OAK RIDGES CORRIDOR PARK MANAGEMENT PLAN

Submitted by:

AMEC Earth & Environmental
Envision – The Hough Group
Suzanne Barrett
***Urban*METRICS**
D.R. Poulton & Associates Inc
Andre Scheinman Heritage Preservation Consultant

On behalf of:

Toronto and Region Conservation

August 2006

Supported by:

EXECUTIVE SUMMARY

The Oak Ridges Corridor Park (ORCP) consists of approximately 428 ha (1,057 acres) of land that will be transferred by private owners and developers to the Province of Ontario as part of the Pickering Land Exchange Agreement reached in 2004. The intent of the transfer of lands is to provide a natural continuous east-west corridor that protects the headwaters of two major watersheds - the Humber and Rouge Rivers. The land is an irregularly shaped parcel that lies on both sides of Yonge Street just south of the community of Oak Ridges in the Town of Richmond Hill. The land was used by First Nations for thousands of years and it has since been used for farming, residential, and recreational purposes for the last 200 years; evidence of this past history can be found across the site. Approximately 40 ha (100 acres) of the land at the western end of the study area are occupied by the Bathurst Glen Golf Course. The study area also contains a number of significant features including wetlands and kettle lakes. This part of the Oak Ridges Moraine contains many wildlife and plant species and may represent one of the most diverse collections of habitats found on the Moraine. These lands also play an integral role in the recharge of the headwater streams.

The Management Plan was developed after considerable discussion with representatives from government, non-government organizations (NGOs), and private citizens. Advisory Committee meetings and public meetings were held between June 16, 2005 and January 10, 2006. A vision for the park was determined as follows:

> *The Oak Ridges Corridor Park will be a sanctuary for nature and an essential ecological linkage on the Oak Ridges Moraine where visitors can learn about ecosystem features and functions, wildlife and human influences, and enjoy activities that are compatible with the natural and cultural values of the park.*

Input was sought to identify goals and objectives for the park, and information from earlier studies was used to identify an east-west trail alignment and to develop a habitat restoration plan. The public was invited to suggest an appropriate name for the property. The results will be announced in 2006 when the land is transferred to provincial ownership.

Detailed designs for the east-west pedestrian trail were created, based on numerous site visits, public workshops and an examination of the various alternatives. This primary spine trail will be approximately 5 km long extending from the Bathurst Glen Golf Course across Yonge Street to a trailhead on Old Colony Road and eventually to the proposed Oak Ridges Community Centre at Lake Wilcox. Meetings were held with the landowners and representatives from York Region to examine potential pedestrian crossing sites at Yonge Street, and a preferred crossing site was chosen near the Lebovic Sales Pavilion. The location and installation of traffic lights at this location was approved at a meeting of the Regional Municipality of York Council on October 27, 2005.

An evaluation of the golf course was undertaken to determine if it should be permitted to remain for a definite period of time. This was the conclusion. Annual revenues after expenses may be available to be used to fund the annual operating costs of the park. Because the financial

records were not available for examination, revenues were based on other golf courses in the Greater Toronto Area. This information will have to be verified after operating the course for one or two years. Golf course revenues could also be used to augment the habitat restoration funds provided by the original landowners and other sources yet to be determined.

All the existing natural forests, lakes and wetland habitats will be fully protected. A restoration plan for the majority of lands that were in agricultural use prior to the land acquisition has been developed. The major focus is on reforestation and developing a treed canopy as quickly as possible that will serve to buffer and expand the natural forests. Approximately 135 ha of land are recommended for reforestation and planting should be accomplished within the first five years. The presence of fertilizer and herbicide residues in soils should be verified and cover crops may be required for one or two years prior to tree planting. Other restoration initiatives will include establishing grasslands where possible on the drier upland sites and creating additional small wetlands in lowland areas to enhance biodiversity and assist in amphibian dispersal and breeding. Partnerships with other organizations should be sought to assist in reforestation, habitat restoration and for the control of non-native species.

It is proposed to distinguish and define the park by the use of oak trees at entrance ways to the park. This will require some formal plantings around the parking lots where oak trees can provide shade and provide a source of food for wildlife. Buffers will be used to separate the park from surrounding residential land use. It is suggested that appropriate signage be erected as soon as possible around the perimeter of the park, within the park, and at access points. All other signs should be removed.

There are several buildings of interest on the lands. They include the Gray house (Drynoch) adjacent to Philips Lake, the golf course superintendent's house, club house and workshops associated with the golf course, the Lebovic Sales Pavilion on Yonge Street, a cobblestone house on Yonge Street, a severely fire damaged building (Dynamo House) adjacent to Bond Lake and associated sheds, and an old log house on the east side of Bond Lake in a state of disrepair. There are existing lease agreements for the Lebovic Sales Pavilion and the former Gray house. However, when these expire, the buildings may be used as part of the park infrastructure or to generate revenue from suitable tenants. It is suggested that once the buildings within the lands have been transferred to the Province, details of the lease agreements with tenants be reviewed so that proper use can be made of the buildings. Currently, suggestions are that the sales pavilion ultimately become a trailhead centre, the Cobblestone house be used by NGOs in the area, the Gray house and boathouse be used for institutional purposes (either educational or conservation organization), and the golf course buildings be used as they currently are.

The formation of a Park Management Committee is recommended that would include representatives from provincial, regional and local government, as well as non-government organizations. This committee should be in place when the lands are transferred to the Province of Ontario. Such a committee will act as a liaison between the many stakeholders and the park staff and ensure that the vision for the park is achieved. It is recommended that a park supervisor be hired to undertake day-to-day activities and that person will require part-time

assistance during busy times of the year. It is also recommended that the Park Manager work with local community groups to co-ordinate restoration, clean-up, monitoring, and other activities. Community groups may wish to be involved in educational and interpretive programs. The various local interest groups may also wish to establish a “Friends of the Park” group that would liaise with the TRCA. The TRCA needs to determine how it wishes to integrate an outreach program for the park within its current framework of programs and with those of the Town of Richmond Hill.

