remote natural habitat patch from a distant urban or suburban development, for example via a trail system.



Habitat Patch Total Score

The combination of “good” matrix influence on the site, and the mix of “fair” to “poor” for habitat patch size and shape, results in an overall “fair” L3 habitat patch quality with a few “good” L2 patches (Map 9). Note that the wetland patch in the lower portion of the study area scores “good” or L2 for total score primarily because this patch is one of the few habitat patches on the site that exhibits an L2 (“good”) shape. Landscape scores are intended to be applied at the broader landscape level and therefore caution needs to be exercised when referring to such measures at the more refined site level.

4.4 Vegetation Community Findings for Bloomington Wetland

4.4.1 Vegetation Community Representation

The Bloomington Wetland study area provides a good vegetation community representation of the Oak Ridges Moraine natural features such as kettle bogs and associated mature, upland forest. A total of 48 different ELC vegetation community types were described in 1996 and 2001 including 8 that only occur as complexes or inclusions within larger communities (Appendix 1). There are 14 forest communities (11 natural and 3 plantation), 2 successional communities (thickets), 25 wetland communities (including 2 kettle bogs), 4 aquatic communities, and 3 meadow communities.

Table 3. Summary of Vegetation Communities, Bloomington Wetland

Class	Number of Types	Area (hectares)
Forest	14	55.7
Successional	2	1.6
Meadow	3	34.3
Wetland	25	36.8
Aquatic	4	3.8
Dynamic (beach, bluff, barren)	0	0
Total	48	132.2

Bloomington Wetland has 55.7 ha of forest (including 12 ha of plantation), almost one half of the whole study area. Large stands of mature, deciduous forest communities are dominated by Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1) and Dry-Fresh Sugar Maple - White Ash Deciduous Forest (FOD5-8), with beech (*Fagus grandifolia*), red oak (*Quercus rubra*), red maple (*Acer rubrum*), and eastern hemlock (*Tsuga canadensis*) as secondary associates. Lowland forest communities consist of Fresh-Moist Sugar Maple - Hardwood Deciduous Forest (FOD6-5), Fresh-Moist Poplar Deciduous Forest (FOD8-1), and Fresh-Moist Hemlock - Hardwood Mixed Forest (FOM6-2). Early successional dry-fresh deciduous forest communities, namely Dry-Fresh Poplar Deciduous Forest (FOD3-1) are dominated by trembling aspen, large-tooth aspen (*Populus*



grandidentata and *P. tremuloides*), and white birch (*Betula papyrifera*). There's one non-native forest, Fresh-Moist Non-native Lowland Deciduous Forest (FOD7-c) dominated by common buckthorn (*Rhamnus cathartica*). Forest plantations are: Red Pine Coniferous Plantation (CUP3-1), White Pine Coniferous Plantation (CUP3-2), and White Spruce Coniferous Plantation (CUP3-C).

Wetlands are a very prominent feature. They occupy 36.8 ha, 28% of the natural cover at Bloomington Wetland. Wet pockets are found in the depressions of the site, sustaining several wetland communities from mineral to organic meadow marshes, deciduous and coniferous swamp forests, and shrub and treed kettle bogs. Cattail shallow marshes, both mineral (MAS2-1A & MAS2-1b) and organic (MAS3-1) cover large tracts of the wetlands. Reed Canary Grass Mineral Meadow Marsh (MAM2-2), Forb Mineral Meadow Marsh (MAM2-10), and Forb Organic Meadow Marsh (MAM3-9) were also present.

Swamp communities at Bloomington Wetland ranged from white cedar– conifer organic coniferous swamps (SWC3-2), to white cedar– hardwood organic mixed swamps (SWM4-1), to mineral deciduous swamps dominated by silver maple (SWD3-2), willow (SWD4-1), and poplar (SWD4-3). Organic deciduous swamps were dominated by black ash (SWD5-1), red maple (SWD6-1) and poplar– paper birch (SWD7-1). Thicket swamps include willow mineral thicket swamps (SWT2-2), willow organic thicket swamps (SWT3-2), and winterberry organic thicket swamps (SWT3-7). Two kettle bog communities were identified at Bloomington Wetland, a Leatherleaf Shrub Kettle Bog (BOS2-1) and a Tamarack– Leatherleaf Treed Kettle Bog featuring tamarack (*Larix laricina*) and leatherleaf (*Chamaedaphne calyculata*) as two prominent species.

Shallow aquatic community types (SAS1-1, SAF1-3, SAM1-2, and SAM1-4) are present covering 3.8 ha, supporting communities of common duckweed (*Lemna minor*), star-leaved duckweed (*Lemna trisulca*), coontail (*Ceratophyllum demersum*), common elodea (*Elodea canadensis*), and pondweeds (*Potamogeton* spp.).

Succession communities at Bloomington Wetland are composed of meadows (covering 34.3 ha) including Native Forb Meadow (CUM1-A), Non-native Cool-season Grass Graminoid Meadow (CUM1-b), and a few thickets (covering 1.6 ha) of sumac (*Rhus typhina*) (CUT1-1) and common buckthorn (CUT1-b). Meadow and successional communities occur on the north side of Bloomington Road.

Invasive non-native species, mainly common buckthorn and purple loosestrife (*Lythrum salicaria*), are most prominent in the cultural and successional areas (buckthorn) and some of the marshes and swamps (loosestrife). The kettle bogs and aquatic habitats have more limiting ecological conditions so are more mildly affected by invasive non-native species at this site. There are other problematic species such as dog-strangling vine (*Cynoglossum officinale*), garlic mustard (*Alliaria petiolata*), Manitoba maple (*Acer negundo*), common reed (*Phragmites australis*), and black locust (*Robinia pseudoacacia*) that were found sporadically throughout the study area but in fewer of the vegetation community polygons.



4.4.2 Vegetation Communities of Conservation Concern

In the rural landscape where Bloomington Wetland study area lies, vegetation communities are of conservation concern if they rank L1 to L3. Fifteen communities are ranked L1 to L3 (14 wetland types and 1 mixed forest type). One of the wetlands only occurs as a vegetation complex within another community. The communities are listed with ranks in Appendix 1; location and boundaries shown on Map 10. The communities of conservation concern (L1 to L3) occupy 30 ha, 23% of the total natural cover.

The communities are considered of conservation concern at Bloomington Wetland because they occur in relatively few squares across the jurisdiction and they have uncommon geophysical features (e.g. kettle wetlands, mixed forests with hemlock component, organic soils >40 cm deep). It is in part the hydrology characteristics of the study area that contributes to these factors.

Organic soils indicate a great age, undisturbed history, and significant carbon storage. They are also where many species of conservation concern are found. The diverse habitats are home to a plethora of plants that require either high quality wetland or forest or the ecotone between forest and wetland. The two kettle bogs are ranked L1, three organic swamps (SWD5-1, SWD6-1, SWT3-7) rank L2, and the remaining ten L3 communities found are: swamps, marshes, shallow aquatics, and the one mixed forest.

4.5 Flora Species Findings for Bloomington Wetland

4.5.1 Flora Species Representation

Floristic surveys conducted throughout Bloomington Wetland in 2001 identified a total of 497 species of vascular plants (Appendix 2). Of this total, 48 species were recorded by OMNR in 1996 (OMNR 2001) and not recorded again by TRCA in 2001. There are 496 naturally-occurring species and 1 planted species, red pine (*Pinus resinosa*). Of the non-planted species, 375 are native (75%) which is what is typically achieved in higher quality moraine study areas. These totals are quite similar to another equally sized ORM study area –the West Gormley Lands (to the northeast of Stouffville Road and Bayview Avenue) where 471 naturally occurring species were recorded.

Table 4. Summary of Flora Species, Bloomington Wetland

Total # of species	497
Naturally-occurring species	496
Planted species	1
Native (naturally-occurring) species	375
Non-native (naturally-occurring) species	121
Number of L1 - L3 species	141

The high biodiversity of Bloomington Wetland is due to age, relative lack of disturbance (disregarding Highway 404 and Bloomington Road that have had their own impacts on the area),



the rolling topography and resulting microhabitats, and soil types. More fertile, yet disturbed post-agricultural habitats, have lower species richness (although they have a different composition) and more non-natives. The conifer plantations also tend to have lower species richness. However, these plantings can create conditions favourable for certain native species such as Indian-pipe (*Monotropa uniflora*) and pink pyrola (*Pyrola asarifolia*).

4.5.2 Flora Species of Conservation Concern

There are 141 vascular plant species of conservation concern (rank L1 to L3) at Bloomington Wetland. The fact that there are 8 “L1” species, 28 “L2” species, and 105 “L3” species in a 180 ha study area is quite remarkable in the TRCA jurisdiction. Appendix 2 lists plant species by ranks and locations are shown on Map 11. The ranks are based on sensitivity to human disturbance associated with development; and habitat dependence, as well as on rarity (TRCA 2010). In most cases, the species are not currently rare but are at risk of long-term decline due to the other criteria.

There are 33 “L1 to L3” plants that score 4 or 5 for local occurrence and are regionally rare (found in six or fewer of the forty-four 10x10 km grid squares that cover the TRCA jurisdiction). A few of them rank as provincially-uncommon (provincial rank S4): northern wild rice (*Zizania palustris* var. *palustris*) and small beggar’s-ticks (*Bidens discoidea*). The TRCA’s only other records of small beggar’s-ticks are at the Brock Lands, Frenchman’s Bay, Oak Ridges Moraine Corridor Park, and Caledon Tract Wetland. One species: butternut (*Juglans cinerea*), is endangered both provincially and federally. Butternut is being severely attacked across the host range by the pathogen, butternut canker (*Sirococcus clavignenti-juglandacearum*). The canker is an invasive alien species threatening the long-term viability of butternut. Butternut is still abundant in the TRCA jurisdiction but almost all surveyed trees are showing signs of the canker.

Almost all of the flora species of conservation concern (140) are sensitive to development, being vulnerable to at least one kind of disturbance that is associated with land use changes (see Map 7 for sensitivity to development scores). They score three or more out of a possible five points. The only species that scores lower is hybrid swamp maple (*Acer x freemanii*). The largest family of plants in this subset is the Cyperaceae or sedge family with 26 species, many of which are found in the kettle bog.

A large proportion of the species of concern (those associated with kettles, seepage swamps or cool mixed to coniferous forests) are vulnerable to hydrological changes. Examples include round-branched ground pine (*Lycopodium dendroidium*), mitrewort (*Mitella diphylla*), water arum (*Calla palustris*), Clinton’s wood fern (*Dryopteris clintoniana*), cinnamon fern (*Osmunda cinnamomea*), fringed sedge (*Carex crinita*), blue-flag iris (*Iris versicolor*), and the bog/fen indicator species listed in Appendix 2. Species that are not obligate or facultative wetland species such as eastern hemlock (*Tsuga canadensis*) and oak fern (*Gymnocarpium dryopteris*), yet still require a moist sheltered environment, would be threatened by increased drying especially from nearby land use changes and direct canopy tree removal and the associated increases in exposure to wind and sunlight.



When disturbances are introduced to an area, native plants may be readily out competed by invasive alien species; some natives are more susceptible than others. An example of this is seen when comparing some of the wetlands before and after the Highway 404 and Bloomington Road extension in the 1980's. The impacts associated with this project (e.g. increases in stormwater and nutrient loads) turned diverse wetland types into uniform cattail marshes (OMNR 2001). Plants that can be easily outcompeted include black choke-berry (*Aronia melanocarpa*), velvet-leaf blueberry (*Vaccinium myrtiloides*), squirrel-corn (*Dicentra canadensis*), northern green orchis (*Platanthera hyperborea*), and long-spurred violet (*Viola rostrata*). Nutrient inputs from agriculture, fill dumping, or golf courses often encourages the spread of invasive species such as common reed in wetlands, especially those with deeper water. Nutrient and salt inputs can affect wetlands and bottomlands; invasive species such as common reed (and purple loosestrife thrive in disturbed wetlands (Galatowitsch *et al.* 1999).

Dog-strangling vine (*Cynanchum rossicum*) is a formidable threat in the province (TRCA 2008). It did not exist as a dominant in the vegetation community polygon layers in 2001 however, if it follows the trajectory it has taken to the south east in Rouge Park and other parts of the watershed, it will likely become the dominant ground layer species in most upland habitats except for mature forests. Biological control is the best long-term hope for dealing with it. Garlic mustard (*Alliaria petiolata*) tends to appear in those communities that are successional and/or disturbed in nature. It is often found in association with non-native community types and along trail systems. At present, infiltration of this species into healthier sections is minimal. Scots pine (*Pinus sylvestris*) can be a vigorous regenerator in successional areas. Hybrid cattail and narrow-leaved cattail (*Typha x glauca* and *T. angustifolia*) exists in some wetlands but were not dominants at the time of the surveys.

Increased human traffic into a natural area results in disturbance caused by trampling and the incursion of invasive species that compete with the existing native flora. Many flora species of concern identified at Bloomington Wetland have delicate stems and root systems and are not able to withstand trampling and soil compaction. Forest species examples include: Mackay's fragile fern (*Cystopteris tenuis*), round-branched ground pine, bearded short husk (*Brachyelytrum erectum*), star flower (*Trientalis borealis*), and woolly sweet cecily (*Osmorhiza claytonia*). Other species, notably many of the showy-flowered monocots such as bluebead lily (*Clintonia borealis*) and rose twisted-stalk (*Streptopus roseus*), only produce one set of leaves per growing season and will not replace them if they are broken off by trampling.

Wild columbine (*Aquilegia canadensis*), smaller yellow lady's slipper (*Cypripedium calceolous var. parviflorum*), Canada violet (*Viola canadensis*), and ferns such as Christmas fern (*Polystichum acrostichoides*) are examples of species that are visually appealing and so are vulnerable to picking or digging as people try to transplant them to their gardens. As urban development increases around Bloomington Wetland the populations of these species may be subjected to greater pressures of trampling, picking and collection.



Alterations to soil and groundwater properties are common threats arising from urban development, both on-site and on adjacent lands. For example, run-off from adjacent agricultural lands, golf courses, lawns, roads and driveways often contains pesticides, nutrients, sediment, oil and road salt. Large Canada geese populations are also a possible nutrient source in kettle lakes on the moraine. When this surficial contamination enters nearby habitat it can potentially alter the physical and chemical composition in an unfavourable manner. A large proportion of Bloomington Wetland's flora species of concern are sensitive to surficial contamination. These include species such as Indian cucumber root (*Medeola virginiana*), white-fruited mountain rice grass (*Oryzopsis asperifolia*), woodland horsetail (*Equisetum sylvaticum*), and coontail (Hightshoe 1988).

Habitat fragmentation can lead to increased populations of herbivores such as white-tailed deer (*Odocoileus virginianus*); deer have had significant impacts in the TRCA jurisdiction, especially in the Rouge watershed.

All of the 141 flora species of conservation concern found in Bloomington Wetland are considered habitat specialists, scoring 3 or more out of a possible 5 points for *habitat dependence* (Map 12). Roughly, they are found in seven or fewer vegetation cohorts (groupings of vegetation types with similar floristic characteristics) (TRCA 2010). They will not readily recover when these habitats are lost or altered. Bloomington Wetland has habitat specialists corresponding to all of its main habitat types except plantations. Some examples of species of the mature deciduous forests include violets and a spring ephemeral - squirrel-corn (*Dicentra canadensis*). Organic thicket, mixed, or coniferous swamps support species such as ferns (*Osmunda cinnamomea*, *O. regalis* var. *spectabilis*, *Dryopteris cristata*), many sedges (*Carex* spp.), three-leaved false Solomon's seal (*Maianthemum trifolium*), and some of the same species as the kettle bogs (e.g. leatherleaf).

The most interesting group of habitat specialists at Bloomington Wetland are perhaps the kettle bog indicator species (Appendix 2). These plants are only found in bogs or fens and there are very few populations identified in the TRCA jurisdiction. Some examples are mountain holly (*Nemopanthus mucronatus*), bog willow (*Salix pedicellaris*), and round-leaved sundew (*Drosera rotundifolia*). Additional species especially thrive in the eco-tone between kettle bog and upland forest such as white spruce (*Picea glauca*), goldthread (*Coptis trifolia* ssp. *groenlandica*), and star flower.

Northern wild rice and the water-milfoils (*Myriophyllum verticillatum* and *M. sibiricum*) are found in larger, open water bodies as is supplied by the kettle lakes. Other species found in the aquatic habitats include four pondweeds (*Potamogeton pusillus*, *P. zosteriformis*, *P. natans*, *P. amplifolius*), star duckweed and bushy naiad (*Najas flexilis*). Blue-flag iris (*Iris versicolor*) and fringed sedge are examples of species that are usually limited to shallow marshes with varying degrees of tree and shrub cover, or shallow open water and along shores.

Successional and edge habitat can support species such as Canada plum (*Prunus nigra*).

There are also myco-heterotrophs present in various vegetation communities. These are plants that have a symbiotic relationship with certain types of fungi; an added layer of habitat specialization. These plants are Indian-pipe and three orchids: smaller yellow lady's slipper,



Loesel's twayblade (*Liparis loeselii*), and northern green orchis. Their presence likely implies a healthy fungal population in the soil.

