

# Review of Provincially Significant Wetlands in the City of Toronto

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Report for:  
City of Toronto  
City Planning

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Photo Credit: Painted Turtles, Toronto Islands Coastal Wetland Complex: Sarah Mainguy



## EXECUTIVE SUMMARY

The purpose of this study was to review the boundaries of Provincially Significant Wetlands (PSWs) located within the City of Toronto and verify that the PSWs continue to meet the criteria for which they are designated.

Provincially significant wetlands are identified by the Ministry of Natural Resources (MNR) using evaluation procedures established by the Province. Under the Provincial Policy Statement (2005), development is not permitted in PSWs south and east of the Canadian Shield, and site alteration is not permitted on lands adjacent to significant wetlands unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Consistent with the PPS, the City of Toronto Official Plan prohibits development or site alteration within PSWs and only permits development on lands adjacent to PSWs if it can be demonstrated through a study that there will be “no negative impacts on the natural features or the ecological functions for which the area is identified”.

There are six PSWs located within the City of Toronto (Figure 1). From west to east, they are:

- Lower Humber River Wetland Complex
- Toronto Islands Coastal Wetland Complex
- East Don Valley Wetland Complex
- Highland Creek Wetland Complex
- Rouge River Marshes Wetland Complex
- Townline Swamp Wetland Complex

All six wetlands include more than one distinctive wetland unit and are therefore considered to be wetland complexes.

Since the early 1980s, it has been recognized that wetlands in Toronto, as in other parts of Ontario, support critical natural heritage features and functions. Other functions of wetlands directly benefit human beings, including provision of education and recreational opportunities. The Province of Ontario developed a system for evaluating relative importance of wetlands in southern and northern Ontario that has been in use since 1984. This system, the Ontario Wetland Evaluation System or OWES, provides a framework for determining which wetlands are provincially significant, based on measuring attributes that relate to their features and functions. Four broad categories are evaluated and scored by the OWES: biological, hydrological, social and special features. A cumulative score of at least 600 points, or scores in the Special Features or Biological categories of over 200 points, makes the wetland provincially significant.

For this study, existing information on PSWs was obtained from wetland files within the Ontario Ministry of Natural Resources' Aurora District office, and through conversations with MNR staff. At approximately the same time as this study was being carried out (between 2005 and late 2007), all wetlands within the City of Toronto were re-evaluated by MNR. Where possible, MNR incorporated recommendations and information gathered by this study into the updated wetland evaluation. Additional information was obtained from studies being carried out by the

City of Toronto on Areas of Natural and Scientific Interest (ANSIs) and existing and potential municipal ESAs were ANSIs and ESAs overlapped with PSWs. Some information was also derived from the MNR Natural Heritage Information Centre. Species information was also obtained from TRCA databases and files.

Field investigations of wetlands carried out for this study included boundary review, review of vegetation communities and other features to determine if habitat for reported significant species was present, review of condition, amphibian surveys, bird surveys, and documenting of ecological functions. MNR subsequently reviewed the first draft of this study. Recommendations for changes in the boundaries were reviewed by MNR, and a subsequent site visit was conducted to review the boundary with MNR and adjust boundaries if required.

This study found that all previously identified PSWs continued to qualify as PSWs, mainly due to the Special Features component, which in all cases was greater than 200 so each wetland was considered significant based on the Special Features component alone. None of the wetlands was significant based on the biological component. Most wetlands scored high in the social component, as almost all (except Townline Swamp) are used as recreational and educational areas by neighbouring schools and universities. Two non-coastal wetlands (East Don Valley and Townline Swamp) scored highly in the hydrological component, because of their contribution to water storage, water quality improvement and ground water recharge. The remaining four wetlands in Toronto (Lower Humber River, Toronto Islands, Highland Creek and Rouge River Marshes) are not important from a hydrological perspective because they do not provide functions of storing water or improving water quality due to their location on the much larger Lake Ontario.

The largest point contribution to the total wetland score was associated with the Special Features score in all wetlands, due to the presence of numerous regionally and locally significant plant and animal species, and in most cases due to the presence of provincially significant species as well. Species at Risk included Blanding's turtle (Threatened) and northern map turtle (Special Concern), in the Lower Humber River, Toronto Islands and Rouge River marshes. Snapping turtle, recently designated a species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada, was also noted in many wetlands. Black tern (Threatened) was often listed in wetland evaluations as a species that was noted in the 1980s, but had not been noted for over a decade. Most wetlands are located on major rivermouths in close proximity to Lake Ontario, and as such provide feeding areas for colonial bird species, waterfowl and rare migrants as they move through the urban environment. The wetlands provide important foraging areas for many of the significant species nesting at Tommy Thompson Park. They provide foraging and resting areas for hundreds of migrating bird species.

Conditions in PSWs were variable. Most PSWs had areas of high quality vegetation, but these were interspersed with areas of high disturbance and lower quality. All PSWs contained large numbers of non-native flora species. All PSWs were in close proximity to major trails, many of which are maintained by the City with clearly marked paths, boardwalks and imported surface materials. Many of the PSWs within river valleys could potentially be affected by activities related to residences at the top of the slope. Changes in wetlands over the past two decades may include minor changes to water levels.

In three of the wetlands (Lower Humber River, Toronto Islands Coastal and Townline Swamp wetland complexes) recommendations for boundary revisions were none or minimal, mainly involving refinement of the boundary to the updated 2003 aerial photo base. Minor revisions were made to two wetland complexes: Highland Creek Wetland Complex, and Rouge River Marshes Wetland Complex. For the East Don Valley wetland, the boundaries were revised as the polygons appeared to be “shifted”, that is, the polygons were similar to the shape of the wetland but offset slightly to the south. In addition, MNR identified nine additional wetlands which have now been added to the East Don Valley Wetland Complex (see Appendix 2) as re-mapping of this wetland by MNR was already ongoing when the present study commenced.

Field staff reviewing wetland boundaries in the field for this project frequently noted that all wetlands included polygons smaller than 2 ha. The OWES recommends individual wetlands smaller than 2 ha not be included in wetland complexes unless the rationale is clearly documented. The rationale for including these small wetlands was generally related to the fact that small wetlands assume a greater importance in this urban landscape where the remaining habitat is fragmented and degraded, and that many small wetlands support vegetation communities rare in the Ecodistrict or other important ecological functions.

The total area of all PSW complexes within the City of Toronto is 162.2 ha. The area of PSWs in the City of Toronto is approximately 0.25% of the landscape (Toronto has a total area of 64,156.4 ha). Four of the complexes include mainly lacustrine wetlands (Lower Humber River, Highland Creek, Toronto Islands Coastal and Rouge River Marshes), supported by the fluctuations in the water level of Lake Ontario. Two wetland complexes (East Don and Townline Swamp) encompass significant areas of palustrine wetlands, defined as “wetlands with no or intermittent inflow and either permanent or intermittent outflow” (OWES page 111). All wetlands are composed mainly of swamps and marshes, with no areas of bog or fen present in any of these complexes.

Wetlands are well accepted as fundamental in building effective natural heritage systems for the maintenance of ecological integrity at a landscape level. The designation of provincially significant wetlands is one of the cornerstones of provincial policies to protect Natural Heritage Systems in many areas of the province. The City of Toronto Official Plan protects provincially significant wetlands.



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## 1.0 INTRODUCTION

The purpose of this study was to review the boundaries of Provincially Significant Wetlands (PSWs) located within the City of Toronto and verify that the PSWs continue to meet the criteria for designation. Areas of Natural and Scientific Interest (ANSIs) in the City of Toronto which overlap some of the PSWs, as well as municipal Environmentally Significant Areas (ESAs), are also being similarly reviewed through separate studies.

In Ontario, wetlands are defined as “lands that are seasonally or permanently covered by shallow water as well as lands where the water table is close to or at the surface. In either case the presence of abundant water causes the formation of hydric soils and favours the dominance of either hydrophytic or water tolerant plants” (PPS 2005). Provincially significant wetlands are identified by the Ontario Ministry of Natural Resources (MNR) using evaluation procedures established by the Province. Provincially significant wetlands south and east of the Canadian Shield are protected from development by the Provincial Policy Statement (PPS 2005).

Municipal official plan policies play an important role in protecting provincially significant natural heritage such as wetlands from development-related impacts. There is emphasis in the PPS on municipal control and accountability for the land use planning process. The City of Toronto Official Plan policy 3.4.14 concerning protection of provincially significant natural heritage features is consistent with the PPS (see section 2.3 below). In order to support the implementation of Official Plan and PPS policies respecting protection of PSWs, the City of Toronto retained North-South Environmental Inc. and Dougan & Associates to verify the boundaries of PSWs located in the City of Toronto and confirm that these wetlands continue to meet the criteria for which they were originally identified.

There are six PSWs located within the City of Toronto (Figure 1). From west to east, they are:

- Lower Humber River Wetland Complex
- Toronto Islands Coastal Wetland Complex
- East Don Valley Wetland Complex
- Highland Creek Wetland Complex
- Rouge River Marshes Wetland Complex
- Townline Swamp Wetland Complex

All six wetlands include more than one distinctive wetland unit and are therefore considered to be wetland complexes. Wetland complexes are described in more detail in section 6 of Appendix 1.

For the current study, North-South Environmental Inc. (NSE) and Dougan & Associates (D&A) undertook the following tasks:

- Reviewed available information for each PSW from sources such as TRCA and MNR files and past reports, and assessed information gaps;
- developed a field work plan and carried out the field work to review, confirm and update information for each PSW;
- reviewed and described the MNR criteria for designating PSWs and commented on their rationale and defensibility;
- overlaid the current PSW boundaries over the most recent aerial photography for the City (2003) and determined whether boundary refinements might be needed; and
- prepared a report and updated GIS layer on the results

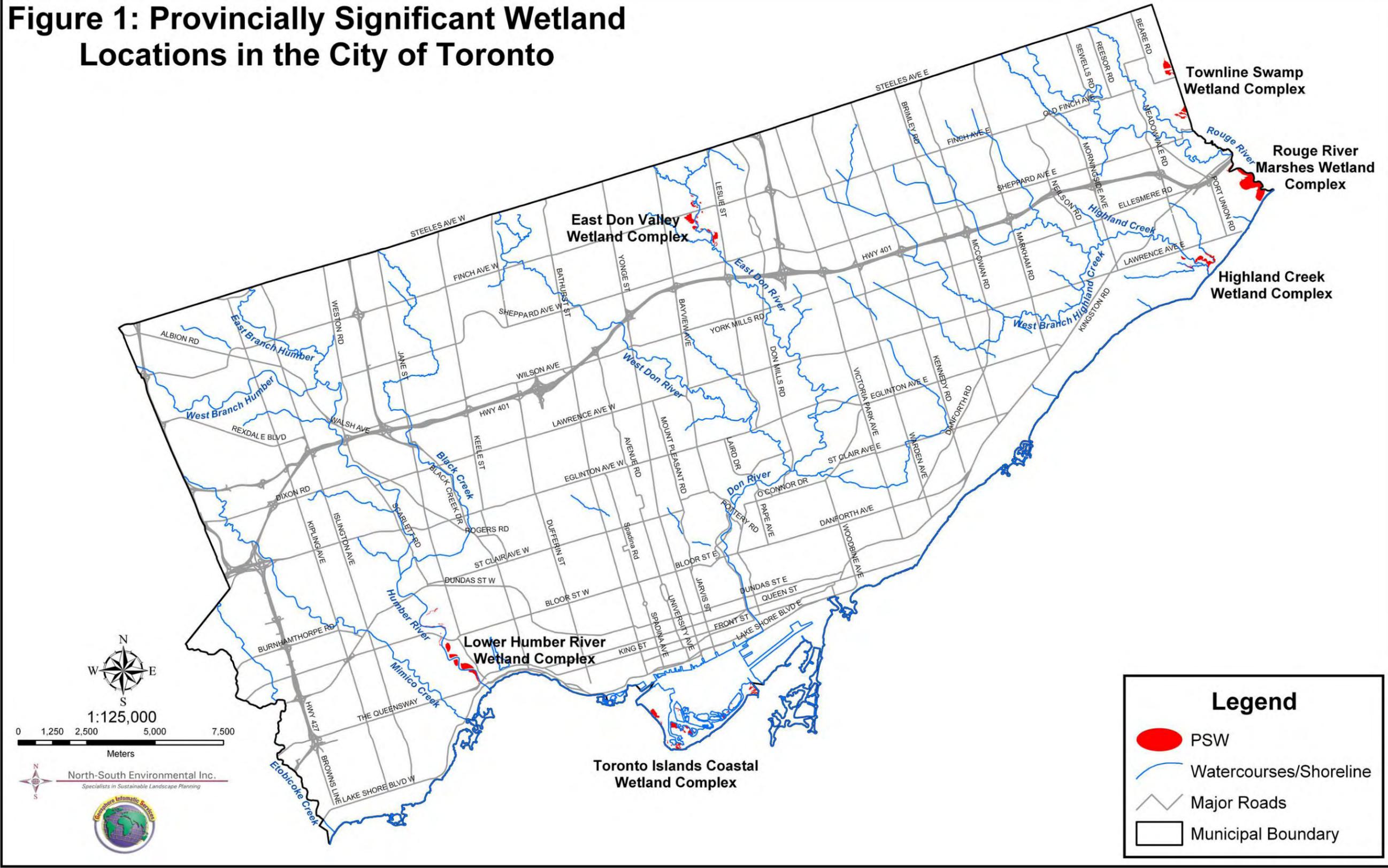
This report documents the results of the study. Section 2 provides an overview of the importance of wetlands and wetland protection. Section 3 describes the study methods. Section 4 provides an overview of the results of the assessment of each wetland. Summary and conclusions are provided in section 5. A description of the rationale and methods for the Ontario Wetland Evaluation System (OWES) is provided in Appendix 1. A fact sheet containing key information for each wetland and a map showing the wetland boundary is contained in Appendix 2. Where boundary modifications have been identified, the maps in Appendix 2 show both the previous and modified wetland boundaries. The wetland information provided in this report is a summary only. For more complete and more detailed information the reader should refer to the MNR wetland evaluations.

## **2.0 IMPORTANCE OF WETLANDS AND WETLAND PROTECTION**

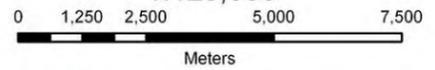
### **2.1 Wetland Functions and Values**

Wetlands in Toronto, as in other parts of Ontario, support natural heritage features and functions so critical that wetlands are now recognized as one of the most important priorities for protection. Many of the functions of wetlands are indispensable to human well-being in all areas of human habitation because they relate to water quality and quantity. Wetlands provide a multitude of ecosystem services, a term coined by SCEP (1970) to indicate in human terms the benefits provided by natural ecosystems. As argued by Daily et al. (1997), generally, the flow of ecosystem goods and services in a region is determined by the type, spatial layout, extent, and proximity of the ecosystems supplying them. This is as true in the Toronto environment as it is in southern Ontario as a whole. Wetlands in Toronto assists in flood control, erosion control and water quality improvement: functions that directly benefit people in their daily lives within the City. Wetlands also help to ensure a stable, long term supply of groundwater (MNR 2009). Other functions of wetlands which directly benefit human beings include provision of social benefits, such as education and recreational opportunities. They also provide habitat for wildlife and vegetation species that continue to benefit humans directly such as fish, timber, wild rice and bullfrogs. Some of these social benefits, such as provision of food and timber, have become less relevant in the metropolitan environment of Toronto; not least because the use of wetlands for these tangible resources by a population the size of Toronto's would probably be unsustainable.

**Figure 1: Provincially Significant Wetland Locations in the City of Toronto**



1:125,000



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**Legend**

- PSW
- Watercourses/Shoreline
- Major Roads
- Municipal Boundary



However, the direct benefits of wetland environments for education and recreation have increased, because there are so few other environments that can provide educational opportunities, and because of the variety of natural features in wetland environments.

Wetlands are also biodiversity “hot spots”. Wetlands are highly important as reservoirs for provincially, regionally, and locally significant species, contributing to biodiversity at a magnitude disproportionate to their often small size. Biodiversity, or biological diversity, refers to the variability among living organisms - within species (genetic diversity), between species (species diversity), and in ecosystems (ecosystem diversity) (Environment Canada 2009). Biodiversity is important not only for its intrinsic value but also for what it provides us with, such as clean air and water, compounds for new medicines, and seeds for new crops. Loss of species or change in species composition can threaten ecosystem health and affect our economic and socio-cultural sustainability (Environment Canada 2009). Since humans are part of biodiversity, we benefit from maintaining surrounding diversity.

Wetland habitats in urban areas often occupy a smaller area of the landscape than uplands, especially in landscapes intensively developed for agricultural or urban uses. Even so, many of the animal and plant species in urban environments depend directly on wetlands for habitats. Even wildlife not consistently dependent on wetland habitats increasingly rely on wetlands as forests are lost because wetlands are often the last habitats that remain within a landscape, as their development can be technologically challenging and therefore expensive in comparison to other habitat types.

In Toronto, wildlife dependent on wetlands include animals that rely on wetlands for their entire life cycle: fish, certain highly aquatic amphibians, reptiles and mammals such as mudpuppies, northern map turtles and muskrats. Other amphibians that rely on both wetland and upland habitat such as toads and leopard frogs, which only require wetlands for short, but critical, periods each year, can be found in Toronto wetlands. In the City of Toronto, wetlands provide the only habitat for some waterfowl, heron and songbird species. Wooded wetlands also provide some of the only habitat for area-sensitive species of birds within the City, where swamps (wooded wetlands) form large mosaics with slope forests and remaining table land forests. In the Toronto area, wetlands also teem with upland-dependent, generalist bird species, which range widely between wetlands and other habitats during their life cycle.

## **2.2 Wetland Protection in Ontario**

An estimated eighty percent of wetlands have been lost in southern Ontario since the time of European settlement. Most of these losses were in the late 19<sup>th</sup> and early 20<sup>th</sup> century, though they continue to the present day. Local appeals for a new initiative in wetland conservation in Ontario began in the late 1920s and 1930s when the combined results of drought and deforestation led to extensive soil loss and flooding (Conservation Ontario 2009). Although the responsibility for managing natural resources lay with the Province, the scale of erosion and water problems was such that it required a new approach, and when a number of municipal councils agreed to become involved, this spirit of cooperation led to the passage of the Conservation Authorities Act in 1946 (Conservation Ontario 2009). Since that time, management of wetlands has been indirectly provided by Conservation Authorities, which are a

joint provincial and local financial and legislative responsibility. Conservation Authority's Construction and Regulation to Waterways Regulation (administered by conservation authorities since the mid-1950s) has become one of the most important pieces of legislation protecting wetlands in Ontario. In 2006, this legislation was amended specifically to protect wetlands; with implementation of the Regulation of Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses (O. Reg. 166/06 in Toronto). Specific protection of wetlands in Toronto by municipal legislation is described in more detail in Section 2.3.

Protection of PSWs by provincial policy was formalized in 1992, after an extensive 10 year consultation period (Penfold 1998). It was updated in the Provincial Policy Statement implemented in 1997. Development of this policy was greatly supported by Canada's signing of the Ramsar Convention on Wetlands of International Importance in 1981 (Environment Canada 2008), reflecting a change in attitudes to wetland conservation subsequently shown in federal initiatives such as the federal policy on wetland protection released in 1992 (Lynch-Stewart et al. 1996), and Canada and North America-wide agreements to protect wetlands, such as the North America Waterfowl Management Plan (1986), the Great Lakes Wetlands Conservation Action Plan (1994) and the Great Lakes Sustainability Fund (established in 2000). Tireless lobbying by the public and organizations like the Federation of Ontario Naturalists (Ontario Nature 2009), the Nature Conservancy and Birdlife International was also a driving force for wetland conservation.

Provincial Policy Statements since 1992 have recognized the significance of wetlands, particularly in southern Ontario. The 1997 PPS stated that development proposals must "have regard for" its policies. In 2005 this terminology was strengthened to stipulate that development must "be consistent with" the PPS. The PPS provides protection for significant natural features, including significant wetlands, in Section 2.1 (Natural Heritage). The PPS voices the general policy that natural features and areas should be protected for the long term. It stipulates that diversity and connectivity, long term ecological functions and biodiversity of natural systems should be maintained, restored and improved, recognizing linkages between the features themselves as well as their relationship to groundwater and surface water. In southern Ontario (south of the Canadian Shield) the PPS does not permit development in provincially significant wetlands, significant habitat of endangered and threatened species, and significant coastal wetlands.

Wetland protection may also be indirectly achieved through the policies for protection of certain other natural heritage features in the PPS, though in other features, development may not be completely prohibited. In Ontario south of the Canadian Shield, development is not permitted in significant woodlands, significant valleylands, significant wildlife habitat and significant Areas of Natural and Scientific Interest (ANSIs), unless it can be demonstrated that there will be no negative impacts on the features or on their ecological functions. Development is not permitted within fish habitat except in accordance with provincial and federal requirements.

The province also applies policies to lands adjacent to natural heritage features and areas. The province defines adjacent lands as areas contiguous to a specific natural heritage feature where it is likely that development or site alteration would have a negative impact on the feature. Development is not permitted within adjacent lands unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on

the natural features or on their ecological functions. The Natural Heritage Reference Manual (1999) which supports policy 2.3 of the PPS recommends that adjacent lands are those lands within 120 m of individual wetlands comprising a wetland complex.

Provincial protection for PSWs in southern Ontario is strong but not absolute. There is still no specific wetlands legislation in Ontario or Canada (Environment Canada 2005), though wetlands are specifically recognized in the natural heritage protection measures of *Ontario's Planning and Development Act*, through the PPS. However, under the PPS, the definition of development does not include infrastructure authorized under an environmental assessment process or works subject to the *Drainage Act* (i.e., sewage and water systems, waste management systems, electric power generation and transmission, pipelines, transit and roads, and associated facilities). Therefore these activities may be permitted within significant natural areas including significant wetlands. Aggregate extraction is not permitted within PSWs south of the Canadian Shield, though it may be allowed in wetlands on the Canadian Shield.

In Ontario, wetlands also may receive indirect protection through the *Fish and Wildlife Conservation Act*, *Municipal Act*, *Endangered Species Act*, *Lakes and Rivers Improvement Act*, *Conservation Land Act*, *Conservation Authorities Act*, *Environmental Assessment Act*, and *Ontario Water Resources Act*. However other legislation, such as the provincial *Tile Drainage Act*, still works against wetland conservation by permitting wetland drainage for agricultural purposes. Installation of drains also affects wetlands in urban environments, as in most cases, the installation of municipal drains significantly alters the local water cycle, resulting in dramatic changes to wetland area and function (Environment Canada 2005).

Typically wetlands ranked as provincially significant are afforded the greatest level of protection. However, evaluated wetlands that do not rank as provincially significant can be designated as locally significant by local municipalities, as has been done in many jurisdictions. In some municipalities commitments to development have been made prior to the identification and evaluation of wetlands in some areas. This has been very problematic, reinforcing the importance of proper assessment prior to undertaking any type of plans for land use change.

As a general rule, the only true consistency among the Official Plans of Central Ontario municipalities located south and east of the Canadian Shield is that they give full protection to the two features of provincial interest within which development is prohibited under the PPS: Significant Wetlands and the Habitat of Threatened and Endangered Species (Fraser 2003). These are the two "sacred cows" of natural heritage from the Province's perspective and their protection is generally accepted as a given among land use planners and developers (Fraser 2003).