Finally, to ensure that the new park achieves its objectives, its relationship with surrounding lands and opportunities for expansion both to the east and west must be considered. There should be an integration of this park with other natural areas on the Oak Ridges Moraine to ensure that a truly sustainable ecosystem is preserved and the unique features of the area are protected for future generations.

TABLE OF CONTENTS

Page

1.0 INTRODUCTION AND METHODOLOGY 1

1.1 Planning Process 2
1.2 Purpose 6
1.3 TRCA and Conservation Lands 7

2.0 VISION, GOALS AND OBJECTIVES 11

3.0 EXISTING ENVIRONMENT 14

3.1 Plant Communities 14
3.1.1 Forest 14
3.1.2 Wetlands 17
3.1.3 Old Field Habitats 21
3.1.4 Hedgerows 22
3.1.5 Grassland 22
3.1.6 Agricultural Areas 23
3.2 Waterbodies 23
3.3 Wildlife 25
3.4 Human Heritage 26
3.4.1 Existing Buildings/Heritage 26
3.4.2 Archaeology 31
3.4.3 Golf Course 31
3.4.4 Parking Lots 32
3.4.5 Roads 32

4.0 SIGNIFICANT FEATURES 34

4.1 Significant Natural Areas 34
4.2 Significant Species 35
4.3 Wildlife Movement 36
4.4 Human Heritage 37

5.0 SITE PROTECTION AND RESTORATION 38

5.1 Protection and Restoration Goals 38
5.2 Opportunities and Constraints 44
5.3 Timeframes 45
5.4 Habitats to be Restored 46
5.4.1 Forests 47
5.4.2 Wetlands 49
5.4.3 Grassland 50
5.4.4 Buffers 51

TABLE OF CONTENTS (Cont'd)

Page

5.5 Wildlife 53
5.5.1 Large Mammals - Ungulates 54
5.5.2 Small and Medium Mammals 55
5.5.3 Amphibians 55
5.5.4 Reptiles 56
5.6 Human Heritage 56
5.6.1 Existing Buildings/Heritage 56
5.6.2 Archaeology 58
5.6.3 Golf Course 58

6.0 TRAILS 61

6.1 Trail Design Guidelines 62
6.2 Primary Trails 63
6.3 Secondary Trails 64
6.4 Tertiary Trails and Lookouts 64
6.5 Trailheads 64
6.6 Decommissioning Existing Trails 65
6.7 Trail Maintenance/Operation and Park Prohibited Activities 65
6.8 Signage 66
6.8.1 Trail Identification/Information Signs 67
6.8.2 Directional Signs 67
6.8.3 Regulatory Signs 68
6.8.4 Awareness Signs 68
6.8.5 Interpretive/Educational Signs 68
6.9 Emergency Access 69

7.0 EDUCATION AND OUTREACH 74

7.1 Public Orientation & Interpretation 74
7.2 Education and Research 75
7.3 Stewardship/Community Outreach 75

8.0 MONITORING AND REVIEW 77

9.0 FINANCIAL 79

9.1 One-Time Costs 79
9.2 Annual Costs 79
9.3 Annual Revenue 80
9.4 Partnerships 80

TABLE OF CONTENTS (Cont'd)

Page

10.0 RECOMMENDATIONS AND IMPLEMENTATION 82

10.1 Park Management Advisory Committee 82
10.1.1 Short-term Priorities for Park Management Advisory Committee (Years 1-5) 82
10.1.2 Medium Term Priorities (Years 5 to 10) 88
10.1.3 Long-term Priorities (>10 Years) 89

11.0 REFERENCES 92

LIST OF FIGURES

1 Site Context 9
2 Location Plan 10
3 Existing Natural Areas 33
4 Restoration Areas 60
5 Trails Planning Workshop Summary 70
6 Trails Master Plan 71
7 Emergency Access Plan 72
8 Recommended Signage Locations 73

LIST OF TABLES

1 Existing, Proposed and Restored Natural Areas 39
2 Restoration Objectives 40
3 Restoration Areas 42
4 Schedule for Restoration Planting with Estimated Area and Costs 44
5 Wetland Seed Mix 50
6 Grassland Seed Mixture 51
7 Flora and Fauna Monitoring Activities and Associated Costs 78

1.0 INTRODUCTION AND METHODOLOGY

The Oak Ridges Moraine is one of Ontario's most significant landforms. This irregular ridge stretches 160 km from the Trent River in the east to the Niagara Escarpment in the west. The Escarpment and Moraine together form the foundation of south-central Ontario's natural heritage and greenspace systems. Strategically located north of and parallel to Lake Ontario, the moraine divides the watersheds draining south into western Lake Ontario from those draining north into Georgian Bay, Lake Simcoe and the Trent River system. The Moraine shapes the present and future form and structure of the Greater Toronto region, and its ecological functions are critical to the region's continuing health.

The Province of Ontario is in the process of exchanging lands which it owns in North Pickering for privately owned lands in the Town of Richmond Hill as part of its strategy to protect environmentally sensitive lands on the Oak Ridges Moraine and to ensure permanent greenbelt protection. The Richmond Hill landowners and the provincial government reached a general agreement in November 2001 to negotiate the land exchange, and in November 2003 the government improved the settlement by adding 19 ha (47 acres) to the future park and secured a $3.5 million contribution by the landowners to be used for creating a primary east-west spine trail and for habitat restoration purposes. This land exchange settled outstanding land disputes before the Ontario Municipal Board affecting moraine lands in Richmond Hill. By agreeing to this solution, the Province and the landowners ensured the provision of an east-west natural corridor at its narrowest “pinch point” in the Town of Richmond Hill (Figure 1).