4.6 Fauna Species Findings for Bloomington Wetland

4.6.1 Fauna Species Representation

The TRCA fauna surveys at Bloomington Wetland in 2011, documented a total of 55 bird species, six mammals, and five herpetofauna species, bringing the total number of possible breeding vertebrate fauna species identified by the TRCA to 66. An additional ten bird species, including ovenbird (*Seiurus aurocapillus*), mourning warbler (*Geothlypis philadelphia*) and least flycatcher (*Empidonax minimus*), and one herp species were recorded in an earlier TRCA inventory conducted in 1996. The apparent absence of these ten bird species in the more recent inventory may be attributed to simple annual variations in the occurrence of low density populations – all but one species had been reported as single territories. The one species represented by two territories in 1996, veery (*Catharus fuscescens*), may have declined due to changes in habitat and local landscape.

Striped chorus frog (*Pseudacris triseriata*) was reported in 1996 from the most north-westerly wetland; this wetland was not visited during the 2011 spring inventory and therefore the current status of this frog species cannot be commented on. Three other additional herp species were reported during the 2001 TRCA survey; one of these species, American bullfrog (*Lithobates catesbeiana*), was reported from the same north-western wetland and therefore, again, the current status cannot be assessed. Grey treefrog (*Hyla versicolor*) and northern leopard frog (*Lithobates pipiens*) were both reported from the wetland adjacent to the railway tracks, an area that was visited in 2011 but not during the nocturnal calling-periods of these two species; neither species was reported from the study area in 2011, although in this year the latter species was documented as roadkill on Leslie Street, 600 metres south of Bloomington Road. It should also be noted that in 2005, AECOM conducted extensive frog surveys in wetland areas adjacent to Bloomington Road on dates in April, May and June; conducting such surveys into the late spring and early summer resulted in documentation of a thriving population of grey treefrog and smaller numbers of northern leopard frog.

Several other bird species reported during the 1996 inventory appear to be maintaining their small local population: e.g. wood thrush (*Hylocichla mustelina*; four pairs in 1996 and three pairs in 2011) and northern waterthrush (*Parkesia noveboracensis*; two pairs in 1996 and three pairs in 2011). Finally, one significant species has certainly disappeared from the study area: pied-billed grebe (*Podilymbus podiceps*) was reported from the wetland on the north side of Bloomington Road in 1987 and 1988, but subsequent reduction in open water in this wetland means that the habitat is no longer suitable for this aquatic species. Refer to Appendix 3 for a list of the fauna species and their corresponding L-ranks.



4.6.2 Fauna Species of Conservation Concern

Fauna species, like vegetation communities and flora species, are considered of regional concern if they rank L1 to L3 based on their scores for the seven criteria mentioned in Section 3.2. Since Bloomington Wetland is situated within the rural zone this report does not consider in detail those species ranked as L4, i.e. those species that are of concern in urban landscapes. As with flora, this is a proactive, preventive approach, identifying where conservation efforts need to be made before a species becomes rare.

Fauna surveys at the Bloomington Wetland study area reported 11 bird species of regional concern (all ranked L3), including Virginia rail (*Rallus limicola*), sora (*Porzana carolina*) and northern waterthrush. In addition, there was one mammal species of regional concern (hairy-tailed mole, *Parascalops breweri*, L3), and four herpetofauna of regional concern including the L2 ranked wood frog (*Rana sylvatica*), spring peeper (*Pseudacris crucifer*), and common snapping turtle (*Chelydra serpentina*), bringing the total to 16 fauna species of regional concern (Table 5). Locations of these breeding fauna are depicted on Map 13. One of the species of concern documented at the study area – common snapping turtle - is listed as Special Concern on the provincial Species at Risk list.

Table 5: Summary of Fauna Species, Bloomington Wetland

Fauna	# species	# L1–L3: Species of Regional Concern	# L4: Species of Urban Concern	Total #L1-L4: Species of Regional or Urban Concern
birds	55	11	25	36
herps	5	4	1	5
mammals	6	1	3	4
Total	66	16	29	45

Local occurrence is one of seven scoring criteria for fauna species and is based on TRCA data and information from the Natural Heritage Information Centre (NHIC) of the Ontario Ministry of Natural Resources (OMNR) (NHIC 2008). Using local occurrence as a measure of regional rarity, any species that is reported as a probable or confirmed breeder in fewer than 10 of the forty-four 10x10 km UTM grid squares in the TRCA jurisdiction is considered regionally rare (i.e. scores three to five points for this criterion) (TRCA, 2010).

From the fauna inventory compiled for the study area in 2011 the only species documented which is considered regionally rare was hairy-tailed mole. It is likely that within the TRCA jurisdiction this species is highly under-recorded since as with all other mole species this animal is almost entirely fossorial; many of the regional reports are of dead animals found above ground (usually in late summer and fall). Archival records from TRCA document several other regional rarities for the study area which have not been reported in recent years: pied-billed grebe from 1987/88 is no longer present in the study area since the extent of suitable open aquatic habitat has diminished considerably; a single yellow-bellied sapsucker (*Sphyrapicus varius*) was reported in 1996 from



the forest just to the north of Bloomington Road, next to the railway. Both striped chorus frog and American bullfrog were reported from single wetlands within the study area in 1996 and 2001 respectively; unfortunately, these wetlands were not checked specifically in 2011 and therefore their current status within the study area is unknown.

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

Fauna species are considered to have a high sensitivity to development if they score three or more points (out of a possible five) for this criterion. At the Bloomington Wetland study area, all 16 of the species that are ranked L1 to L3 receive this score and are therefore considered sensitive to one or more of the impacts associated with development (Map 8). Three of these species (wood frog, spring peeper and common snapping turtle) are ranked as L2, the remainder are ranked as L3 and include a mixture of forest, wetland and open habitat species.

Of the sensitive forest species reported from the study area, American woodcock and wild turkey (*Meleagris gallopavo*) are ground-nesting birds and as such are highly susceptible to ground-borne disturbance, e.g. off-leash dog-walking. Ground-nesting birds are highly susceptible both to increased predation from ground-foraging predators that are subsidized by local residences (house cats, raccoons) and to repeated flushing from the nest (by pedestrians, off-trail bikers and dogs) resulting in abandonment and failed breeding attempts. The absence of other ground-nesting species such as ovenbird in habitat which otherwise seems highly suitable suggests that disturbance from local residential areas may be having an impact (there was one ovenbird territory reported in 1996), however, field-work in 2011 did not reveal any particularly intense disturbance. Alternatively, it is possible that the forest block – at least the habitat that is suitable for ovenbird – may simply be too small. These same disturbances also have considerable impact on wood frogs and spring peeper in their upland summer-foraging and over-wintering habitat; both of these species are still present at the study area in reasonably large numbers.

Since the landscape is still largely rural, higher ranked bird species should be persisting at this study area more than is evidenced in the inventory gathered by the TRCA. It is important to



understand that negative matrix influences are not solely associated with the proximity of urban and suburban developments; many of the negative influences can be transferred deep within an otherwise intact natural matrix by extensive trail networks used by large numbers of people originating from quite distant urban and suburban centres. Extensive public use of a natural habitat can have substantial negative impact through the cumulative effects of hiking, dog-walking and biking on the site. Various studies have shown that many bird species react negatively to human intrusion (i.e. the mere presence of people) to the extent that nest-abandonment and decreased nest-attentiveness lead to reduced reproduction and survival. One example of such a study showed that abundance was 48% lower for hermit thrushes (a ground-nesting/foraging species) in intruded sites than in the control sites (Gutzwiller and Anderson 1999). Elsewhere, a recent study reported that dog-walking in natural habitats caused a 35% reduction in bird diversity and a 41% reduction in abundance, with even higher impacts on ground-nesting species (Banks and Bryant 2007). However, none of these impacts seem to be arising in the forest habitat associated with the Bloomington Wetlands study area.

Sensitive wetland bird species appear to be faring somewhat better than the ground-nesting forest species with both Virginia rail (two territories) and sora (one territory) present, and three pairs of northern waterthrush (two pairs in the wetland to the south of Bloomington Road) holding their own in the two large patches of thicket swamp.

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

Nine of the fauna species of regional concern that were identified at the Bloomington Wetland study area are considered area sensitive, including three species that require at least 20 ha of forest habitat. These three species – pileated woodpecker (*Dryocopus pileatus*), wild turkey and scarlet tanager (*Piranga olivaceus*) – are represented in the study area by just one pair each although the expected nesting density for the first two species is lower than for scarlet tanager. The largest forest patch size for the study area is given as over 33 ha which should certainly allow for more than the few area-sensitive species territories; however, much of the area identified as forest cover is very narrow in shape, delineating property boundaries around the residential properties on the west side of the site. The effective forest patch size is considerably smaller, perhaps too small to support a healthy population of scarlet tanagers, but still large enough to accommodate at least three pairs of wood thrush. The thicket swamps are relatively extensive and therefore readily satisfy the patch size requirements of northern waterthrush.



Species' patch-size constraints are due to a variety of factors including foraging requirements and the need for isolation within a habitat block during nesting. In the latter case, regardless of the provision of a habitat patch of sufficient size, if that block is seriously and frequently disturbed by human intrusion, such species will be liable to abandon the site. Such a variety of habitat needs are more likely satisfied within a larger extent of natural cover.

Area sensitive non-avian species which appear to be thriving at the study area include both wood frog and spring peeper. These species are considered area sensitive primarily due to their requirement for two distinct habitat elements in order to complete their life-cycles. Both species overwinter in upland forested habitat and then migrate to nearby wetlands in the early spring to breed, returning to forest habitats to forage throughout the summer and fall months. The mosaic of wetland and forest habitat, particularly north of Bloomington Road, presents excellent opportunities for these two species of regional concern.

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

Eight of the species of regional concern that occur at the Bloomington Wetland study area score high for patch isolation sensitivity: four herpetofauna (two frog species and two turtle species), three bird species and a mammal species. The bird species are wild turkey, Virginia rail and sora; the former is highly mobile and susceptible to road-kill, however this species (the subject of a very successful re-introduction program in southern Ontario) appears to be faring very well across the region. The two other bird species are both relatively long-distance migrants and as such are very capable of moving large distances between wetland habitats. However, during their breeding season much of their movement within and between adjacent patches of wetland is conducted at ground-level – i.e. either by walking or by flying very low to the ground. This habit puts them very much at risk of roadkill when high-traffic roads bisect their habitat.

The four herpetofaunal species – wood frog, spring peeper, midland painted turtle and common snapping turtle - (together with grey treefrog and northern leopard frog reported by AECOM in 2005) are highly mobile, moving considerable distances across the local landscape to and from breeding and wintering habitats. Populations associated with the wetlands set further back from the highways, e.g. the north-west pond, and the swamp on the west-side of the railway, have access to all the life-cycle habitat requirements without encountering paved surfaces. Unfortunately, the populations on either side of Bloomington Road are liable to attempt migration



and dispersal across this busy highway with the inevitable result of roadkill. Although no concerted efforts were made to locate roadkill in the spring and summer of 2011, dead wood frogs were discovered about 500 metres to the east of the Leslie Street junction in early April, and one dead snapping turtle was found on Bloomington Road 350 metres west of the same junction in late May. AECOM also mentions two roadkill painted turtles found in the vicinity of Bloomington Wetland in July, 2005 (AECOM 2011). As traffic volume on this road continues to increase there will be an increase in the number of roadkill incidents for all local herpetofauna species, including the provincially threatened snapping turtle.

Fauna species that score greater than three points under the **habitat dependence** criterion are considered habitat specialists (Map 14). These species exhibit a combination of very specific habitat requirements that range from the microhabitat (e.g. decaying logs, aquatic vegetation) and requirements for particular moisture conditions, vegetation structure or spatial landscape structures, to preferences for certain community series and macro-habitat types. Just nine fauna species that occur in the study area are considered habitat specialists; only four of these are forest-dependent bird species (wild turkey, wood thrush, scarlet tanager, and yellow-billed cuckoo, *Coccyzus americanus*).

Richness is essentially the presence or absence of species at a site. Beyond mere presence of individual species is the idea that a natural system can be considered as a healthy functioning system if there is an association of several species thriving within that system. Each habitat type supports particular species associations. As the quality of the habitat patch improves so will the representation of flora and fauna species within that habitat. In this way representation biodiversity is an excellent measure of the health of a natural system. At the Bloomington Wetland study area, the presence of such a low number of habitat dependent species, especially bird species that are dependent on forest, and the fact these species are represented by just one or two territories apiece, indicates that the forest habitat in the study area is functioning at a rather low level. The wetland habitat accommodates three habitat dependent bird species, but this total is drawn from a much smaller regional list of wetland dependent species. Within the TRCA jurisdiction there are a potential 25 forest dependent bird species of concern, but only 11 equivalent wetland species. Thus the three wetland bird species at Bloomington Wetland (six territories) are a better representation of the regional wetland species richness than are the four forest bird species (five territories within the study area).

5.0 Summary and Recommendations

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



5.1 Site Summary

1. Bloomington Wetland is located on the Oak Ridges Moraine, with diverse topography and abundant aquifers; morainal upland forests and kettle wetlands make up the bulk of natural habitat.
2. Habitat quality, patch size and species mobility are heavily impacted by Highway 404, Bloomington Road, and the Canadian National Railway that runs through the kettle bog.
3. The relatively high flora biodiversity at Bloomington Wetland relies on the rural matrix and the functioning of the ORM wetland complexes as a larger ecosystem.
4. Forty-eight vegetation types were observed, ranging from mature forest to kettle bogs.
5. Fifteen of the communities are ranked “L1 to L3” (14 wetland and aquatic types and 1 mixed forest type).
6. Bloomington Wetland includes 38 ha of provincially significant wetland communities, including a one ha kettle bog.
7. There were 497 flora species observed of which 141 are species of conservation concern (L1 to L3); flora species of concern were associated especially with mature forests and kettle bogs, lakes and other wetlands.
8. A total of 33 of the 141 L1 to L3 plant species are also considered regionally-rare.
9. Two provincially uncommon flora species were observed: northern wild rice (one of two known TRCA populations) and small beggar’s ticks (one of five known TRCA populations).
10. A total of 66 vertebrate fauna species were observed including 16 species of conservation concern.
11. A surprisingly low number of forest-associated fauna species of concern were encountered.
12. Two Species at Risk were observed on the site: butternut and common snapping turtle.

5.2 Site Recommendations

In order to maintain and enhance the current biodiversity at Bloomington Wetland, the overall integrity of the broader, landscape-level natural heritage system, including the study area, must be protected. Therefore, habitat patch size and shape both within the site boundaries and in the local



landscape need to be optimized so as to provide large enough habitat patches with interior habitat to sustainably support sensitive flora and fauna. Connectivity between natural habitats within and beyond Bloomington Wetland must be improved, especially across Bloomington Road and Highway 404.

Furthermore, habitat quality and integrity must be protected from the negative matrix influences described in the body of the report. This includes better management of current water quality and quantity issues; mitigating any future impacts on the wetlands as a result of water run-off; controlling invasive non-native species; and working with local landowners that have an impact on the study area (e.g. dog walkers and farmers). The study area is privately owned therefore, landowner stewardship is crucial for protecting and enhancing species and habitat.

The following recommendations address the above natural heritage concerns, with an emphasis upon habitat size and connectivity issues. Thus, it is recommended overall that **1) existing habitat quality be protected and enhanced; 2) connectivity features both within and beyond the study boundaries be created and enhanced; and 3) invasive species be controlled when feasible.**

1. Protect and Enhance Existing Habitat Quality

The first priority is to maintain conditions that allow existing communities and species of conservation concern to thrive. This is especially true of the wetland communities and adjacent critical upland forest where almost all species of concern are located. Of particular significance at Bloomington Wetland are the kettle bogs and lake that accommodate several flora and fauna species of conservation concern. One of the most important recommendations for Bloomington Wetland species and communities is to maintain wetland functions including discharge and recharge functions. "Alterations to water regimes, even minor ones, could have dramatic impacts on wetland communities and their resident species" (OMNR, 2001). This sentiment refers to both water quality and quantity alterations. It is usually much more difficult to remediate ecological damage (e.g. the damage done to the wetlands adjacent to Highway 404 and Bloomington road) as opposed to avoiding or mitigating the impacts of land use changes. It is important that land management decisions strive to protect the extent of these areas if such communities are to persist in the TRCA jurisdiction (together with the unique flora and invertebrate species associated with such communities).

Secondly, as land-use changes and human population continues to increase, it becomes necessary to enhance and buffer existing habitat from negative matrix influences. There is also a great opportunity to improve habitat for forest-associated fauna which was surprisingly low. Forest cover is currently in a configuration which works against the positive attribute of total forest area, i.e. much of the identified forest cover is present as narrow strips of habitat, bordering residential properties or at the edge of the wetlands, roads and railway. From a fauna perspective this configuration effectively and considerably reduces the forest habitat available for nesting purposes, and this is well illustrated by the rather limited extent of interior forest, occurring only within the forest block north of Bloomington Road and west of the railway.