### **2.3 Wetland Protection in the Toronto Official Plan**

Municipal wetland protection in addition to Conservation Authority regulation has been in place for decades. Within the City of Toronto the Official Plans of some of the former municipalities, such as Scarborough and Metro Toronto, specifically identified wetlands as special features to be protected. The former cities of Toronto and Etobicoke mapped PSWs as ESAs in their Official

Plans and prohibited or restricted development in ESAs and required a study for proposed undertakings adjacent to PSWs, and limited activities to those compatible with these features.

The City of Toronto Official Plan (2007) prohibits development or site alteration within PSWs and only permits development on lands adjacent to PSWs if it can be demonstrated through a study that there will be “no negative impacts on the natural features or the ecological functions for which the area is identified” (OP policy 3.4.14). This policy is consistent with the PPS (2005). Official Plan policies also protect wetlands which are not provincially significant. For example, any wetlands which are designated as municipal environmentally significant areas (ESAs) are protected from development and an impact study is required for any proposed undertakings in those areas not already the subject of an Environmental Assessment. Wetlands are also identified as one of the features of the natural heritage system and are generally located in areas that are protected through a Natural Areas land use designation such as in the valley and ravine systems.

### **3.0 METHODS**

#### **3.1 Use of the Ontario Wetland Evaluation System**

The Ontario Wetland Evaluation System (OWES, MNR 1993 with updates in 1994 and 2002) forms the framework for this study. The Province of Ontario developed a system for evaluating whether a wetland is provincially significant that has been in use since 1984. The OWES manual developed for implementing the system (MNR 1993 and subsequent updates) provides a framework for evaluating wetlands based on measuring attributes that relate to their features and functions. Four broad categories are evaluated and scored by the OWES: biological, hydrological, social and special features. A cumulative score of at least 600 points, or scores in the Special Features or Biological categories of over 200 points, makes the wetland provincially significant. A detailed review of attributes and scoring protocols used by the OWES is provided in Appendix 1. The OWES manual was used in providing background information on development of the wetland system, and in providing guidance for reviewing wetland boundaries.

#### **3.2 Review of Background Information**

The field program was developed by North-South Environmental, on the basis of a gap analysis of the amount and type of information available for each study area (Table 1). Information on PSWs was primarily obtained from wetland files within the Ontario Ministry of Natural Resources’ Aurora District office, and through conversations with MNR staff. It must be noted that during the course of this study, all wetlands within the jurisdiction of the Aurora District Office were being re-evaluated as an independent project by MNR. All wetlands within the City of Toronto, with the exception of the Lower Humber River Wetland Complex, were re-evaluated by MNR between 2006 and 2008. Where possible, MNR incorporated recommendations and information gathered by the City to add to the wetland evaluation. Additional information was obtained through consultation of ESA documents and ANSI files, where ESAs and/or ANSIs overlapped with PSWs.

Table 1. Data Gaps and Tasks Required in PSWs (based on 2006 assessment)

| PSW Name                                | Original Area (ha) | Data Available  | Data Required   |
|---|--------------------|---|---|
| East Don Valley Wetland Complex         | 11.4               | Recent TRCA fauna and flora surveys in some portions of this PSW, little MNR data available after original field work in 1985; field check of assumptions used in fish habitat evaluation required; score based largely on <i>Carex trichocarpa</i> and locally significant species | Boundary and feature verification, plant community classification, social (field observations only), amphibians, birds, flora, incidental wildlife                            |
| Lower Humber River Wetland Complex      | 19                 | Recent flora surveys in wetland communities (MNR), recent information on social features, records of provincially significant reptiles, vegetation community mapping in wetlands; fish habitat evaluation.  | Boundary and feature verification, fauna surveys should be done here to contribute to PSW and ESA studies; breeding birds and amphibians also recommended as part of ESA work |
| Highland Creek Wetland Complex          | 7.63               | Little recent data available; limited plant surveys in 1983, mainly in upland areas; fish survey in 1994. High score based largely on black-crowned night heron   | Boundary and feature verification, vegetation classification, amphibians, social (field observations only), flora, birds (black-crowned night heron), incidental wildlife.    |
| Toronto Islands Coastal Wetland Complex | 21.9               | Recent vegetation surveys, ELC, fauna records from TRCA and Toronto Field Naturalists   | Boundary and feature verification, amphibian and incidental wildlife surveys on Ward's Island and Centre Islands only (already recommended for ESA work)                      |
| Rouge River Marshes Wetland Complex     | 68                 | Extensive vegetation surveys, ELC, fauna as part of ANSI studies by MNR in 1990s  | Boundary and feature verification, amphibians, no additional field work required  |
| Townline Swamp Wetland Complex          | 63 (total)         | Vegetation surveys, ELC, fauna  | Boundary and feature verification within City of Toronto only (most of this wetland is in Pickering), no additional field work required                                       |

Information was provided by the MNR Natural Heritage Information Centre (NHIC), as well as obtained through their website. Species information was also obtained from TRCA databases and files. This information was scrutinized to determine if there were any gaps in information for some wetlands, or if information needed updating (MNR considers information historical if it is greater than 20 years old, and this guideline was followed in evaluating species information).

### 3.3 Field Program

Generally, recent (*i.e.*, last 5 yrs) updates of Toronto Islands Coastal, Lower Humber River and Highland Creek wetland complexes were completed by MNR in 2006, so those sites were visited mainly to verify whether habitat for significant species was present, and to review the boundary of each wetland in the complex (Toronto Islands wetlands were also visited several times in the course of ESA surveys and these dates are included here). The least information was associated with the East Don Valley, Townline Swamp and Highland Creek Complexes (these re-evaluations were completed in late 2007). Only a portion of the Townline Swamp was investigated because most of this wetland is located within the City of Pickering. The field plan was implemented by Dougan & Associates Inc., with assistance from NSE. A summary of the dates when each PSW was surveyed is provided in Table 1.

Table 2. Dates of Initial Field Surveys in Toronto PSWs

| PSW Name                                | Date of Survey (2006 unless otherwise noted)  |
|---|---|
| Toronto Islands Coastal Wetland Complex | 2 May, 3 July, 10 July, 16 July, 10 November  |
| Lower Humber River Wetland Complex      | 22 April, 27 April, 20 May, 10 June, 11 June, 18 June, 19 June, 21 June, 24 June, 7 July, 2 July, 8 July, 14 July, 21 July, 14 November |
| East Don Valley Wetland Complex         | 1 May, 11 May, 22 June, 26 June, 4 July, 5 November; 15 September (2008)  |
| Highland Creek Wetland Complex          | 30 May, 24, June, 27 June, 10 July, 3 August; 18 September (2008)   |
| Rouge River Marshes Wetland Complex     | 27 May, 25 June, 19 January (2007); 22 August (2007)  |
| Townline Swamp Wetland Complex          | 23 August   |

#### 3.3.1 Landowner Contact

The major portions of PSWs within the City of Toronto are on public land owned by the City of Toronto. Small portions of the boundaries were on private land, but in this case boundaries could be surveyed adequately from publicly-owned portions. Landowner contact was therefore not required during the study.

### **3.3.2 Boundary Verification**

All PSWs within the City of Toronto were visited and the boundary reviewed. The boundaries of each PSW as provided by the MNR were overlaid on 2003 aerial photographs, and the printed ortho-photo with the boundary overlay was scrutinized in the field. The scrutiny was intended to note gross changes to wetland boundaries, such as areas overtaken by development, but also included an assessment of whether the wetland was delineated according to OWES protocols. Recommendations for refining the existing boundary of PSWs were made where required, with recommendations for changes based on the guidance provided in the OWES for delineation of wetlands (see Appendix 1). Recommended refinements to boundaries were shown on hard-copy mapping supplied for field work, and then digitized on to the digital aerial photo in Arcview.

### **3.3.3 Vegetation Mapping and Flora Surveys**

If vegetation communities were previously mapped by MNR, the communities were not re-classified or refined unless it appeared in the field that there were radical changes to the plant community. However, in some sites, some vegetation surveys were conducted (i.e. where vegetation mapping appeared out-of-date according to the air photo). In that case, vegetation mapping and classification were carried out according to Ontario Land Classification protocols, which were later updated to wetland evaluation protocols.

### **3.3.4 Condition**

General human activities that affected the condition of each PSW were briefly noted (*i.e.*, trails and other impacts were not be mapped in detail). Locations of unusually high human impact (e.g., areas denuded by motor vehicle traffic, swimming pool outlets) were recorded on a hand-held GPS. Unusual concentrations (for the City) of non-native plant species were recorded.

### **3.3.5 Amphibian Surveys**

Amphibian surveys were generally not conducted as part of this study, as the presence of amphibian breeding habitat (unless they are provincially, regionally or locally significant, or are bullfrogs) does not contribute to wetland scores, though it is considered an important function of wetlands. There are no regional or local lists for amphibian status in the Toronto area published by MNR, however, recent changes in the wetland evaluation protocols (2005 updates) have included the provision that municipal or conservation authority lists can be used to score locally significant special features, as long as they are approved by MNR. Local status of amphibians has been evaluated and listed by TRCA (TRCA 2008), though these lists are not used by MNR in wetland evaluations.

The only area in which amphibian surveys were conducted as part of the current study was within the Rouge River Marshes PSW, because amphibian habitat is so extensive within the wetland that it could potentially be viewed as a significant wetland function. However, additional amphibian survey information was collected for PSWs through a separate study being carried out by the City of Toronto on municipal ESAs. Where these areas overlapped with PSWs the list of species is provided here as part of the wetland data.

Amphibian surveys mainly focused on detection of breeding frogs that use vernal pools for breeding, as these represented the species with the most stringent habitat requirements in the City of Toronto (and most are considered species of concern by TRCA). Only areas where vernal pools had been noted in the past, or where they were evident on aerial photos, were surveyed. Surveys in most PSWs were conducted in mid-April to mid-May, according to protocols recommended by the CWS Marsh Monitoring Program, modified to focus on detecting early-breeding frogs that utilize temporary pools, with ranges within the Toronto area. Abundance codes were used for estimating frog numbers, as outlined by the CWS Marsh Monitoring protocols. Bullfrog surveys (the presence of bullfrogs adds one point to the score) were conducted in the early morning, during breeding bird surveys, if these were required.

### **3.3.6 Breeding Bird Surveys**

Breeding bird surveys were conducted mainly during a separate study of municipal ESAs being carried out by the City of Toronto. Breeding bird surveys were conducted in early summer, on dates between approximately 24 May and 10 July, as recommended by Canadian Wildlife Service protocols for the Forest Bird Monitoring Program. The surveys were focused as much as possible on obtaining evidence of probable breeding, according to techniques outlined by Bird Studies Canada (2001). That is, visits were planned to obtain evidence of territory or anxiety behaviour, rather than on finding nest sites (though nesting evidence was recorded if available). A second visit was planned to obtain evidence of territory, particularly those for which increased evidence of breeding was not found on the first visit. The locations of provincially significant species were recorded with a hand-held GPS unit or mapped on to the ortho-photo and later digitized.

### **3.3.7 Surveys of Incidental Wildlife**

Observations of incidental wildlife were conducted in the course of other surveys wherever possible, by turning over debris and looking for tracks and trails. Incidental observations included more cryptic species such as mammals, reptiles and certain amphibians, but also included insects such as dragonflies, butterflies and moths. However, surveys were not designed to focus on these groups.

### **3.3.8 Surveys of Special Features, Groundwater Discharge, etc.**

Observations of other significant features or concentrations of species, and groundwater discharge (scored as part of the Special Features or Hydrological components, respectively) were made whenever they were encountered. Evidence of concentrations of mammals or birds were mainly obtained from incidental observations or existing information. The observations were focused on obtaining information on the following ecological functions:

- Presence of significant concentration of fauna in critical habitat at critical times during their life cycle (this includes vernal pools that persist until at least the end of May and contain invertebrate indicator species such as fairy shrimp or function as amphibian breeding habitat; deer wintering habitat (based on evidence of high browsing levels or tracks and trails within a concentrated area), and, in suitable habitat, nesting or feeding

habitat for colonial bird species and waterfowl or shorebird concentrations). The field program did not include determination of migration habitat for songbirds or raptors.

- Areas with indicators of seepage; upwelling points and other evidence of groundwater discharge were mapped during the course of vegetation and wildlife surveys.

### 3.3.9 Review of Boundary with MNR

Where significant changes to the boundaries of a wetland were identified based on the results of field surveys (e.g., additional wetland areas, substantial changes to wetland boundaries) these were mapped in the field and on the air photo. MNR reviewed the recommended changes, and then follow-up visits were conducted in 2008 that included personnel from both MNR and the study team. Refinements to the boundary were discussed, and the final boundary represented in field mapping. Where significant boundary changes were identified these are identified on the maps in Appendix 2.

## 4.0 RESULTS

All six PSWs were surveyed in the course of the study. A summary of the scoring for each component of the OWES for each PSW is provided in Table 1. The breakdown of scoring for each attribute and the rationale is provided for each PSW in Appendix 2. The rationale provided for the values scored for each component is based on MNR (1993). All previously identified PSWs continued to qualify as PSWs, mainly due to the Special Features component, which in all cases was greater than 200 so each wetland is considered significant based on the Special Features component alone.

Table 3. Summary of Scores for Wetlands in the City of Toronto

| PSW Name   | Biological Component | Social Component | Hydrological Component | Special Features Component | Total Score |
|--|----------------------|------------------|------------------------|----------------------------|-------------|
| East Don Valley Wetland Complex (19.2 ha)                                  | 105                  | 159              | 242                    | 250                        | 756         |
| Highland Creek Wetland Complex (12.9 ha)                                   | 116                  | 170              | 20                     | 250                        | 556         |
| Lower Humber River Wetland Complex (25.6 ha)                               | 130                  | 212              | 22                     | 250                        | 614         |
| Rouge River Marshes Wetland Complex (55.7 ha)                              | 174                  | 220              | 20                     | 250                        | 664         |
| Toronto Islands Coastal Wetland Complex (31.0 ha)                          | 158                  | 135              | 8                      | 250                        | 551         |
| Townline Swamp Wetland Complex (75.3 ha total: 17.8 ha in City of Toronto) | 138                  | 151              | 212                    | 250                        | 751         |

#### **4.1 Biological Component**

A score of greater than 200 points in the biological component alone determines a wetland as provincially significant. None of the wetlands was significant based on the biological component (as defined by the OWES). The score for the biological component was moderate to low for all wetlands, because they generally have a limited number of vegetation communities and are relatively small in size, being generally confined to small areas of floodplains or coastlines. The score for this component was lowest for the East Don Valley Complex because it was one of the wetlands with the smallest size, combined with the least diversity.

#### **4.2 Social Component**

Most wetlands in Toronto provide educational and recreational opportunities. Most wetlands scored high in the social component, as almost all (except Townline Swamp) are used as recreational and educational areas by neighbouring schools and universities. In addition, as with most natural areas in Toronto, many PSWs have been investigated by naturalists and others for decades. The Ministry of Natural Resources has also been documenting features in PSWs within the City of Toronto since the 1970s.

#### **4.3 Hydrological Component**

Most wetlands in Toronto are not important from a hydrological perspective. The four coastal wetlands scored low in the Hydrological component: their contribution to water storage, water quality improvement and ground water recharge is minimal because of their position on the shore of Lake Ontario. The Hydrological component score for the Highland Creek Wetland Complex is substantially lower as a result of the 2006/7 evaluation because it was recognized that the wetland is coastal, and water levels are determined by Lake Ontario levels. The two wetlands with primarily palustrine and riverine components (Townline Swamp and East Don River respectively) scored very high in the Hydrological component, because of their significant contribution to water storage, water quality improvement and ground water recharge.

#### **4.4 Special Features**

All wetlands scored as provincially significant based on the Special Features score alone. In addition, the largest point contribution to the total wetland score was associated with the Special Features score in all wetlands, due to the presence of numerous regionally and locally significant plant and animal species, and due to the presence of a few provincially significant species, as noted in Table 4. Most of the provincially significant species are not, however, considered Species at Risk nationally or provincially. Only two Species at Risk protected under the Endangered Species Act (with a status of Threatened), were noted; Blanding's turtle, in the Lower Humber River and Rouge River marshes, and least bittern, noted in the Rouge River Marshes. Species of Special Concern noted in several wetlands included eastern milksnake and northern map turtle. Red-headed woodpecker, noted in the Humber Valley in 2003, currently considered a species of Special Concern in Ontario, was recently listed as nationally Threatened (March 2009), and its status in Ontario may change to reflect the change in national status.

Wetlands on the lake and at rivermouths were highly significant for providing nesting and/or foraging habitat for colonial waterbirds, and for providing fish habitat. PSWs are well-known stopover sites for migrating birds. The Toronto Islands coastal wetlands are configured such that there are numerous sheltered bays and sandy shorelines which provide shallow water for foraging, and basking sites for turtle species. Rivermouths are also highly productive environments for many organisms.

Table 4. Numbers of significant species noted in Toronto PSWs

| Wetland                                 | Provincially Significant species | Regionally significant species | Locally significant species | Endangered and Threatened Species |
|---|----------------------------------|--------------------------------|-----------------------------|-----------------------------------|
| East Don Valley Wetland Complex         | 1 fauna<br>1 flora               | 2 flora                        | 44 flora                    | none                              |
| Highland Creek Wetland Complex          | 2 fauna                          | none                           | 13 flora                    | none                              |
| Lower Humber River Wetland Complex      | 13 fauna<br>1 flora              | 2 flora                        | 18 flora                    | Blanding's turtle                 |
| Rouge river Marshes Wetland Complex     | 15 fauna                         | 2 flora                        | 54 flora                    | Blanding's turtle, least bittern  |
| Toronto Islands Coastal Wetland Complex | 23 fauna<br>1 flora              | 3 flora                        | 55 flora                    | none                              |
| Townline Swamp Wetland Complex          | 3 fauna                          | 1 flora                        | 18 flora                    | none                              |

#### 4.5 Condition Assessment

Most PSWs had areas of high quality, or aspects of high quality, but these were interspersed with areas of high disturbance and lower quality. All PSWs contained large numbers of non-native species, many of them trees, which have the potential to dominate large areas of vegetation. Non-native trees noted most frequently in PSWs were Manitoba maple (*A. negundo*), crack willow (*Salix fragilis*), hybrid willow (*S. X rubens*) and European birch (*Betula papyrifera*), and increasingly, European alder (*Alnus glutinosa*). Some highly invasive non-native shrub species occur in and adjacent to PSWs as well, including common buckthorn (*Rhamnus cathartica*) and tartarian and Morrow's honeysuckle (*Lonicera tatarica*, *L. morrowii*). Common invasive non-native ground flora includes purple loosestrife (*Lythrum salicaria*), giant reed grass (*Phragmites australis*), reed canary-grass (*Phalaris arundinacea*), dog-strangling vine (*Cynanchum nigrum*), dame's rocket (*Hesperis matronalis*) and garlic-mustard (*Alliaria petiolata*).

All PSWs were in close proximity to major trails, many of which are maintained by the City with clearly marked paths, boardwalks and imported surface materials. Almost all trails broke off into innumerable smaller *ad hoc* trails that caused impacts over a much wider area than the main trail, which included soil compaction and denuding of vegetation. Evidence of dogs running loose was found within many PSWs. Litter was found in many PSWs. In some areas, particularly the Toronto Islands, there were signs that people spent longer periods of time in the vicinity of the wetland, such as picnic areas, fire pits and even some tent sites.

Many of the PSWs within river valleys could potentially be affected by activities related to residences at the top of the slope. Dumping of compost and building debris was common adjacent to residences, and where residential lots were manicured close to the edge of the valley wall there was often abundant tree fall. In some instances trees at the edge of the valley wall had been cut, and shrubby vegetation at the edge of the valley had been removed. Edge vegetation is important to the function within natural areas, as it protects them from physical edge effects like drying winds and direct sunlight, which can dry out soils and leaf litter, reducing insect numbers.

Changes in wetlands over the past two decades may have included minor changes to water levels. During field work in the Rouge River Marshes Wetland Complex, it was noted that the river appeared to be slightly lower in relation to the surrounding floodplain than previously. However, many of the wetlands are dependent on fluctuating lake levels so the influence of river flooding is less significant than the level in Lake Ontario. The continuing successional processes on the floodplain, with succession to a treed community in some areas, may increase evapotranspiration in some areas.

#### **4.6 Management Needs**

Broad recommendations for management were provided in each fact sheet. These mainly consisted of the following:

- Non-native tree and shrub species should be removed if they are threatening the integrity of the wetland, particularly Norway maple, European birch, and common buckthorn;
- Other non-natives should be removed as well, based on assessments on a case-by-case basis as removal techniques for ground flora can threaten native communities;
- Trails should be planned and managed, particularly *ad hoc* trails;
- Picnic sites and tent sites should be managed;
- Encroachment by neighbouring residences should be managed;
- Proliferation of impacts from adjacent uses should be managed.

#### **4.7 Boundary Review**

##### **4.7.1 Recommended Boundary Revisions and Rationale**

Any modifications to the boundary of a wetland must be approved by MNR. Boundary revisions identified in this study are shown on the maps and fact sheet for each wetland provided in Appendix 2. Boundary revisions were recommended only if the boundary of wetland vegetation, based on the 50% rule (see Appendix 1 section 4 for more detailed description of the 50% rule), did not correspond to the boundary overlaid over the aerial photo. Boundary revisions were

recommended, based on observations in the field and subsequently confirmed in the field with MNR. Boundaries were also revised by MNR between 2006 and 2007 as a result of the ongoing refinement of wetland mapping undertaken by MNR during that period.

In three of the wetlands (Lower Humber River, Toronto Islands Coastal and Townline Swamp wetland complexes) recommendations for boundary revisions were none or minimal, mainly involving refinement of the boundary to the photo base. Wetland polygons shown on the mapping generally encompassed greater than 50% wetland species as required by the OWES. Many of the wetlands on the Toronto Islands were small (less than 2 ha), encompassing stands of red-osier dogwood and intermittent patches of aquatic submergents or fringes of shoreline marsh. However, these small wetlands were important, as they appeared to be supporting a diversity of wetland plants, providing linkage, shoreline stabilization and habitat.

Minor revisions were made to two wetland complexes: Highland Creek Wetland Complex and Rouge River Marshes Wetland Complex. Major revisions were made to one wetland: East Don Valley Wetland Complex. These revisions are described below.

- The Highland Creek wetland boundary was refined in some areas, with the only substantial extension being a lobe of approximately 100 m to the north end of the southernmost wetland.
- For the Rouge River Marshes PSW, discussions were initiated with MNR to determine if some areas classified in the wetland mapping as hardwood swamp should be re-classified as lowland forest (at the drier end of the continuum between swamp and forest). It was noted during the review in the field that possibly some of these swamps had become drier because the river levels had dropped, with the result that flooding within the swamps was less frequent than in the past. The flora appeared to be dominated largely by transitional species adapted to both wetland and upland environments, which cannot be used to delineate a wetland boundary (OWES 1993). There may also have been an increase in evapotranspiration in the swamp areas due to the growth of trees. However, during subsequent field visits in summer it was determined that though these areas appeared somewhat drier, on balance they still supported a slightly greater than 50% cover of wetland plants. The boundaries were revised to eliminate a small portion of this swamp, but most of the swamp was included.
- For the East Don Valley wetland, the boundaries were revised as the polygons appeared to be “shifted”, that is, the polygons were similar to the shape of the wetland but offset slightly to the south. This is likely due to the fact that the East Don Valley wetland boundary had not yet been revised by MNR with the 2003 aerial photography. Subsequent site visits ensured that wetland boundaries were represented accurately. Nine additional wetlands were added within the floodplain as a result of these recent field visits. These additional wetlands are small, but appeared to be important in providing habitat that support additional diversity of both flora and fauna within the urban landscape.