The park consists of approximately 428 ha (1,057 acres) of land between Bathurst Street and Leslie Street, and north of Jefferson Side Road and Stouffville Road (Figure 2). The current boundary of the park, as indicated in the Management Plan, has been provided by The Ministry of Municipal Affairs and Housing (MMAH) and represents a close approximation of the legal boundary of the park. Some of the lands conveyed as part of the land transfer will not be administered as part of the park (Figure 2). Instead, these small parcels will be managed by others such as the Town of Richmond Hill and local school board. Additional lands located to the east of Bayview Avenue have been brought into public ownership. Although they do not form part of this management plan, they may be available for public utilization in the future.

The Province of Ontario, through the Minister of Municipal Affairs and Housing, requested Toronto and Region Conservation (TRCA) develop a Management Plan for the lands, currently referred to, as the Oak Ridges Corridor Park (ORCP) with the objectives that the lands be managed to protect and restore natural ecosystems, and that a five km pedestrian trail be designed and built across the lands. The TRCA issued a Request for Proposals (RFP) on April 8, 2005 to undertake this work. AMEC Earth & Environment (AMEC) together with ENVision – The Hough Group, UrbanMetrics Inc., D.R. Poulton & Associates Inc., Andre Schiemann and Suzanne Barrett responded to the RFP and were selected to undertake the project.

The study area is identified within the Greenbelt Plan (2005) which builds upon the ecological protections provided by the Oak Ridges Moraine Conservation Plan (ORMCP 2002) and the Niagara Escarpment Plan (NEP). The Protected Countryside lands identified in the Greenbelt Plan are intended to enhance the spatial extent of agriculturally and environmentally protected lands currently covered by the ORMCP and the NEP while, at the same time, improving linkages between these areas and the surrounding major lake systems and watersheds. As the study area is located within the Oak Ridges Moraine Conservation Plan Area, it is subject to the requirements of the Oak Ridges Moraine Conservation Act and the Oak Ridges Moraine Conservation Plan Regulation (2001). In particular, the Oak Ridges Moraine Conservation Plan identifies a Natural Core Area, which is generally located between Yonge Street and Bayview Avenue and a Natural Linkage Area located between Bathurst Street and Yonge Street. A Natural Core Area protects those lands with the greatest concentrations of key natural heritage features which are critical to maintaining the integrity of the Moraine as a whole. A Natural Linkage Area protects critical natural and open space linkages between the Natural Core Areas and along rivers and streams.

1.1 Planning Process

The purpose of this project was to develop a Management Plan to guide the protection, restoration, use, operation and maintenance of the lands. This process involved stakeholders and the general public.

An Advisory Committee composed of representatives from the consulting team, TRCA, MMAH, the Ministry of Natural Resources (MNR), Ontario Realty Corporation (ORC), York Region (YR), the Town of Richmond Hill (RH), Save the Oak Ridges Moraine (STORM), the Oak Ridges Trail Association (ORTA), Oak Ridges Moraine Foundation (ORMF), Richmond Hill Naturalists (RHN), Humber Watershed Alliance (HWA), Jefferson Forest Residents Association (JFRA), Citizens Environment Watch, Lebovic Homes, Metrus Development and Mattamy Homes was established. The names of individual members and their affiliations are listed below:

Advisory Committee

Michael G. Scott, Oak Ridges Moraine Foundation
Kim Gavine, Oak Ridges Moraine Foundation
Harold Sellers, Oak Ridges Trail Association
Councillor Dave Barrow, Town of Richmond Hill
Councillor Vito Spatafora, Town of Richmond Hill
Barb Jeffrey, Regional Municipality of York
Ian Buchanan, Regional Municipality of York
Audrey Hollasch, Town of Richmond Hill
Bryan Kozman, Ministry of Municipal Affairs and Housing
Wayne Williams, Ministry of Municipal Affairs and Housing
Mark Christie, Ontario Realty Corporation
Debbe Crandall, Save the Oak Ridges Moraine

Jim Bradley, Humber Watershed Alliance
Sharon Bradley, Richmond Hill Naturalists
Michael White, Resident
Sonia Dong, Citizens Environment Watch
Carrie Hoffelner, Jefferson Forest Residents Association
Tom Farrell, Ministry of Natural Resources
Randy Peddigrew, Mattamy Development Corporation
Bruce Fischer, Metrus Development Inc.,
Lloyd Cherniak, Lebovic Enterprises

Consulting Team

Mark Taylor, AMEC Earth & Environmental
Fiona Christiansen, AMEC Earth & Environmental
Suzanne Barrett
Peter Thoma, Urban Metrics Inc.,
Ian Dance, ENVision – The Hough Group
Christina Pilz, ENVision – The Hough Group

TRCA Staff

Adele Freeman, Director, Watershed Management
Jim Dillane, Director, Finance & Business Excellence
Carolyn Woodland, Director, Development Services
Deb Martin-Downs, Director, Ecology
Nick Saccone, Director, Restoration Projects
Derek Edwards, Director, Parks and Culture
Gary Wilkins, Humber Watershed Specialist
Dena Lewis, Manager, Terrestrial & Aquatic Ecology
Russel White, Senior Planner
Ron Dewell, Senior Manager, Conservation Lands and Property Services
Mike Bender, Supervisor, Conservation Land Planning Group
Mark Lowe, Landscape Architect

Meetings of the Advisory Committee, as well as public meetings were held over eight months. The following is a brief summary of the planning process.

June 16, 2005 Advisory Committee Meeting

- Development of a draft vision, goals and objectives; and,
- Presentation and discussion of mapping and information about existing natural features.

July 6, 2005 Public Workshop

- 61 participants;
- Refinement of the vision, goals and objectives;
- Presentation of information about natural features, including “no go” areas based on 30 m buffers from all significant natural areas; and,
- Identification of potential trail routes by participants, avoiding the “no go” areas (natural features plus buffers).

July 19, 2005 York Region Roads Meeting

- Meeting with York Region staff to discuss options for Yonge Street crossing.