- i) Ensure existing biodiversity is not compromised in any land use planning for the study area and surrounding landscape.
- ii) Maintain wetland functions including discharge and recharge functions.
- iii) Increase forest cover within Bloomington Wetland study area and the White Rose – Preston Lake Wetland Complex with a focus on stream corridors, existing forests, and lands adjacent to wetlands. For example, reforesting the two meadow areas to the west and east of the railway line would considerably improve and enhance the landscape attributes of the forest cover throughout the entire study area and may go some way in providing many more opportunities for breeding forest fauna species of regional concern.
- iv) Conduct careful, well-planned restoration and regeneration in the surrounding landscape (that is currently severely lacking in natural habitat). Increasing high quality habitat adjacent to the study area would help maintain and likely improve habitat quality within the boundary.
- i) Ensure that land use decisions (such as restoration) for the study area and surrounding land matches site conditions. For example, any improvement in the diversity of forest bird species and the maintenance of herpetofauna in wetland/forest complexes in the area require the high quality swamps and larger blocks of forest.
- v) Discourage the creation of any formal trails in the future. Work with landowners to manage the amount of informal trails.
- vi) Work with landowners within the drainage basin to reduce nutrient inputs and manage water quality and infiltration.
- vii) Encourage and work with local landowners to plant buffers and to discourage large populations of Canada geese (mainly with native vegetation buffers around aquatic features).
- viii) Welcome the assistance of local landowners already involved in land stewardship.
- ix) Investigate the possibility of remediating damaged wetlands that have resulted from stormwater runoff from Highway 404 and Bloomington Road.

2. Create and Enhance Connectivity Opportunities

In the northern regions of the Rouge watershed, where the Bloomington Wetland study area is located, natural cover is relatively sparse, thereby impacting habitat connectivity



across the ORM and south towards the relatively dense natural cover of Rouge Park. Wildlife corridors are crucial for maintaining habitat and species diversity and resilience. Bloomington Wetland offers relatively high quality habitat patches with which to connect from all directions. “The high diversity of wetland types and species at White Rose – Preston Lake is the result of its large number and variety of wetlands that are connected to each other and to adjacent upland habitats. **To maintain species and community diversity, the interconnected network of wetlands and uplands must be maintained and strengthened**” (OMNR, 2001). Connectivity in this area has been severely impaired by major road and highway construction and the filling-in of valleys that could have otherwise been used as wildlife corridors (OMNR, 2001).

- i) Significantly improve habitat patch connections in the Rouge watershed on all sides of the Bloomington Wetland study area, retaining and strengthening natural connections to the rest of the White Rose – Preston Lake Wetland Complex to the east, Simeon Lake and Lake St. George ANSI’s to the south, and natural cover to the north in the Lake Simcoe watersheds. Priority is given to the east-west connections along the Oak Ridges Moraine.
- ii) Consider Bloomington Wetland not in isolation but as part of the larger complex of wetlands and critical adjacent uplands on the ORM in land use planning. It is essential for the persistence of amphibian and reptile populations that animals have easy access to and from the different habitats that they utilize at different stages of their annual life-cycle, and that their dispersal across the landscape (thereby maintaining genetic viability at the landscape level) is enhanced rather than obstructed.
- iii) Value and enhance adjacent agricultural and other open land as migration corridors.
- iv) Create at least one additional Highway 404 wildlife underpass for east-west wildlife movement.
- v) Ensure effective and adequate passage (e.g. tunnels) for amphibians, turtles (including the snapping turtle – a Species at Risk) and mammals across or under Bloomington Road and other roads in the vicinity that will experience increases in traffic.

3. Control Invasive Species

Several invasive non-native plant species pose threats to the native biodiversity at the Bloomington Wetland study area. Management of invasive species will need to be tailored to the individual species in question, depending on how widespread and established they are.



- i) More aggressive invasive species such as common buckthorn, dog-strangling vine, and common reed should be addressed firstly through controlling sources of disturbance such as erosion (in forest environments), nutrient input, and trampling.
- ii) Consider competitive plantings for containing some invasions, and biological control for the most aggressive species such as dog-strangling vine (may be the best option in the longer term).
- iii) Disturbed wetlands that are invaded by common reed and hybrid cattail may be suitable for intensive restoration activities (e.g. preserving cold-water groundwater inputs, habitat structures) dependant on the presence of sensitive fauna species (e.g. turtles and frogs).



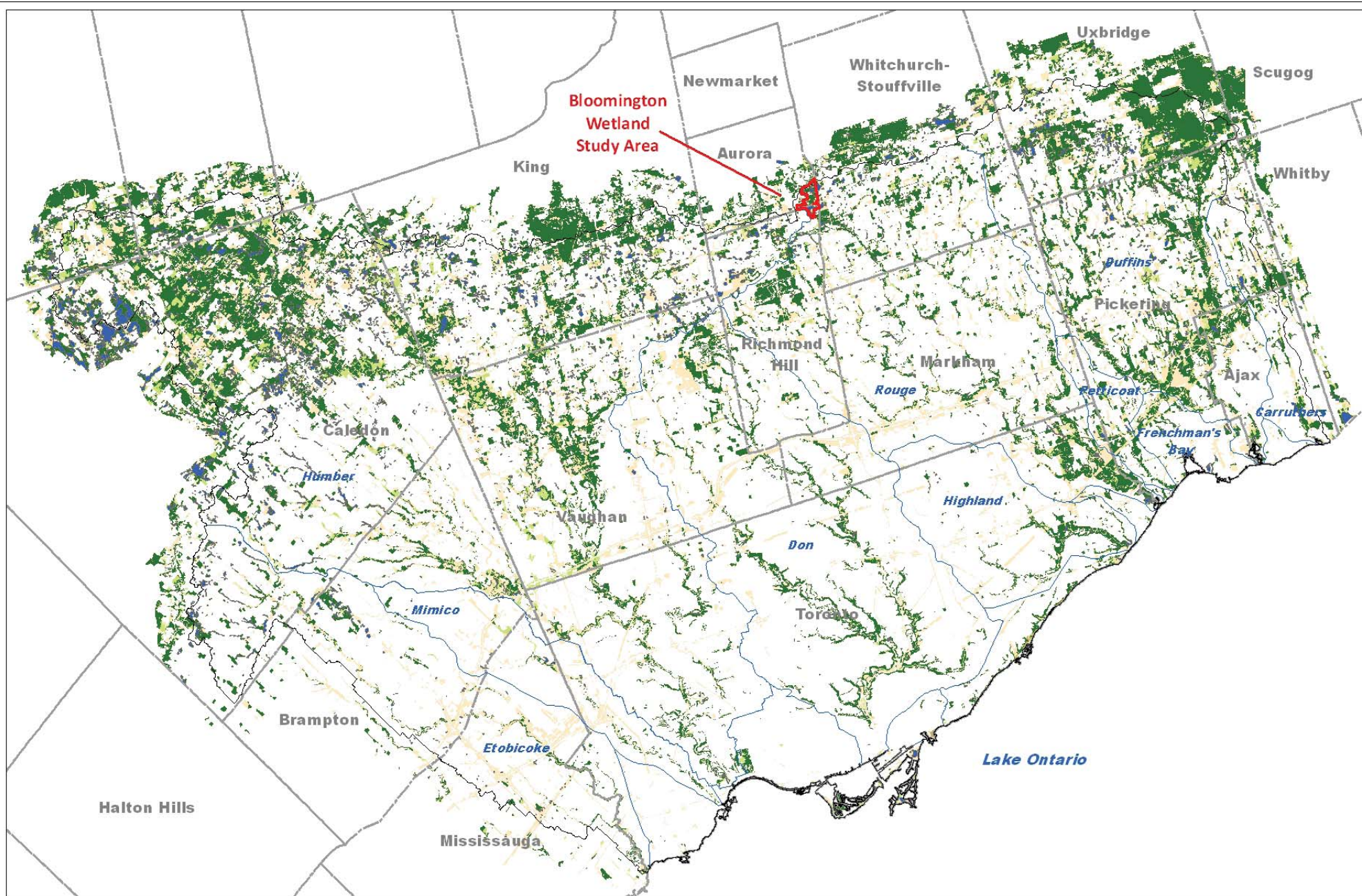
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Date: January 2012





* Landscape analysis based on 2007/2008 Orthophotography

Map 1:
Bloomington Wetland Study Area
in the Context of Regional Natural Cover

Natural Cover *

-  Forest
-  Successional
-  Meadow
-  Wetland
-  Beach/Bluff

Legend

-  Bloomington Wetland Study Area
-  TRCA Jurisdiction
-  Watershed
-  Municipal Boundary



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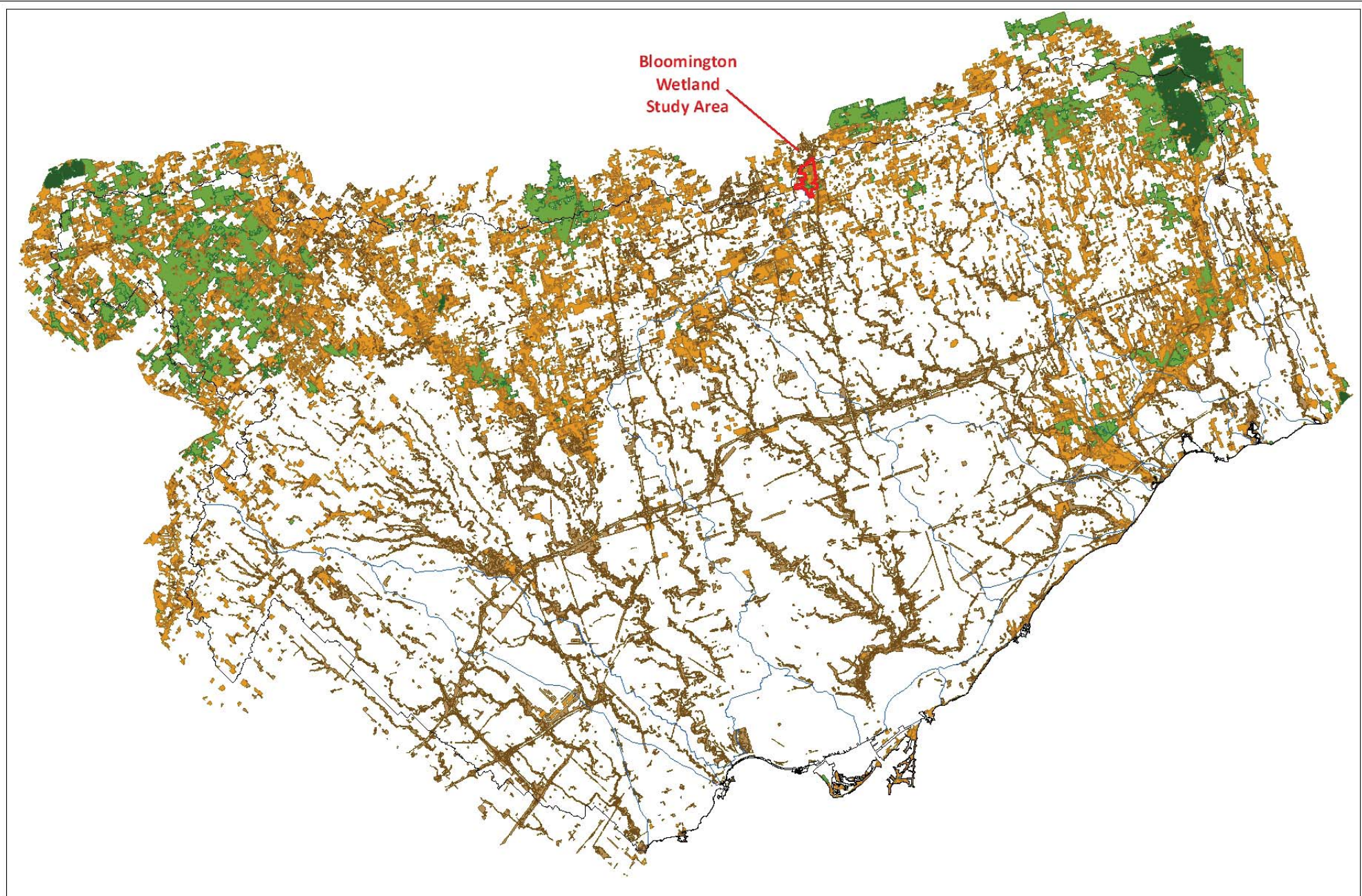
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Meters

Date: January 2012
Orthophoto: Spring 2009, First Base
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Map 2: Bloomington Wetland Study Area

Legend

 Bloomington Wetland
Boundary



Bloomington
Wetland
Study Area

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0 2.5 5 10 15 20 Kilometers

Date: January 2012

* Landscape analysis based on 20072008 Orthophotography

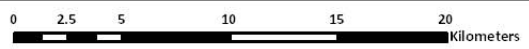
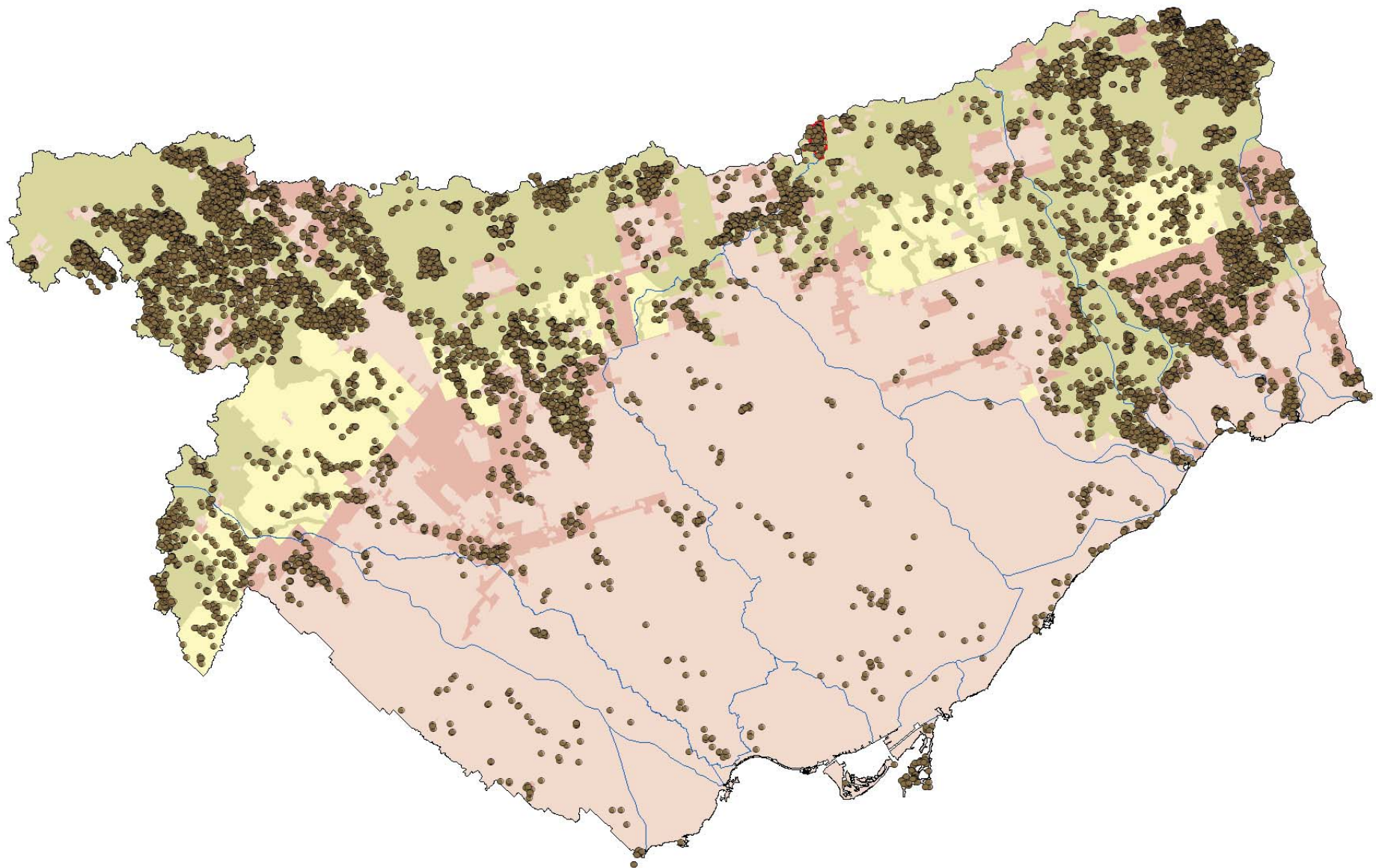
Map 3: Regional Natural System Habitat Patch Quality