The maps included in Appendix 2 represent the most recent wetland boundaries as confirmed in the field by MNR, Dougan & Associates and North-South Environmental, Inc.

#### **4.7.2 Rationale for Inclusion of Wetlands Under 2.0 ha in Size**

Field staff reviewing wetland boundaries in the field for this project frequently noted that some of the wetland polygons were far smaller than 2 ha. These wetlands were particularly scrutinized, as the OWES recommends individual wetlands smaller than 2 ha not be included in wetland complexes (plant community polygons within wetland boundaries should not be smaller than 0.5 ha) unless the rationale is clearly documented. However, a rationale was always listed in the MNR Wetland Evaluation reports for inclusion of wetlands smaller than 2 ha. The rationale was generally related to the fact that small wetlands assume a greater importance in this urban landscape where the remaining habitat is usually fragmented and degraded. In this study the following rationale was used for including smaller wetlands:

- occur in ecodistrict 7E-4 where wetlands are very rare;
- support wetland types not well represented elsewhere in the wetland complex;
- Sustain significant species/communities (*i.e.*, rare or uncommon species in ecodistrict 7E-4)
- support breeding amphibians;
- are hydrologically connected by a watercourse to other wetlands; and
- provide intervening habitat beside larger wetlands.

#### **4.7.3 Accuracy of Wetland Boundaries**

The wetland boundaries shown in this report are drawn as accurately as possible and were verified in the field by this consultant and MNR staff. However, due to considerations identified below, it is not always possible to draw a wetland boundary with complete accuracy. Where greater accuracy is required such as where a wetland boundary is unclear or is in dispute it is general practice for several observers (usually representing both agencies and consultants) to flag the wetland boundary in the field, where it can be accurately surveyed. It is recommended that accurate surveying be carried out for any boundaries in dispute in the Toronto area.

The wetland boundaries shown in Appendix 2 were drawn on the 2003 aerial photograph according to the aerial photo “signature” shown by the change in plant community visible on the aerial photograph and subsequently confirmed with ground-truthing in the field. In cases where the distinction between upland and wetland vegetation is very clear, for example, when a cattail marsh gives way to an upland forest, this boundary is relatively accurate. However, in some cases the boundary of the wetland in the aerial photograph is not distinct. For example, where the slope between upland and wetland is very gradual, the change from upland to wetland vegetation may not be visible on the aerial photograph, though it may be visible on the ground. Another example is in cedar swamps, when eastern white cedar, a species adapted to both wet and dry conditions, grows up the slope from the wetland and becomes a surrounding forest, and other species such as ground flora must be used to classify the vegetation community. In this case the wetland vegetation visible on the ground can be obscured on an aerial photo by a dense growth of trees, and it may not be possible to draw the boundary accurately on the map.

## 5.0 SUMMARY AND CONCLUSIONS

All six provincially significant wetlands located in the City of Toronto were examined and found to continue to qualify as provincially significant. These wetlands were originally designated according to the established principles of the available edition of the Ontario Wetland Evaluation System (MNR 1993 with updates in 1994 and 2002). After evaluation based on data collected through this study (2006 – 2007), as well as recent (2007) MNR field work and data gathering, all six PSWs were found to continue to meet the current (2002) OWES designation criteria.

All six PSWs qualify mainly due to their Special Features component. These wetlands support significant numbers of locally and regionally rare plant species, as well as some provincially significant flora and fauna. Most are major rivermouth wetlands in close proximity to Lake Ontario, and as such provide feeding areas for colonial bird species, waterfowl and rare migrants as they move through the urban environment. They provide foraging and resting areas for hundreds of migrating bird species. Several of the wetlands also support rare species of turtle (primarily Blanding's turtle and northern map turtle) and a high diversity of fish, including critical spawning areas.

The work carried out as part of this study as well as a concurrent wetland evaluation update carried out by MNR's Aurora District Office, determined that there should be changes in the scoring for five of the six wetland complexes located within the City of Toronto. These changes reflect improvements in the aerial photography (allowing more accurate mapping of communities), changes in the status of many species, additional records of significant species, and further refinement of boundaries through field work. Refinement of certain rules in the wetland evaluation protocols triggered the re-evaluation of the Hydrological score for the Highland Creek Wetland Complex. The MNR considers wetland evaluations to be "open file" reports, as a result further updates will be conducted if new information becomes available.

During the course of this study nine additional wetlands were incorporated into the East Don Valley Wetland Complex by MNR. The work carried out for this study resulted in a minor expansion to the boundaries of the Highland Creek Wetland Complex. There were no or very minor changes to the boundaries of the Toronto Islands Coastal Wetland Complex, Lower Humber River Wetland Complex, Townline Swamp Wetland Complex and the Rouge River Marshes Wetland Complex.

The total area of all PSWs within the City of Toronto is 162.2 ha. which represents 0.25% of the landscape (Toronto has a total area of 64,156.4 ha). All six PSWs are wetland complexes because they contain more than one distinctive wetland unit. Four of the complexes include mainly lacustrine wetlands (Lower Humber River, Highland Creek, Toronto Islands Coastal and Rouge River Marshes) which are supported by the fluctuations in the water level of Lake Ontario. The remaining two complexes (East Don and Townline Swamp) encompass significant areas of palustrine wetlands, defined as "wetlands with no or intermittent inflow and either permanent or intermittent outflow" (MNR 1993 page 111). All wetlands are composed mainly of swamps and marshes, with no areas of bog or fen present in any of these complexes. All wetland complexes include areas smaller than 2 ha, because of the importance of wetland habitats in urban environments, primarily because wetlands are very rare in Ecodistrict 7E-4, and

because small wetlands often supported wetland types not well represented elsewhere in the wetland complex. A few small wetlands also supported breeding amphibians.

Wetlands are well accepted as fundamental in building effective natural heritage systems for the maintenance of ecological integrity at a landscape level. The designation of provincially significant wetlands is one of the cornerstones of provincial policies to protect Natural Heritage Systems in many areas of the province. The importance of wetlands in the regional natural heritage system is further reinforced within the Greenbelt and the Oak Ridges Moraine Plans which consider Provincially Significant Wetlands to be core features in these areas. Both the PPS and City of Toronto Official Plan prohibit development or site alteration within provincially significant wetlands.

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**APPENDIX 1. SUMMARY OF ONTARIO WETLAND EVALUATION**

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## **Summary and Comment on the Rationale and Methods for the Ontario Wetland Evaluation System**

### **1.0 Background**

The Ministry of Natural Resources originally developed the OWES in 1983 for the purpose of measuring wetland values among different wetlands, to determine which wetlands within the province were most valuable (OMNR 1993). A wetland value was defined as derived from some attribute, feature, characteristic, activity, expression or function of a wetland that has a demonstrable worth to some segment of society *i.e.* to wildlifers, recreationists, educators, scientists, local residents, the “public at large” and others. The system was designed to allow their accurate definition, identification, measurement, and ultimately, their evaluation.

The Ontario Wetland Evaluation System (OWES) has withstood academic and legal challenges (in the course of modification and refinement as a result of literature review, expert review and extensive field testing) for over two decades, and has become a proven tool that assists with land use planning throughout Ontario. It has survived numerous legal challenges through the Ontario Municipal Board. The OWES provides a reasonable and valid approach for assessing wetland values.

Provincially significant wetlands have been the subject of challenges at the Ontario Municipal Board (OMB). However, in almost all cases the methods of the wetland evaluation itself are not challenged, and in most cases development the policy prohibiting development within wetlands has been adhered to, and development has not been allowed within the PPS. For example, a study by Ontario Nature (Ontario Nature 2003) of 71 OMB cases between 1996 and 2003, with a primary focus on natural heritage, noted that 27 cases involved wetlands (all but one provincially significant). None of the cases challenged the methods of the OWES. In almost all cases, the proposal did not involve development of the PSW, but generally involved impacts from development of lands adjacent to the PSW. In only two cases, roads were allowed to be built within PSW boundaries in order to facilitate planning for the rest of the site. This study covered the period when planning was required to “have regard to” the Provincial Policy Statement. Decisions since 2005, when the wording was changed to “be consistent with” the PPS, require development to stay out of PSW boundaries as long as they are up-to-date and accurate.

### **2.0 Development of the First Wetland Evaluation Manual**

The original need and justification for the development of a system of evaluation for Ontario’s wetlands was derived from several considerations (OMNR 1993). The greatest need stemmed from the fact that no work had been done to quantify wetland values in a manner that permitted comparison of wetlands in order to make knowledgeable land use decisions (OMNR 1993). Another consideration stemmed from an increased scientific understanding of the role that many wetlands play in maintaining wildlife populations, regulating stream flow and in pollution abatement. As well, because wetlands are areas where land and water come together, they provide habitat for a diverse variety of wildlife species that can live nowhere else. Another consideration was that many people see wetlands as having special and unique recreational, educational and scientific value to themselves and to society as a whole. Prior to development of the OWES, no mechanism had existed to identify which wetlands in a given area or region were the most important to society as a whole. The OWES was devised to meet these needs.

Active work to develop the OWES was started in 1980 by the Wildlife Branch, MNR and the Canadian Wildlife Service, Ontario Region, through the establishment of the Canada/Ontario steering committee on Wetland Evaluation. The process considered a wide range of research conducted since the mid-1970s which evaluated those wetland characteristics that contribute to the positive value of wetlands.

In early 1981 a consulting firm was retained to review all existing systems of wetland evaluation, as well as wetland information applicable to southern Ontario, and propose a wetland evaluation model for areas of the province south of the Precambrian Shield. During the summer of 1981, field testing of the new system was carried out on 45 different wetlands in several parts of Ontario by between 15 and 20 people including the Halton and Kawartha Regions Conservation Authorities. In September 1981, a second consultant reviewed the results of the field testing, conducted additional field testing, and re-drafted the document in light of reviews and discussions. The Steering Committee deemed that substantial revisions were necessary, so re-writing, editing and reviewing of the new draft continued throughout the winter of 1981-1982 and included several meetings of the Steering Committee, which at that point consisted of six experts from Canadian Wildlife Service, MNR, Ducks Unlimited and Environment Canada. The review committee consisted of fifteen experts including wetlands biologists, hydrologists and wildlife biologists.

The hydrological component was still unresolved at this stage, so a hydrological consultant was retained to work with the Committee to help develop the system. In March 1982, five outside hydrologists were asked to review the hydrological component. The resulting responses of hydrologists had a major bearing on re-focussing the hydrological component.

A second draft of the evaluation system was published in May 1982, and field testing proceeded throughout the summer in 110 wetlands. To test whether the evaluation was replicable, eleven wetlands were tested three times and twenty-two were evaluated twice, while the remainder were evaluated once. As part of the review process, six outside experts reviewed the system. A statistical analysis of variance was conducted to determine if the scoring of replicated wetland evaluations was comparable.

Finally, a report that included changes recommended as a result of the review process was reviewed through a workshop conducted in December 1982 with all members of the Steering Committee. The workshop reviewed all studies, reports and reviews and made final decisions on all aspects of the evaluation. The final first edition of the wetland evaluation system (MNR 1983) was produced as a result of this process.

### **3.0 Subsequent Revisions of the OWES**

The OWES has been revised and/or updated several times in response to new scientific evidence when it has become available, in response to issues raised by field testing of the manual in the years since the first edition, and in response to continuing new development issues and policies in Ontario. There has been an expansion in expertise and interest in wetlands throughout the years that has guided the revisions. This has been accompanied by an accelerating need to apply the best tools available to conserve irreplaceable wetland habitat in Ontario's landscape.

A second edition was published in 1984. It incorporated some minor revisions and reorganizations resulting from the experiences of various field teams from MNR, Conservation Authority and CWS offices following the 1983 field testing. The second edition was not different in scoring or procedure in any substantial way.

The OWES was revised as a third edition in 1993 by the Southern Ontario Wetland Evaluation Review Committee, and subsequently the Provincial Wetlands Working Group, with input and review from many sources including faculty of several universities, biologists of the Royal Ontario Museum, MNR Regional ecologists, and consultants. The major revision in 1993 was the expansion of the OWES to include northern Ontario (with a northern wetland evaluation system for the Shield published as a separate manual). Revisions were also made based on new scientific information and eight years of experience with the 1984 manual, including the use of the manual to evaluate approximately 2000 wetlands (MNR 2002). The third edition incorporated a major effort to clarify instructions. It also incorporated particular attention to hydrological values of wetlands. The judgement of dozens of people about the relative importance of the recognized values is the basis for credibility of the assigned scores (MNR 2002).

Updates to the third edition were published in 1994 and in 2002. The 2002 revisions were carried out by MNR's Wetland Evaluation Technical Team (WETT) with input from several sources. The 2002 amendments dealt with the treatment of agricultural lands in the manual and provided updates to the sources to be used to determine regionally and provincially significant species, colonial waterbirds and winter cover for wildlife, ensuring consistency of the manual with the Provincial Policy Statement applicable at that time. The manual is currently being updated again to ensure consistency with the 2005 Provincial Policy Statement, and to recognize the recent revision of Ontario's Site Regions.

#### **4.0 Purpose of the OWES**

The OWES is a tool that allows planners to consider the **relative values of different wetlands** through the examination and ranking of a number of different wetland functions. However, there are some limitations in the use of the OWES. The evaluation system does not evaluate the vulnerability of wetlands to various sorts of developments and pressures. The wetland evaluation system is also not designed to suggest the kinds of management that would be best for a wetland. However, the information gathered through the application of this evaluation system can provide the basis for considering management options. The evaluation is not a complete biophysical inventory and certain information, particularly about the presence of rare features and about hydrological functions, may be lacking even after the evaluation is completed. Finally, the wetland manual was not designed as a tool for measuring the changes in a wetland's function over time. Thus, it should not be used in absence of other data to determine whether a provincially significant wetland has become non-significant. If an alternate use is to be proposed for a PSW, more information must be obtained (MNR 1993).

#### **5.0 Wetland Definition and Delineation**

The ultimate responsibility for protection of provincially significant wetlands rests with the Ministry of Natural Resources; thus, approval for wetland delineation and evaluation rests with

the MNR. Trained individuals can conduct a wetland evaluation. However a re-evaluated wetland cannot be determined as significant, or by the same token, no longer significant, until approved by MNR.

A brief summary of wetland delineation is provided here, as the OWES provides considerable detail on the delineation of wetlands, and therefore should be consulted if detail is required. A wetland is defined in the OWES as follows:

*“Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants”.*

The outer boundary of a wetland is the one used in several key aspects of the evaluation. The outer wetland boundary is determined according to the “50% rule”; that is, at the point where 50% of the plant community consists of upland species. This rule is critical, as frequently wetland boundaries must be drawn over a zone of gradual ecological change. Typical wetland and upland indicator species, which can be used to determine the boundary, are listed in the OWES. The use of soils to delineate the boundary of a wetland has been debated for many years (for example, it is used in U.S. Army Corps of Engineers wetland delineation protocols) as wetland soils can have characteristics that identify them as hydric (having been formed under a wetland hydrological regime). However, soils may suggest the upland boundaries of only those wetlands that have not been drained or converted to other human uses and where the original hydrological regime remains more or less intact, and the soils boundary should only be used in absence of better information. Soil type boundaries on soils maps are general and should not be considered definitive.

Internal boundaries (polygons drawn within the wetland boundary) are drawn to represent different wetland communities within wetlands. In Toronto, almost all wetlands include swamps (wetlands dominated by trees or shrubs) and/or marshes (wetlands dominated by non-woody plants), and internal boundaries delineate different swamp and marsh communities within the wetland. However, these boundaries may be approximate (MNR 1993). The outer boundary is drawn around the entire mosaic of communities that comprise the wetland. This can sometimes appear counter-intuitive, for example, in the case where the boundary is drawn mainly around wetlands within a floodplain but incorporates additional wetland areas based on seepage on the adjoining slopes.

Lakes, as defined by the OWES, are not scored as wetlands. The definition of a lake is: *“Areas of open water that are greater than 8 ha in size and at some location are greater than 2 m depth from the normal low water mark”* (MNR 1994). The deep water boundary of wetlands on the borders of lakes should be drawn at approximately 2 m depth of seasonally low water level, with some exceptions, as provided in the OWES.

## **6.0 Wetland Complexes**

A wetland complex is the extension of the concept of a single contiguous wetland (see wetland definition above). In a wetland complex, uplands or open water lakes may subdivide the area

into a number of distinctive wetland units, but the entire wetland is evaluated as a single unit (MNR 2002). The topography of the landscape in which these wetlands occur, the short distances between some of the wetlands, and the density of wetlands per unit of areal landscape may be so complex that delineation of the wetland units into individually recognized wetlands would not be an ecologically or functionally sound process (MNR 2002). Such groupings of wetlands are referred to as “wetland complexes”. All six Provincially Significant Wetlands in the City of Toronto are wetland complexes.

Wetlands within a complex are commonly related in a functional way, that is, as a group they tend to have similar or complementary biological, social and/or hydrological functions. Much of the wildlife in the area of a complex is variously dependent on the presence of the entire complex of wetlands, with each wetland unit contributing to the whole. Similarly, in wetlands divided by open water, fish may move between more than one wetland within the complex to complete different parts of their life cycle.

Basic rules for complexing are summarized as follows:

- Wetlands should not be complexed across watersheds except in rare circumstances;
- The maximum distance between units of a complex must not exceed 0.75 km straight line distance;
- Lacustrine wetlands often occur at the mouths of streams entering the lake. As long as these wetlands are within the 0.75 distance criterion, they may be considered as units of a complex (i.e. they are not considered within different watersheds though they are at the mouths of different streams). It is up to the professional judgement of the biologist to ensure that the complex is justified on functional grounds.

## **7.0 Size of Wetlands Included in the Evaluation**

Guidelines in the OWES state:

*“in general, wetlands smaller than 2 ha (5 acres) will not be evaluated. However, very small wetlands can sometimes provide important habitat for wildlife or be important for other reasons. This is particularly true in wetland complexes. Wetlands smaller than 2 ha can be evaluated and the rationale for including them attached to the data record”.*

Wetland patches smaller than 2 ha are included in almost all wetland evaluations in the City of Toronto. However, the rationale provided for scoring wetlands less than 2 ha in size is reasonable (see Section 4.8), given that small patches of habitat in urban areas are often critical in enhancing function and significance.

## **8.0 Scoring System**

The scoring system provides a reasonable and rigorously tested way of measuring relative attributes related to wetland values. In many cases, wetland values themselves are not evaluated, but are measured indirectly by measuring related attributes. A summary of the rationale and scoring for the biological, social, hydrological and species features components of the Ontario Wetland Evaluation System is provided in Table A-1.

In the evaluation, wetland values are grouped into four principal components. These are biological, social, hydrological and special features. Each component is evaluated individually and separately from others. Each component is further subdivided into subcomponents, and some subcomponents are further subdivided into attributes and some into sub-attributes. As noted in Section 2.2, the relative wetland scores were derived with the assistance of considerable review, consultation and field testing over a decade. A summary of the scoring system is provided below. A detailed description of the scoring system can be found in the recent wetland evaluation manual (MNR 1994 updated 2002). The rationale provided for the values scored for each component is taken from MNR (1993).

**Biological Component (a maximum of 250 points; with any wetland scoring more than 200 points in this component alone considered provincially significant):** This component includes three subcomponents: productivity, biodiversity and size. The scores in the biological component recognize that strong links exist between productivity, diversity and a wetland's hydrological setting.

**Social Component (a maximum of 250 points):** This component evaluates the shorter term uses and amenities that wetlands provide to people. Its main purpose is to measure some of the direct human uses of wetlands. This component includes eight sub-components: economically valuable products, recreational activities, landscape aesthetics, education and public awareness, proximity to areas of human settlement, ownership, size (in relation to social values) and aboriginal values and cultural heritage.

**Hydrological Component (a maximum of 250 points):** The hydrological component assesses the role a wetland plays in the maintenance, control and/or modification of the quantity and quality of water passing through a drainage basin. The hydrological component is designed to determine the net hydrological benefit provided by the wetland to the portion of the basin downstream of the wetland. The quantity of water associated with a wetland can be highly significant. This is because wetlands can only exist where the water table is at or above the mineral soil surface for a significant portion of the year. In the case of non-lacustrine wetlands (wetlands not on a lake), there are three ways the wetland remains saturated for a sufficient length of time to allow wetland vegetation to become dominant: the retention of water from rain or snow due to poor drainage, spring and fall input of groundwater, or a constant input of groundwater throughout the year. Saturation of lacustrine or riverine wetlands is maintained by the water level of the adjacent lake or river (MNR 1993). Many of the hydrological values of wetlands are measured by scoring related attributes, rather than the values directly.

**Special Features Component (a maximum of 250 points; with any wetland scoring more than 200 points in this component alone considered provincially significant):** This component evaluates some biological attributes of wetlands related to rarity that cannot logically be evaluated under other components. It evaluates four sub-components: the geographical rarity of wetlands, the occurrence of rare species, and habitat quality for wildlife, including fish. Ecosystem age is also considered in this component.

Rarity of species is evaluated according to the following sources:

- Fauna and flora of Threatened, Endangered species status in Canada: derived from Committee on the Status of Endangered Wildlife in Canada (COSEWIC); list of Canadian Species at Risk (COSEWIC 2007).
- Fauna and flora of Threatened, Endangered or Special Concern status in Ontario: derived from Committee on the Status of Species at Risk in Ontario (COSSARO); list of Ontario Species at Risk (MNR 2009).
- Rarity of flora and fauna in the province is assessed by the Natural Heritage Information Centre of the MNR. The following S1 to S3 status indicates species that are provincially significant:
  - S1: Critically Imperiled — Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
  - S2: Imperiled — Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
  - S3: Vulnerable — Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- Regional rarity (rarity in the former MNR Central Region) was assessed by Riley *et al.* (1989). A species is considered regionally rare if it occurs in 40 or fewer stations in the area.
- Local rarity (rarity in Site District 7E-4, centred in the City of Toronto, southern York and Peel Regions, and southeastern Halton Region) has been assessed recently by the Ontario Ministry of Natural Resources (Varga *et al.* 2000). A plant species is considered locally rare if it occurs at 12 or fewer stations in this Site District.