August 8, 2005 Advisory Committee

- Discussion of initial spine trail route, based on July 6 workshop input.

September 12, 2005 Advisory Committee

- Discussion of additional information about the proposed spine trail route; and,
- Discussion of initial restoration proposals.

September 28, 2005 York Region Transportation Meeting

- Meeting with York Region staff to discuss options regarding Yonge Street crossing and restoration.

October 11, 2005 Public Workshop

- 52 participants;
- Presentation of spine trail route, trail connections and loops;
- Concerns arose about location of proposed Yonge Street pedestrian crossing;
- Discussion of restoration goals and objectives, trail connections and loops, and other passive recreation, interpretation and education activities; and,
- Announcement of park naming competition.

October 31, 2005 Advisory Committee

- Discussion of ecological protection and restoration plan; and,
- Discussion of trail master plan, including Yonge Street crossing alternatives.

November 7, 2005 Advisory Committee

- Continued discussion and approval of trail master plan.

November 15, 2005 Team Review of Buildings

- Site visit to review buildings with owners; and,
- Meeting with owners to discuss several options regarding spine trail and buildings.

November 25, 2005 TRCA Authority Meeting

- Endorsement of primary spine trail alignment, dated September 12, 2005, prepared by AMEC Earth & Environmental.
- Con-Strada awarded a contract for construction of the Oak Ridges Corridor Park spine trail subject to execution of the Oak Ridges Corridor Park Developer's Contribution Collateral Agreement by the Province of Ontario, TRCA and all parties, and the province providing to TRCA all necessary funds for the work;
- Staff was authorized to enter into agreements in a form satisfactory to TRCA staff and solicitors with Mattamy Corporation and J. Falconi for the operation of the Bathurst Glen Golf Course and Driving Range;

November 29, 2005 Public Workshop

- 37 participants; and,
- Review of draft Management Plan components.

November 29, 2005 Site Meeting with Contractor

- Site meeting with Con-Strada regarding spine trail.

January 10, 2006 Advisory Committee

- Details of timeline for final submission of Plan to TRCA for consideration; and,
- Meeting of advisory committee to provide comments on Draft Management Plan.

January 29, 2006 Construction Drawings

- Issue of contractor package, including construction drawings, for spine trail.


Volunteers. M. Taylor

The public information summary reports, advisory committee minutes, and the rationale and criteria used for identifying the spine trail alignment are filed with Toronto and Region Conservation.

1.2 Purpose

The purpose of the Management Plan is as follows:

- To provide guidance for protecting the natural heritage features and functions of the property;
- To identify opportunities for enhancing the existing natural environment;
- To naturalize the landscape within the boundaries of the property to provide habitats that reflect the physiographic conditions of the landform and climate;
- To confirm an east-west primary spine trail alignment through a public consultative design process, provide construction details for same, and identify secondary trail routes to the local community;
- To provide management directions and an implementation plan that is consistent with the vision, goals and objectives as set out in Section 2.0;
- To assist with the protection, restoration and interpretation of heritage resources;
- To recommend public use needs and opportunities; and,

- To assess the Bathurst Glen Golf Course to determine its future status as part of the property.

The protection and/or enhancement measures for the property are formulated from an ecological landscape conservation perspective, with the primary goal to protect and restore sustainable natural vegetation communities, wildlife habitat and wildlife communities. Recommendations are based on background information such as conservation objectives and planning guidance provided in: Riley and Mohr (1994), OMNR (2004), Environment Canada (1998), TRCA (2004), Geomatics International (1993 & 1998) and Oak Ridges Moraine Conservation Plan (2002).

1.3 TRCA and Conservation Lands

The property is in the process of being transferred to the Province as per the Pickering Land Exchange Program. The Province, through MMAH, asked TRCA to facilitate the development of a Management Plan for the property. It is anticipated that TRCA will be asked to assume management responsibilities for the land including the implementation of the Management Plan. If TRCA assumes management responsibility for the property, work will be guided by the new "Living City" vision; TRCA's new vision of a healthy, attractive, sustainable urban region.

TRCA is committed to community partnerships with all sectors of society, to encourage environmental stewardship and build on innovative thinking about environmental health, social responsibility and sustainable economies.


Young Volunteer. M. Taylor

TRCA's "Living City" vision has four major objectives:

- **Healthy Rivers and Shorelines** – restore the integrity and health of our rivers and shorelines within nine watersheds of the region and the Lake Ontario waterfront.

- **Regional Biodiversity and Greenspace** – protect and restore a rich variety of animals and plants that thrive in a network of greenspace.

- **Sustainable Living through Education** – engage people in environmentally friendly practices to improve our quality of life.