Habitat Patch Quality *

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

Legend

- Bloomington Wetland Study Area
- TRCA Jurisdiction
- Watershed

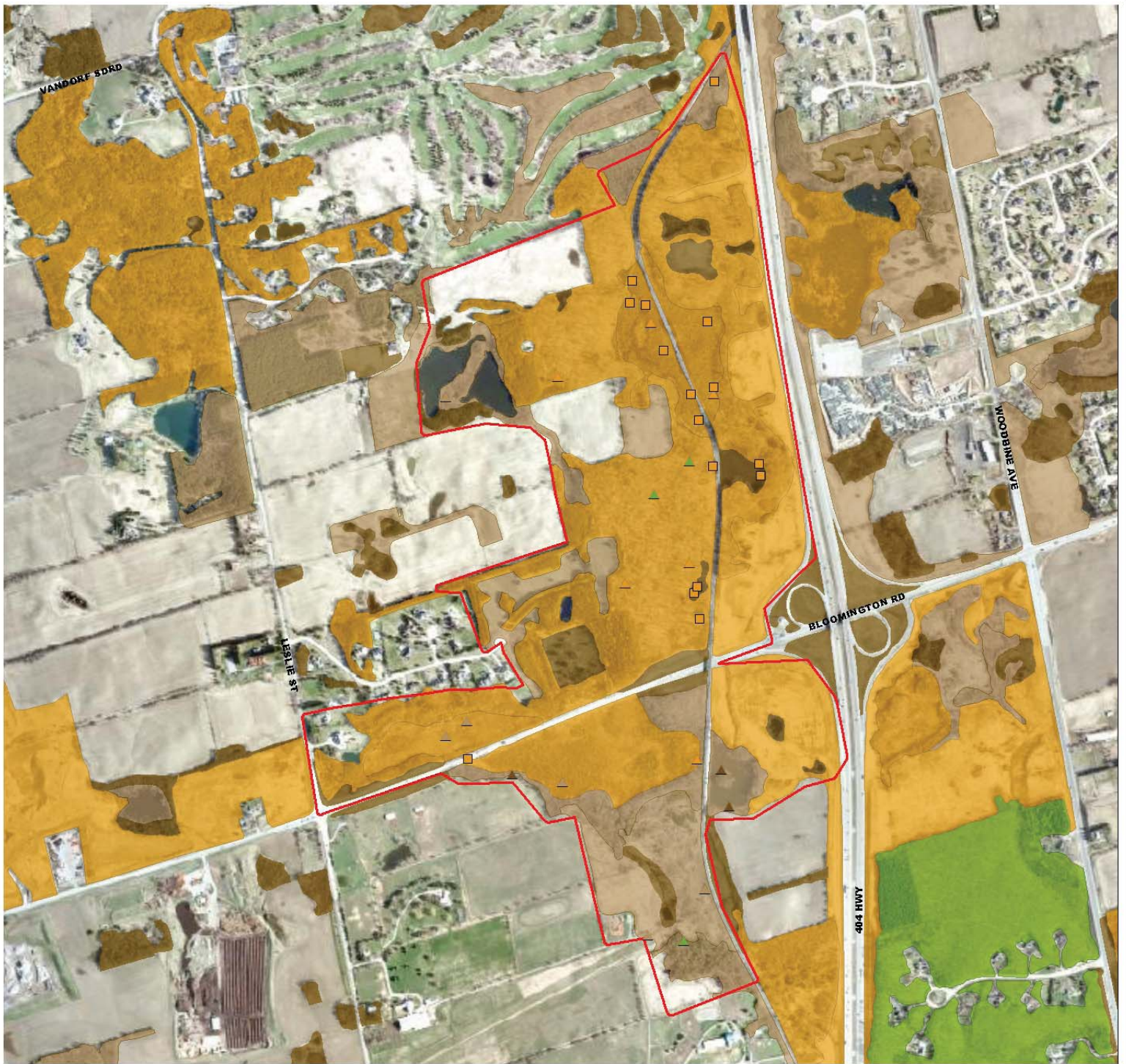


Date: January 2012

Map 4:
Distribution of Fauna
Regional Species of Concern

Legend

- Fauna Species of Concern (L1 - L3)
- Bloomington Wetland Study Area
- TRCA Jurisdiction
- Watershed
- Agricultural & Rural Area
- Built-up Area
- Designated Greenfield Area
- Greenbelt Area



Fauna Area Sensitivity Scores

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

- △ Fauna Species
- Frog Species

Habitat Patch Size Scores *

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



Date: January 2012
 Orthophoto: Spring 2009, First Base Solutions Inc.
 * Landscape analysis based on 20072008 Orthophotography

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

Legend

- Bloomington Wetland Study Area

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



0 75 150 300 450 600
 Meters

Date: January 2012
 Orthophoto: Spring 2009, First Base Solutions Inc.
 * Landscape analysis based on 2007/2008
 Orthophotography

Map 6:
Interior Forest at
Bloomington Wetland

Legend

- Bloomington Wetland Study Area
 - Forest
- Forest Interior**
- | | |
|--|---|
| 100m-200m | 400m-500m |
| 200m-300m | 500m-600m |
| 300m-400m | 600m-700m |



Flora Sensitivity to Development Scores

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

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

○ Flora Species

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0 75 150 300 450 600 750 Meters

Date: January 2012

Orthophoto: Spring 2009, First Base Solutions Inc.

* Landscape analysis based on 2007/2008 Orthophotography

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

Legend

Habitat Matrix Influence Scores *

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

□ Bloomington Wetland Study Area



Fauna Sensitivity to Development Scores

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

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

- △ Fauna Species
- Frog Species



0 75 150 300 450 600 750 Meters

Date: January 2012
Orthophoto: Spring 2009, First Base Solutions Inc.
* Landscape analysis based on 2007-2008 Orthophotography

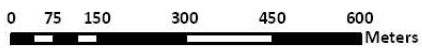
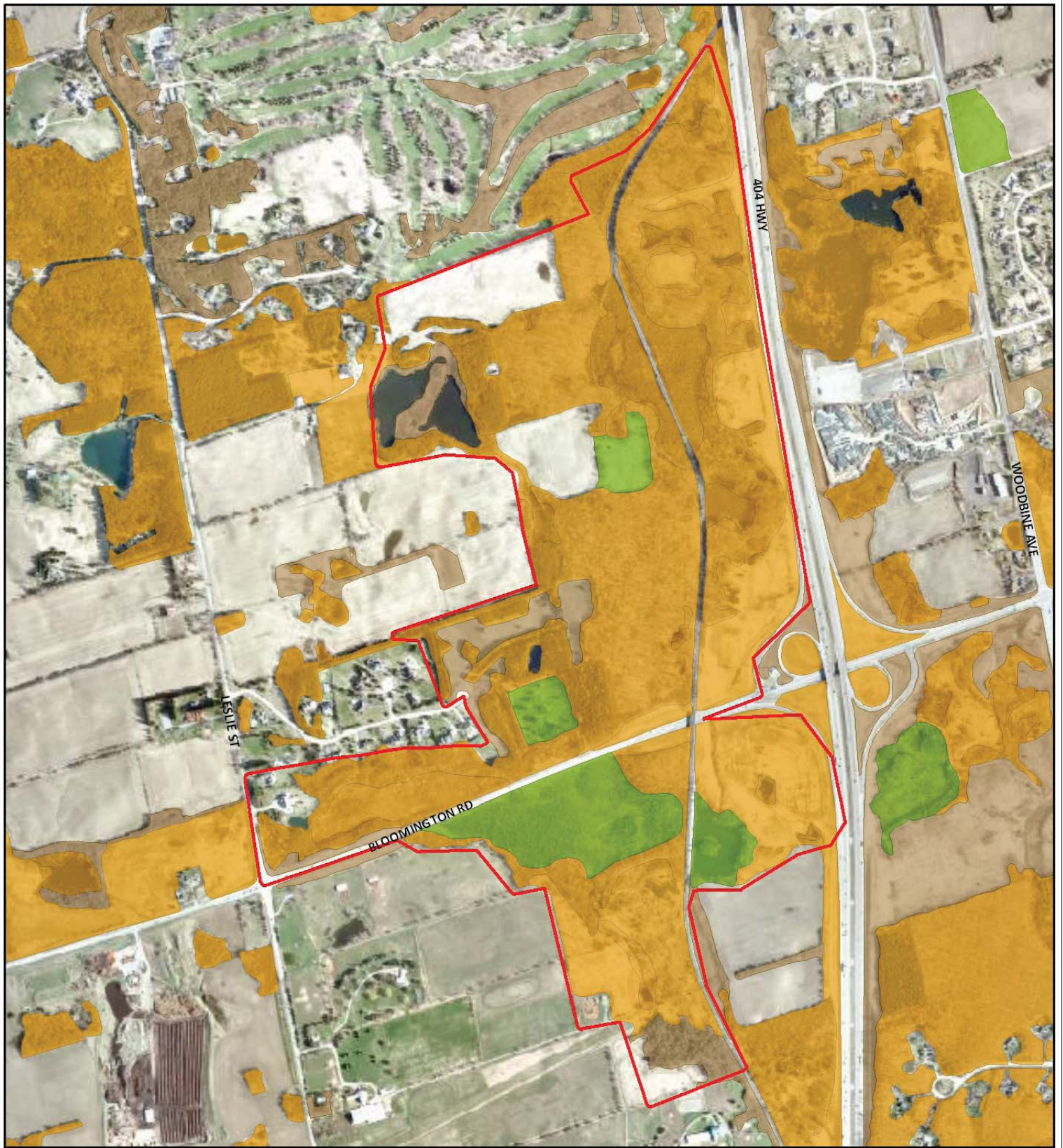
**Map 8:
Scores for Matrix Influence
and Fauna Sensitivity to
Development**

Legend

Habitat Matrix Influence Scores *

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

□ Bloomington Wetland Study Area



Map 9: Habitat Patch Quality

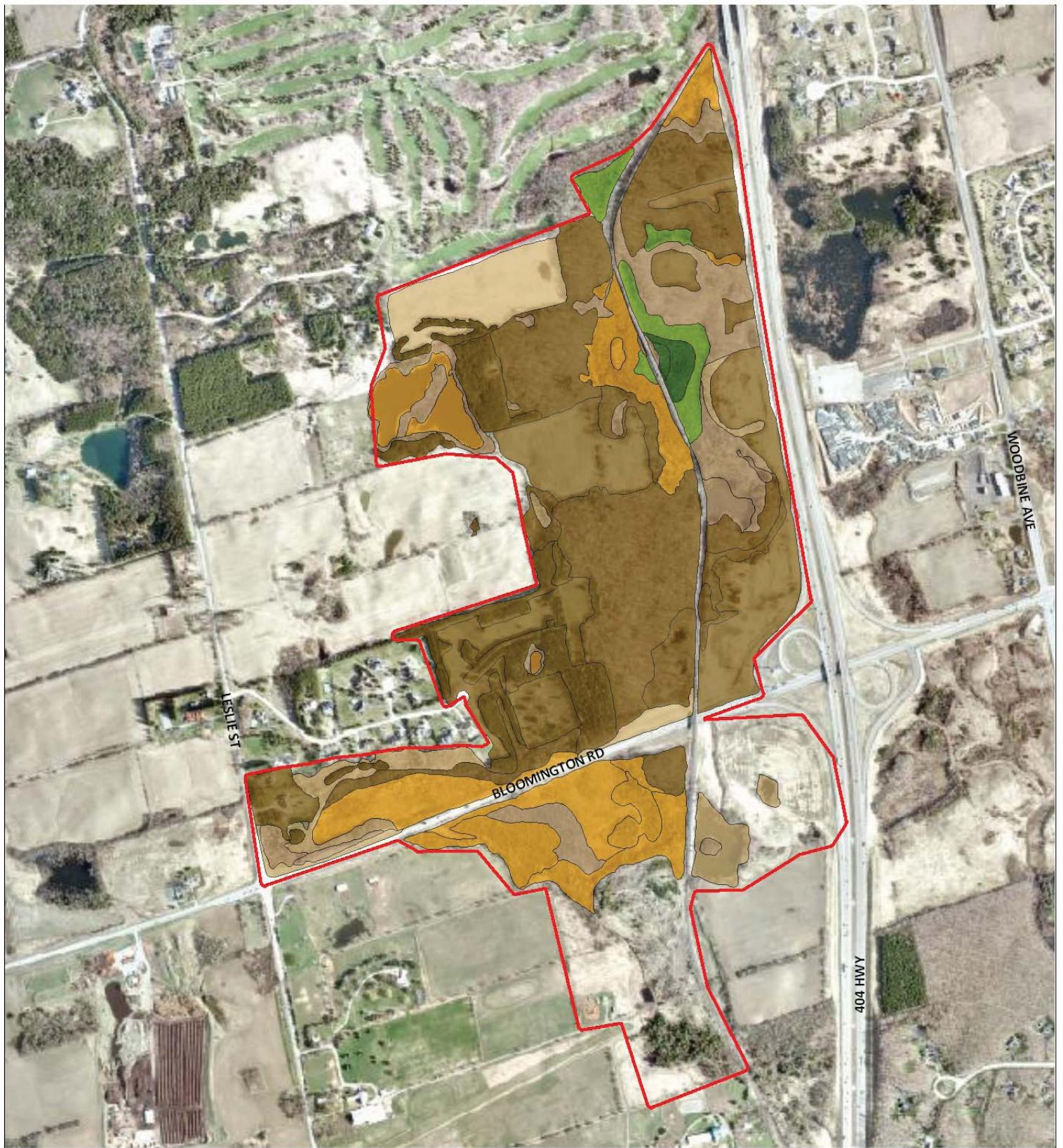
Date: January 2012
 Orthophoto: Spring 2009, First Base Solutions Inc.
 * Landscape analysis based on 2007/2008
 Orthophotography

Legend

Habitat Patch Quality *

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

Bloomington Wetland Study Area



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0 75 150 300 450 600
 Meters


Date: January 2012
 Orthophoto: Spring 2009, First Base
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Map 10: Vegetation Communities with their Associated Local Ranks

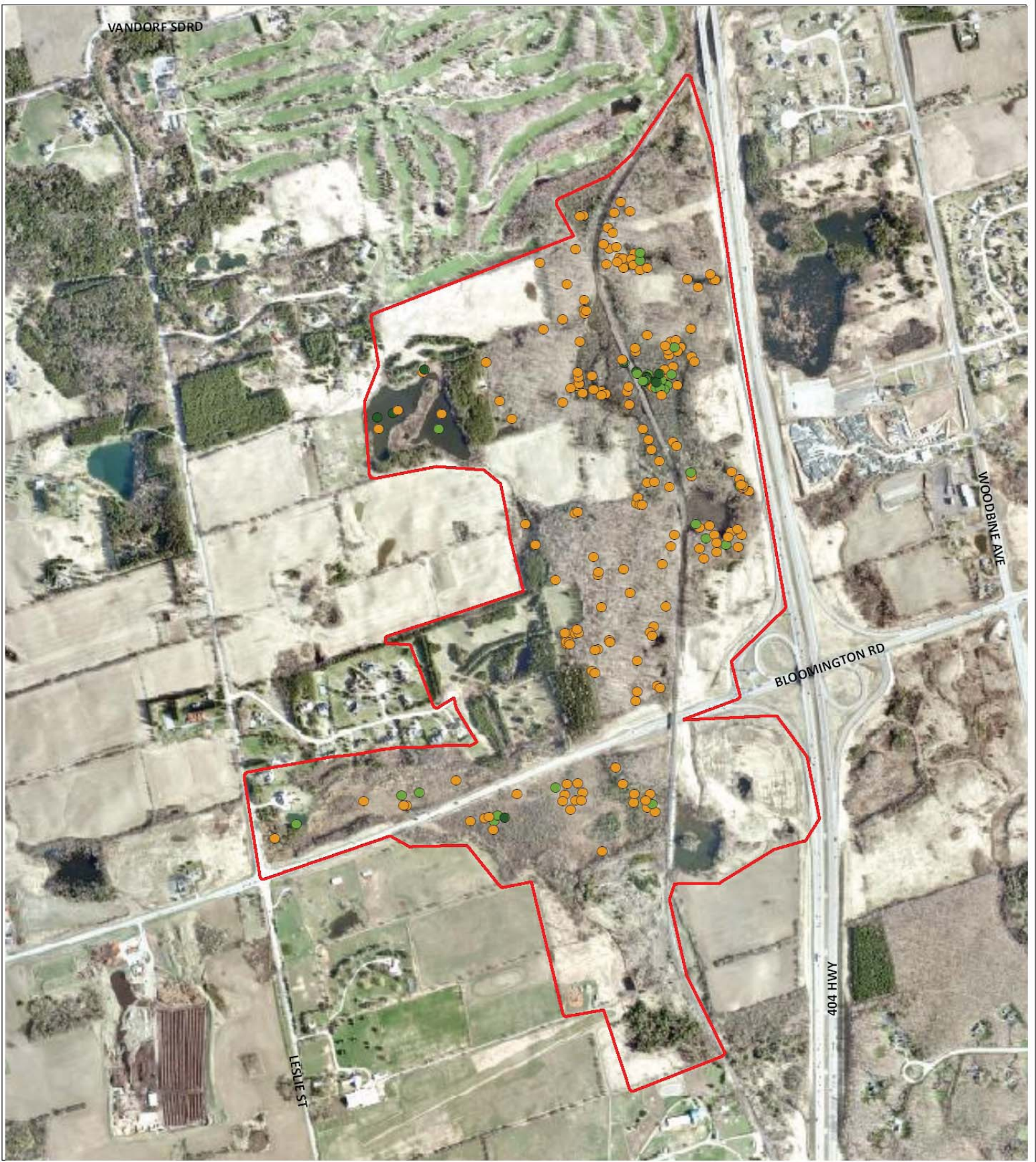
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Vegetation Community Ranks

	L1		L4
	L2		L5
	L3		L+

 Bloomington Wetland
 Study Area

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



VANDORF SDRD

WOODBINE AVE

BLOOMINGTON RD

404 HWY

LESLIE ST

TORONTO AND REGION
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0 75 150 300 450 600 Meters

Date: January 2012
 Orthophoto: Spring 2009, First Base Solutions Inc.