Table A-1. Summary of Rationale and Scoring for Biological, Social, Hydrological and Species Features Components of the Ontario Wetland Evaluation System.

| Value  | Rationale  | Attributes Measured   | Score |
|--|--|---|-------|
| <b>Biological Component (a maximum of 250 points; with any wetland scoring more than 200 points in this component alone considered provincially significant)</b> |  |   |       |
| Productivity   | Productivity is a reflection of the ability of an area to produce biomass, as measured by the production of living organisms regardless of species.  | Evaluated by measuring growing degree-days/soils, wetland type (fractional area of swamp, marsh and peatlands), and site type (position of wetland in the landscape; i.e. on a lake, on a stream, in a depression fed by surface water or isolated from surface water inputs and fed by groundwater). | 50    |
| Biodiversity   | Biodiversity is the genetic, taxonomic and ecosystem variety of a given area, environment, ecosystem or the whole planet.  | Evaluated by measuring six attributes related to diversity: number of wetland types, number and type of vegetation communities, diversity of surrounding habitat, proximity to other wetlands, interspersions and open water type.  | 150   |
| Size (Biological Component)  | Size is evaluated by recognizing that some of the biodiversity attributes have the effect of dramatically increasing the overall ecological quality of the wetland.                                  | Evaluated by summing attributes dependent on size (number of wetland types, vegetation communities, diversity of surrounding habitat, proximity to other wetlands, interspersions and open water) within a matrix of size classes   | 50    |
| <b>Social Component (maximum score 250 points)</b>   |  |   |       |
| Economically Valuable Products   | Provides a measure of human utility value that may be lost if a wetland is degraded or destroyed. Economically valuable products in a wetland must be useable on a sustainable basis to be included. | Wood products (forested area), presence or absence of wild rice, presence or absence of commercial fish, presence or absence of snapping turtles and bullfrogs, and number of furbearers present  | 50    |

| Value                                  | Rationale   | Attributes Measured  | Score |
|--|---|--|-------|
| Recreational Activities                | Recreational activities that are specifically dependent on the characteristics of the wetland itself (nature appreciation, hunting and fishing) are scored.   | This component is evaluated by ranking intensity of use for hunting, nature appreciation or ecosystem study, and fishing (high, moderate, low intensity).  | 80    |
| Landscape Aesthetics                   | Landscape Aesthetics have a demonstrable worth to society.  | Two attributes of wetland aesthetics are scored: distinctness and absence of human disturbance.  | 10    |
| Education and Public Awareness         | Education and public awareness includes the <b>current</b> use of wetlands by school groups for educational exercises or observations, the use of wetlands for research, and also the existence of facilities for the interpretation of nature and the environment. | Evaluated by measuring the frequency of use by educational groups (frequent, infrequent, none), the intensity of facilities (interpretation centre, self-guided trails, paths or none) and programs and the sophistication of research conducted long-term research, referred articles published, non-research reports, none). | 40    |
| Proximity to Areas of Human Settlement | Proximity to areas of human settlement is included because when a wetland is located in or near an urban area, subdivision, small town or cottage development, it can be identified, viewed and visited by more people.   | Measured by the distance of the wetland to a settlement, measured along well-travelled roads.  | 40    |
| Ownership                              | The ownership of a wetland may have a bearing on its value to society. More people are likely to benefit from the values of a wetland if it is in some form of public ownership.  | This is evaluated by scoring the fractional area in trust for conservation, in public ownership and private ownership.   | 10    |

| Value  | Rationale  | Attributes Measured  | Score |
|--|--|--|-------|
| Size (Social Component)                                  | Size is included in the context of social function because certain social values are correlated with a wetland's size. Size-dependent social features are resource products with cash value, recreational activities and proximity to urban areas.   | The score for this attribute is derived from a matrix combining wetland size and the total score for size-dependent social features.   | 20    |
| Aboriginal and Cultural Values                           | Wetlands may have values associated with aboriginal use, or historical use by other cultures, in the past  | Aboriginal values derived from wetland products related to, for example, fishing, trapping, wild rice and other plant harvesting, or may result from cultural and spiritual values. Cultural values may stem from noteworthy historical events, as indicated by archaeological sites, historical portages, log chutes, burial sites, historical fishing ports, famous hunt clubs etc. Scored according to whether any attributes are significant, not significant or not known | 30    |
| <b>Hydrological Component (maximum score 250 points)</b> |  |  |       |
| Flood Attenuation  | Reduction in flood peaks in areas downstream of wetlands is an important ecological function, as well as an obvious human value function. The ecological benefits include protection of downstream riparian areas from erosion and sedimentation and from washout or siltation of spawning beds. This function is not considered significant if the wetland is situated on a large lake (Great Lakes and Lake St. Clair) or major river as defined in the OWES | Determined by stepwise measuring of three attributes: the size of the wetland, the size of the wetland basin and the size of other detention areas in the basin  | 100   |

| <b>Value</b>              | <b>Rationale</b>   | <b>Attributes Measured</b>   | <b>Score</b> |
|---------------------------|--|--|--------------|
| Water Quality Improvement | Water quality benefits from wetlands in the temporary storage and transformation of elements. The ability of a wetland to improve water quality is based primarily on the location of the wetland in the watershed rather than on the size of the wetland. | Determined by measuring three attributes: short-term water quality improvement (based on watershed improvement factor, pollution uptake factor, catchment land use factor), function as a long-term nutrient trap (based on scores related to wetland type and position within the landscape) and potential for groundwater discharge (measured by presence of indicators) | 100          |
| Carbon Sink               | Wetlands that are actively accumulating organic soils in the form of peat are a “sink” for atmospheric carbon dioxide  | Measured by extent of organic soils  | 5            |
| Shoreline Erosion Control | Shoreline wetlands, i.e. riverine or lacustrine site types, provide a measure of protection from shoreline erosion caused by flowing water or waves.   | Measured by scoring according to the type of vegetation along the shore  | 15           |
| Groundwater Recharge      | Some wetlands serve a groundwater recharge function, depending on the soil type and the topographic and geologic setting of the wetland  | Measured by scoring according to whether the wetland is on a river (not a major river), or in a depression or isolated in the landscape; combined with soil type   | 60           |

| Value  | Rationale   | Attributes Measured  | Score  |
|--|---|--|--|
| <b>Special Features Component (maximum score 250; a wetland scoring over 200 in this component alone is considered provincially significant)</b> |   |  |  |
| Rarity   | Wetlands support distinctive plant communities, often including rare or unusual species and significant features.   | <ul style="list-style-type: none"> <li>Wetland rarity measured by scoring rarity of wetlands generally, as well as the wetland type, within the Site District;</li> <li>Species rarity scored separately according to presence or absence of rare plant species, breeding habitat of threatened or endangered species, traditional migration habitat for an endangered or threatened species, provincially significant plant or animal species, regionally and locally significant species;</li> </ul> | 80 for wetland type, no maximum for species rarity |
| Significant Features and Habitats  | Some wetlands have special importance because of their geographical location or the unusual nature of their habitat   | Scored for six attributes according to provincial, regional or local significance as judged by MNR: breeding or feeding areas for colonial waterbirds (except Double-crested Cormorant and feeding areas for Great Blue Heron), winter cover for wildlife, waterfowl staging or moulting areas, waterfowl breeding, migratory stopover area, fish habitat.   | 625  |
| Ecosystem Age  | Old ecosystems have special or unique value as they are living representative examples of the time-tested ecological norms of our planet. In such places ecosystem processes can proceed relatively unimpeded by human intervention | Fractional area of peatlands, swamp and marsh  | 75   |

**APPENDIX 2. PSW FACT SHEETS**

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**City of Toronto PSW Survey (2006)**

**PSW Fact Sheet**

| PSW NAME                        | PLANNING DISTRICT | AREA (HA) | UTM GRID REFERENCE   |
|---------------------------------|-------------------|-----------|----------------------|
| East Don Valley Wetland Complex | City of Toronto   | 19.2      | 10 17 314706 4849366 |

**1. LOCATION**

This PSW encompasses the wetlands along the east branch of the Don River. These wetlands are bounded by Leslie Street, Sheppard Avenue, Bayview Avenue, and Finch Avenue.

**2. DESCRIPTION**

This wetland consists of a series of 13 palustrine wetlands, based mainly on groundwater seepage and on depressions in old oxbows adjacent to the river. The landform in the area is the Iroquois Plain, South Slope and Peel Plain which contains plains of water-laid and ice-laid deposits. This wetland complex was revised to include nine small additional wetlands that were within 750 m of the complex, increasing the area from 11 ha to 19 ha. This PSW is composed of 62% swamp and 38% marsh. Vegetation communities in the wetland complex are diverse, with thirty-nine plant communities identified, though most of these are small (under 0.5 ha). Marshes vary with respect to the dominant vegetation. Narrow-leaved cattail (*Typha latifolia*) dominates two of these communities. Other shallow marsh communities are dominated by broad-leaved sedges which mainly include lakebank sedge (*Carex lacustris*) and narrow leaved sedges, including hairy-fruited sedge (*Carex trichocarpa*). The invasive common reed (*Phragmites australis*) has invaded one of these open wetlands. Seventy percent of the wetland complex is situated on organic soils, whereas the rest of the complex is underlain by mineral soils. Another community type that covers a significant amount of the wetland complex is thicket swamps. The dominant vegetation in the thicket swamps varies based on location; being either dominated by speckled alder (*Alnus incana* ssp. *rugosa*) or red-osier dogwood (*Cornus stolonifera*). Other vegetation communities found in this study area include ash swamp, white pine coniferous swamp, and waterweed submerged shallow aquatic. The dominant species in these communities include: black ash (*Fraxinus nigra*), white pine (*Pinus strobus*), and nuttall's waterweed (*Elodea nuttallii*).

Fauna is dominated by bird species that can nest in a variety of large and small habitats, such as black-capped chickadee, gray catbird, blue jay, cedar waxwing, and American goldfinch. A few regionally less common species of bird were noted within the PSW, including yellow-billed cuckoo, wood thrush, sharp-shinned hawk, green heron, great blue heron, beaver, and black-crowned night-heron. In addition, there are some regionally rare mammals in the wetland complex such as star-nosed mole and beaver.

### 3. SUMMARY OF SCORES USED IN PSW DESIGNATION

The Ontario Wetland Evaluation System (OWES), 1993 edition and 2005 updates, should be used as a reference when reading this checklist. This checklist provides a summary of a complex series of evaluation scores that should be interpreted further through the OWES.

Wetland evaluation scores from the pre-2006 Ministry of Natural Resources wetland evaluation record and evaluation scores revised after the 2006-2007 field investigations carried out in this study for the East Don Valley Wetland Complex are provided below.

| Component                                  | Score Prior to 2006 | Score based on 2006/2007 field data | Maximum Score available |
|--|---------------------|-------------------------------------|-------------------------|
| Total Score for Biological Component       | 84                  | 105                                 | 250                     |
| Total Score for Social Component           | 125                 | 159                                 | 250                     |
| Total Score for Hydrological Component     | 210                 | 242                                 | 250                     |
| Total Score for Special Features Component | 194                 | 250                                 | 250                     |
| <b>Total Score</b>                         | <b>613</b>          | <b>756</b>                          | <b>1000</b>             |

Note: A wetland is designated provincially significant if the total score is 600 or more points, or if the Biological or Special Features Component is 200 or more points.

#### Other Designations:

- This PSW is also included as part of the East Branch Don River Candidate Provincial Life Science Area of Natural and Scientific Interest (ANSI) by MNR.
- This area is identified as a potential ESA (East Don Valley Swamp) in the City of Toronto (NSE/Dougan 2008).
- This area was identified as an ESA in 1982 by TRCA (number 69)

### 4. DETAILED ANALYSIS OF SCORING

#### A. Biological Component

##### i) Score for Productivity

- *Growing Degree-days – 14/30 points based on 3200-3600 growing degree-days with clay-loam and humic-mesic soils*
- *Wetland Type – 11/15 points based on proportion of swamp and marsh*
- *Site Type – 2/5 points based on palustrine (permanent or intermittent flow) proportions of wetland*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### A. Biological Component

###### ii) Score for Biodiversity

- *Number of Wetland Types - 13/30 points based on two wetland types*
- *Vegetation Communities - 23/45 points based on low number of vegetation forms*
- *Diversity of Surrounding Habitat - 6/7 points based on moderate diversity of surrounding habitat*
- *Proximity to Other Wetlands - 8/8 points based on hydrological connection to open lake/deep river within 1.5km*
- *Interspersion - 12/30 points based on 61 to 80 intersections between communities*
- *Open Water Types - 8/30 points based on type 1 open water*

###### iii) Score for Size

- *8/50 points: based on cumulative total of 19.2 ha and a score of 70 for biodiversity subcomponent*

##### B. Social Component

###### i) Score for Economically Valuable Products

- *Area of wetland forested – 0/18 points based on <5 ha*
- *Wild Rice Present or Absent – 0/6 points based on not present*
- *Commercial Bait Fish and/or Coarse Fish Present or habitat not suitable for fish – 12/12 points based on presence*
- *Bullfrogs Present or Absent – 0/1 point based on absence*
- *Snapping Turtles present or Absent – 0/1 point based on absence*
- *Furbearers Present or Absent – 9/12 points based on three species noted – Habitat present 2006*

###### ii) Score for Recreational Activities

- *High, moderate, low – 40/80 points based on use by Woodbine Jr. High School, public lands with maintained trails, benches and signage*

###### iii) Score for Landscape Aesthetics

- *Distinctness – 3/3 points based on clearly distinct wetlands*
- *Absence of Human Disturbance – 4/7 points based on localized disturbance*

###### iv) Score for Education and Public Awareness

- *Educational Uses – 20/20 points based on frequent use by Woodbine Jr. High School*
- *Facilities and Programs – 2/8 points based on trails, benches and lookouts*
- *Research and Studies – 5/12 points based on reports on some aspect of wetland features*

###### v) Scores for Proximity to Areas of Human Settlement and ownership

- *Distance of Wetland from Settlement – 40/40 points based on close proximity of wetland to a city of more than 10,000 inhabitants*
- *Score of 8/10 for public ownership not in trust for wetland protection*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### B. Social Component

###### vii) Score for Size (in the Context of Social Component)

- *Size combined with social attributes that are size-dependent - 16/20 points for wetland size 19.2 ha, combined with score of 91-105 for size-dependent social features (economically valuable products, recreational activities, proximity to areas of human settlement)*

###### viii) Score for Aboriginal and Cultural Heritage Value

- *Aboriginal Values – 0/30 points based on none known*
- *Cultural Heritage Values – 0/30 points based on none known*

##### C. Hydrological Component

###### i) Score for Flood Attenuation

- *100/100 points based on storage area provided by wetland relative to catchment area*

###### ii) Score for Water Quality Improvement

- *Short-Term Water Quality Improvement – 41/60 points based on water quality improvement factor, land use factor and pollutant uptake factor*
- *Long-Term Nutrient Trap – 10/10 points based on more than 50% of the wetland having organic soil*
- *Groundwater Discharge – 29/30 points based on high potential for groundwater discharge (extensive seeps, steep slopes)*

###### iii) Score for Function as Carbon Sink

- *5/5 points based on no coverage by organic soils*

###### iv) Score for Shoreline Erosion Control

- *0/15 points based on wetland isolated or palustrine*

###### v) Score for Ground Water Recharge

- *Wetland Site Type – 50/50 points based on isolated or palustrine wetland*
- *Wetland Soil Recharge Potential – 7/10 points based on palustrine wetland type*

##### D. Special Features Component

###### i) Score for Rarity

- *Wetland Rarity within the Landscape and Rarity of Wetland Type – 80/80 based on rarity within the landscape of swamp and marsh*

###### ii) Score for Rare Species

- *Breeding Habitat for an Endangered or Threatened Species: 250 points for each species, no maximum – 0 points based on no evidence of breeding habitat for endangered or threatened species*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

###### ii) Score for Rare Species

- *Traditional Migration or Feeding Habitat for an Endangered or Threatened Species – 0 points (no maximum, see OWES for formula) based on no evidence of migration or feeding habitat for endangered or threatened species*
- *Provincially Significant Animal Species – 50 points (no maximum, see OWES for formula) based on one provincially significant animal species*
  - Black-crowned Night-heron
- *Provincially Significant Plant Species – 50 points (no maximum, see OWES for formula) based on one provincially significant plant species (habitat present 2006):*
  - Hairy-fruited sedge (*Carex trichocarpa*) – S3: habitat present 2006
- *Regionally (Former MNR Central Region) Significant Species – 30 points (no maximum, see OWES for formula) based on two regionally significant species*
  - Nuttall’s Waterweed (*Elodea nuttallii*)
  - Springs Clearweed (*Pilea fontana*)
- *Locally Significant Species (Site District 7E-4) – 83 points (no maximum, see OWES for formula) based on 44 locally significant species (habitat present 2006):*
  - Sweetflag (*Acorus americanus*)
  - Speckled Alder (*Alnus incana ssp. rugosa*)
  - Great Angelica (*Angelica atropurpurea*)
  - Three-parted Beggar’s ticks (*Bidens tripartitus*)
  - Fringed brome (*Bromus ciliatus*)
  - Pennsylvania Bittercress (*Cardamine pennsylvanica*)
  - Bristly Sedge (*Carex comosa*)
  - Softleaf Sedge (*Carex disperma*)
  - Inland Sedge (*Carex interior*)
  - Smooth-sheath Sedge (*Carex laevivaginata*)
  - Bristly-stalk Sedge (*Carex leptalea ssp. leptalea*)
  - Finely-nerved Sedge (*Carex leptoneuria*)
  - Prairie Sedge (*Carex prairiea*)
  - Tussock Sedge (*Carex stricta*)
  - American Golden-saxifrage (*Chrysosplenium americanum*)
  - Stout Wood-reedgrass (*Cinna arundinacea*)
  - Nodding Wood-Reedgrass (*Cinna latifolia*)
  - Goldthread (*Coptis trifolia ssp. groenlandica*)
  - Small Lady’s-Slipper (*Cypripedium calceolus var. parviflorum*)
  - Showy Lady’s-slipper (*Cypripedium reginae*)
  - Clinton’s Wood fern (*Dryopteris clintoniana*)
  - Crested Wood fern (*Dryopteris cristata*)
  - Water Horsetail (*Equisetum fluviatile*)
  - Marsh Horsetail (*Equisetum palustre*)
  - Woodland Horsetail (*Equisetum sylvaticum*)
  - Purple Avens (*Geum rivale*)

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

###### ii) Score for Rare Species (continued)

- Oak Fern (*Gymnocarpium dryopteris*)
- American Water-pennywort (*Hydrocotyle americana*)
- Tamarack (*Larix laricina*)
- Tufted Loosestrife (*Lysimachia thyrsiflora*)
- Naked Bishop's-cap (*Mitella nuda*)
- Yellow Water-lily (*Nuphar variegatum*)
- Eastern Ninebark (*Physocarpus opulifolius*)
- Water Smartweed (*Polygonum amphibium*)
- Alder-leaved Buckthorn (*Rhamnus alnifolia*)
- Smooth Gooseberry (*Ribes hirtellum*)
- Swamp Red-currant (*Ribes triste*)
- Water Dock (*Rumex orbiculatus*)
- Rough-leaved Goldenrod (*Solidago patula*)
- Rough-stemmed Goldenrod (*Solidago rugosa* ssp. *rugosa*)
- Large Bur-reed (*Sparganium eurycarpum*)
- Longleaf Stitchwort (*Stellaria longifolia*)
- American Speedwell (*Veronica americana*)
- Sweet White Violet (*Viola blanda*)

###### iii) Score for Significant Features and/or Fish and Wildlife Habitat

- *Nesting of Colonial Waterbirds – 15/50 points based on none known*
- *Winter Cover for Wildlife – 0/100 points based on little or poor winter cover present*
- *Waterfowl Staging or Moulting – 10/150 points based on no information*
- *Waterfowl Breeding – 10/100 points based on habitat suitable*
- *Migratory Passerine, Shorebird or Raptor Stopover Area – 0/100 points based on not significant*

###### iv) Score for Fish Habitat

- *Spawning and Nursery Habitat – 2/100 points based on significance in Site District*
- *Fish Migration and Staging Habitat – 0/25 points based on not present*

###### v) Score for Ecosystem Age

- *2/25 points based on swamp and marsh habitat*

###### vi) Score for Coastal Wetland

- *0/75 based on not present*

#### 5. EXTRA INFORMATION

- Purple Loosestrife present
- Seasonal (1-3 months) and semi-permanent (> 3 months) flooding present

**6. SIGNIFICANCE**

This site should continue to be considered a PSW according to the following rationale:

- Total score > 600; Special Features score >200

**7. MANAGEMENT NEEDS**

- Debris should be removed, ad hoc trails should be managed, trails should be planned and a few primary trails surfaced to eliminate impacts.
- Non-native species, particularly purple loosestrife, European alder, common buckthorn and giant reed grass, should be removed.
- Some communities may be changing due to succession; portions of the open communities appear from comparison of 2003 aerial photography with original wetland mapping to have become smaller, with the possibility that the treed communities have encroached into these open communities.
- Upland communities (field and forest) need to be maintained adjacent to the wetland, as they provide habitat for nesting turtles and waterfowl.

**8. Rationale for Boundary Revisions:** The locations and boundaries of vegetation communities have been revised as part of the 2006-2007 field work; with a change in the total area of the wetland complex, and the addition of nine wetlands. Boundaries were refined based on further field surveys and on review and verification with MNR; plant community boundaries have been revised to account for greater accuracy in the representation on the map and finer delineation of some communities.

**9. PRINCIPLE REFERENCES**

Field work North-South Environmental 2006, Dougan and Associates 2006, MNR 1993, 2005, 2006, 2007a



# East Don Valley Wetland Complex

October 2007



### Legend

-  Revised/Confirmed PSW Boundary Based on 2006/07 Field Work
-  PSW Boundary Prior to 2006/07 Field Work
-  Roads



1:6,000

0 100 200 400  
Meters

Orthoimagery from City of Toronto 2003  
PSW boundary based on MNR, October 2007



**City of Toronto PSW Survey (2006)**

**PSW Fact Sheet**

| PSW NAME                       | PLANNING DISTRICT | AREA (HA) | UTM GRID REFERENCE   |
|--------------------------------|-------------------|-----------|----------------------|
| Highland Creek Wetland Complex | City of Toronto   | 12.9      | 10 17 333070 4847845 |

**1. LOCATION**

This PSW encompasses wetlands at the mouth of Highland Creek, just north of the Highland Creek Sewage Treatment Plant. It is bounded to the north by residential development along Lawrence Ave, to the west by residential development and the Treatment Plant, to the east by residential development, and to the south by the CN railway line, the Highland Creek Treatment Plant, and the shore of Lake Ontario.

**2. Description**

This PSW occurs within a river mouth valley that cuts through the Iroquois Plain. It encompasses four individual wetlands, with communities roughly evenly divided between marsh and swamp (mainly dominated by willow), with 98% on predominantly clay-loam soils and 2% on sandy soils. 85% of the wetland complex is lacustrine and 15% is palustrine. The wetlands are in most cases along the floodplain of Highland Creek, which near its mouth is highly influenced by the levels of Lake Ontario. The natural area surrounding the marshes is extensive, including the steep wooded valley walls of Highland Creek as well as intervening forests and successional areas.

Ten wetland community types have been delineated within the PSW. These include community types within the broad categories of willow swamp, mainly dominated by the non-native hybrid willow (*Salix X rubens*), meadow marsh, mineral shallow marsh, willow mineral thicket swamp and duckweed floating-leaved shallow aquatic marsh. Dominant plant species include hybrid willow, cattail (*Typha X glauca*, *T. angustifolia*), reed canary-grass (*Phalaris arundinacea*) and sedges (e.g. lakebank sedge, *Carex lacustris*), with smaller areas dominated by Canada blue-joint (*Calamagrostis canadensis*), jewelweed (*Impatiens capensis*). Revisions to the location and boundaries of some of the wetland community polygons were made, including an extension of approximately 100 m to the west of wetland 2 based on 2006/2007 field work. This resulted in an increase in the total area of the PSW from 7.6 ha to 12.9 ha.