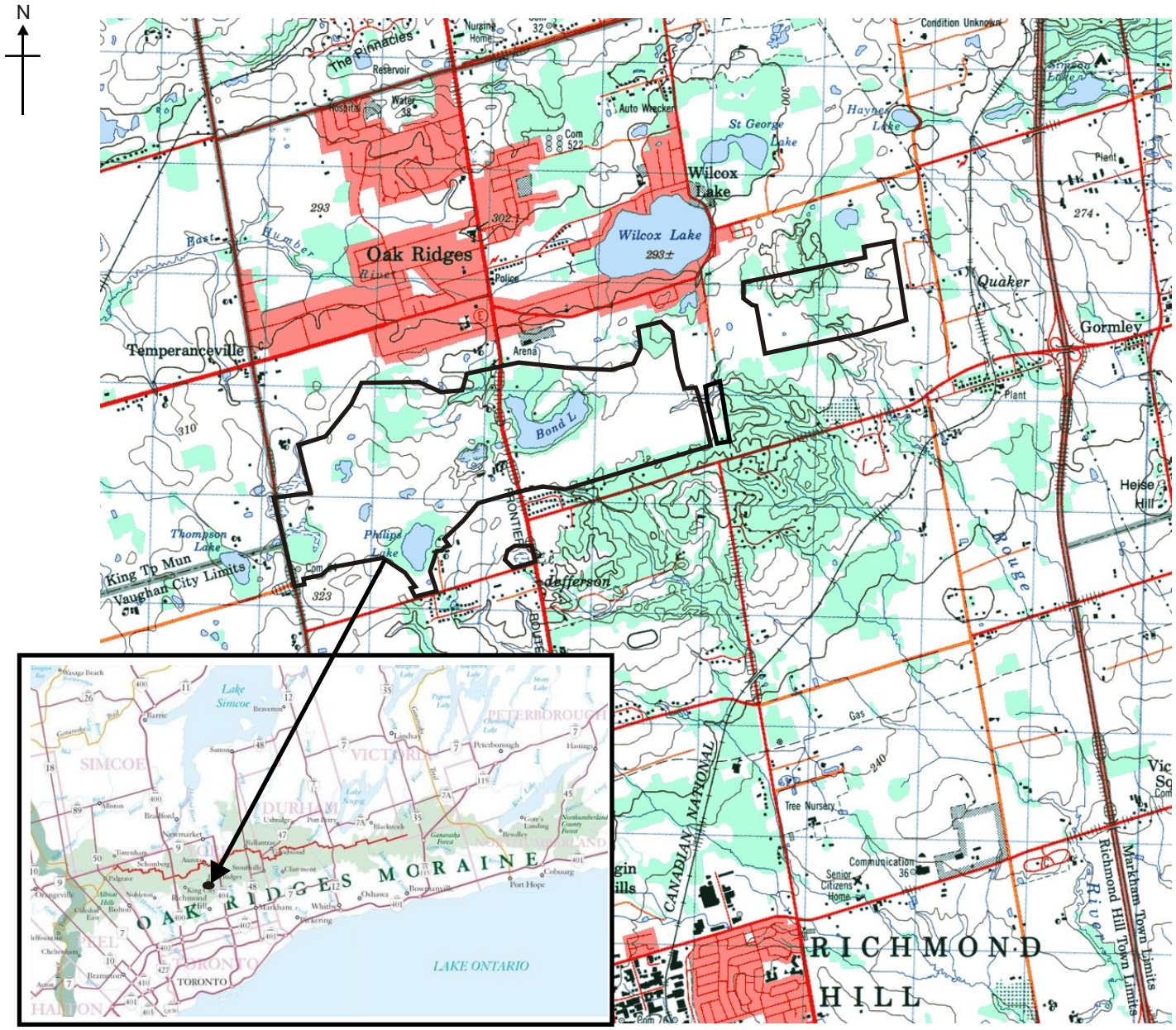
- **Business Excellence** - continue to improve in the development and delivery of programs through creative and effective partnerships.

The ORCP Management Plan will meet the Living City objectives through the application of practical initiatives described, in part, by the TRCA's Terrestrial Natural Heritage System Strategy.

TRCA's terrestrial natural heritage approach recognizes the implications of rapid conversion of natural and agricultural cover into urban expansion areas in the Greater Toronto Area. The approach acknowledges two basic principles:

- That rare species protection is not enough for ensuring regional ecological health; and,
- That the protection of more than "significant sites" is needed to ensure regional ecological health.

The Terrestrial Natural Heritage System Strategy defines a target system based on ecological principles that aim to identify and protect existing cover, as well as identify lands that, when restored to natural cover will maintain or improve the functioning of the existing natural areas with progressive changes in land use. In general, the terrestrial natural heritage target system for the subject property identifies potential natural cover between Bathurst Street and Yonge Street and forest between Bayview Avenue and Yonge Street.