Map 11: Locations of Flora Species of Concern

Legend

Flora Species of Concern

- L1 ● L3
- L2

Bloomington Wetland Study Area



Flora Habitat Dependence Scores

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

○ Flora Species

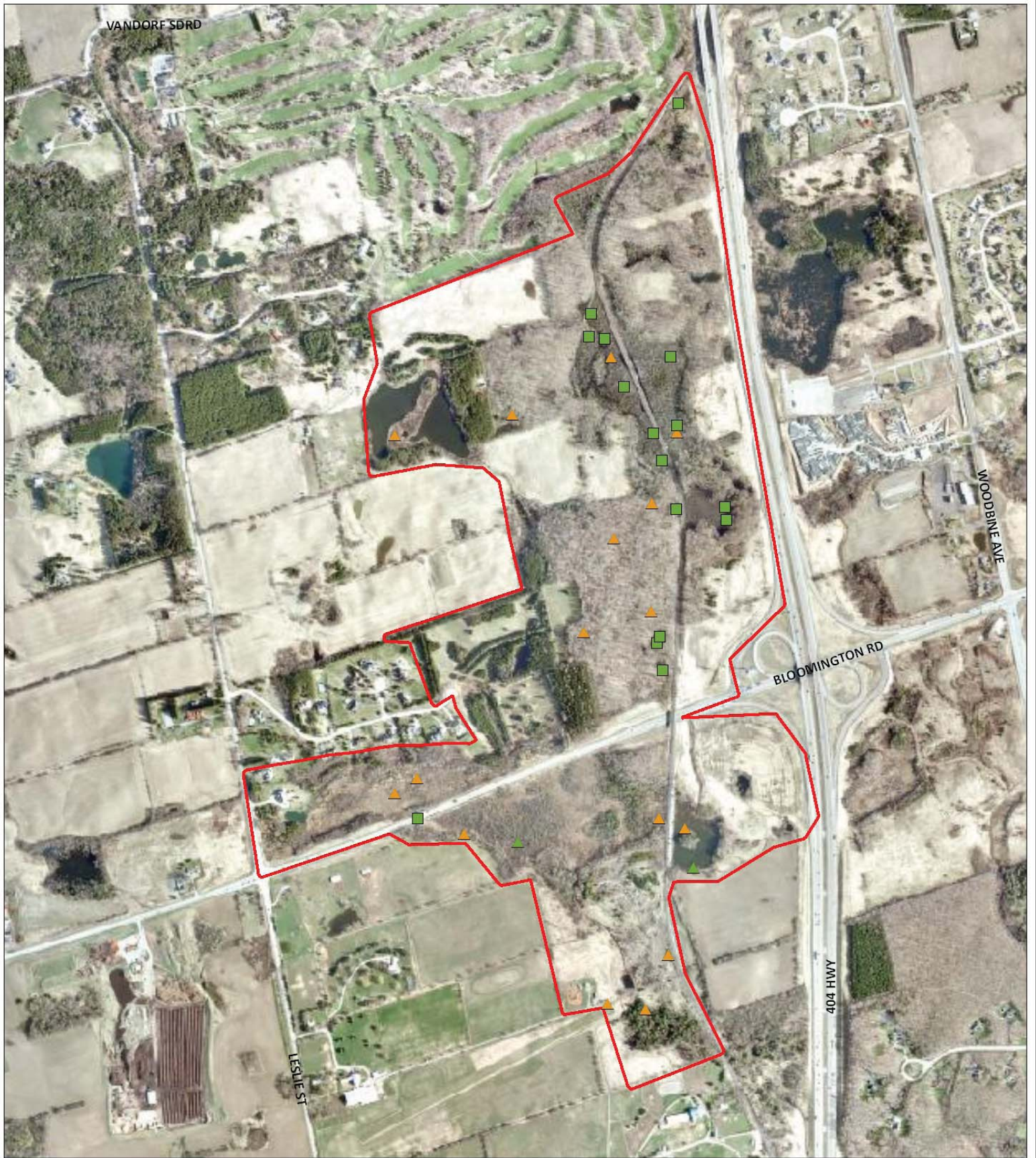
NOTE: All flora species with their associated scores for habitat dependence can be found in Appendix #2.



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

Legend

Bloomington Wetland Study Area



Date: January 2012
 Orthophoto: Spring 2009, First Base
 Solutions Inc.

Map 13: Locations of Fauna Species of Concern

Legend

Fauna Species of Concern		Frog Species of Concern	
▲ L1	▲ L3	■ L1	■ L3
▲ L2		■ L2	
Bloomington Wetland Study Area			



Fauna Habitat Dependence Scores

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

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



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

Legend

- Bloomington Wetland Study Area
- △ Fauna Species
- Frog Species

Appendix 1: List of TRCA Vegetation Communities at Bloomington Wetland

ELC Code	Vegetation Type (** indicates present as inclusion and/or complex only)	Tot. area # ha	Scores			Local Rank (2010-04)
			Local Occur.	Geophy. Requir.	Total Score	
Forest						
FOM6-1	Fresh-Moist Sugar Maple - Hemlock Mixed Forest	0.2	1.5	2.0	3.5	L4
FOM6-2	Fresh-Moist Hemlock - Hardwood Mixed Forest	0.4	2.0	3.0	5.0	L3
FOD3-1	Dry-Fresh Poplar Deciduous Forest	4.7	2.0	2.0	4.0	L4
FOD3-2	Dry-Fresh Paper Birch Deciduous Forest**		2.5	1.0	3.5	L4
FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest	13.2	1.0	0.0	1.0	L5
FOD5-2	Dry-Fresh Sugar Maple - Beech Deciduous Forest**		1.5	0.0	1.5	L5
FOD5-8	Dry-Fresh Sugar Maple - White Ash Deciduous Forest	16.2	1.5	0.0	1.5	L5
FOD5-10	Dry-Fresh Sugar Maple - Paper Birch - Poplar Deciduous Forest**		2.5	1.0	3.5	L4
FOD6-5	Fresh-Moist Sugar Maple - Hardwood Deciduous Forest	2.1	1.5	0.0	1.5	L5
FOD7-c	Fresh-Moist Exotic Lowland Deciduous Forest	2.8	2.5	0.0	2.5	L+
FOD8-1	Fresh-Moist Poplar Deciduous Forest	4.2	1.0	0.0	1.0	L5
CUP3-1	Red Pine Coniferous Plantation	6.4	1.5	0.0	1.5	L5
CUP3-2	White Pine Coniferous Plantation	0.8	1.5	0.0	1.5	L5
CUP3-C	White Spruce Coniferous Plantation	4.7	2.0	0.0	2.0	L5
Successional						
CUT1-1	Sumac Deciduous Thicket	1.0	2.0	0.0	2.0	L5
CUT1-b	Buckthorn Deciduous Thicket	0.6	2.5	0.0	2.5	L+
Wetland						
SWC1-1	White Cedar Mineral Coniferous Swamp**		2.5	2.0	4.5	L4
SWC3-2	White Cedar - Conifer Organic Coniferous Swamp	1.4	2.5	3.0	5.5	L3
SWM1-1	White Cedar - Hardwood Mineral Mixed Swamp	0.7	2.0	2.0	4.0	L4
SWM4-1	White Cedar - Hardwood Organic Mixed Swamp	2.8	2.0	3.0	5.0	L3
SWD3-1	Red Maple Mineral Deciduous Swamp**		3.5	2.0	5.5	L3
SWD3-2	Silver Maple Mineral Deciduous Swamp	1.7	2.5	2.0	4.5	L4
SWD4-1	Willow Mineral Deciduous Swamp	0.6	2.0	1.0	3.0	L4
SWD4-3	Paper Birch - Poplar Mineral Deciduous Swamp	3.6	2.0	2.0	4.0	L4
SWD5-1	Black Ash Organic Deciduous Swamp	1.0	3.5	3.0	6.5	L2
SWD6-1	Red Maple Organic Deciduous Swamp	0.2	3.5	3.0	6.5	L2
SWD7-1	Paper Birch - Poplar Organic Deciduous Swamp	3.0	2.5	3.0	5.5	L3
SWT2-2	Willow Mineral Thicket Swamp	2.2	2.0	2.0	4.0	L4

Appendix 1: List of TRCA Vegetation Communities at Bloomington Wetland

ELC Code	Vegetation Type (** indicates present as inclusion and/or complex only)	Tot. area # ha	Scores			Local Rank (2010-04)
			Local Occur.	Geophy. Requir.	Total Score	
SWT2-a	Exotic Mineral Thicket Swamp**		3.5	1.0	4.5	L+
SWT3-2	Willow Organic Thicket Swamp	3.7	2.5	3.0	5.5	L3
SWT3-7	Winterberry Organic Thicket Swamp	2.5	3.5	4.0	7.5	L2
BOS2-1	Leatherleaf Shrub Kettle Bog	0.2	3.5	5.0	8.5	L1
BOT2-1	Tamarack - Leatherleaf Treed Kettle Bog	0.9	3.5	5.0	8.5	L1
MAM2-2	Reed Canary Grass Mineral Meadow Marsh	0.2	1.0	1.0	2.0	L+
MAM2-10	Forb Mineral Meadow Marsh	0.1	1.5	1.0	2.5	L5
MAM3-2	Reed Canary Grass Organic Meadow Marsh**		3.5	2.0	5.5	L+
MAM3-9	Forb Organic Meadow Marsh	0.1	3.0	3.0	6.0	L3
MAS2-1A	Broad-leaved Cattail Mineral Shallow Marsh	0.5	2.0	1.0	3.0	L4
MAS2-1b	Narrow-Leaved Cattail Mineral Shallow Marsh	2.3	2.0	0.0	2.0	L+
MAS2-9	Forb Mineral Shallow Marsh	0.1	3.0	1.0	4.0	L4
MAS3-1A	Broad-leaved Cattail Organic Shallow Marsh	9.0	2.5	3.0	5.5	L3
Aquatic						
SAS1-1	Pondweed Submerged Shallow Aquatic	0.1	2.0	2.0	4.0	L4
SAM1-2	Duckweed Mixed Shallow Aquatic	0.3	3.0	2.0	5.0	L3
SAM1-4	Pondweed Mixed Shallow Aquatic	3.2	3.0	2.0	5.0	L3
SAF1-3	Duckweed Floating-leaved Shallow Aquatic	0.2	2.5	1.0	3.5	L4
Meadow						
CUM1-A	Native Forb Meadow	26.4	1.5	0.0	1.5	L5
CUM1-b	Exotic Cool-season Grass Graminoid Meadow	7.9	1.0	0.0	1.0	L+
CUM1-c	Exotic Forb Meadow**		1.5	0.0	1.5	L+

Appendix 2: List of Flora Species Found at Bloomington Wetland in 1996 and 2001

** indicates species were found by OMNR and not TRCA

Scientific Name	Common Name	Bog/Fen Indicator	Local Occur. 1-5	Popn. Trend 1-5	Hab. Dep. 0-5	Sens. Dev. 0-5	Total Score 2-20	Rank TRCA (03/2009)
<i>Andromeda polifolia</i> ssp. <i>glaucophylla</i>	bog rosemary	yes	5	5	5	4	19	L1
<i>Drosera rotundifolia</i> **	round-leaved sundew	yes	4	5	5	5	19	L1
<i>Menyanthes trifoliata</i>	bog buckbean	yes	4	5	5	5	19	L1
<i>Myriophyllum sibiricum</i> **	northern water-milfoil		5	5	5	4	19	L1
<i>Myriophyllum verticillatum</i>	whorled water-milfoil		5	5	5	4	19	L1
<i>Potamogeton pusillus</i>	small pondweed		4	5	5	5	19	L1
<i>Sarracenia purpurea</i>	pitcher-plant	yes	4	5	5	5	19	L1
<i>Zizania palustris</i> var. <i>palustris</i>	northern wild rice		5	4	5	5	19	L1
<i>Aronia melanocarpa</i>	black choke-berry	yes	4	5	5	4	18	L2
<i>Calla palustris</i>	water arum		3	5	4	5	17	L2
<i>Carex aquatilis</i>	water sedge		3	4	5	5	17	L2
<i>Carex lasiocarpa</i> **	slender woolly sedge	yes	3	4	5	5	17	L2
<i>Carex limosa</i> **	mud sedge	yes	5	4	5	4	18	L2
<i>Carex magellanica</i> ssp. <i>irrigua</i>	stunted sedge	yes	4	4	5	5	18	L2
<i>Coptis trifolia</i> ssp. <i>groenlandica</i>	goldthread		2	5	5	5	17	L2
<i>Dulichium arundinaceum</i> **	three-way sedge		3	4	5	5	17	L2
<i>Eriophorum virginicum</i>	tawny cotton-grass	yes	4	4	5	5	18	L2
<i>Kalmia polifolia</i>	bog laurel	yes	4	5	5	4	18	L2
<i>Ledum groenlandicum</i>	Labrador-tea	yes	4	5	5	4	18	L2
<i>Lycopodium dendroideum</i>	round-branched ground-pine		2	5	5	5	17	L2
<i>Najas flexilis</i> **	bushy naiad		3	4	5	5	17	L2
<i>Nemopanthus mucronatus</i>	mountain holly	yes	4	3	5	5	17	L2
<i>Osmunda claytoniana</i> **	interrupted fern		3	5	5	5	18	L2
<i>Osmunda regalis</i> var. <i>spectabilis</i>	royal fern		2	5	5	5	17	L2
<i>Picea mariana</i> **	black spruce	yes	4	4	5	5	18	L2
<i>Platanthera hyperborea</i>	northern green orchis		3	4	5	5	17	L2
<i>Polygala paucifolia</i>	fringed polygala		3	5	4	5	17	L2
<i>Potamogeton zosteriformis</i>	flat-stemmed pondweed		3	5	5	5	18	L2
<i>Potentilla palustris</i>	marsh cinquefoil		3	5	4	5	17	L2
<i>Pyrola asarifolia</i>	pink pyrola		3	4	5	5	17	L2
<i>Salix pedicellaris</i>	bog willow	yes	4	4	5	4	17	L2
<i>Sparganium natans</i>	lesser bur-reed		5	3	5	5	18	L2

Appendix 2: List of Flora Species Found at Bloomington Wetland in 1996 and 2001

** indicates species were found by OMNR and not TRCA

Scientific Name	Common Name	Bog/Fen Indicator	Local Occur. 1-5	Popn. Trend 1-5	Hab. Dep. 0-5	Sens. Dev. 0-5	Total Score 2-20	Rank TRCA (03/2009)
<i>Utricularia vulgaris</i>	common bladderwort		3	4	5	5	17	L2
<i>Vaccinium angustifolium</i> **	lowbush blueberry	yes	5	4	4	5	18	L2
<i>Vaccinium oxycoccos</i> **	small cranberry	yes	4	5	5	4	18	L2
<i>Viburnum cassinoides</i> **	withe-rod		4	4	5	4	17	L2
<i>Abies balsamea</i>	balsam fir		2	3	4	5	14	L3
<i>Acer x freemanii</i>	hybrid swamp maple		5	3	5	2	15	L3
<i>Adiantum pedatum</i>	northern maidenhair fern		2	3	5	5	15	L3
<i>Alopecurus aequalis</i>	short-awned foxtail		3	4	5	4	16	L3
<i>Anaphalis margaritacea</i> **	pearly everlasting		3	4	4	3	14	L3
<i>Anemone acutiloba</i>	sharp-lobed hepatica		2	4	4	5	15	L3
<i>Aquilegia canadensis</i>	wild columbine		2	4	3	5	14	L3
<i>Aralia racemosa</i> ssp. <i>racemosa</i>	spikenard		2	4	4	4	14	L3
<i>Bidens discoidea</i> **	small beggar's-ticks		5	2	4	4	15	L3
<i>Brachyelytrum erectum</i>	bearded short-husk		3	5	3	4	15	L3
<i>Carex albursina</i>	white bear sedge		2	3	5	4	14	L3
<i>Carex alopecoidea</i>	foxtail wood sedge		2	3	5	4	14	L3
<i>Carex brunnescens</i> ssp. <i>brunnescens</i>	brownish sedge		3	3	4	4	14	L3
<i>Carex cephaloidea</i>	thin-leaved sedge		3	3	5	3	14	L3
<i>Carex cephalophora</i>	oval-headed sedge		3	3	4	4	14	L3
<i>Carex comosa</i>	bristly sedge		3	3	5	4	15	L3
<i>Carex crinita</i>	fringed sedge		2	4	4	4	14	L3
<i>Carex diandra</i>	lesser panicled sedge		3	4	5	4	16	L3
<i>Carex digitalis</i>	slender wood sedge		4	4	4	3	15	L3
<i>Carex disperma</i>	two-seeded sedge		2	3	5	4	14	L3
<i>Carex laxiculmis</i> var. <i>laxiculmis</i> **	spreading wood sedge		4	3	5	3	15	L3
<i>Carex leptoneuria</i>	few-nerved wood sedge		2	4	4	4	14	L3
<i>Carex lupulina</i>	hop sedge		2	4	4	4	14	L3
<i>Carex platyphylla</i>	broad-leaved sedge		3	4	4	3	14	L3
<i>Carex trisperma</i> var. <i>trisperma</i>	three-seeded sedge		4	3	5	4	16	L3
<i>Carex tuckermanii</i>	Tuckerman's sedge		2	4	4	4	14	L3
<i>Carex utriculata</i>	beaked sedge		2	3	4	5	14	L3
<i>Carex vesicaria</i>	inflated sedge		3	3	5	4	15	L3