Fifty-five species of fauna were noted in 2006 surveys. Fauna is dominated by bird species that can nest in a variety of large and small habitats, such as black-capped chickadee, common grackle, and northern cardinal. A few wetland-dependent species of marsh were noted within the PSW, including swamp sparrow and frog species including bullfrog and gray treefrog. Forest-dependent species are also found in the wetland and its surrounding natural area, including area-sensitive species such as Brown Creeper and Veery.

**3. SUMMARY OF SCORES USED IN DESIGNATION**

The Ontario Wetland Evaluation System (OWES), 1993 edition and 2002 updates, should be used as a reference when reading this checksheet. This checksheet provides a summary of a complex series of evaluation scores that should be interpreted further through the OWES.

### 3. SUMMARY OF SCORES USED IN DESIGNATION (continued)

Wetland evaluation scores from the pre-2006 Ministry of Natural Resources wetland evaluation record and evaluation scores revised after the 2006-2007 field investigations carried out in this study for the East Don Valley Wetland Complex are provided below.

| Component                                  | Score Prior to 2006 | Score based on 2006/2007 field data | Maximum Score Available |
|--|---------------------|-------------------------------------|-------------------------|
| Total Score for Biological Component       | 112                 | 116                                 | 250                     |
| Total Score for Social Component           | 169                 | 170                                 | 250                     |
| Total Score for Hydrological Component     | 142                 | 20                                  | 250                     |
| Total Score for Special Features Component | 226                 | 250                                 | 250                     |
| <b>Total Score</b>                         | <b>649</b>          | <b>556</b>                          | <b>1000</b>             |

Note: A wetland is designated provincially significant if the total score is 600 or more points, or if the Biological or Special Features Component is 200 or more points.

#### Comments:

Changes have been recommended to the location and boundaries of some polygons. This did not change the overall significance of the wetland. The hydrological score was substantially decreased because the wetland was re-assessed as lacustrine on the Great Lakes (Highland Creek in this location is strongly influenced by the water levels in Lake Ontario).

#### Other Designations:

- This area was evaluated as a Sensitive Feature by MNR within the Site District because of its large numbers of breeding and migrating waterfowl (Hanna 1984)
- This area is considered a potential ESA (Stephenson's Swamp/Highland Creek East) within the City of Toronto (NSE/Dougan 2008),
- This area was identified as an ESA by TRCA (number 74: Stephenson's Swamp)

### 4. DETAILED ANALYSIS OF SCORING

#### A. Biological Component

##### i) Score for Productivity

- *Growing Degree-days – 26/30 points based on 3600-4000 growing degree-days with clay-loam and sandy soils*
- *Wetland Type – 11/15 points based on proportion of swamp and marsh*
- *Site Type – 5/5 points based on lacustrine, riverine and palustrine proportions of wetland*

#### 4. DETAILED ANALYSIS OF SCORING

##### A. Biological Component

###### ii) Score for Biodiversity

- *Number of Wetland Types: - 13/30 points based on two wetland types*
- *Vegetation Communities- 13/45 points based on low to moderate number of vegetation forms*
- *Diversity of Surrounding Habitat- 6/7 points based on moderate diversity of surrounding habitat (present in 2006)*
- *Proximity to Other Wetlands- 8/8 points based on hydrological connection with open lake*
- *Interspersion – 12/30 points based on 61 to 80 intersections between communities*
- *Open Water Types – 14/30 points based on type 3 open water*

###### iii) Score for Size

- *8/50 points: based on cumulative total of 12.9 ha and score of 62 for biodiversity subcomponent*

##### B. Social Component

###### i) Score for Economically Valuable Products

- *Area of wetland forested – 3/18 points based on 5-25 ha*
- *Wild Rice Present or Absent – 0/6 points based on absence*
- *Commercial Bait Fish and/or Coarse Fish Present or habitat not suitable for fish – 12/12 points based on presence*
- *Bullfrogs Present or Absent – 1/1 point based on presence (updated in 2006)*
- *Snapping Turtles present or Absent – 1/1 point based on presence (updated in 2006)*
- *Furbearers Present or Absent – 12/12 points based on 5 species noted, habitat still suitable 2006*

###### ii) Score for Recreational Activities

- *High, moderate, low – 48/80 points based on public land used for nature enjoyment (Toronto Field Naturalists, Bruce Trail Club, fishing)*

###### iii) Score for Landscape Aesthetics

- *Distinctness – 3/3 points based on distinctness of wetlands*
- *Absence of Human Disturbance – 2/7 points based on moderate disturbance*

###### iv) Score for Education and Public Awareness

- *Educational Uses – 20/20 points based on frequent use by Toronto Field Naturalists*
- *Facilities and Programs – 0/8 points based on none in evidence*
- *Research and Studies – 5/12 points based on reports on some aspect of wetland functions (City of Scarborough, TRCA, MNR, City of Toronto)*

###### v) Score for Proximity to Areas of Human Settlement

- *Distance of Wetland from Settlement – 40/40 points based on close proximity of wetland to a city of more than 10,000 inhabitants*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### **B. Social Component**

vi) Score for Ownership

- *Fractional Area of Wetland in Private or Public Ownership, as well as Fractional Area Protected – 8/10 points based on entire wetland in public ownership*

vii) Score for Size (in the Context of Social Component)

- *Size combined with social attributes that are size-dependent - 15/20 points for wetland size 12.9 ha, combined with total score of 114 for size-dependent social features (economically valuable products, recreational activities, proximity to areas of human settlement)*

viii) Score for Aboriginal and Cultural Heritage Value

- *Aboriginal Values – 0/30 points based on none known*
- *Cultural Heritage Values – 0/30 points based on none known*

##### **C. Hydrological Component**

i) Score for Flood Attenuation

*0/100 points based on location of wetland on Lake Ontario*

ii) Score for Water Quality Improvement

- *Short-Term Water Quality Improvement – 0/60 points based on location on Lake Ontario*
- *Long-Term Nutrient Trap – 0/10 points based on location on Lake Ontario*
- *Groundwater Discharge – 12/30 points based on moderate potential for groundwater discharge*

iii) Score for Function as Carbon Sink

*0/5 points based on no coverage by organic soils*

iv) Score for Shoreline Erosion Control

*8/15 points based on emergent vegetation along creek*

v) Score for Ground Water Recharge

- *Wetland Site Type – 0/50 points based on wetland > 50% lacustrine*
- *Wetland Soil Recharge Potential – 0/10 points based on lacustrine wetland type*

##### **D. Special Features Component**

i) Score for Rarity

*Wetland Rarity within the Landscape and Rarity of Wetland Type – 80/80 based on rarity within the landscape of swamp and marsh, 0 based on rarity of wetland type*

ii) Score for Rare Species

- *Breeding Habitat for an Endangered or Threatened Species: 250 points for each species, no maximum – 0 points based on none known*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### ii) Score for Rare Species (continued)

- *Traditional Migration or Feeding Habitat for an Endangered or Threatened Species – 0 points (no maximum, see OWES for formula) based on none known*
- *Provincially Significant Animal Species – 80 points (no maximum, see OWES for formula) based on two provincially significant species*
  - *Black-crowned Night-Heron (noted in 2006)*
  - *Caspian Tern (noted in 2006)*
- *Provincially Significant Plant Species – 0 points (no maximum, see OWES for formula) based two provincially significant species*
- *Regionally Significant Species (Former MNR Central Region, Site Region) – 0 points (no maximum, see OWES for formula) based on one regionally significant species*
- *Locally Significant Species (Site District 7E-4) – 52 points (no maximum, see OWES for formula) based on 13 plant species (noted in 2006-2007), to be revised in final report*
  - *Sweetflag (Acorus americanus)*
  - *Speckled Alder (Alnus rugosa ssp. incana)*
  - *Three-parted Beggar's Ticks (Bidens tripartita)*
  - *Nodding Wood-reed Grass (Cinna arundinacea)*
  - *Needle Spike-rush (Eleocharis acicularis)*
  - *Water Horsetail (Equisetum palustre)*
  - *Swamp Loosestrife (Lysimachia terrestris)*
  - *Water Smartweed (Polygonum amphibium)*
  - *River Bulrush (Scirpus fluviatilis)*
  - *Great Bur-reed (Sparganium americanum)*
  - *White Meadowsweet (Spiraea alba)*
  - *American Germander (Teucrium canadense)*
  - *Northern Water-meal (Wolffia borealis)*

##### iii) Score for Significant Features and/or Fish and Wildlife Habitat

- *Nesting of Colonial Waterbirds – 15/50 points based on feeding area for Black-crowned Night Heron (noted in 2006)*
- *Winter Cover for Wildlife – 0/100 points based on none known*
- *Waterfowl Staging or Moulting – 10/150 points based on known to occur; however, MNR Sensitive Area report (MNR file, unpublished) documents this marsh as an important stopover area for migrating waterfowl*
- *Waterfowl Breeding – 10/100 points based on suitable habitat; the Sensitive Area Report form (MNR File, Unpublished) notes that the estuary and floodplain of Highland Creek are very productive areas of breeding waterfowl.*
- *Migratory Passerine, Shorebird or Raptor Stopover Area – 0/100 points based on not significant*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

iv) Score for Fish Habitat

- *Spawning and Nursery Habitat – 50/100 points based on significance in Site District*
- *Fish Migration and Staging Habitat – 10/25 points based on local significance*

v) Score for Ecosystem Age

- *2/25 points based on roughly equal proportions of swamp and marsh*

vi) Score for Coastal Wetland

- *25/75 based on coastal wetland 10-50 ha*

#### 5. EXTRA INFORMATION

- Purple Loosestrife present in 2-many locations
- All types seasonally flooded areas present

#### 6. SIGNIFICANCE

This site should continue to be considered a PSW according to the following rationale:

- Total score > 600; Special Features score >200

#### 7. MANAGEMENT NEEDS

- Debris observed washed up on bank of creek, creek generally had very high flows. Some dumping of yard waste observed adjacent to private houses at the edge of the ravine. Some trails evident. Non-native plant species include privet (*Ligustrum vulgare*), common reed (*Phragmites australis*), reed canary-grass (*Phalaris arundinacea*), purple loosestrife.
- Debris should be removed, ad hoc trails should be managed, trails should be planned and a few primary trails surfaced to eliminate impacts. Non-native species, particularly giant reed grass, should be removed.

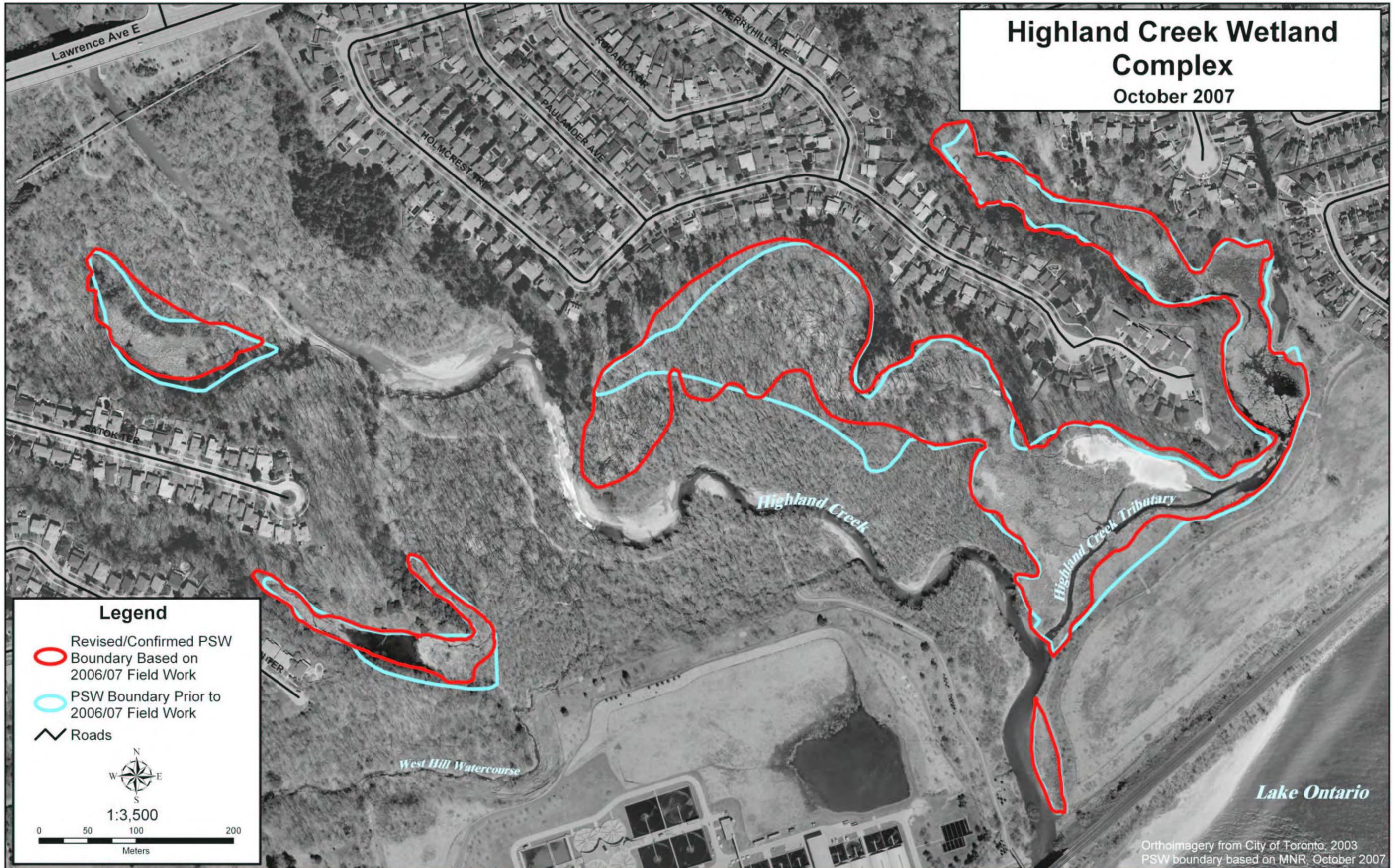
#### 8. RATIONALE FOR BOUNDARY REVISIONS: Minor revisions are shown to wetland boundaries, with an extension of approximately 100 m to the wetland at the south end of the complex.

#### 9. PRINCIPLE REFERENCES

Field work Dougan and Associates 2006, Field work North-South Environmental 2006, MNR 1994, 2006, 2007b

# Highland Creek Wetland Complex

October 2007



## Legend

- Revised/Confirmed PSW Boundary Based on 2006/07 Field Work
- PSW Boundary Prior to 2006/07 Field Work
- Roads



1:3,500



Orthoimagery from City of Toronto, 2003  
PSW boundary based on MNR, October 2007



**City of Toronto PSW Survey (2006)**

**PSW Fact Sheet**

| PSW NAME                            | PLANNING DISTRICT | AREA (HA) | UTM GRID REFERENCE   |
|-------------------------------------|-------------------|-----------|----------------------|
| Lower Humber River Wetland Complex- | City of Toronto   | 25.6      | 10 17 305589 4833739 |

**1. LOCATION**

This PSW encompasses marshes and swamps along the Lower Humber River floodplain from the rivermouth to Dundas Street. The southern extent of the wetland is separated from Lake Ontario by three major roadways (the Gardiner Expressway, The Queensway and Lake Shore Boulevard), which have large spans above the river but effectively terminate the wetland area. The wetland is bounded to the east and west mainly by intensive urban development. The north end of the PSW is bounded by manicured land at Dundas Street. The Humber Treatment Plant is located adjacent to the west side of the PSW at the rivermouth. Additional major road crossings include a bridge on Bloor Street and a bridge at Old Mill Road just to the north. The wetlands are encompassed by the Toronto Humber Yacht Club and several parks, including Humber Marshes Park, King’s Mill Park, Etienne Brulé Park, and Home Smith Park.

**2. DESCRIPTION**

This PSW consists of 15 wetlands, comprising an area of 25.6 ha of swamp (84%) and marsh (16%). Nineteen wetland community types have been delineated within the PSW. The complex consists of 86.7% lacustrine wetlands (wetlands primarily supported by lake processes) at the rivermouth and 9.7% riverine wetlands (wetlands supported by river flooding) above the lake level within the floodplain. One small wetland (3.6% of the wetland complex) just north of Bloor Street is palustrine (a wetland with an outflow but no inflow), based on groundwater discharge. 96% of the wetland is underlain by clay/loam soils, with 4% underlain by organic soils.

Submergent and floating aquatic vegetation types comprise 50% of the wetland complex, and are present in areas that are constantly flooded. They predominate in coastal bays and in a pond in an old oxbow. These are dominated by pondweeds (*Potamogeton* spp.), common coontail (*Ceratophyllum demersum*) and Eurasian water-milfoil (*Myriophyllum spicatum*), with bullhead lily (*Nuphar variegatum*) and fragrant water-lily (*Nymphaea odorata*). The oxbow pond is vegetated with duckweed (*Lemna minor*).

Shallow aquatic marshes dominate 17.8% of wetlands, with most of these in the lacustrine areas where flooding is seasonal. They are dominated by cattails (*Typha* spp.), river bulrush (*Scirpus fluviatilis*), and giant reed grass (*Phragmites australis*), with reed canary-grass (*Phalaris arundinacea*) and several forb species. Upper margins of wetlands, flooded less frequently, are vegetated with meadow-marshes sustaining mainly grasses (reed canary-grass being the most common), sedges such as lakebank sedge (*Carex lacustris*) and forbs such as the non-native purple loosestrife (*Lythrum salicaria*), touch-me-not (*Impatiens capensis*) and other wetland and transitional species.

Swamps cover 14.8% of wetlands. The northernmost wetland between Dundas and Bloor is supported by groundwater seepage, and sustains an open deciduous swamp unusual in the Toronto area dominated by yellow birch (*Betula papyrifera*) and red maple (*Acer rubrum*), with a ground layer of sensitive fern

## 2. DESCRIPTION (continued)

(*Onoclea sensibilis*) and skunk-cabbage (*Symplocarpus foetidus*). Deciduous swamps dominated by hybrid willow are also noted in transitional areas at the edge of lacustrine wetlands near the mouth of the river.

Fauna mainly includes bird species that nest in a variety of open woodlands and thickets, such as song sparrow, gray catbird, blue-gray gnatcatcher, eastern kingbird and common grackle. Many adaptable bird species dependent on open wetlands were noted within the PSW, including waterfowl such as mallard, Canada goose, gadwall and green-winged teal, and songbirds such as red-winged blackbird and spotted sandpiper. Gadwall and green-winged teal are dependent on open upland areas adjacent to the wetland for nesting. Several species are present that depend on large cavities in dead trees for nest sites, including red-headed woodpecker (a confirmed breeding species which is provincially rare), hooded merganser, eastern screech-owl, American kestrel, wood duck and hairy woodpecker. This indicates that the presence of large dead trees, which support habitat for cavity-nesters, is a critical contributor to this wetland's function. Reptile species include northern map turtle, Blanding's turtle, abundant painted turtle and pond slider, which is an introduced species. Breeding amphibians include abundant American toads and leopard frogs. Spotted salamanders have been noted breeding in the Lower Humber River wetlands in the past, but searches for this species have not been conducted for many years. Mammals noted within the PSW included wetland-dependent species such as muskrat and beaver. Common urban mammals such as raccoon, Virginia opossum and coyote have also been documented.

The area is documented as a stopover area for migrating songbirds. The wetlands in this complex near the mouth are highly significant for fish, with 50 fish species noted.

## 3. SUMMARY OF SCORES USED IN DESIGNATION

The Ontario Wetland Evaluation System (OWES), 1993 edition and 2002 updates, should be used as a reference when reading this checklist. This checklist provides a summary of a complex series of evaluation scores that should be interpreted further through the OWES.

Wetland evaluation scores from the pre-2006 Ministry of Natural Resources wetland evaluation record and evaluation scores revised after the 2006-2007 field investigations carried out in this study for the East Don Valley Wetland Complex are provided below.

| Component                                  | Score Prior to 2006 | Score based on 2006/2007 field data | Maximum Score Available |
|--|---------------------|-------------------------------------|-------------------------|
| Total Score for Biological Component       | 129                 | 130                                 | 250                     |
| Total Score for Social Component           | 212                 | 212                                 | 250                     |
| Total Score for Hydrological Component     | 22                  | 22                                  | 250                     |
| Total Score for Special Features Component | 250                 | 250                                 | 250                     |
| <b>Total Score</b>                         | <b>613</b>          | <b>614</b>                          | <b>1000</b>             |

### 3. SUMMARY OF SCORES USED IN DESIGNATION

Note: A wetland is designated provincially significant if the total score is 600 or more points, or if the Biological or Special Features Component is 200 or more points.

#### Comments:

Double-crested Cormorant was used in the 2007 MNR update to add 50 points to the score for nesting area for colonial birds. However, this species can no longer be used to score the Special Features component (2002 OWES update). However, this will not change the Special Features score, as it is well over the maximum of 250 points.

Additional Threatened species' feeding habitat (Blanding's turtle) adds 150 points to Special Features score; however, this will not change the score for Special Features, which is at the maximum already.