Source: NTS 30-M-14

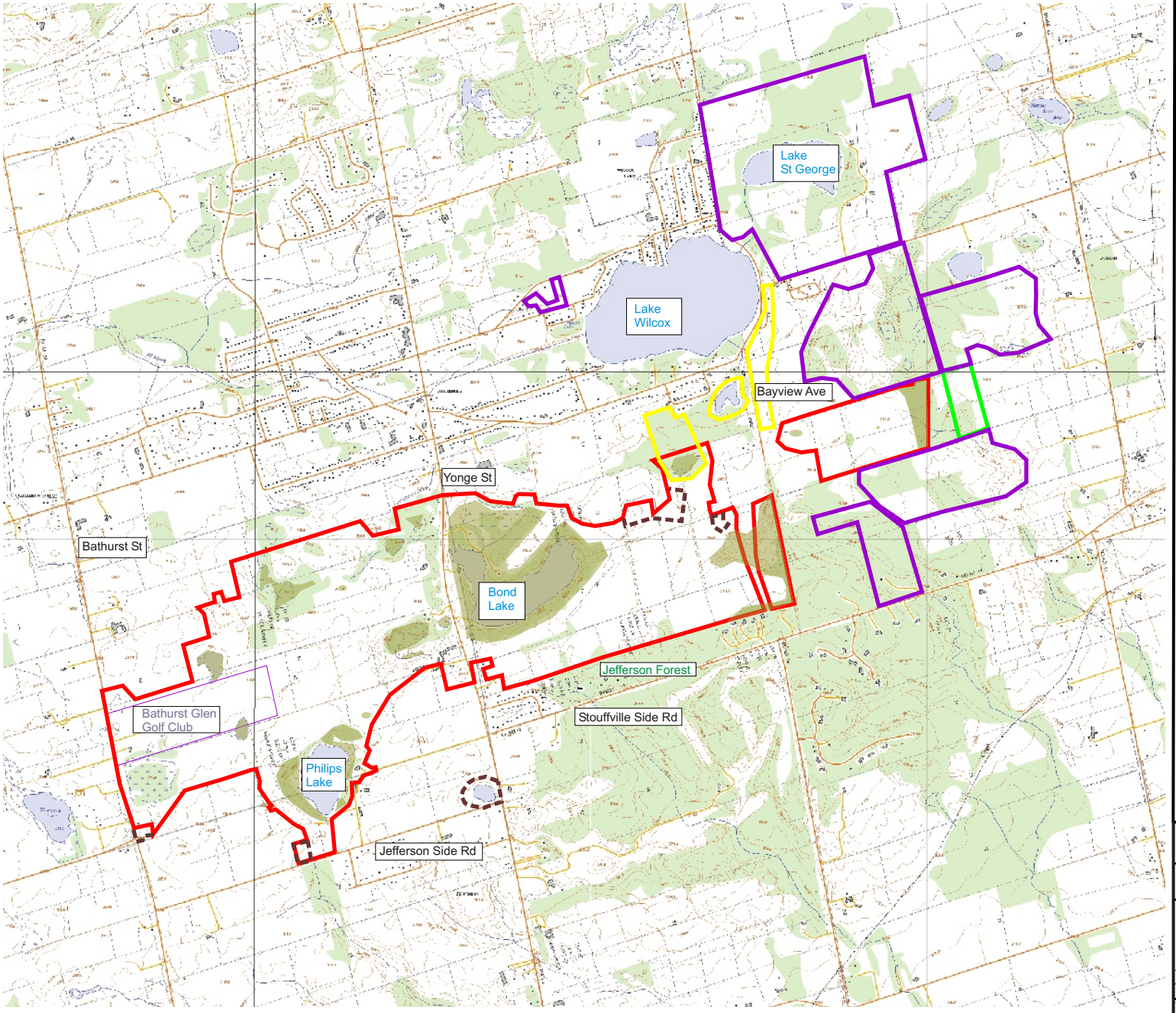
amec

CONTRACT

OAK RIDGES CORRIDOR PARK MANAGEMENT PLAN

FIGURE 1: SITE CONTEXT

PROJECT NUMBER TC 51410		DATE OCT 2005	
VENDOR DWG No	CLIENT DWG No	SHEET No 1 OF 1	REV 0



Study Area

Lands Conveyed as part of Land Transfer but not Administered by TRCA as part of Park

Proposed Public Lands

TRCA Property

Other Public Lands

Environmentally Significant Areas, Areas of Natural Scientific Interest or Provincially Significant Wetlands within study area

amec

CONTRACT

OAK RIDGES CORRIDOR PARK MANAGEMENT PLAN

FIGURE 2: LOCATION PLAN

PROJECT NUMBER TC 51410		DATE DEC 2005	
VENDOR DWG No	CLIENT DWG No	SHEET No 1 OF 1	REV 0

2.0 VISION, GOALS AND OBJECTIVES

The following vision, goals and objectives were developed for the ORCP as a result of an interactive process between the consulting team, the advisory committee and the public.

Vision

The Oak Ridges Corridor Park will be a sanctuary for nature and an essential ecological linkage on the Oak Ridges Moraine where visitors can learn about ecosystem features and functions, wildlife and human influences, and enjoy activities that are compatible with the natural and cultural values of the park.

Goals

1. To support the implementation of the Oak Ridges Moraine Conservation Act by contributing to the protection, restoration and enhancement of the Moraine's ecological functions, protecting water quality and quantity, maintaining the integrity of the continuous natural system and fostering partnerships for stewardship.

2. To address the challenge of sustaining a sanctuary for nature in an urban setting by including public uses that provide opportunities for passive recreation, linkages to the Oak Ridges Trail, and experiential learning, while protecting the environmental integrity of the park.

Objectives

Natural Heritage

- Protect, restore and enhance the forests, kettle lakes and wetlands of the park as a functioning natural heritage system including natural features and processes, wildlife habitats, wildlife movement, and linkages to other natural systems on the Oak Ridges Moraine and the watersheds of the Humber and Rouge Rivers.

Environmental Sustainability

- Design and manage the park and golf course as a showcase for sustainability such as "green building" design, minimizing human footprint, restricting motorized vehicles, recycling water, using renewable energy, and no lighting.

- Protect the park from negative external influences such as invasive species, encroachments, pets, traffic, and changes to the hydrology.

Cultural Heritage

- Give appropriate protection and recognition of the park's cultural heritage, both pre- and post-European contact with First Nations.

Public Use

- Provide windows, not doors, for people to enjoy and learn about the sensitive natural features of the park.

- Incorporate a variety of year-round opportunities for trail use and other appropriate passive recreation activities without compromising the environmental integrity of the park.

- Design and manage the park to welcome and accommodate local residents, as well as visitors from the region.

- Organize public uses of the park in partnership with other recreation, interpretation and education opportunities in the Town of Richmond Hill and the surrounding region.

Bathurst Glen Golf Course

- Operate the existing golf course as an integral part of the park such that it functions as an ecological corridor, provides wildlife habitats, maintains environmental integrity, acts as an important community recreation facility and contributes financially to the operations of the park.

Experiential Learning

- Provide proactive and engaging interpretive programs to educate and promote the park's natural and cultural heritage, emphasize the role of the Oak Ridges Moraine in south-central Ontario, enhance users' experience, and foster community responsibility and stewardship.

Equity

- Include opportunities to share the benefits of the park with everyone, including people with disabilities.

Stewardship

- Encourage community stewardship of the park such as participation in clean-up and restoration projects, and complementary management of neighbouring properties.

Financial Sustainability

- Establish financially sustaining partnerships with public agencies, businesses and community groups to ensure effective implementation and operations of the park over the long-term.

Monitoring

- Collaborate with agencies, universities, NGOs and other institutions to ensure long-term monitoring of the park's resources and environmental functions, and to provide guidance for any changes to park policies and operations.