Appendix 2: List of Flora Species Found at Bloomington Wetland in 1996 and 2001

** indicates species were found by OMNR and not TRCA

Scientific Name	Common Name	Bog/Fen Indicator	Local Occur. 1-5	Popn. Trend 1-5	Hab. Dep. 0-5	Sens. Dev. 0-5	Total Score 2-20	Rank TRCA (03/2009)
<i>Celastrus scandens</i>	American bittersweet		2	4	3	5	14	L3
<i>Ceratophyllum demersum</i>	coontail		2	3	5	4	14	L3
<i>Chamaedaphne calyculata</i>	leatherleaf	yes	3	4	4	4	15	L3
<i>Chelone glabra</i>	turtlehead		2	3	4	5	14	L3
<i>Cicuta bulbifera</i>	bulblet-bearing water-hemlock		2	3	5	4	14	L3
<i>Cinna latifolia</i>	nodding wood reed		3	3	5	3	14	L3
<i>Circaea alpina</i>	smaller enchanter's nightshade		2	4	5	4	15	L3
<i>Clintonia borealis</i>	bluebead lily		2	5	4	5	16	L3
<i>Cypripedium calceolus</i> var. <i>parviflorum</i>	smaller yellow lady's slipper		3	4	4	5	16	L3
<i>Cystopteris tenuis</i>	Mackay's fragile fern		2	4	5	5	16	L3
<i>Dicentra canadensis</i>	squirrel-corn		2	4	5	4	15	L3
<i>Dryopteris cristata</i>	crested wood fern		2	4	4	4	14	L3
<i>Eleocharis smallii</i>	Small's spike-rush		3	4	5	3	15	L3
<i>Epilobium angustifolium</i> **	fire-weed		3	4	4	4	15	L3
<i>Epilobium leptophyllum</i>	narrow-leaved willow-herb		2	5	4	4	15	L3
<i>Equisetum fluviatile</i>	water horsetail		2	4	5	4	15	L3
<i>Equisetum scirpoides</i>	dwarf scouring-rush		2	4	5	5	16	L3
<i>Equisetum sylvaticum</i>	woodland horsetail		2	3	5	4	14	L3
<i>Galium tinctorium</i> **	stiff marsh bedstraw		4	4	4	3	15	L3
<i>Gaylussacia baccata</i> **	black huckleberry	yes	4	4	4	4	16	L3
<i>Glyceria borealis</i>	northern manna grass		3	3	5	5	16	L3
<i>Glyceria septentrionalis</i>	eastern manna grass		2	3	5	4	14	L3
<i>Gymnocarpium dryopteris</i>	oak fern		2	3	5	5	15	L3
<i>Hydrocotyle americana</i>	marsh pennywort		2	4	4	4	14	L3
<i>Hydrophyllum canadense</i>	Canada waterleaf		2	3	5	4	14	L3
<i>Hypericum punctatum</i>	spotted St. Johnswort		4	4	4	3	15	L3
<i>Ilex verticillata</i>	winterberry		2	4	4	5	15	L3
<i>Iris versicolor</i>	blue flag		2	5	4	5	16	L3
<i>Juglans cinerea</i>	butternut		1	5	4	4	14	L3
<i>Larix laricina</i>	tamarack	yes	2	4	4	4	14	L3
<i>Lemna trisulca</i>	star duckweed		2	4	5	3	14	L3
<i>Liparis loeselii</i>	Loesel's twayblade		3	3	5	5	16	L3

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Scientific Name	Common Name	Bog/Fen Indicator	Local Occur. 1-5	Popn. Trend 1-5	Hab. Dep. 0-5	Sens. Dev. 0-5	Total Score 2-20	Rank TRCA (03/2009)
<i>Lobelia siphilitica</i>	great blue lobelia		2	3	4	5	14	L3
<i>Lonicera canadensis</i>	fly honeysuckle		2	4	4	4	14	L3
<i>Lysimachia thyrsoiflora</i>	tufted loosestrife		3	3	4	4	14	L3
<i>Maianthemum trifolium</i>	three-leaved false Solomon's seal		3	4	5	4	16	L3
<i>Medeola virginiana</i>	Indian cucumber-root		2	5	4	5	16	L3
<i>Menispermum canadense</i>	moonseed		2	4	4	4	14	L3
<i>Mitchella repens</i>	partridgeberry		2	4	4	5	15	L3
<i>Mitella diphylla</i>	mitrewort		2	3	4	5	14	L3
<i>Mitella nuda</i> **	naked mitrewort		2	4	5	5	16	L3
<i>Monotropa uniflora</i>	Indian-pipe		2	4	5	5	16	L3
<i>Onoclea sensibilis</i>	Clinton's wood fern		2	4	5	4	15	L3
<i>Oryzopsis asperifolia</i>	white-fruited mountain-rice		2	4	4	5	15	L3
<i>Osmunda cinnamomea</i>	cinnamon fern		2	4	5	5	16	L3
<i>Picea glauca</i>	white spruce		1	5	4	4	14	L3
<i>Poa alsodes</i>	grove meadow grass		3	3	5	3	14	L3
<i>Polygonum hydropiperoides</i>	mild water-pepper		4	2	5	3	14	L3
<i>Polystichum acrostichoides</i>	Christmas fern		1	3	5	5	14	L3
<i>Potamogeton amplifolius</i> **	large-leaved pondweed		3	4	5	4	16	L3
<i>Potamogeton natans</i>	floating pondweed		2	4	5	3	14	L3
<i>Prenanthes alba</i>	white wood lettuce		3	4	4	3	14	L3
<i>Prunus nigra</i> **	Canada plum		2	4	4	4	14	L3
<i>Pyrola elliptica</i>	shinleaf		2	4	4	4	14	L3
<i>Ranunculus pensylvanicus</i> **	bristly buttercup		5	3	4	3	15	L3
<i>Sagittaria cuneata</i> **	arrowhead			4	5	4	13	L3
<i>Salix lucida</i>	shining willow		2	4	5	3	14	L3
<i>Salix serissima</i> **	autumn willow	yes	4	3	5	4	16	L3
<i>Scirpus cyperinus</i>	woolly bulrush		2	3	4	5	14	L3
<i>Sparganium emersum</i> ssp. <i>emersum</i>	green-fruited bur-reed		2	3	5	4	14	L3
<i>Sparganium eurycarpum</i>	great bur-reed		2	4	5	4	15	L3
<i>Sphenopholis intermedia</i> **	slender wedge grass		3	3	4	4	14	L3
<i>Spirodela polyrhiza</i> **	greater duckweed		2	4	5	3	14	L3
<i>Streptopus roseus</i>	rose twisted-stalk		2	4	4	5	15	L3

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<i>Taxus canadensis</i>	Canada yew		2	4	4	5	15	L3
<i>Trientalis borealis</i> ssp. <i>borealis</i>	star-flower		2	4	4	5	15	L3
<i>Ulmus rubra</i>	slippery elm		4	5	4	3	16	L3
<i>Uvularia grandiflora</i>	large-flowered bellwort		1	4	5	5	15	L3
<i>Vaccinium myrtilloides</i>	velvet-leaf blueberry	yes	3	4	4	5	16	L3
<i>Vallisneria americana</i> **	tape-grass		3	4	5	4	16	L3
<i>Veronica scutellata</i> **	marsh speedwell		3	2	5	4	14	L3
<i>Viburnum acerifolium</i>	maple-leaved viburnum		2	3	4	5	14	L3
<i>Viola blanda</i>	sweet white violet		3	4	4	3	14	L3
<i>Viola canadensis</i>	Canada violet		3	4	4	4	15	L3
<i>Viola cucullata</i>	marsh blue violet		3	3	4	4	14	L3
<i>Viola macloskeyi</i> ssp. <i>pallens</i> **	northern white violet	yes	3	4	4	3	14	L3
<i>Viola rostrata</i>	long-spurred violet		2	4	4	4	14	L3
<i>Acer rubrum</i>	red maple		2	4	1	5	12	L4
<i>Acer saccharinum</i>	silver maple		1	2	5	3	11	L4
<i>Acer spicatum</i>	mountain maple		2	3	4	4	13	L4
<i>Actaea pachypoda</i>	white baneberry		2	3	4	3	12	L4
<i>Allium tricoccum</i>	wild leek		1	3	4	4	12	L4
<i>Amelanchier laevis</i>	smooth serviceberry		2	2	4	3	11	L4
<i>Amelanchier sanguinea</i> var. <i>sanguinea</i> **	round-leaved serviceberry		3	2	3	4	12	L4
<i>Apocynum androsaemifolium</i>	spreading dogbane		2	3	2	4	11	L4
<i>Asarum canadense</i>	wild ginger		2	3	4	3	12	L4
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	swamp milkweed		1	3	4	4	12	L4
<i>Aster macrophyllus</i>	big-leaved aster		2	3	2	4	11	L4
<i>Betula alleghaniensis</i>	yellow birch		1	4	3	5	13	L4
<i>Betula papyrifera</i>	paper birch		1	4	2	4	11	L4
<i>Bidens tripartitus</i> **	three-parted beggar's-ticks		3	2	4	2	11	L4
<i>Boehmeria cylindrica</i>	false nettle		2	4	4	3	13	L4
<i>Calamagrostis canadensis</i>	Canada blue joint		1	3	4	4	12	L4
<i>Caltha palustris</i>	marsh marigold		2	4	3	4	13	L4
<i>Cardamine diphylla</i>	broad-leaved toothwort		2	3	4	4	13	L4
<i>Carex arctata</i>	nodding wood sedge		2	4	2	3	11	L4

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<i>Carex aurea</i>	golden-fruited sedge		2	2	4	4	12	L4
<i>Carex communis</i>	fibrous-rooted sedge		2	4	3	3	12	L4
<i>Carex deweyana</i>	Dewey's sedge		2	4	3	3	12	L4
<i>Carex gracillima</i>	graceful sedge		2	3	4	2	11	L4
<i>Carex hystericina</i>	porcupine sedge		2	3	2	5	12	L4
<i>Carex intumescens</i>	bladder sedge		2	4	4	2	12	L4
<i>Carex lacustris**</i>	lake-bank sedge		2	3	3	4	12	L4
<i>Carex laxiflora</i>	loose-flowered sedge		3	3	4	3	13	L4
<i>Carex peckii</i>	Peck's sedge		3	3	4	3	13	L4
<i>Carex pedunculata</i>	early-flowering sedge		2	3	3	3	11	L4
<i>Carex pennsylvanica</i>	Pennsylvania sedge		2	4	3	4	13	L4
<i>Carex projecta</i>	necklace sedge		3	2	4	3	12	L4
<i>Carex pseudo-cyperus</i>	pseudocyperus sedge		2	3	3	4	12	L4
<i>Carex retrorsa</i>	retorse sedge		2	3	3	4	12	L4
<i>Carex sparganioides</i>	bur-reed sedge		2	2	5	2	11	L4
<i>Carex spengelii</i>	long-beaked sedge		2	4	4	2	12	L4
<i>Carex stricta</i>	tussock sedge		2	3	3	4	12	L4
<i>Carpinus caroliniana</i> ssp. <i>virginiana</i>	blue beech		1	3	4	3	11	L4
<i>Carya cordiformis</i>	bitternut hickory		2	4	4	2	12	L4
<i>Caulophyllum giganteum</i>	long-styled blue cohosh		2	3	4	4	13	L4
<i>Cornus rugosa</i>	round-leaved dogwood		2	4	4	3	13	L4
<i>Corylus cornuta</i>	beaked hazel		2	4	3	4	13	L4
<i>Crataegus macracantha</i>	long-spined hawthorn		2	2	4	3	11	L4
<i>Crataegus pedicellata**</i>	scarlet hawthorn		4	2	3	3	12	L4
<i>Cystopteris bulbifera</i>	bulblet fern		2	3	4	4	13	L4
<i>Danthonia spicata</i>	poverty oat grass		2	4	3	4	13	L4
<i>Diervilla lonicera</i>	bush honeysuckle		2	3	2	4	11	L4
<i>Dryopteris intermedia</i>	evergreen wood fern		2	4	4	3	13	L4
<i>Dryopteris marginalis</i>	marginal wood fern		2	3	3	4	12	L4
<i>Eleocharis obtusa</i>	blunt spike-rush		3	2	5	2	12	L4
<i>Elodea canadensis</i>	common water-weed		2	3	5	3	13	L4
<i>Epifagus virginiana</i>	beech-drops		2	3	5	2	12	L4

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<i>Epilobium coloratum</i>	purple-leaved willow-herb		2	3	4	2	11	L4
<i>Equisetum variegatum</i> ssp. <i>variegatum</i>	variegated scouring-rush		2	2	5	4	13	L4
<i>Eupatorium perfoliatum</i>	boneset		1	3	4	3	11	L4
<i>Fagus grandifolia</i>	American beech		1	4	3	4	12	L4
<i>Festuca subverticillata</i>	nodding fescue		3	2	4	3	12	L4
<i>Fraxinus nigra</i>	black ash		2	4	4	3	13	L4
<i>Galium aparine</i> **	cleavers		3	3	4	2	12	L4
<i>Galium asprellum</i>	rough bedstraw		3	2	4	2	11	L4
<i>Glyceria grandis</i>	tall manna grass		2	3	4	2	11	L4
<i>Juncus effusus</i> ssp. <i>solutus</i>	soft rush		2	4	4	3	13	L4
<i>Lactuca canadensis</i>	wild lettuce		3	3	2	3	11	L4
<i>Lycopus americanus</i>	cut-leaved water-horehound		2	4	3	3	12	L4
<i>Lycopus uniflorus</i>	northern water-horehound		2	3	3	3	11	L4
<i>Maianthemum canadense</i>	Canada May-flower		1	4	1	5	11	L4
<i>Monarda fistulosa</i>	wild bergamot		3	3	2	3	11	L4
<i>Osmorhiza claytonii</i>	woolly sweet cicely		2	3	4	3	12	L4
<i>Panicum acuminatum</i> var. <i>acuminatum</i>	hairy panic grass		2	3	3	3	11	L4
<i>Penthorum sedoides</i>	ditch stonecrop		3	2	4	3	12	L4
<i>Pinus strobus</i>	white pine		1	4	3	4	12	L4
<i>Polygonatum pubescens</i>	downy Solomon's seal		2	4	2	5	13	L4
<i>Polygonum amphibium</i>	water smartweed		2	3	4	4	13	L4
<i>Populus grandidentata</i>	large-toothed aspen		2	3	4	3	12	L4
<i>Pteridium aquilinum</i> var. <i>latiusculum</i>	eastern bracken		2	4	2	4	12	L4
<i>Quercus rubra</i>	red oak		1	4	2	4	11	L4
<i>Rubus pubescens</i>	dwarf raspberry		2	3	3	5	13	L4
<i>Rudbeckia hirta</i>	black-eyed Susan		1	4	4	3	12	L4
<i>Sagittaria latifolia</i>	common arrowhead		1	2	5	4	12	L4
<i>Salix amygdaloides</i> **	peach-leaved willow		2	2	5	3	12	L4
<i>Salix bebbiana</i>	Bebb's willow		2	3	3	4	12	L4
<i>Salix discolor</i>	pussy willow		2	3	4	3	12	L4
<i>Salix petiolaris</i>	slender willow		2	3	5	3	13	L4
<i>Schizachne purpurascens</i> ssp. <i>purpurascens</i>	purple melic grass		2	3	3	5	13	L4