#### Other Designations:

- This area, as well as surrounding uplands, are included in the Humber Valley Life Science Area of Natural and Scientific Interest by MNR
- Most of this area (the east side of the river as far as Bloor Street, and including additional upland areas) is designated as an ESA (the Humber Valley ESA) by the City of Toronto. The west side of the valley is considered a potential ESA (Humber Valley Extension) (NSE/Dougan 2008)
- This area was identified as an ESA by TRCA (number 5)

### 4. DETAILED ANALYSIS OF SCORING

#### A. Biological Component

##### i) Score for Productivity

- *Growing Degree-days – 26/30 points based on 3600-4000 growing degree-days with mainly clay-loam soils and a small proportion of organic soils*
- *Wetland Type – 14/15 points based on swamp and marsh wetland types*
- *Site Type – 5/5 points based on predominantly lacustrine, riverine and a small proportion of palustrine site types*

##### ii) Score for Biodiversity

- *Number of Wetland Types: - 13/30 points based on two wetland types*
- *Vegetation Communities – 15/45 points based on vegetation communities mainly with 1-3 vegetation forms*
- *Diversity of Surrounding Habitat – 4/7 points based on moderate diversity of surrounding habitat*
- *Proximity to Other Wetlands – 8/8 points based on proximity of wetland to open lake*
- *Interspersion – 15/30 points based on 82 intersections of plant communities*
- *Open Water Types – 20/30 points based on Type 4 open water*

##### ii) Score for Size

- *10/50 points: based on cumulative total of 75 points for biodiversity, area of 25.6 ha*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### B. Social Component

###### i) Score for Economically Valuable Products

- *Area of wetland forested – 3/18 points based on 4 ha*
- *Wild Rice Present or Absent – 0/6 points based on absence*
- *Commercial Bait Fish and/or Coarse Fish Present or habitat not suitable for fish – 12/12 points based on species present*
- *Bullfrogs Present or Absent – 0/1 point based on absence*
- *Snapping Turtles present or Absent – 1/1 point based on presence*
- *Furbearers Present or Absent – 12/12 points based on five species present*

###### ii) Score for Recreational Activities high, moderate, low

- *80/80 points based on high use by naturalist groups and fishers*

###### iii) Score for Landscape Aesthetics

- *Distinctness – 3/3 points based on distinctness*
- *Absence of Human Disturbance – 2/7 points based on moderate disturbance*

###### iv) Score for Education and Public Awareness

- *Educational Uses – 20/20 points based on hikes led by Toronto Field Naturalists*
- *Facilities and Programs – 2/8 points based on maintained paths*
- *Research and Studies – 12/12 points based on research and non-research reports*

###### v) Score for Proximity to Areas of Human Settlement

- *Distance of Wetland from Settlement – 40/40 points based on close proximity of wetland to a city of more than 10,000 inhabitants*

###### vi) Score for Ownership

- *Fractional Area of Wetland in Private or Public Ownership, as well as Area Protected – 8/10 points based on ownership 100% public*

###### vii) Score for Size (in the Context of Social Component)

- *Size combined with social attributes that are size-dependent - 17/20 points for wetland size 25.6 ha, combined with cumulative score of 128 for size-dependent social features (economically valuable products, recreational activities, proximity to areas of human settlement)*

###### viii) Score for Aboriginal and Cultural Heritage Value

- *Aboriginal Values – 0/30 points based on unknown*
- *Cultural Heritage Values – 0/30 points based on unknown*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### C. Hydrological Component

###### i) Score for Flood Attenuation

- *0/100 points based on storage area provided by wetland relative to catchment area*

###### ii) Score for Water Quality Improvement

- *Short-Term Water Quality Improvement – 0/60 points based on position of wetlands on Lake Ontario*
- *Long-Term Nutrient Trap – 0/10 points based on position of wetlands on Lake Ontario*
- *Groundwater Discharge – 14/30 points based on high evidence of groundwater discharge in some areas*

###### iii) Score for Function as Carbon Sink

- *0/5 points based on low coverage of area by organic soils*

###### iv) Score for Shoreline Erosion Control

- *8/15 points based on emergent shoreline vegetation*

###### v) Score for Ground Water Recharge

- *Wetland Site Type – 0/50 points based on lacustrine site type*
- *Wetland Soil Recharge Potential – 0/10 points based on lacustrine wetland type*

##### D. Special Features Component

###### i) Score for Rarity

*Wetland Rarity within the Landscape and Rarity of Wetland Type – 80/80 based on rarity within the landscape score*

###### ii) Score for Rare Species

- *Breeding Habitat for an Endangered or Threatened Species: 250 points for each species, no maximum – 0 points based on none present (note: red-headed woodpecker has been re-assessed at Threatened at the national level, and may be re-assessed as Threatened at the provincial level).*
- *Traditional Migration or Feeding Habitat for an Endangered or Threatened Species – 150 points (no maximum, see OWES for formula) based on*
  - *Blanding's Turtle (Threatened) - documented in 2006)*
- *Provincially Significant Animal Species – 152 points (no maximum, see OWES for formula) based on 13 species*
  - *Black-crowned Night-heron (noted foraging 2006)*
  - *Caspian Tern (noted foraging 2006)*
  - *Great Egret (noted nesting 2003)*
  - *Northern Map Turtle (noted 2006)*
  - *Eastern Milksnake (noted 2006)*
  - *Golden Eagle (1994; rare foraging)*
  - *Great Black-backed Gull (rare visitor)*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### ii) Score for Rare Species (continued)

- *Provincially Significant Animal Species – 152 points (no maximum, see OWES for formula) based on 13 species*
  - Little Gull (rare visitor)
  - Red-headed Woodpecker – 2 confirmed nests in 2003
  - Red-necked Grebe (rare visitor)
  - Rough-legged Hawk (rare visitor)
  - Tundra Swan (rare visitor)
  - White-eyed Vireo (rare visitor)
- *Provincially Significant Plant Species – 50 points (no maximum, see OWES for formula) based on*
  - Cup Plant (*Silphium perfoliatum*) – S2; noted 2004, habitat present 2006
- *Regionally (Former MNR Central Region, Site Region) Significant Species – 30 points (no maximum, see OWES for formula) based on two species (habitat present 2006)*
  - Awned Sedge (*Carex atherodes*)
  - Nuttall's Waterweed (*Elodea nuttallii*)
- *Locally Significant Species (Site District 7E-4) – 57 points (no maximum, see OWES for formula) based on 18 locally significant species (most noted 2004, habitat present 2006)*
  - Three-parted Beggar's Ticks (*Bidens tripartitus*)
  - Purple Cress (*Cardamine douglassii*)
  - Smooth-sheathed Sedge (*Carex laevivaginata*)
  - Common Coontail (*Ceratophyllum demersum*)
  - Wood-reed Grass (*Cinna arundinacea*)
  - Yellow Pond-lily (*Nuphar variegata*)
  - White Water-lily (*Nymphaea odorata*)
  - Water Smartweed (*Polygonum amphibium*)
  - Leafy Pondweed (*Potamogeton foliosus*)
  - Black Willow (*Salix nigra*)
  - River Bulrush (*Scirpus fluviatilis*)
  - Common Three-square (*Scirpus pungens*)
  - Rough-leaved Goldenrod (*Solidago patula*)
  - Giant Bur-reed (*Sparganium eurycarpum*)
  - Greater Duckweed (*Spirodela polyrhiza*)
  - Skunk-cabbage (*Symplocarpus foetidus*)
  - Wood-sage (*Teucrium canadense*)
  - Golden Alexanders (*Zizia aurea*)

##### iii) Score for Significant Features and/or Fish and Wildlife Habitat

- *Nesting of Colonial Waterbirds – 15/50 points based on active feeding area for Caspian tern, great egret (which was documented nesting in 2003), common tern, black-crowned night-heron*
- *Winter Cover for Wildlife – 0/100 points based on little cover present*
- *Waterfowl Staging or Moulting – 20/150 points based on known to occur*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### iii) Score for Significant Features and/or Fish and Wildlife Habitat (continued)

- *Waterfowl Breeding – 10/100 points based on presence of suitable habitat*
- *Migratory Passerine, Shorebird or Raptor Stopover Area – 10/100 points based on presence of suitable habitat*

##### iv) Score for Fish Habitat

- *Spawning and Nursery Habitat – 50/100 points based on habitat significant in Site District*
- *Fish Migration and Staging Habitat – 15/25 points based on habitat significant in Site District*

##### v) Score for Ecosystem Age

- *1/25 points based on swamp and marsh*

##### vi) Score for Coastal Wetland

- *25/75 points based on 25.6 ha coastal wetland area*

#### 5. EXTRA INFORMATION

- Purple loosestrife present
- Diversity of seasonally flooded areas present
- Feeding area for osprey

#### 6. SIGNIFICANCE

This site should continue to be considered a PSW according to the following rationale:

- Total score > 600; Special Features score > 200.

#### 7. MANAGEMENT NEEDS

- Ad hoc trails should be managed, trails should be planned to avoid significant and sensitive features. Non-native species, particularly Norway maple, purple loosestrife and common reed should be removed. MNR recommends control of carp in this wetland, as they churn up aquatic vegetation and cause turbidity.
- Nutrient inputs and fine sediment inputs should be mitigated, as they cause algal blooms and high turbidity levels (MNR 2007)
- Upland areas, including both meadows and forests, must be maintained adjacent to this wetland, as many species within this wetland depend on both uplands and wetlands.

#### 8. Rationale for Boundary Revisions: None recommended.

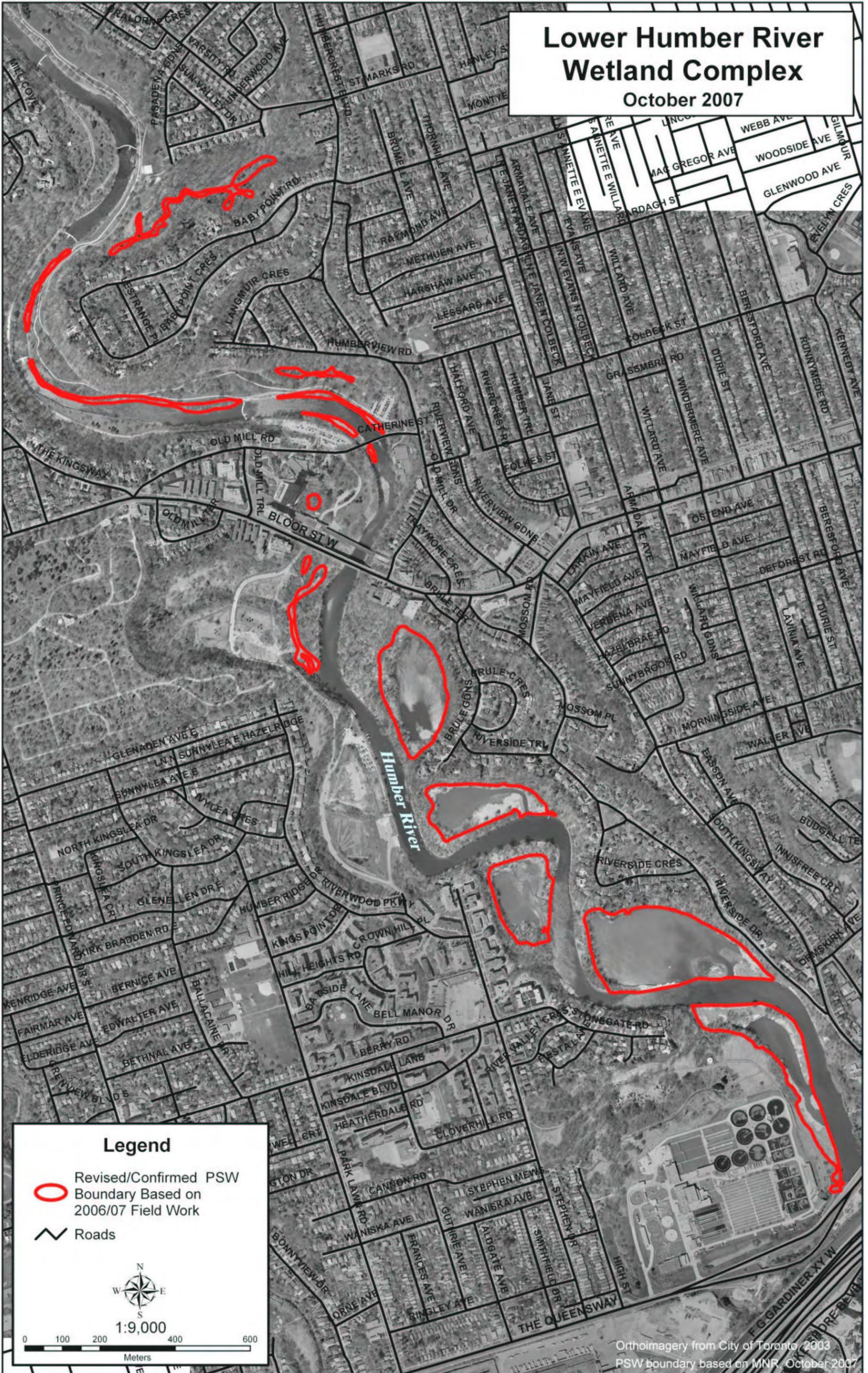
#### 9. PRINCIPLE REFERENCES

Field work Dougan and Associates 2006, MNR 1983, 1984, 2007c



# Lower Humber River Wetland Complex

October 2007

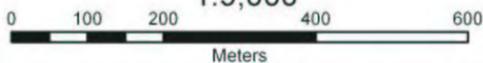


### Legend

-  Revised/Confirmed PSW Boundary Based on 2006/07 Field Work
-  Roads



1:9,000





**City of Toronto PSW Survey (2006)**

**PSW Fact Sheet**

| PSW NAME                            | PLANNING DISTRICT                                | AREA (HA) | UTM GRID REFERENCE   |
|-------------------------------------|--|-----------|----------------------|
| Rouge River Marshes Wetland Complex | City of Toronto, Regional Municipality of Durham | 55.7      | 10 17 334911 4850685 |

**1. LOCATION**

This PSW encompasses the marshes along the floodplain of the Rouge River and the coastal marshes at the river mouth. The PSW is bounded to the south by Lake Ontario, and to the north by Highway 401. The western portion of the PSW includes the floodplain on the west side of the Rouge River within the City of Toronto. The eastern portion includes the floodplain on the east side of the Rouge River within the Regional Municipality of Durham. The PSW is bounded to the east and west by the forested slopes of the Rouge Valley, and outside the slopes, by residential development.

**2. DESCRIPTION**

This PSW is composed of six individual wetlands, comprising 36% swamp and 64% marsh, cutting into the Iroquois Plain physiographic region. This PSW is generally considered one of the most significant wetlands in the City of Toronto in terms of size, quality and diversity. Twenty-three vegetation communities were described within the wetland. The areas of deepest water support high-diversity aquatic marsh types including submerged and floating aquatic types such as bullhead lily (*Nuphar variegatum*), fragrant water-lily (*Nymphaea odorata*), pondweeds (*Potamogeton* spp.), bladderworts (*Utricularia* spp.), water smartweed (*Polygonum amphibium*), waterweed (*Elodea canadensis*) and water-milfoil (*Myriophyllum spicatum*). Shallow marsh types in areas of standing water up to 50 cm deep are mainly dominated by broad-leaved cattail (*Typha latifolia*) and hybrid cattail (*Typha x glauca*). Other shallow marsh types include narrow-leaved sedge marsh. Canada bluejoint (*Calamagrostis canadensis*) meadow marsh dominates the drier edges of these areas. Meadow marshes dominated by sedges (*Carex* spp.) or forbs are common in these areas. Rarer shallow marshes on organic soils, dominated by water arum (*Calla palustris*), marsh cinquefoil (*Potentilla palustris*) and arrowhead (*Sagittaria latifolia*) occur in the northern reaches of the PSW just south of Highway 401. Thicket swamps occur in the upper portions of the lakefront marsh. They are dominated by red-osier dogwood (*Cornus stolonifera*), speckled alder (*Alnus rugosa*) and shrub willows (*Salix* spp.). Treed swamps within the PSW (which appear to be succeeding to lowland forests on the basis of recent field work) are found along the margins of the lakefront marsh and in old river meanders. Dominants most commonly include ash (*Fraxinus* spp.), Manitoba maple (*Acer negundo*) and hybrid willow trees (*Salix x rubens*), with a large proportion of non-native plants in the understory and ground layer.

On the basis of 2006 field work it appeared that much of the swamp area, while still classified as wetland, may be becoming drier and succeeding to lowland forest, possibly because of a drop in water levels as the Rouge River becomes further entrenched in its channel.

## **2. DESCRIPTION (continued)**

Fauna includes many marsh-dependent bird species including many that are area-sensitive. There is evidence of breeding for 69 bird species within the PSW and its immediate environs. Virginia rail, American bittern, blue-winged teal, least bittern, American coot, common moorhen, black tern (a national and provincial Species of Concern) and marsh wren are wetland-breeding species unusual in southern Ontario wetlands within an urban landscape matrix. There are also a few area-sensitive forest species present such as red-shouldered hawk and brown creeper.

The only amphibian species noted commonly in this wetland during amphibian surveys in 2006 was green frog, which was noted in 5 of the 7 point counts performed within the PSW in suitable habitat (pools of standing water). American toad, for which breeding habitat is becoming increasingly rare within the City, was noted on two point counts. However, this wetland supports small numbers of amphibians which have almost disappeared from the City: two wood frogs were noted on one point count, and a spring peeper was noted on one point count.

The Rouge Valley Park report (Varga et al. 1991) notes that there was a large turtle population that nested in the uplands surrounding the Rouge lakeshore marshes. However, this area is now largely residential and it is not known if the upland slopes are significant for nesting turtles. Map Turtles and Blanding's Turtles, both provincially significant, have been reported here since 1980. Blandings turtles in this marsh have been monitored as recently as 2006 as part of a telemetry study conducted by the Toronto Zoo. Map turtles were caught in the marshes in 1999. Map and Blanding's turtles are known from other large rivermouth areas and protected bays in the City of Toronto and Mississauga.

The Rouge River Marshes area is considered one of the significant habitats in the Rouge Valley Park for fish, especially for reproduction. Fourteen fish species utilize the marsh for spawning and rearing. In comparison with four other lakeside marshes around Toronto, the Rouge was ranked with Duffins marsh as the richest fish habitat in terms of common species, total number of species, and numbers of reproducing fish species. The Rouge Marsh was the only one of the five to support spawning northern pike and bowfin.

## **3. SUMMARY OF SCORES USED IN DESIGNATION**

The Ontario Wetland Evaluation System (OWES), 1993 edition and 2002 updates, should be used as a reference when reading this checklist. This checklist provides a summary of a complex series of evaluation scores that should be interpreted further through the OWES.

Wetland evaluation scores from the pre-2006 Ministry of Natural Resources wetland evaluation record and evaluation scores revised after the 2006-2007 field investigations carried out in this study for the East Don Valley Wetland Complex are provided below.

### 3. SUMMARY OF SCORES USED IN DESIGNATION (continued)

| Component                                  | Score Prior to 2006 | Score based on 2006/2007 field data | Maximum Score Available |
|--|---------------------|-------------------------------------|-------------------------|
| Total Score for Biological Component       | 178                 | 174                                 | 250                     |
| Total Score for Social Component           | 220                 | 220                                 | 250                     |
| Total Score for Hydrological Component     | 42                  | 20                                  | 250                     |
| Total Score for Special Features Component | 250                 | 250                                 | 250                     |
| <b>Total Score</b>                         | <b>690</b>          | <b>664</b>                          | <b>1000</b>             |

Note: A wetland is designated provincially significant if the total score is 600 or more points, or if the Biological or Special Features Component is 200 or more points.

#### Comments:

Biological Component score adjusted to admit record for wild rice (recorded in the 1980s, habitat still present)

In the previous draft of this report, it was originally recommended that most polygons representing hardwood swamp should be removed from the wetland boundary, as shown on mapping for the site, as 2006 field work (conducted in late fall) indicated that these appeared to be dominated by greater than 50% upland or transitional species such as Manitoba maple, green ash, garlic mustard and dame's rocket. It was thought that these could be re-classified as Manitoba maple lowland forest. However, further field visits determined that for the most part the proportion of wetland plant cover was slightly over 50%.

#### Other Designations:

- Wetlands are encompassed by the provincially significant Rouge Valley Life Science Area of Natural and Scientific Interest by MNR
- This area is identified as a potential ESA (Rouge Marsh Area) within the City of Toronto (NSE/Dougan 2008)
- This area was identified as an ESA by TRCA (number 79, Rouge Marsh Area)
- This area is identified as a Key Natural Heritage and Key Hydrologic Feature located within the Greenbelt

### 4. DETAILED ANALYSIS OF SCORING

#### A. Biological Component

##### i) Score for Productivity

- *Growing Degree-days* – 20/30 points based on 3600-4000 growing degree-days and clay/loam and sand soils
- *Wetland Type* – 12/15 points based on slightly larger proportion of marsh than swamp
- *Site Type* – 5/5 points based on lacustrine site type

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### A. Biological Component

###### ii) Score for Biodiversity

- *Number of Wetland Types: - 13/30 points based on two wetland types (swamp and marsh)*
- *Vegetation Communities - 19/45 points based on moderate to high number of vegetation types within each vegetation community*
- *Diversity of Surrounding Habitat – 6/7 points based on low diversity of surrounding habitat*
- *Proximity to Other Wetlands - 8/8 points based on hydrological connection by surface water to other wetlands and to open lake*
- *Interspersion – 30/30 points based on large number of intersections between vegetation community boundaries*
- *Open Water Types – 30/30 points based on type 5 open water*

###### iii) Score for Size

- *31/50 points: based on wetland of 55.7 ha with cumulative total of 106 points for biodiversity subcomponent*

##### B. Social Component

###### i) Score for Economically Valuable Products

- *Area of wetland forested – 3/18 points based on 19 ha*
- *Wild Rice Present or Absent – 0/6 points based on area of wild rice present under 0.5 ha*
- *Commercial Bait Fish and/or Coarse Fish Present or habitat not suitable for fish – 12/12 points based on presence*
- *Bullfrogs Present or Absent – 1/1 point based on presence*
- *Snapping Turtles present or Absent – 1/1 point based on presence (habitat still present)*
- *Furbearers Present or Absent – 12/12 points based on four species (habitat still present)*

###### ii) Score for Recreational Activities

- *80/80 points based on high use for nature study and fishing*

###### iii) Score for Landscape Aesthetics

- *Distinctness – 3/3 points based on highly distinct wetlands*
- *Absence of Human Disturbance – 4/7 points based on localized disturbance*

###### iv) Score for Education and Public Awareness

- *Educational Uses – 20/20 points based on frequent educational use by Toronto Field Naturalists and Friends of the Rouge*
- *Facilities and Programs – 2/8 points based on lookouts, boardwalks*
- *Research and Studies – 12/12 points based on long-term research articles and on non-research reports completed on some aspect of the wetland's functions*

###### v) Score for Proximity to Areas of Human Settlement

- *Distance of Wetland from Settlement – 40/40 points based on close proximity of wetland to a city of more than 10,000 inhabitants*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### B. Social Component

###### vi) Score for Ownership

- *Fractional Area of Wetland in Private or Public Ownership, as well as Fractional Area Protected – 10/10 points based on entire area of wetland in trust for wetland protection*

###### vii) Score for Size (in the Context of Social Component)

- *Size combined with social attributes that are size-dependent - 20/20 points for wetland size 55.7 ha, combined with score of 149 for size-dependent social features (economically valuable products, recreational activities, proximity to areas of human settlement)*

###### viii) Score for Aboriginal and Cultural Heritage Value

- *Aboriginal Values – 0/30 points based on none known*
- *Cultural Heritage Values – 0/30 points based on none known*

##### C. Hydrological Component

###### i) Score for Flood Attenuation

- *0/100 points based on storage area provided by wetland relative to catchment area (wetland on large lake or major river receives score of 0)*

###### ii) Score for Water Quality Improvement

- *Short-Term Water Quality Improvement – 0/60 points based on position of wetland on Lake Ontario*
- *Long-Term Nutrient Trap – 0/10 points based on position of wetland on Lake Ontario*
- *Groundwater Discharge – 12/30 points based on some high potential for groundwater discharge*

###### iii) Score for Function as Carbon Sink

- *0/5 points based on less than 50% organic soil coverage*

###### iv) Score for Shoreline Erosion Control

- *8/15 points based on tree and shrub vegetation on shoreline*

###### v) Score for Ground Water Recharge

- *Wetland Site Type – 0/50 points based on >50% lacustrine (by area)*
- *Wetland Soil Recharge Potential – 0/10 points based on position on a major lake*

##### D. Special Features Component

###### i) Score for Rarity

- *Wetland Rarity within the Landscape and Rarity of Wetland Type – 80/80 based on rarity within the landscape, 0 for rarity of wetland type*
- *Breeding Habitat for an Endangered or Threatened Species: 250 points for each species, no maximum – 0 points based on none known*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