3.0 EXISTING ENVIRONMENT

In the following section, a number of documents have been used to describe the existing natural areas of the ORCP. These references include: *Natural Features Evaluation and Impact Analysis Drynoch Estates* (Michael Michalski Associates, January 1999), and *The Master Environmental Servicing Plan, Oak Ridges Farm Co-Tenancy, Town of Richmond Hill* (Schaeffer & Associates, 1998), which contains an *Oak Ridges Farm Co-Tenancy Natural Features Evaluation and Impact Analysis (*Michael Michalski Associates, January 1999). In addition, the *Master Environmental Servicing Plan Yonge East Secondary Plan Area, Town of Richmond Hill* (Cosburn Patterson Mather Limited, 1999) contains A*n Ecological Analysis of Bond Lake* (Garter Lee, 1999), *Bond Lake and Its Watershed Natural Features and Trophic State* (Michael Michalski Associates, May 1999) and *Ecological Analysis Bond Lake Park Homes, Town of Richmond Hill* (ESG International Inc., January 1999). Additional electronic information was made available for the ORCP area from the Richmond Hill Naturalists, and TRCA natural heritage data. Site visits were undertaken by AMEC (June/July 2005) to verify findings.

3.1 Plant Communities

Each vegetation patch has been identified with a unique number and a brief description has been provided where available (Figure 3). This baseline data can be updated as new information is acquired and the data can be used to provide feedback regarding the progress and success of the various restoration initiatives.

3.1.1 Forest

There are 15 patches of forest habitat and some patches (such as F10 and F11) contain more than one forest type. Where possible, these forest types are identified on Figure 3 as “a”, “b”, etc. The majority of forests within the park are deciduous.

Deciduous Forest

There are 12 deciduous forest areas (F1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12 and 13). F1 to F9 are located between Bathurst and Yonge Streets and F10 to F12 are located between Yonge Street and Bayview Avenue. Areas F13 to F15 are located east of Bayview Avenue.

Areas F1 and F2 form a dense narrow band of deciduous trees and shrubs around wetland areas (W1 and W2). In general, the species are indicative of drier, successional upland sites. The overstorey and understorey includes Manitoba maple (*Acer negundo*), trembling aspen (*Populus tremuloides*), white elm (*Ulmus americana*), red maple (*Acer rubrum*), Tartarian honeysuckle (*Lonicera tatarica*), highbush cranberry (*Viburnum trilobum*), choke cherry (*Prunus virginiana*) and common buckthorn (*Rhamnus cathartica*). Herbaceous ground cover includes common species such as enchanter’s nightshade (*Cicaea lutetiana*), tall buttercup (*Ranunculus acris*), red baneberry (*Actaea rubra*), field horsetail (*Equisetum arvense*) and false helleborine (*Epipactis helleborine*) (Michael Michalski Associates, January 1999).

Area F3 includes the forest stand surrounding Philips Lake. Area F4 is similar in composition to F3 and is situated on the steep slopes around the wetland (W5). Dominant species include sugar maple (*Acer saccharum*), black cherry (*Prunus serotina*), ironwood (*Ostrya virginiana*), red oak (*Quercus rubra*), white ash (*Fraxinus americana*), white birch (*Betula papyrifera*) and large-toothed aspen (*Populus grandidentata*). The understorey contains many shrub and herb species characteristic of mesic forest stands including choke cherry, witch hazel (*Hamamelis virginiana*), bush-honeysuckle (*Diervilla lonicera*), large-leaved aster (*Aster macrophyllus*), zig-zag goldenrod (*Solidago flexicaulis*), agrimony (*Agrimonia gryposepala*) and wild lily-of-the-valley (*Maianthemum canadense*) (Michael Michalski Associates, January 1999).

Area F6 includes all the upland cover on the slopes around wetlands (W7 and W8). Forest cover composition is variable, ranging from semi-open successional on the southern side of the wetlands to a more mature closed-canopy on the northern side. The latter is dominated by sugar maple, with ironwood, white ash, white birch, basswood (*Tilia americana*), red oak and black cherry. Shrubs and herbaceous species include Virginia waterleaf (*Hydrophyllum virginianum*), false solomon's seal (*Maianthemum racemosum*), enchanter's nightshade, blue cohosh (*Caulophyllum thalictroides*), zig-zag goldenrod, red baneberry and spinulose wood fern (*Dryopteris carthusiana*) (Michael Michalski Associates, January 1999).

Area F7 is located around wetland (W9) and forms the largest block of woodland located to the west of Yonge Street. The composition of the woodland is variable, with cover ranging from early successional areas dominated by trembling aspen and balsam poplar (*Populus balsamifera*) and regenerating sugar maple to more successionally advanced cover with a wider array of overstorey species. The woodland also includes a small area of pine plantation (Michael Michalski Associates, January 1999).


Woodland Trail. M. Taylor

Area F8 is a narrow fringe of successional woodland located along the northern side of the wetland (W9). For much of its length, the patch is dominated by trembling aspen and balsam poplar, however, white cedar (*Thuja occidentalis*) is also present in the western portion of the stand. The understorey includes a mix of species typical of successional cover, such as red-osier dogwood (*Cornus stolonifera*), raspberry (*Rubus strigosus*), Virginia creeper (*Parthenocissus inserta*), smooth brome (*Bromus inermis*) and orchard grass (*Dactylis glomerata*) (Michael Michalski Associates, January 1999).

Area F9 is a small narrow successional stand situated along the edge of W12. The overstorey includes Manitoba maple, white ash and black cherry. Tall shrubs are common and include hawthorn (*Crataegus punctata*), raspberry, choke cherry, common buckthorn and flowering raspberry (*Rubus odoratus*). Herbaceous cover includes enchanter's nightshade, tall buttercup, common burdock (*Arctium minus*), dame's rocket (*Hesperis matronalis*), red baneberry, field horsetail and false helleborine (Michael Michalski Associates, January 1999).

Area F10 contains the northern part of the Jefferson Forest which extends into the southern portion of the park and is characterized by red oak, sugar maple and American beech (*Fagus grandifolia*) with some eastern hemlock (*Tsuga canadensis*) occurring at lower elevations. Other notable species include white birch, black cherry, white ash, American basswood and ironwood.The understorey consists of witch hazel, ash and maple saplings, and common buckthorn (Gartner Lee, 1999).