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<i>Scirpus microcarpus</i>	barber-pole bulrush		2	2	4	3	11	L4
<i>Scirpus validus</i> **	soft-stemmed bulrush		2	2	5	3	12	L4
<i>Sium suave</i>	water-parsnip		3	2	4	4	13	L4
<i>Smilax hispida</i>	bristly greenbrier		3	3	3	3	12	L4
<i>Solidago rugosa</i> ssp. <i>rugosa</i>	rough-stemmed goldenrod		3	3	2	3	11	L4
<i>Spiraea alba</i>	wild spiraea		2	4	4	3	13	L4
<i>Thelypteris palustris</i> var. <i>pubescens</i>	marsh fern		2	4	2	4	12	L4
<i>Thuja occidentalis</i>	white cedar		1	4	1	5	11	L4
<i>Tiarella cordifolia</i>	foam-flower		1	3	3	4	11	L4
<i>Trillium erectum</i>	red trillium		1	4	3	5	13	L4
<i>Trillium grandiflorum</i>	white trillium		1	3	4	5	13	L4
<i>Tsuga canadensis</i>	eastern hemlock		1	4	3	5	13	L4
<i>Typha latifolia</i>	broad-leaved cattail		1	4	4	4	13	L4
<i>Veronica americana</i>	American speedwell		2	3	4	4	13	L4
<i>Waldsteinia fragarioides</i>	barren strawberry		2	4	4	3	13	L4
<i>Acer saccharum</i> ssp. <i>saccharum</i>	sugar maple		1	3	0	2	6	L5
<i>Achillea millefolium</i> ssp. <i>lanulosum</i>	woolly yarrow		2	2	0	1	5	L5
<i>Actaea rubra</i>	red baneberry		2	3	1	3	9	L5
<i>Agrimonia gryposepala</i>	agrimony		2	2	0	2	6	L5
<i>Alisma plantago-aquatica</i>	water-plantain		2	2	4	2	10	L5
<i>Ambrosia artemisiifolia</i>	common ragweed		2	1	3	0	6	L5
<i>Amphicarpaea bracteata</i>	hog-peanut		2	2	2	2	8	L5
<i>Anemone canadensis</i>	Canada anemone		2	2	2	2	8	L5
<i>Anemone virginiana</i> **	common thimbleweed		2	3	0	3	8	L5
<i>Apocynum cannabinum</i>	hemp dogbane		2	2	2	2	8	L5
<i>Aralia nudicaulis</i>	wild sarsaparilla		2	3	1	4	10	L5
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit		1	3	2	3	9	L5
<i>Asclepias syriaca</i>	common milkweed		2	2	0	2	6	L5
<i>Aster cordifolius</i>	heart-leaved aster		2	1	0	2	5	L5
<i>Aster lanceolatus</i> ssp. <i>lanceolatus</i>	panicled aster		1	2	3	1	7	L5
<i>Aster lateriflorus</i> var. <i>lateriflorus</i>	calico aster		2	2	3	2	9	L5
<i>Aster novae-angliae</i>	New England aster		1	2	2	1	6	L5

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<i>Aster puniceus</i> var. <i>puniceus</i>	swamp aster		2	2	2	2	8	L5
<i>Athyrium filix-femina</i> var. <i>angustum</i>	northeastern lady fern		2	3	1	3	9	L5
<i>Bidens cernuus</i>	nodding bur-marigold		2	2	3	3	10	L5
<i>Bidens frondosus</i>	common beggar's-ticks		2	1	4	0	7	L5
<i>Carex bebbii</i>	Bebb's sedge		2	2	3	3	10	L5
<i>Carex blanda</i>	common wood sedge		2	2	1	2	7	L5
<i>Carex cristatella</i>	crested sedge		2	2	4	1	9	L5
<i>Carex granularis</i>	meadow sedge		2	2	1	3	8	L5
<i>Carex radiata</i>	straight-styled sedge		2	2	2	2	8	L5
<i>Carex rosea</i>	curly-styled sedge		2	2	3	2	9	L5
<i>Carex stipata</i>	awl-fruited sedge		2	3	2	3	10	L5
<i>Carex vulpinoidea</i>	fox sedge		2	2	4	1	9	L5
<i>Cicuta maculata</i>	spotted water-hemlock		2	2	2	2	8	L5
<i>Circaea lutetiana</i> ssp. <i>canadensis</i>	enchanter's nightshade		2	1	1	1	5	L5
<i>Clematis virginiana</i>	virgin's bower		2	2	2	3	9	L5
<i>Clinopodium vulgare</i> **	wild basil		3	3	1	3	10	L5
<i>Conyza canadensis</i>	horse-weed		3	1	2	0	6	L5
<i>Cornus alternifolia</i>	alternate-leaved dogwood		2	2	1	2	7	L5
<i>Cornus stolonifera</i>	red osier dogwood		1	2	0	3	6	L5
<i>Crataegus punctata</i>	dotted hawthorn		2	2	3	3	10	L5
<i>Cryptotaenia canadensis</i>	honestwort		2	2	4	1	9	L5
<i>Desmodium canadense</i>	showy tick-trefoil		2	2	3	3	10	L5
<i>Dryopteris carthusiana</i>	spinulose wood fern		2	3	2	2	9	L5
<i>Echinocystis lobata</i>	wild cucumber		2	2	3	1	8	L5
<i>Eleocharis erythropoda</i>	creeping spike-rush		2	2	4	1	9	L5
<i>Elymus virginicus</i> var. <i>virginicus</i>	Virginia wild rye		2	2	3	2	9	L5
<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	sticky willow-herb		2	2	2	2	8	L5
<i>Equisetum arvense</i>	field horsetail		1	2	1	1	5	L5
<i>Equisetum hyemale</i> ssp. <i>affine</i>	scouring-rush		2	2	2	2	8	L5
<i>Erigeron annuus</i>	daisy fleabane		2	2	0	1	5	L5
<i>Erigeron philadelphicus</i> ssp. <i>philadelphicus</i>	Philadelphia fleabane		2	2	0	1	5	L5
<i>Erigeron strigosus</i>	rough fleabane		3	2	1	1	7	L5

Appendix 2: List of Flora Species Found at Bloomington Wetland in 1996 and 2001

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Scientific Name	Common Name	Bog/Fen Indicator	Local Occur. 1-5	Popn. Trend 1-5	Hab. Dep. 0-5	Sens. Dev. 0-5	Total Score 2-20	Rank TRCA (03/2009)
<i>Erythronium americanum</i> ssp. <i>americanum</i>	yellow trout-lily		2	3	3	2	10	L5
<i>Eupatorium maculatum</i> ssp. <i>maculatum</i>	spotted Joe-Pye weed		2	2	3	3	10	L5
<i>Eupatorium rugosum</i>	white snakeroot		2	2	2	1	7	L5
<i>Euthamia graminifolia</i>	grass-leaved goldenrod		2	1	4	1	8	L5
<i>Fragaria vesca</i> ssp. <i>americana</i>	woodland strawberry		3	2	2	2	9	L5
<i>Fragaria virginiana</i>	wild strawberry		2	2	0	2	6	L5
<i>Fraxinus americana</i>	white ash		1	2	0	3	6	L5
<i>Fraxinus pennsylvanica</i> **	red ash (sensu lato)		5	2	0	3	10	L5
<i>Fraxinus pennsylvanica</i> var. <i>pennsylvanica</i>	red ash		2	2	2	3	9	L5
<i>Fraxinus pennsylvanica</i> var. <i>subintegerrima</i>	green ash		2	2	2	3	9	L5
<i>Galium palustre</i>	marsh bedstraw		2	2	3	3	10	L5
<i>Galium triflorum</i>	sweet-scented bedstraw		2	2	2	2	8	L5
<i>Geum aleppicum</i>	yellow avens		2	3	3	2	10	L5
<i>Geum canadense</i>	white avens		2	2	1	2	7	L5
<i>Glyceria striata</i>	fowl manna grass		2	2	1	2	7	L5
<i>Hackelia virginiana</i>	Virginia stickseed		2	2	0	2	6	L5
<i>Hydrophyllum virginianum</i>	Virginia waterleaf		2	2	1	2	7	L5
<i>Impatiens capensis</i>	orange touch-me-not		1	2	0	2	5	L5
<i>Juncus articulatus</i>	jointed rush		2	2	4	2	10	L5
<i>Juncus dudleyi</i>	Dudley's rush		2	2	3	1	8	L5
<i>Juncus tenuis</i>	path rush		2	2	1	1	6	L5
<i>Laportea canadensis</i>	wood nettle		2	3	2	2	9	L5
<i>Leersia oryzoides</i>	rice cut grass		2	2	3	2	9	L5
<i>Lemna minor</i>	common duckweed		2	2	4	2	10	L5
<i>Lysimachia ciliata</i>	fringed loosestrife		2	2	2	2	8	L5
<i>Maianthemum racemosum</i> ssp. <i>racemosum</i>	false Solomon's seal		2	3	2	3	10	L5
<i>Maianthemum stellatum</i>	starry false Solomon's seal		2	2	1	3	8	L5
<i>Matteuccia struthiopteris</i> var. <i>pennsylvanica</i>	ostrich fern		1	2	2	2	7	L5
<i>Mentha arvensis</i> ssp. <i>borealis</i>	wild mint		2	2	3	2	9	L5
<i>Muhlenbergia mexicana</i> var. <i>mexicana</i>	common muhly grass		3	2	0	1	6	L5
<i>Oenothera biennis</i>	common evening-primrose		2	1	1	1	5	L5
<i>Onoclea sensibilis</i>	sensitive fern		2	3	1	3	9	L5

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<i>Ostrya virginiana</i>	ironwood		2	3	2	2	9	L5
<i>Oxalis stricta</i>	common yellow wood-sorrel		3	1	1	1	6	L5
<i>Panicum capillare</i>	panic grass		3	1	4	1	9	L5
<i>Parthenocissus inserta</i>	thicket creeper		1	2	0	1	4	L5
<i>Phryma leptostachya</i>	lopseed		2	2	3	2	9	L5
<i>Pilea pumila</i>	dwarf clearweed		2	2	1	1	6	L5
<i>Plantago rugelii</i>	red-stemmed plantain		2	2	0	1	5	L5
<i>Poa palustris</i>	fowl meadow-grass		2	2	3	2	9	L5
<i>Podophyllum peltatum</i>	May-apple		1	3	3	3	10	L5
<i>Polygonum lapathifolium</i> var. <i>lapathifolium</i>	pale smartweed		2	1	4	0	7	L5
<i>Populus balsamifera</i> ssp. <i>balsamifera</i>	balsam poplar		1	2	3	2	8	L5
<i>Populus deltoides</i>	cottonwood		2	1	4	1	8	L5
<i>Populus tremuloides</i>	trembling aspen		1	3	1	3	8	L5
<i>Prenanthes altissima</i>	tall wood lettuce		2	3	2	2	9	L5
<i>Prunus serotina</i>	black cherry		2	2	0	2	6	L5
<i>Prunus virginiana</i> ssp. <i>virginiana</i>	choke cherry		1	2	0	1	4	L5
<i>Ranunculus abortivus</i>	kidney-leaved buttercup		2	3	1	2	8	L5
<i>Ranunculus recurvatus</i> var. <i>recurvatus</i>	hooked buttercup		2	3	2	3	10	L5
<i>Ranunculus sceleratus</i>	cursed crowfoot		2	2	3	2	9	L5
<i>Rhus radicans</i> ssp. <i>rydbergii</i>	poison ivy (shrub form)		2	2	0	2	6	L5
<i>Rhus typhina</i>	staghorn sumach		2	1	2	2	7	L5
<i>Ribes americanum</i>	wild black currant		2	3	2	2	9	L5
<i>Ribes cynosbati</i>	prickly gooseberry		2	3	2	2	9	L5
<i>Rubus allegheniensis</i>	common blackberry		2	3	0	1	6	L5
<i>Rubus idaeus</i> ssp. <i>melanolasius</i>	wild red raspberry		1	1	0	1	3	L5
<i>Rubus occidentalis</i>	wild black raspberry		2	1	0	1	4	L5
<i>Rubus odoratus</i>	purple-flowering raspberry		2	2	2	2	8	L5
<i>Salix eriocephala</i>	narrow heart-leaved willow		2	1	3	1	7	L5
<i>Salix exigua</i>	sandbar willow		2	1	5	2	10	L5
<i>Sambucus canadensis</i>	common elderberry		2	3	2	2	9	L5
<i>Sambucus racemosa</i> ssp. <i>pubens</i>	red-berried elder		2	3	2	2	9	L5
<i>Sanguinaria canadensis</i>	bloodroot		2	3	0	3	8	L5

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<i>Scirpus atrovirens</i>	black-fruited bulrush		2	2	4	2	10	L5
<i>Scutellaria galericulata</i>	common skullcap		3	2	3	2	10	L5
<i>Scutellaria lateriflora</i>	mad-dog skullcap		2	2	3	3	10	L5
<i>Smilax herbacea</i>	carrion-flower		3	3	2	2	10	L5
<i>Solidago altissima</i>	tall goldenrod		1	2	0	0	3	L5
<i>Solidago caesia</i>	blue-stemmed goldenrod		2	2	4	2	10	L5
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada goldenrod		2	2	0	1	5	L5
<i>Solidago flexicaulis</i>	zig-zag goldenrod		2	1	3	2	8	L5
<i>Solidago gigantea</i> **	late goldenrod		2	1	1	1	5	L5
<i>Thalictrum dioicum</i>	early meadow rue		2	3	3	2	10	L5
<i>Tilia americana</i>	basswood		1	4	2	3	10	L5
<i>Ulmus americana</i>	white elm		1	4	0	2	7	L5
<i>Urtica dioica</i> ssp. <i>gracilis</i>	American stinging nettle		2	3	2	2	9	L5
<i>Verbena hastata</i>	blue vervain		2	2	4	2	10	L5
<i>Verbena urticifolia</i>	white vervain		2	2	2	2	8	L5
<i>Viburnum lentago</i>	nannyberry		2	3	1	2	8	L5
<i>Viola conspersa</i>	dog violet		2	2	0	2	6	L5
<i>Viola pubescens</i>	stemmed yellow violet		2	3	1	2	8	L5
<i>Viola sororia</i>	common blue violet		2	2	0	2	6	L5
<i>Vitis riparia</i>	riverbank grape		1	1	0	0	2	L5
<i>Xanthium strumarium</i>	clotbur		3	1	4	0	8	L5
<i>Actaea x ludovici</i> **	hybrid baneberry		5	0	5	0	10	LH
<i>Rumex verticillatus</i>	swamp dock		4	2	4	4	14	LU
<i>Acer platanoides</i>	Norway maple		3				3	L+
<i>Achillea millefolium</i> ssp. <i>millefolium</i>	European yarrow		4				4	L+
<i>Aesculus hippocastanum</i>	horse-chestnut		4				4	L+
<i>Agrostis gigantea</i>	redtop		3				3	L+
<i>Alliaria petiolata</i>	garlic mustard		2				2	L+
<i>Alopecurus pratensis</i>	meadow foxtail		5				5	L+
<i>Amaranthus retroflexus</i>	red-root pigweed		4				4	L+
<i>Arctium lappa</i> **	great burdock		3				3	L+
<i>Arctium minus</i> ssp. <i>minus</i>	common burdock		3				3	L+

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<i>Asparagus officinalis</i>	asparagus		4				4	L+
<i>Barbarea vulgaris</i>	winter cress		3				3	L+
<i>Berberis thunbergii</i>	Japanese barberry		4				4	L+
<i>Bromus inermis</i> ssp. <i>inermis</i>	smooth brome grass		3				3	L+
<i>Butomus umbellatus</i>	flowering-rush		5				5	L+
<i>Capsella bursa-pastoris</i>	shepherd's purse		4				4	L+
<i>Carex spicata</i>	spiked sedge		3				3	L+
<i>Chaenorrhinum minus</i> **	dwarf snapdragon		5				5	L+
<i>Chelidonium majus</i>	celandine		3				3	L+
<i>Chenopodium album</i> var. <i>album</i>	lamb's quarters		3				3	L+
<i>Chrysanthemum leucanthemum</i>	ox-eye daisy		3				3	L+
<i>Cichorium intybus</i>	chicory		3				3	L+
<i>Cirsium arvense</i>	creeping thistle		2				2	L+
<i>Cirsium vulgare</i>	bull thistle		3				3	L+
<i>Convallaria majalis</i>	lily-of-the-valley		3				3	L+
<i>Convolvulus arvensis</i>	field bindweed		4				4	L+
<i>Coronilla varia</i>	crown vetch		4				4	L+
<i>Crataegus monogyna</i>	English hawthorn		3	1	4	0	8	L+
<i>Cynanchum rossicum</i>	dog-strangling vine		3				3	L+
<i>Cynoglossum officinale</i>	hound's tongue		4				4	L+
<i>Dactylis glomerata</i>	orchard grass		3				3	L+
<i>Daucus carota</i>	Queen Anne's lace		3				3	L+
<i>Echinochloa crusgalli</i>	barnyard grass		4				4	L+
<i>Echium vulgare</i>	viper's bugloss		4				4	L+
<i>Elaeagnus umbellata</i>	autumn olive		4				4	L+
<i>Elymus repens</i> **	quack grass		3				3	L+
<i>Epilobium hirsutum</i>	European willow-herb		4				4	L+
<i>Epipactis helleborine</i>	helleborine		3				3	L+
<i>Erysimum cheiranthoides</i>	wormseed mustard		4				4	L+
<i>Euphorbia cyparissias</i>	cypress spurge		5				5	L+
<i>Euphorbia esula</i>	leafy spurge		5				5	L+
<i>Festuca arundinacea</i>	tall fescue		5				5	L+