###### ii) Score for Rare Species

- *Traditional Migration or Feeding Habitat for an Endangered or Threatened Species – 225 points (no maximum, see OWES for formula) based on Blanding’s Turtle (Threatened) – noted 2006 and least bittern (Threatened) – last reported in 1990 (habitat still present 2006)*
- *Provincially Significant Animal Species – 156 points (no maximum, see OWES for formula) based on 15 provincially significant species*
  - Map Turtle – (habitat present 2006, noted 1999)
  - Eastern Milksnake (habitat present 2006, noted 1980)
  - Bald Eagle (habitat present 2006, occasional foraging)
  - Black Tern (habitat present 2006, last reported in 1990)
  - Caspian Tern (habitat present 2006, common foraging)
  - Black-crowned Night-Heron (habitat present 2006)
  - Bufflehead (habitat present 2006, common wintering)
  - Canvasback (habitat present 2006, uncommon migrant)
  - Dunlin (habitat present 2006, common migrant)
  - Great Egret (habitat present 2006, common foraging)
  - Great Black-backed Gull (habitat present 2006, common foraging)
  - Hudsonian Godwit (habitat present 2006, rare migrant)
  - Pectoral Sandpiper (habitat present 2006, rare migrant)
  - Ruddy Duck (habitat present 2006, uncommon migrant)
  - Wilson’s Phalarope (habitat present 2006, rare foraging)
- *Provincially Significant Plant Species – 0 points (no maximum, see OWES for formula) based on none recently recorded*
- *Regionally Significant Species (Former MNR Central Region, Site Region) – 30 points (no maximum, see OWES for formula) based on two species (habitat present 2006)*
  - Clearweed (*Pilea fontana*)
  - Green Water-milfoil (*Myriophyllum verticillatum*)
- *Locally Significant Species (Site District 7E-4) – 93 points (no maximum, see OWES for formula) based on 54 locally rare species (habitat present 2006)*
  - Sweet Flag (*Acorus americanus*)
  - Speckled Alder (*Alnus incana* ssp. *rugosa*)
  - Great Angelica (*Angelica purpurea*)
  - Small Beggar’s-ticks (*Bidens discoideus*)
  - Three-parted Beggar’s-ticks (*Bidens tripartitus*)
  - Water-arum (*Calla palustris*)
  - Marsh Bellflower (*Campanula aparinoides*)
  - Tussock Sedge (*Carex stricta*)
  - Beaked Sedge (*Carex utriculata*)
  - Bulb-bearing Water-hemlock (*Cicuta bulbifera*)
  - Fragrant Umbrella-sedge (*Cyperus odoratus*)
  - Needle Spike-rush (*Eleocharis acicularis*)

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### ii) Score for Rare Species (continued)

- *Locally Significant Species (continued)*
  - Intermediate Spike-rush (*Eleocharis intermedia*)
  - Water Horsetail (*Equisetum fluviatile*)
  - Small Bedstraw (*Galium trifidum*)
  - Floating manna-grass (*Glyceria septentrionalis*)
  - Water Star-grass (*Heteranthia dubia*)
  - Great St. John's-wort (*Hypericum ascyron*)
  - Winterberry (*Ilex verticillata*)
  - Marsh Vetchling (*Lathyrus palustris*)
  - Star Duckweed (*Lemna trisulca*)
  - False Pimpernel (*Lindernia dubia*)
  - Marsh Purslane (*Ludwigia palustris*)
  - Swamp Loosestrife (*Lysimachia terrestris*)
  - Tufted Loosestrife (*Lysimachia thyrsiflora*)
  - Pale Water-milfoil (*Myriophyllum sibiricum*)
  - Slender Najas (*Najas flexilis*)
  - Bullhead Lily (*Nuphar lutea* ssp. *variegata*)
  - Fragrant Water-lily (*Nymphaea odorata*)
  - Water Smartweed (*Polygonum amphibium*)
  - Dotted Smartweed (*Polygonum punctatum*)
  - Berchtold's Pondweed (*Potamogeton berchtoldii*)
  - Flat-stemmed Pondweed (*Potamogeton zosteriformis*)
  - Marsh Cinquefoil (*Potentilla palustris*)
  - White Water-crowfoot (*Ranunculus aquatilis*)
  - Swamp Rose (*Rosa palustris*)
  - Great Water Dock (*Rumex orbiculatus*)
  - Shining Willow (*Salix lucida*)
  - Black Willow (*Salix nigra*)
  - Bog Willow (*Salix pedicellaris*)
  - Slender Willow (*Salix petiolaris*)
  - Wedgeleaf Arrowhead (*Sagittaria cuneata*)
  - Hard-stemmed Bulrush (*Scirpus acutus*)
  - River Bulrush (*Scirpus fluviatilis*)
  - Green-fruited Bur-reed (*Sparganium emersum*)
  - Giant bur-reed (*Sparganium eurycarpum*)
  - Narrow-leaved Meadowsweet (*Spirea alba*)
  - Greater Duckweed (*Spirodela polyrhiza*)
  - American Germander (*Teucrium canadense*)
  - Common Bladderwort (*Utricularia vulgaris*)
  - Wild Celery (*Vallisneria americana*)
  - Northern Water-meal (*Wolffia borealis*)

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### ii) Score for Rare Species (continued)

- *Locally Significant Species (continued)*
  - Columbia Water-meal (*Wolffia columbiana*)
  - Northern Wild-rice (*Zizania palustris*)

##### iii) Score for Significant Features and/or Fish and Wildlife Habitat

- *Nesting of Colonial Waterbirds – 15/50 points based on active feeding by black-crowned night-heron, great egret, Caspian tern*
- *Winter Cover for Wildlife – 0/100 points based on little or poor winter cover present*
- *Waterfowl Staging or Moulting – 10/150 points based on known to occur*
- *Waterfowl Breeding – 10/100 points based on suitability of habitat*
- *Migratory Passerine, Shorebird or Raptor Stopover Area – 10/100 points based on significant in Site District*

##### iv) Score for Fish Habitat

- *Spawning and Nursery Habitat – 50/100 points based on significant in Site District*
- *Fish Migration and Staging Habitat – 15/25 points based on significant in Site District*

##### v) Score for Ecosystem Age

- *1/25 points based on marsh and swamp present*

##### vi) Score for Coastal Wetland

- *25/75 based on size of 55.7 ha*

#### 5. EXTRA INFORMATION

- Abundant purple loosestrife
- Diversity of seasonally flooded areas: ephemeral, temporal and semi-permanent flooded areas present
- The river is now frequently a metre or more below the floodplain. Hardwood swamp areas may be gradually succeeding to lowland forest.

#### 6. SIGNIFICANCE

This site should continue to be considered a PSW according to the following rationale:

- Total score > 600; Special Features score > 200.

Minor change of hardwood swamp to lowland forest will reduce the wetland area slightly, but will not result in decrease in significance because of the continued presence of other values, particularly significant species.

**7. MANAGEMENT NEEDS**

- Runoff retention pond for Highway 401 is present just south of the 401.
- Purple Loosestrife is particularly abundant in this wetland. Non-native species, particularly purple loosestrife, should be removed.
- Dug channels are frequent in the floodplain
- Canada geese are noted to be particularly abundant in portions of the wetland south of Highway 401.

Non-native species control may be an essential step in restoring the integrity of these marshes.

**8. RATIONALE FOR BOUNDARY REVISIONS:** Boundaries were revised to conform with most recent ortho-photography. Minor revisions made to boundary to delete small areas of lowland forest, in consultation with MNR.

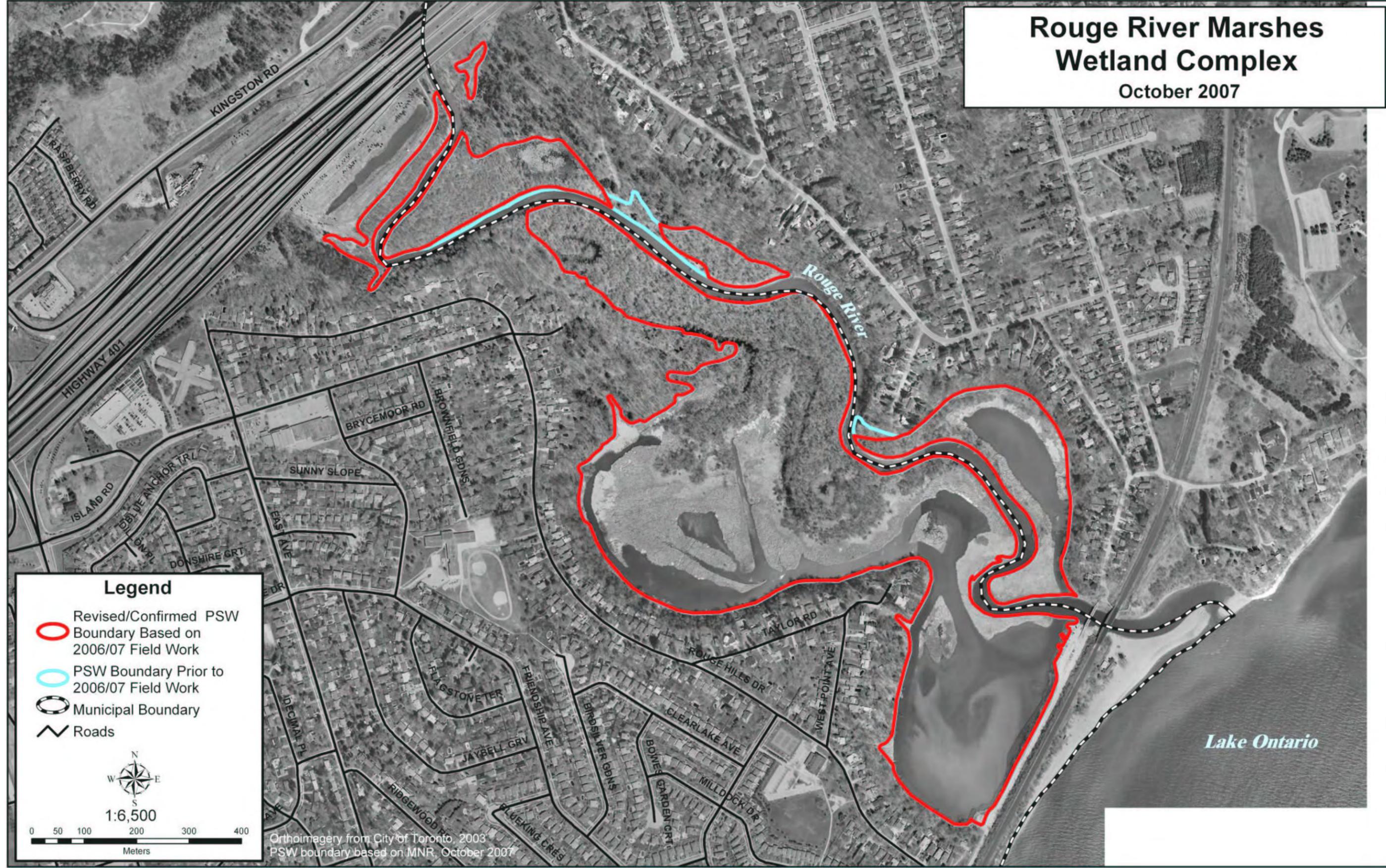
**9. PRINCIPLE REFERENCES**

Field work Dougan and Associates 2006, MNR 1991, MNR 1996, MNR 2007d.



# Rouge River Marshes Wetland Complex

October 2007

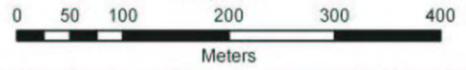


### Legend

- Revised/Confirmed PSW Boundary Based on 2006/07 Field Work
- PSW Boundary Prior to 2006/07 Field Work
- Municipal Boundary
- Roads



1:6,500



Orthoimagery from City of Toronto, 2003  
PSW boundary based on MNR, October 2007



**City of Toronto PSW Survey (2006)**

**PSW Fact Sheet**

| PSW NAME                                | PLANNING DISTRICT | AREA (HA) | UTM GRID REFERENCE   |
|---|-------------------|-----------|----------------------|
| Toronto Islands Coastal Wetland Complex | City of Toronto   | 31.0      | 10 17 314805 4830750 |

**1. LOCATION**

This PSW encompasses 34 wetlands on the Toronto Islands, opposite the City of Toronto waterfront. The islands are between 0.1 to 1.5 kilometres off shore, and form the outer edge of Toronto’s Inner Harbour. They are bounded to the east by the eastern shipping channel, to the south and west by Lake Ontario and to the north by the Inner Harbour.

**2. DESCRIPTION**

This PSW, formed on an active sand beach bar system that has developed over the past few thousand years, consists of 34 wetlands, many of them smaller than 2 ha, but important because they link larger wetlands and support plant communities rare in the Site District. The wetlands largely consist of swamp and marsh.

Hardwood swamps are in many cases difficult to distinguish from lowland forest communities that characterise much of the islands, as they are dominated by a rather open canopy of eastern cottonwood (*Populus deltoides*), which is also the common dominant in forests. However, wetland species include the non-native hybrid willow (*Salix x rubens*), with usually dense red-osier dogwood (*Cornus stolonifera*) dominant in the shrub layer. The ground layer also consists mainly of wetland indicators including touch-me-not (*Impatiens capensis*), reed canary-grass (*Phalaris arundinacea*) and Canada bluejoint (*Calamagrostis canadensis*), as well as species characteristic of transitional areas such as field horsetail (*Equisetum arvense*) and scouring-rush (*E. hyemale*), in addition to a provincially significant hybrid, Nelson’s horsetail (*Equisetum X nelsonii*). Thicket swamps are also dominated by red-osier dogwood and shrub willows, including sandbar willow (*Salix exigua*) and heart-leaved willow (*Salix eriocephala*).

Small portions of shoreline marshes include submerged aquatic vegetation types in the channels and sheltered bays among the islands, which are dominated by pondweeds (*Potamogeton* spp.), water milfoil (*Myriophyllum spicatum*), Canada waterweed (*Elodea canadensis*) and wild celery (*Valisneria americana*). However, most of the submerged aquatic marsh was removed from the wetland complex because of the updates on wetland delineation in deep lakes provided in 2002. There is only one marsh community dominated by floating-leaved aquatics, in Lighthouse Pond on Centre Island. Meadow marshes dominated by grasses and sedges occupy a larger proportion of the wetland area, in low areas between dune ridges and along shorelines. These are dominated by Canada bluejoint, reed canary-grass and the provincially significant Nelson’s horsetail. Shallow marshes dominated by cattails (*Typha* spp.), softstem bulrush (*Scirpus validus*) and giant bur-reed (*Sparganium eurycarpum*) cover the smallest area of wetlands.

**2. DESCRIPTION (continued)**

Fauna in treed swamps is dominated by bird species that can nest in a variety of large and small habitats, such as Northern Cardinal and Black-capped Chickadee. However, a few less common species of open woods and thickets were noted within the PSW, especially in treed swamps along the edge of the islands, including Blue-gray Gnatcatcher, Least Flycatcher, and Yellow Warbler. Thicket swamps supported Willow Flycatcher and Eastern Kingbird. Nesting platforms for Common Tern have been placed in the submerged aquatic marsh on Lighthouse Pond on Centre Island, and these terns feed in the wetland complex. Aquatic marshes provided little breeding habitat for terrestrial species, though they provided critical habitat for fish; and therefore were frequented by foraging Great Blue Heron and Great Egret, Osprey, and Common and Caspian Terns. The sheltered lagoon on the western end of Centre Island and the sheltered bays along the north shore of the island provide habitat for several duck and turtle species (Wood Duck, Mallard, Gadwall, northern map turtle and midland painted turtle were noted here). Woody debris from shoreline trees falling into the water provides abundant basking sites in these areas. Frog species noted breeding in wetlands on Ward's Island were American toad and leopard frog.

### 3. SUMMARY OF SCORES USED IN DESIGNATION

The Ontario Wetland Evaluation System (OWES), 1993 edition and 2002 updates, should be used as a reference when reading this checklist. This checklist provides a summary of a complex series of evaluation scores that should be interpreted further through the OWES.

Wetland evaluation scores from the pre-2006 Ministry of Natural Resources wetland evaluation record and evaluation scores revised after the 2006-2007 field investigations carried out in this study for the East Don Valley Wetland Complex are provided below.

| Component                                  | Score Prior to 2006 | Score based on 2006/2007 field data | Maximum Score Available |
|--|---------------------|-------------------------------------|-------------------------|
| Total Score for Biological Component       | 163                 | 158                                 | 250                     |
| Total Score for Social Component           | 219                 | 135                                 | 250                     |
| Total Score for Hydrological Component     | 8                   | 8                                   | 250                     |
| Total Score for Special Features Component | 250                 | 250                                 | 250                     |
| <b>Total Score</b>                         | <b>640</b>          | <b>551</b>                          | <b>1000</b>             |

Note: A wetland is designated provincially significant if the total score is 600 or more points, or if the Biological or Special Features Component is 200 or more points.

#### Other Designations:

- This PSW is identified as part of the Toronto Islands Life Science Area of Natural and Scientific Interest by MNR.
- Many wetlands within this PSW are included within ESAs designated by the City of Toronto, including portions of Hanlan's Beach ESA, Mugg's Island ESA, Centre Island Meadow ESA, Snake Island Area ESA, Ward's Island ESA and West Algonquin ESA. Other portions have been identified as potential ESAs within the City of Toronto including Hanlan's Beach Extension, Centre Island Meadow Extension, and Ward's Island Extension.
- Many wetlands within this PSW were identified as portions of ESAs by TRCA: Hanlan's Beach (number 115), Muggs Island (number 116), Centre Island (number 117), Snake Island (number 118) Wards Island (number 119) and West Algonquin Island (number 129).

#### 4. DETAILED ANALYSIS OF SCORING

##### A. Biological Component

###### i) Score for Productivity

- *Growing Degree-days/soils – 15/30 points based on sand substrate within an area of 3600-4000 growing degree-days*
- *Wetland Type – 13/15 points based on 35% swamp and 65% marsh*
- *Site Type – 3/5 points based on lacustrine site type on enclosed bay with barrier beach*

###### ii) Score for Biodiversity

- *Number of Wetland Types: - 13/30 points based on two wetland types*
- *Vegetation Communities – 24/45 points based on most wetlands having one to three vegetation types*
- *Diversity of Surrounding Habitat – 3/7 points based on low diversity of surrounding habitat*
- *Proximity to Other Wetlands – 8/8 points based on hydrological connection by surface water to open lake*
- *Interspersion – 21/30 points based on 126 to 150 intersections between communities*
- *Open Water Types – 30/30 points based on type 5 open water*

###### ii) Score for Size

- *28/50 points: based on cumulative total of 101 for biodiversity component, in an area of 31 ha*

##### B. Social Component

###### i) Score for Economically Valuable Products

- *Area of wetland forested – 3/18 points based on 11 ha forested*
- *Wild Rice Present or Absent – 0/6 points based on absence*
- *Commercial Bait Fish and/or Coarse Fish Present or habitat not suitable for fish – 12/12 points based on presence*
- *Bullfrogs Present or Absent – 0/1 point based on absence*
- *Snapping Turtles present or Absent – 1/1 point based on presence*
- *Furbearers Present or Absent – 12/12 points based on 4 species (habitat present 2006)*

###### ii) Recreational Activities high, moderate, low

- *80/80 points based on maximum points for fishing and nature enjoyment/ecosystem study*

###### iii) Score for Landscape Aesthetics

- *Distinctness – 3/3 points based on (in many cases) clearly distinct wetlands*
- *Absence of Human Disturbance – 4/7 points based on one or several localized disturbances*

###### iv) Score for Education and Public Awareness

- *Educational Uses – 20/20 points based on use by Toronto Islands Nature School and Toronto Field Naturalists' hikes*
- *Facilities and Programs – 4/8 points based on availability of self-guided trails or brochures*
- *Research and Studies – 12/12 points based on availability of research papers and non-research reports*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### B. Social Component

v) Score for Proximity to Areas of Human Settlement

- *Distance of Wetland from Settlement – 40/40 points based on close proximity of wetland to a city of more than 10,000 inhabitants*

vi) Score for Ownership

- *Fractional Area of Wetland in Private or Public Ownership, as well as Area Protected – 8/10 points based on entire wetland complex in public ownership*

vii) Score for Size (in the Context of Social Component)

- *Size combined with social attributes that are size-dependent - 19/20 points for wetland size 31 ha, combined with cumulative score of 148 for size-dependent social features (economically valuable products, recreational activities, proximity to areas of human settlement)*

viii) Score for Aboriginal and Cultural Heritage Value

- *Aboriginal Values – 0/30 points based on unknown*
- *Cultural Heritage Values – 0/30 points based on unknown*

##### C. Hydrological Component

i) Score for Flood Attenuation

- *0/100 points based on storage area provided by wetland relative to catchment area: wetland on Lake Ontario*

ii) Score for Water Quality Improvement

- *Short-Term Water Quality Improvement – 0/60 points based on location on Lake Ontario*
- *Long-Term Nutrient Trap – 0/10 points based on location on Lake Ontario*
- *Groundwater Discharge – 2/30 points based on presence of swamp/marsh (evidence of some discharge)*

iii) Score for Function as Carbon Sink

- *0/5 points based on 0 area of organic soil*

iv) Score for Shoreline Erosion Control

- *6/15 points based on submergent vegetation along shoreline*

v) Score for Ground Water Recharge

- *Wetland Site Type – 0/50 points based on wetland more than 50% lacustrine*
- *Wetland Soil Recharge Potential – 0/10 points based on lacustrine wetland type*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

###### i) Score for Rarity

- *Wetland Rarity within the Landscape and Rarity of Wetland Type – 80/80 based on rarity within the landscape score, 0 for rarity of wetland type*

###### ii) Score for Rare Species

- *Breeding Habitat for an Endangered or Threatened Species: 250 points for each species, no maximum – 0 points based on none present*
- *Traditional Migration or Feeding Habitat for an Endangered or Threatened Species – 0 points (no maximum, see OWES for formula) based on*
  - None
- *Provincially Significant Animal Species – 172 points (no maximum, see OWES for formula) based on 23 species (habitat present 2006; see attached)*
  - American Golden Plover (habitat present 2006; rare migrant)
  - Black-crowned Night-heron (regular foraging)
  - Black Tern (habitat present 2006; rare migrant)
  - Bufflehead (habitat present 2006; common migrant)
  - Canvasback (habitat present 2006, common migrant)
  - Caspian Tern (common foraging)
  - Dunlin (habitat present 2006, common migrant)
  - Forster's Tern (habitat present 2006, rare foraging)
  - Great Egret (noted 2006; common foraging)
  - Great Black-backed Gull (habitat present 2006; common foraging)
  - Golden Eagle (habitat present 2006; rare migrant)
  - Horned Grebe (habitat present 2006; common migrant)
  - Little Gull (habitat present 2006; rare foraging)
  - Marbled Goldwit (habitat present 2006, rare migrant)
  - Peregrine Falcon (habitat noted 2002; rare foraging)
  - Redhead (habitat noted 2006; common migrant)
  - Red-headed Woodpecker (habitat noted 2006; rare migrant)
  - Ruddy Duck (habitat noted 2006; rare migrant)
  - Short-billed Dowitcher (habitat noted 2006; rare migrant)
  - Whimbrel (habitat noted 2006; occasional migrant)
  - Yellow Rail (habitat noted 2006; rare migrant)
  - Blanding's Turtle (habitat present 2006; noted 1978, but recent (2003-2006) observations of this turtle in all major rivermouths in Toronto indicate it is probably still present)
  - Northern Map Turtle (noted 2006)
- *Provincially Significant Plant Species – 50 points (no maximum, see OWES for formula) based on one provincially significant species (habitat present 2006)*
  - Low Nut-rush (*Scleria verticillata*) – habitat present 2006