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<i>Festuca pratensis</i>	meadow fescue		3				3	L+
<i>Galeopsis tetrahit</i>	hemp-nettle		4				4	L+
<i>Galium verum</i>	yellow bedstraw		4				4	L+
<i>Geum urbanum</i>	urban avens		3				3	L+
<i>Glechoma hederacea</i>	creeping Charlie		3				3	L+
<i>Hemerocallis fulva</i>	orange day-lily		4				4	L+
<i>Hieracium aurantiacum</i>	orange hawkweed		4				4	L+
<i>Hieracium caespitosum</i> ssp. <i>caespitosum</i>	yellow hawkweed		3				3	L+
<i>Hordeum jubatum</i> ssp. <i>jubatum</i>	squirrel-tail barley		4				4	L+
<i>Hypericum perforatum</i>	common St. Johnswort		3				3	L+
<i>Ipomoea hederacea</i>	ivy-leaved morning-glory		5				5	L+
<i>Kochia scoparia</i>	summer-cypress		5				5	L+
<i>Lactuca serriola</i>	prickly lettuce		3				3	L+
<i>Larix decidua</i>	European larch		4				4	L+
<i>Lathyrus latifolius</i>	everlasting pea		4				4	L+
<i>Leonurus cardiaca</i> ssp. <i>cardiaca</i> **	motherwort		3				3	L+
<i>Lepidium campestre</i> **	field pepper-grass		4				4	L+
<i>Linaria vulgaris</i>	butter-and-eggs		3				3	L+
<i>Lithospermum officinale</i>	Eurasian gromwell		4				4	L+
<i>Lonicera tatarica</i>	Tartarian honeysuckle		4				4	L+
<i>Lonicera x bella</i>	shrub honeysuckle		3				3	L+
<i>Lotus corniculatus</i>	bird's foot trefoil		3				3	L+
<i>Lythrum salicaria</i>	purple loosestrife		3				3	L+
<i>Malus pumila</i>	apple		2				2	L+
<i>Matricaria matricarioides</i>	pineappleweed		5				5	L+
<i>Medicago lupulina</i>	black medick		3				3	L+
<i>Medicago sativa</i> ssp. <i>sativa</i>	alfalfa		3				3	L+
<i>Melilotus alba</i>	white sweet clover		3				3	L+
<i>Melilotus officinalis</i>	yellow sweet clover		3				3	L+
<i>Myosotis scorpioides</i>	true forget-me-not		3				3	L+
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil		5				5	L+
<i>Nasturtium microphyllum</i>	small-leaved watercress		4				4	L+

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<i>Nepeta cataria</i>	catnip		3				3	L+
<i>Pastinaca sativa</i>	wild parsnip		4				4	L+
<i>Phleum pratense</i>	Timothy grass		3				3	L+
<i>Picea abies</i>	Norway spruce		5				5	L+
<i>Pinus sylvestris</i>	Scots pine		3				3	L+
<i>Plantago lanceolata</i>	English plantain		4				4	L+
<i>Poa compressa</i>	flat-stemmed blue grass		3				3	L+
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky blue grass		3				3	L+
<i>Polygonum aviculare</i>	prostrate knotweed		4				4	L+
<i>Polygonum convolvulus</i>	black bindweed		4				4	L+
<i>Polygonum persicaria</i>	lady's thumb		3				3	L+
<i>Potentilla recta</i> **	sulphur cinquefoil		3				3	L+
<i>Ranunculus acris</i>	tall buttercup		3				3	L+
<i>Rhamnus cathartica</i>	common buckthorn		2				2	L+
<i>Ribes rubrum</i>	garden red currant		3				3	L+
<i>Robinia pseudoacacia</i>	black locust		3				3	L+
<i>Rorippa sylvestris</i> **	creeping yellow cress		5				5	L+
<i>Rosa multiflora</i>	multiflora rose		3				3	L+
<i>Rumex crispus</i>	curly dock		3				3	L+
<i>Salix x rubens</i>	European tree willow		3				3	L+
<i>Setaria glauca</i>	yellow foxtail		5				5	L+
<i>Silene vulgaris</i>	bladder campion		4				4	L+
<i>Sinapis arvensis</i>	charlock		4				4	L+
<i>Solanum dulcamara</i>	bittersweet nightshade		3				3	L+
<i>Sorbus aucuparia</i>	European mountain-ash		3				3	L+
<i>Syringa vulgaris</i>	common lilac		3				3	L+
<i>Taraxacum officinale</i>	dandelion		3				3	L+
<i>Thlaspi arvense</i>	penny-cress		3				3	L+
<i>Tragopogon dubius</i> **	lemon-yellow goat's beard		3				3	L+
<i>Tragopogon pratensis</i> ssp. <i>pratensis</i>	meadow goat's beard		3				3	L+
<i>Trifolium pratense</i>	red clover		3				3	L+
<i>Trifolium repens</i>	white clover		3				3	L+

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<i>Tussilago farfara</i>	coltsfoot		2				2	L+
<i>Typha angustifolia</i>	narrow-leaved cattail		3				3	L+
<i>Typha x glauca</i>	hybrid cattail		3				3	L+
<i>Verbascum thapsus</i>	common mullein		3				3	L+
<i>Veronica anagallis-aquatica</i>	water speedwell		5				5	L+
<i>Veronica officinalis</i>	common speedwell		3				3	L+
<i>Viburnum opulus</i>	European highbush cranberry		3				3	L+
<i>Vicia cracca</i>	cow vetch		3				3	L+
<i>Vinca minor</i>	periwinkle		4				4	L+
<i>Acer negundo</i>	Manitoba maple		2	0	0	2	4	L+?
<i>Agrostis stolonifera</i>	creeping bent grass		3				3	L+?
<i>Geranium robertianum</i>	herb Robert		3				3	L+?
<i>Lepidium densiflorum</i>	common pepper-grass		5				5	L+?
<i>Phalaris arundinacea</i>	reed canary grass		3				3	L+?
<i>Phragmites australis</i>	common reed		3				3	L+?
<i>Potentilla norvegica</i>	rough cinquefoil		4				4	L+?
<i>Prunella vulgaris</i>	heal-all		4				4	L+?
<i>Pinus resinosa</i>	red pine		2	5	5	5	17	pL2

Appendix 3: TRCA Fauna List for Bloomington Wetlands Study Area, 2002 to 2011 (also showing archival records)

Common Name	Code	Scientific Name	count	LO	PTn	PTt	AS	PIS	HD	StD	+	TS	L-Rank
Survey Species: species for which the TRCA protocol effectively surveys.													
Birds													
American woodcock	AMWO	<i>Scolopax minor</i>	1	0	2	3	3	2	2	4	0	16	L3
black-billed cuckoo	BBCU	<i>Coccyzus erythrophthalmus</i>	1996	0	3	2	3	1	3	3	0	15	L3
bobolink	BOBO	<i>Dolichonyx oryzivorus</i>	2001	0	3	3	3	1	1	5	1	17	L3
brown thrasher	BRTH	<i>Toxostoma rufum</i>	2	0	3	3	2	2	1	4	0	15	L3
mourning warbler	MOWA	<i>Geothlypis philadelphia</i>	1996	0	3	2	2	2	2	4	0	15	L3
northern waterthrush	NOWA	<i>Parkesia noveboracensis</i>	3	1	2	2	3	1	4	5	1	19	L3
ovenbird	OVEN	<i>Seiurus aurocapillus</i>	1996	0	2	3	4	2	4	4	0	19	L3
pie-billed grebe	PBGR	<i>Podilymbus podiceps</i>	1987/88	3	2	2	2	1	4	4	0	18	L3
pileated woodpecker	PIWO	<i>Dryocopus pileatus</i>	2	0	2	2	4	1	3	3	0	15	L3
scarlet tanager	SCTA	<i>Piranga olivacea</i>	1	0	2	2	4	1	3	4	0	16	L3
sharp-shinned hawk	SSHA	<i>Accipiter striatus</i>	1996	1	2	2	4	1	3	3	0	16	L3
sora	SORA	<i>Porzana carolina</i>	1	1	2	2	2	3	3	4	0	17	L3
veery	VEER	<i>Catharus fuscescens</i>	1996	1	3	2	3	1	2	5	1	18	L3
vesper sparrow	VESP	<i>Pooecetes gramineus</i>	1	1	3	2	2	2	1	5	1	17	L3
Virginia Rail	VIRA	<i>Rallus limicola</i>	2	0	2	2	2	3	3	4	0	16	L3
wild turkey	WITU	<i>Meleagris gallopavo</i>	1	1	1	0	4	3	4	3	0	16	L3
wood thrush	WOTH	<i>Hylocichla mustelina</i>	3	0	3	2	3	2	2	4	0	16	L3
yellow-bellied sapsucker	YBSA	<i>Sphyrapicus varius</i>	1996	3	2	2	2	1	3	3	0	16	L3
yellow-billed cuckoo	YBCU	<i>Coccyzus americanus</i>	1	1	3	2	3	1	3	3	0	16	L3
alder flycatcher	ALFL	<i>Empidonax alnorum</i>		1	2	2	1	1	2	4	0	13	L4
American redstart	AMRE	<i>Setophaga ruticilla</i>	6	0	2	2	3	1	2	4	0	14	L4
barn swallow	BARS	<i>Hirundo rustica</i>		0	2	3	1	1	2	1	0	10	L4
belted kingfisher	BEKI	<i>Ceryle alcyon</i>		0	3	2	2	1	2	2	0	12	L4
common yellowthroat	COYE	<i>Geothlypis trichas</i>		0	2	2	1	2	1	4	0	12	L4
eastern kingbird	EAKI	<i>Tyrannus tyrannus</i>		0	4	2	2	1	1	3	0	13	L4
eastern meadowlark	EAME	<i>Sturnella magna</i>	1	0	3	2	3	1	1	3	0	13	L4
eastern wood-pewee	EAWP	<i>Contopus virens</i>		0	4	2	2	1	1	3	0	13	L4
field sparrow	FISP	<i>Spizella pusilla</i>		0	3	2	2	1	1	4	0	13	L4
great-crested flycatcher	GCFL	<i>Myiarchus crinitus</i>		0	2	2	3	1	2	2	0	12	L4
great-horned owl	GHOW	<i>Bubo virginianus</i>		0	2	2	2	2	1	2	0	11	L4
green heron	GRHE	<i>Butorides virescens</i>	1	0	3	2	2	1	2	4	0	14	L4
grey catbird	GRCA	<i>Dumetella carolinensis</i>		0	2	2	1	1	1	3	0	10	L4
hairy woodpecker	HAWO	<i>Picoides villosus</i>		0	2	2	3	1	2	2	0	12	L4

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Common Name	Code	Scientific Name	count	LO	PTn	PTt	AS	PIS	HD	StD	+	TS	L-Rank
horned lark	HOLA	<i>Eremophila alpestris</i>		1	3	2	2	1	2	3	0	14	L4
indigo bunting	INBU	<i>Passerina cyanea</i>		0	2	2	1	1	2	4	0	12	L4
least flycatcher	LEFL	<i>Empidonax minimus</i>	1996	0	4	2	2	1	1	3	0	13	L4
northern flicker	NOFL	<i>Colaptes auratus</i>		0	3	2	1	1	2	3	0	12	L4
red-breasted nuthatch	RBNU	<i>Sitta canadensis</i>		0	1	2	3	1	1	2	0	10	L4
red-eyed vireo	REVI	<i>Vireo olivaceus</i>		0	2	2	2	1	1	3	0	11	L4
rose-breasted grosbeak	RBGR	<i>Pheucticus ludovicianus</i>		0	2	2	3	1	2	3	0	13	L4
ruby-throated hummingbird	RTHU	<i>Archilochus colubris</i>	1996	0	2	2	1	1	2	2	0	10	L4
savannah sparrow	SAVS	<i>Passerculus sandwichensis</i>		0	3	2	1	1	1	4	0	12	L4
swamp sparrow	SWSP	<i>Melospiza georgiana</i>		0	1	2	1	2	1	5	1	13	L4
tree swallow	TRES	<i>Tachycineta bicolor</i>		0	2	2	1	1	2	2	0	10	L4
wood duck	WODU	<i>Aix sponsa</i>	3	0	2	1	3	2	2	4	0	14	L4
American Crow	AMCR	<i>Corvus brachyrhynchos</i>		0	1	2	1	1	0	0	0	5	L5
American goldfinch	AMGO	<i>Carduelis tristis</i>		0	2	2	1	1	0	1	0	7	L5
American robin	AMRO	<i>Turdus migratorius</i>		0	1	2	1	1	0	1	0	6	L5
Baltimore oriole	BAOR	<i>Icterus galbula</i>		0	2	2	1	1	0	1	0	7	L5
black-capped chickadee	BCCH	<i>Parus atricapillus</i>		0	1	2	1	1	0	1	0	6	L5
blue jay	BLJA	<i>Cyanocitta cristata</i>		0	4	2	1	1	0	1	0	9	L5
brown-headed cowbird	BHCO	<i>Molothrus ater</i>		0	2	2	1	1	0	1	0	7	L5
Canada goose	CANG	<i>Branta canadensis</i>		0	1	1	1	2	1	0	0	6	L5
cedar waxwing	CEDW	<i>Bombycilla cedrorum</i>		0	1	2	1	1	0	1	0	6	L5
common grackle	COGR	<i>Quiscalus quiscula</i>		0	3	2	1	1	0	1	0	8	L5
downy woodpecker	DOWO	<i>Picoides pubescens</i>		0	3	2	1	1	1	1	0	9	L5
mallard	MALL	<i>Anas platyrhynchos</i>		0	2	2	1	2	0	1	0	8	L5
mourning dove	MODO	<i>Zenaidura macroura</i>		0	2	2	1	1	0	0	0	6	L5
northern cardinal	NOCA	<i>Cardinalis cardinalis</i>		0	2	2	1	1	1	2	0	9	L5
red-tailed hawk	RTHA	<i>Buteo jamaicensis</i>		0	2	2	2	1	1	1	0	9	L5
red-winged blackbird	RWBL	<i>Agelaius phoeniceus</i>		0	2	2	1	1	0	2	0	8	L5
song sparrow	SOSP	<i>Melospiza melodia</i>		0	2	2	1	2	0	2	0	9	L5
warbling vireo	WAVI	<i>Vireo gilvus</i>		0	1	2	1	1	1	2	0	8	L5
yellow warbler	YWAR	<i>Setophaga petechia</i>		0	1	2	1	1	1	3	0	9	L5
European starling	EUST	<i>Sturnus vulgaris</i>											L+
Herpetofauna													
bullfrog	BUFR	<i>Lithobates catesbeiana</i>	2001	3	3	2	2	4	2	5	1	22	L2

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Common Name	Code	Scientific Name	count	LO	PTn	PTt	AS	PIS	HD	StD	+	TS	L-Rank
grey treefrog	TGTF	<i>Hyla versicolor</i>	2001	0	3	3	3	4	2	5	1	21	L2
northern spring peeper	SPPE	<i>Pseudacris crucifer crucifer</i>		0	2	3	3	4	3	5	1	21	L2
striped chorus frog	MICF	<i>Pseudacris triseriata</i>	1996	3	3	3	2	4	3	5	1	24	L2
wood frog	WOFR	<i>Lithobates sylvatica</i>		0	2	3	3	4	3	5	1	21	L2
northern leopard frog	LEFR	<i>Lithobates pipiens</i>	2001	0	3	2	1	4	2	5	1	18	L3
green frog	GRFR	<i>Lithobates clamitans</i>		0	2	2	1	3	1	4	0	13	L4
Incidental Species: species that are reported on as incidental to the TRCA protocol.													
Mammals													
hairy-tailed mole	HTMO	<i>Parascalops breweri</i>	1	4	2	2	1	4	1	4	0	18	L3
eastern chipmunk	EACH	<i>Tamias striatus</i>		0	2	2	2	3	1	3	0	13	L4
muskrat	MUSK	<i>Ondatra zibethicus</i>		0	2	2	1	3	1	3	0	12	L4
white-tailed deer	WTDE	<i>Odocoileus virginianus</i>		0	2	1	3	2	2	1	0	11	L4
grey squirrel	GRSQ	<i>Sciurus carolinensis</i>		0	2	2	1	3	0	0	0	8	L5
raccoon	RACC	<i>Procyon lotor</i>		0	2	2	1	3	1	0	0	9	L5
Herpetofauna													
common snapping turtle	SNTU	<i>Chelydra serpentina serpentina</i>	1	1	3	3	1	5	2	5	2	22	L2
midland painted turtle	MPTU	<i>Chrysemys picta marginata</i>	1	0	2	2	1	5	1	4	1	16	L3
LEGEND													
LO = local occurrence				PIS = Patch Isolation Sensitivity				LX = extirpated					
PTn = continental population trend				STD = sensitivity to development				L+ = non-native/introduced					
PTt = population trend, TRCA				+ = additional points									
HD = habitat dependence				TS = total score									
AS = area sensitivity				L-rank = TRCA Rank, December, 2010									