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### ii) Score for Rare Species (continued)

- Regionally (Former MNR Central Region) Significant Species – 40 points (no maximum, see OWES for formula) based on 3 species (habitat present 2006)
  - Nuttall's Waterweed (*Elodea nuttallii*)
  - Fringed Gentian (*Gentianopsis crinita*) (noted in 2006)
  - Virginia mountain-mint (*Pycnanthemum virginianum*)
- Locally Significant Species ( Site District 7E-4) – 94 points (no maximum, see OWES for formula) based on 55 species (habitat present 2006)
  - Small-flowered Gerardia (*Agalinis paupercula*)
  - Slender-leaved Gerardia (*Agalinis tenuifolia*)
  - Rough Hair Grass (*Agrostis scabra*)
  - Big Bluestem (*Andropogon gerardii*)
  - Hairy Aster (*Symphyotrichum pilosum* var. *pilosum*)
  - Pringle's Aster (*Symphyotrichum pilosum* var. *pringeli*)
  - Three-parted Beggar's Ticks (*Bidens tripartitus*)
  - Marsh Bellflower (*Campanula aparinoides*)
  - Aquatic Sedge (*Carex aquatilis*)
  - Garber's Sedge (*Carex garberi*)
  - Woolly Sedge (*Carex pellita*)
  - Greenish Sedge (*Carex viridula*)
  - Bulb-bearing Water-hemlock (*Cicuta bulbifera*)
  - River Cyperus (*Cyperus bipartitus*)
  - Fragrant Cyperus (*Cyperus odoratus*)
  - Needle Spike-rush (*Eleocharis acicularis*)
  - Elliptic Spike-rush (*Eleocharis elliptica*)
  - Few-flowered Spike-rush (*Eleocharis pauciflora*)
  - Canada Waterweed (*Elodea canadensis*)
  - Water Horsetail (*Equisetum fluviatile*)
  - Larger Canadian St. John's-wort (*Hypericum majus*) – extirpated
  - Richardson's Rush (*Juncus alpinoarticulatus*)
  - Baltic Rush (*Juncus balticus*)
  - Small-headed Rush (*Juncus brachycephalus*)
  - Marsh Vetchling (*Lathyrus palustris*)
  - Star Duckweed (*Lemna trisulca*)
  - False Pimpernel (*Lindernia dubia*)
  - Kalm's Lobelia (*Lobelia kalmii*)
  - Loesel's Twayblade (*Liparis loeselii*)
  - Swamp Candle (*Lysimachia terrestris*)
  - Tufted Loosestrife (*Lysimachia thyrsifolia*)
  - Pale Water-milfoil (*Myriophyllum sibiricum*)
  - Slender Najas (*Najas flexilis*)

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### ii) Score for Rare Species (continued)

- *Locally Significant Species (continued)*
  - Bullhead Lily (*Nuphar lutea* ssp. *variegata*)
  - White Water-lily (*Nymphaea odorata*)
  - Wiry Panic Grass (*Panicum flexile*)
  - Switch Grass (*Panicum virgatum*)
  - False Dragonhead (*Physostegia virginiana*)
  - Northern Green Orchid (*Platanthera hyperborea*)
  - Water Smartweed (*Polygonum amphibium*)
  - Great Water Dock (*Rumex orbiculatus*)
  - Hard-stemmed Bulrush (*Scirpus acutus*)
  - River Bulrush (*Scirpus fluviatilis*)
  - Common Three-square (*Scirpus pungens*)
  - Giant Bur-reed (*Sparganium eurycarpum*)
  - Tall Cord Grass (*Spartinus pectinatus*)
  - Nodding Ladies'-tresses (*Spiranthes cernua*)
  - Hooded Ladies'-tresses (*Spiranthes romanzoffiana*)
  - Greater Duckweed (*Spirodela polyrhiza*)
  - Marsh Hedge-nettle (*Stachys palustris*)
  - American Germander (*Teucrium canadense*)
  - Seaside Arrow-grass (*Triglochin maritimum*)
  - Lesser Bladderwort (*Utricularia minor*)
  - Common Bladderwort (*Utricularia vulgaris*)
  - Wild Celery (*Vallisneria americana*)

##### iii) Score for Significant Features and/or Fish and Wildlife Habitat

- *Nesting of Colonial Waterbirds – 15/50 points based on active feeding area for 4 species:*
  - Common Tern (*noted 2006*)
  - Caspian Tern (*noted 2006*)
  - Black-crowned Night-heron (*noted 2006*)
  - Great Egret (*noted 2006*)
- *Winter Cover for Wildlife – 0/100 points based on none*
- *Waterfowl Staging or Moulting – 100/150 points based on regional significance of staging and moulting area*
- *Waterfowl Breeding – 10/100 points based on presence of suitable habitat*
- *Migratory Passerine, Shorebird or Raptor Stopover Area – 10/100 points based on habitat significance in site district for migrating songbirds*

##### iv) Score for Fish Habitat

- *Spawning and Nursery Habitat – 50/100 points based on significance in Site District*
- *Fish Migration and Staging Habitat – 0/25 points based on none present*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

v) Score for Ecosystem Age

- 1/25 points based on proportion of swamp

vi) Score for Coastal Wetland

- 25/75 based on wetland area 31 ha

#### 5. EXTRA INFORMATION

- Abundant purple loosestrife noted
- All types of seasonally flooded area noted (from ephemeral to semi-permanent and some with no seasonal flooding).
- Osprey noted perched on a tree at the edge of the Wildlife Sanctuary lagoon during 2006 field visit

#### 6. SIGNIFICANCE

This site should continue to be considered a PSW according to the following rationale:

- Total score > 600 points; Special Features score > 200

#### 7. CONDITION AND MANAGEMENT NEEDS

There are tracks and trails throughout this wetland, and some areas sustain abundant non-native plants. Numerous recommendations are included in the MNR wetland evaluation. Ad hoc trails should be managed within wetland areas. Trails should be planned to avoid sensitive and significant areas. Non-native tree species, particularly European birch, European alder and non-native conifers, should be removed. Rehabilitation of shorelines would restore natural processes that maintain succession and wetland functions

#### 8. Rationale for Boundary Revisions: no boundary revisions proposed.

#### 9. PRINCIPLE REFERENCES

Field work North-South Environmental 2006, MNR 1993, 2005, 2007e



# Toronto Islands Coastal Wetland Complex

October 2007



**Legend**

- Revised/Confirmed PSW Boundary Based on 2006/2007 Field Work
- Roads

1:10,000

0 50 100 200 300 400 Meters

Orthoimagery from City of Toronto, 2003  
PSW boundary based on MNR, October 2007



**City of Toronto PSW Survey (2006)**

**PSW Fact Sheet**

| PSW NAME                       | PLANNING DISTRICT                     | AREA (HA)                                    | UTM GRID REFERENCE   |
|--------------------------------|---------------------------------------|--|----------------------|
| Townline Swamp Wetland Complex | City of Toronto,<br>City of Pickering | 75.3 ha (17.8 ha within the City of Toronto) | 10 17 332288 4854057 |

**1. LOCATION**

This PSW encompasses eight wetlands in the City of Pickering, the Municipality of Durham and the City of Toronto. It is bounded by Beare Road, Altona Road, Twyn Rivers Drive and Steeles Ave between Little Rouge Creek and Petticoat Creek. The landscape setting is rapidly changing from rural to urban in this area, but the immediate area of the wetlands within the wetland complex consists of upland deciduous forests.

**2. DESCRIPTION**

The PSW area was mapped to include eight wetlands straddling the eastern boundary between the City of Toronto, and the western boundary of the City of Pickering. The wetlands are grouped into one complex because they are all situated in a band of forests and wetlands along the Lake Iroquois Shoreline. The wetlands consist of 87% swamp and 13% marsh, with all wetlands palustrine.

Eighteen wetland community types have been delineated within the PSW. Locations and boundaries of some of the polygons have been revised as part of the 2006 field work, but the area of the wetland will not change significantly. The most common are deciduous swamps covering 72% of the wetland complex. These are dominated by silver maple (*Acer saccharinum*), red maple/silver maple hybrids (*Acer freemanii*), trembling aspen (*Populus tremuloides*), green ash (*Fraxinus pennsylvanica*), black ash (*F. nigra*) and white elm (*Ulmus americana*). 4% of the wetland area is dominated by coniferous swamp dominated by eastern white cedar (*Thuja occidentalis*), and cedar is a common dominant in the sub-canopy in swamps dominated by successional species such as poplar. 12% of the wetlands consist of a variety of thicket swamps, including those dominated by red-osier dogwood (*Cornus stolonifera*), shrub willow species (*Salix* spp.) and in one rare instance, buttonbush (*Cephalanthus occidentalis*). Open aquatic communities comprise 8% of the wetland types.

Fifty-one breeding bird species have been identified in this wetland, as well as 9 amphibian species, 3 reptile species, 23 mammals and 350 vascular plant species.

Adjacent uplands are important for wetland functions within the Townline Swamp. There is an abundant population of woodland frogs such as spring peeper, chorus frog, and gray tree frog that require pools for breeding, as well as connected adjacent wooded uplands for summer foraging and hibernation. Several forest-interior bird species have been noted, such as red-shouldered hawk, pileated woodpecker and ovenbird.

### 3. SUMMARY OF SCORES USED IN DESIGNATION

The Ontario Wetland Evaluation System (OWES), 1993 edition and 2002 updates, should be used as a reference when reading this checklist. This checklist provides a summary of a complex series of evaluation scores that should be interpreted further through the OWES.

Wetland evaluation scores from the pre-2006 Ministry of Natural Resources wetland evaluation record and evaluation scores revised after the 2006-2007 field investigations carried out in this study for the East Don Valley Wetland Complex are provided below.

| Component                                  | Score Prior to 2006 | Score based on 2006/2007 field data | Maximum Score Available |
|--|---------------------|-------------------------------------|-------------------------|
| Total Score for Biological Component       | 122                 | 138                                 | 250                     |
| Total Score for Social Component           | 151                 | 151                                 | 250                     |
| Total Score for Hydrological Component     | 212                 | 212                                 | 250                     |
| Total Score for Special Features Component | 250                 | 250                                 | 250                     |
| <b>Total Score</b>                         | <b>735</b>          | <b>751</b>                          | <b>1000</b>             |

Note: A wetland is designated provincially significant if the total score is 600 or more points, or if the Biological or Special Features component is 200 or more points.

#### Comments:

- Minor change in score for Biological Component because of error in calculation of size score
- Score for Special Features was adjusted because provincially rare score attributed to species that are no longer considered provincially significant (Red-shouldered Hawk, Cooper's Hawk), however this did not change overall score.
- Wetland area may change slightly because of changes in boundaries and location of some polygons, but this will not change the overall score.

#### Other Designations:

- Wetlands and adjacent uplands are included in the Rouge Park Life Science Area of Natural and Scientific Interest (ANSI)
- Considered a Key Natural Heritage Feature located within the Greenbelt

### 4. DETAILED ANALYSIS OF SCORING

#### A. Biological Component

##### i) Score for Productivity

- *Growing Degree-days – 22/30 points based on 3600-4000 growing degree-days and large proportion of clay loam and silt soils, with a small proportion of organic soils*
- *Wetland Type – 9/15 points based on large proportion of swamp and small proportion of marsh*
- *Site Type – 2/5 points based on all palustrine wetlands*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### A. Biological Component

###### ii) Score for Biodiversity

- *Number of Wetland Types: - 13/30 points based on two wetland types*
- *Vegetation Communities- 14/45 points based on moderate number of plant types within communities*
- *Diversity of Surrounding Habitat- 7/7 points based on maximum diversity of surrounding habitat*
- *Proximity to Other Wetlands- 5/8 points based on Rouge River Marshes hydrologically connected from 1.5 to 4 km away*
- *Interspersion – 18/30 points based on 18 intersections between communities*
- *Open Water Types- 14/30 points based on type 3 open water*

###### iii) Score for Size

- *34/50 points: based on cumulative total of 75.3 ha, 106 score for biodiversity*

##### B. Social Component

###### i) Score for Economically Valuable Products

- *Area of wetland forested – 9/18 points based on 57 ha (2000 mapping)*
- *Wild Rice Present or Absent – 0/6 points based on absent*
- *Commercial Bait Fish and/or Coarse Fish Present or habitat not suitable for fish – 12/12 points based on 1992 observation of fish in Amos Pond (habitat still present 2006)*
- *Bullfrogs Present or Absent – 1/1 point based on 1992 observation (habitat still present 2006)*
- *Snapping Turtles present or Absent – 1/1 point based on 1991 observation, (habitat still present 2006)*
- *Furbearers Present or Absent – 12/12 points based on five species noted, habitat still present 2006*

###### ii) Recreational Activities

- *scored as high, moderate, low - 28/80 points based on use by Pickering Field Naturalists for nature observation and fishing in Amos Pond*

###### iii) Score for Landscape Aesthetics

- *Distinctness – 3/3 points based on clearly distinct wetland*
- *Absence of Human Disturbance – 2/7 points based on moderate disturbance*

###### iv) Score for Education and Public Awareness

- *Educational Uses – 12/20 points based on infrequent use for education by Pickering Field Naturalists*
- *Facilities and Programs – 0/8 points based on absence of facilities and programs*
- *Research and Studies – 5/12 points based on one or more non-research reports on some aspect of wetland function*

###### v) Score for Proximity to Areas of Human Settlement

- *Distance of Wetland from Settlement – 40/40 points based on close proximity of wetland to Toronto and Pickering, cities of more than 10,000 inhabitants*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### **B. Social Component**

###### vi) Score for Ownership

- *Fractional Area of Wetland in Private or Public Ownership, as well as Area Protected – 8/10 points based on large proportion of ownership public, in Rouge Park*

###### vii) Score for Size (in the Context of Social Component)

- *Size combined with social attributes that are size-dependent - 18/20 points for wetland size 75.3 ha, combined with score of 102 for size-dependent social features (economically valuable products, recreational activities, proximity to areas of human settlement)*

###### viii) Score for Aboriginal and Cultural Heritage Value

- *Aboriginal Values – 0/30 points based on none known*
- *Cultural Heritage Values – 0/30 points based on none known*

##### **C. Hydrological Component**

###### i) Score for Flood Attenuation

- *100/100 points based on large storage area provided by wetland relative to catchment area*

###### ii) Score for Water Quality Improvement

- *Short-Term Water Quality Improvement – 44/60 points based on high water quality improvement factor, high land use factor and high pollutant uptake factor*
- *Long-Term Nutrient Trap – 3/10 points based on swamp with less than 50% covered with organic soil*
- *Groundwater Discharge – 6/30 points based on little to some potential for discharge*

###### iii) Score for Function as Carbon Sink

- *2/5 points based on swamp type with less than half coverage by organic soil*

###### iv) Score for Shoreline Erosion Control

- *0/15 points based on palustrine wetland type*

###### v) Score for Ground Water Recharge

- *Wetland Site Type – 50/50 points based on palustrine wetland type*
- *Wetland Soil Recharge Potential – 7/10 points based on palustrine wetland type*

##### **D. Special Features Component**

###### i) Score for Rarity

- *Wetland Rarity within the Landscape and Rarity of Wetland Type – maximum 75/80 based on rarity within the landscape and rarity of wetland type*

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

##### ii) Score for Rare Species

- *Breeding Habitat for an Endangered or Threatened Species: 250 points for each species, no maximum – 0 points based on none present*
- *Traditional Migration or Feeding Habitat for an Endangered or Threatened Species – 0 points (no maximum, see OWES for formula) based on none present*
- *Provincially Significant Animal Species – 95 points (no maximum, see OWES for formula) based on three provincially significant species*
  - Black-crowned Night Heron - (habitat present 2006)
  - Black Tern - (habitat present 2006)
  - Red-headed Woodpecker - (habitat present 2006)
- *Provincially Significant Plant Species – 0 points (no maximum, see OWES for formula) based on none present*
- *Regionally Significant Species (Former MNR Central Region, Site Region) – 20 points (no maximum, see OWES for formula) based on one regionally significant species*
  - Fringed Gentian (*Gentianopsis crinita*)
- *Locally Significant Species (Site District 7E-4 or Region of Durham depending on where species were found) – 58 points (no maximum, see OWES for formula) based on 18 species (habitat noted 2006)*
  - Bulb-bearing Water-hemlock (*Cicuta bulbifera*)
  - Bigseed Smartweed (*Polygonum pennsylvanicum*)
  - Buttonbush (*Cephalanthus occidentalis*)
  - Silky Dogwood (*Cornus amomum*)
  - Moonseed (*Menispermum canadense*)
  - Showy Lady's-slipper (*Cypripedium reginae*)
  - Star Duckweed (*Lemna trisulca*)
  - White Water Crowfoot (*Ranunculus longirostris*)
  - Water Dock (*Rumex verticillatus*)
  - Eastern Manna Grass (*Glyceria septentrionalis*)
  - Richardson's Rush (*Juncus alpinoarticulatus*)
  - Greater Duckweed (*Spirodela polyrrhiza*)
  - Canada Waterweed (*Elodea canadensis*)
  - Common Coontail (*Ceratophyllum demersum*)
  - Winterberry (*Ilex verticillata*)
  - Richardson Rush (*Juncus alpinoarticulatus*)
  - Common Moorhen (rare in Durham)
  - Pied-billed Grebe (rare in Durham)

#### 4. DETAILED ANALYSIS OF SCORING (continued)

##### D. Special Features Component

iii) Score for Significant Features and/or Fish and Wildlife Habitat (all habitat still present)

- *Nesting of Colonial Waterbirds – 15/50 points based on foraging by Black-crowned Night-heron*
- *Winter Cover for Wildlife – 10/100 points based on locally significant deer wintering area*
- *Waterfowl Staging or Moulting – 10/150 points based on 10 species noted staging in open water area (Amos Pond)*
- *Waterfowl Breeding – 10/100 points based on 5 species breeding*
- *Migratory Passerine, Shorebird or Raptor Stopover Area – 0/100 points based on not significant*

ii) Score for Fish Habitat

- *Spawning and Nursery Habitat – 5/100 points based on presence of key vegetation groups (low marsh)*
- *Fish Migration and Staging Habitat – 0/25 points based on no habitat*

iii) Score for Ecosystem Age

- *3/25 points based on swamp and marsh*

iv) Score for Coastal Wetland

- *0/75 based on non-coastal wetland*

#### 5. EXTRA INFORMATION

- None provided

#### 6. SIGNIFICANCE

This site should continue to be considered a PSW according to the following rationale:

- Total score > 600 points; Special Features score > 250.

#### 7. MANAGEMENT NEEDS

- Trash and grass cuttings have been dumped within portions of the wetland. In some areas there is heavy invasion of non-native dog-strangling vine (*Cynanchum nigrum*). Ad hoc paths are evident at the north end. Debris should be removed and ad hoc trails should be managed. Non-native species, particularly dog-strangling vine, should be removed.
- A fence within the boundary of the wetland does not appear to be causing impacts to the wetland.

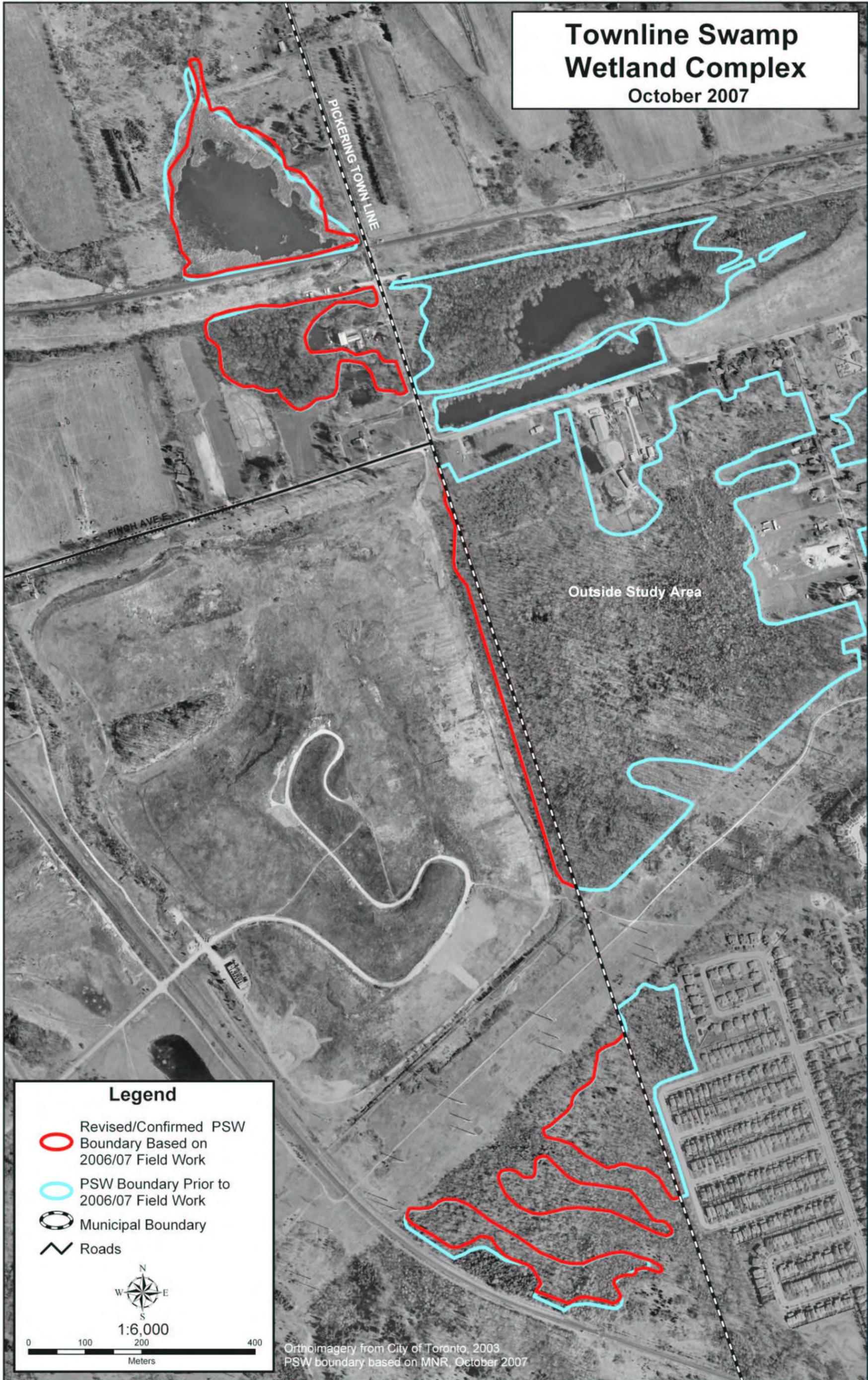
**8. Rationale for Boundary Revisions:** minor revisions were recommended to the boundary and location of some polygons to correspond with the 2003 aerial photography base. This will not change the overall score.

#### 9. PRINCIPLE REFERENCES

Field work North-South Environmental 2006, Dougan & Associates 2006, MNR 2000

# Townline Swamp Wetland Complex

October 2007



### Legend

- Revised/Confirmed PSW Boundary Based on 2006/07 Field Work
- PSW Boundary Prior to 2006/07 Field Work
- Municipal Boundary
- Roads



1:6,000

0 100 200 400  
Meters

Orthoimagery from City of Toronto, 2003  
PSW boundary based on MNR, October 2007