Area F11 (b) is located around the northern edge of Bond Lake and is dominated by sugar maple with scattered beech, white ash, ironwood, black cherry, white birch and basswood (Michael Michalski Associates, January 1999).

Area F12 is located south of Catfish Pond and is dominated by sugar maple in association with beech. White ash, red oak and eastern hemlock are also common canopy species (ESG, 1999).

Area F13 is located east of Bayview Avenue and is dominated by sugar maple in association with red oak, white birch and white pine (*Pinus strobus*) (ESG, 1999).

Area F14 is a narrow band of woody vegetation surrounding a kettle feature with Manitoba maple, willow (*Salix* spp.) and shrubby vegetation, including dogwood, flowering raspberry and common buckthorn.

Area F15 is a narrow band of woody vegetation with Manitoba maple, willow (*Salix* spp.) and shrubby vegetation, including dogwood (*Cornus sericea*), flowering raspberry and common buckthorn.


Mixed Forest nr. Bond Lake. M. Taylor

Mixed Forest

There are two patches that contain mixed forest habitat (F5 and F11 (a)). F5 is relatively heterogeneous, with several horticultural ornamentals constituting a significant proportion of both the overstorey and understorey. Species include black walnut (*Juglans nigra*), Scot's pine (*Pinus sylvestris*), blue spruce (*Picea pungens*), white ash, sugar maple, red pine (*Pinus resinosa*) and trembling aspen. The canopy is discontinuous and includes many species more typical of open fields, including smooth brome grass, meadow fescue (*Festuca pratensis*), yellow bedstraw (*Galium verum*), orchard grass, butter-and-eggs (*Linaria vulgaris*) and Canada thistle (*Cirsium arvense*) (Michael Michalski Associates, January 1999). The area was presumably part of a residential estate at one time.

Area F11 (a) is located at the eastern and western ends of Bond Lake, the hardwood and coniferous trees occurred in roughly equal numbers. Species include white pine with scattered red oak, white ash, white birch, red maple and black cherry (ESG, 1999).

Coniferous Forest

There are at least three patches of coniferous forest habitat (F3, F11 and F11b). Area F3, located on the west side of Bond Lake, is an old plantation that has become invaded around the edges with deciduous species. F11 is located along the southern shore of Bond Lake. Eastern hemlock is the dominant species with scattered white pine and eastern white cedar. F11b is located along the northern shore of Bond Lake. Dominant species include eastern hemlock, white pine, white cedar and white birch (ESG, 1999).

3.1.2 Wetlands

Seventeen wetlands (W1 to W17) including swamps, marshes and one bog (B1) are located within the park.

The Radio Tower Wetland (W1) interior consists of various phases of tree and shrub swamp with some elements of a shrub bog. Dominant trees in the swamp portion of the wetland are silver maple (*Acer saccharinum)*, tamarack (*Larix laricina)* and white elm with some white pine occurring in the interior. Shrubs include winterberry (*Ilex verticillata*), leatherleaf (*Chamaedaphne calyculata*), meadowsweet (*Spiraea alba*) and various willows. Wetland herbaceous plants include marsh cinquefoil (*Potentilla palustris*), tufted loosestrife (*Lysimachia thyrsiflora*), swamp loosestrife (*Lythrum salicaria*), Canada blue joint (*Calamagrostis canadensis)* and bulbous water-hemlock (*Cicuta bulbifera*). Emergent marsh is well-developed

around the margins with wide-leaved cattail (*Typha latifolia*) and sedge (*Carex lacustris*). Free floating aquatics dominate the open water areas and include floating pondweed (*Potamogeton natans*), water smartweed (*Polygonum amphibium*) and duckweeds (*Lemna minor, L. trisulca*) (Michael Michalski Associates, January 1999). The wetland drains via a culvert under Bathurst Street to the wooded valley to the west of the study area.

Wetland W2 (a, b, c, d, e, h, i) consists primarily of open water supporting dense submerged aquatics, such as Canada water-weed (*Elodea canadensis*) and water smartweed. The riparian zone supports various emergents and hydrophyte species including water parsnip (*Sium suave*), cut-grass (*Leersia oryzoides*), water plantain (*Alisma plantago-aquatica*), spike rush (*Eleocharis erythropoda*) and water horsetail (*Equisetum fluviatile*). The margin also supports a small area of cattail (Michael Michalski Associates, January 1999).

Wetland W3 (a to e) is located around Philips Lake. This wetland supports free-floating aquatics and scattered emergents, including watermeal (*Wolffia Columbiana, W. Borealis*) and duckweed (Michael Michalski Associates, January 1999).

Wetland W4 is a small depression which supports a dense emergent marsh community dominated by cattail with arrowhead (*Sagittaria latifolia*), tall manna grass (*Glyceria grandis*), sedges (*Carex stipata, C. vulpinoidea, C. aquatilis*), three-way sedge (*Dulichium arundinaceum*), boneset (*Eupatorium perfoliatum*) and jewelweed (*Impatiens capensis*) (Michael Michalski Associates, January 1999). It has a water control device that allows the water levels to be regulated. In late summer the exposed mud surfaces provide feeding areas for shorebirds such as spotted sandpiper (*Actitis macularia*) and greater yellowlegs (*Tringa melanoleuca*).

Wetland (W5) is located approximately 20 m below the surrounding tableland. The western portion is primarily open water with dense submerged aquatics and scattered emergents along its margin. The eastern part supports dense emergent marsh interspersed with willow thicket in the interior. The aquatic plants include flat-stemmed pondweed *(Potamogeton zosteriformis*), water smartweed, duckweeds and common coontail (*Ceratophyllum demersum*). The emergent marsh/willow thicket area consists mainly of wide-leaved cattail and large pussy willow (*Salix discolor*) (Michael Michalski Associates, January 1999).

Wetland W6 is situated along an intermittent surface drainage channel that flows northward to the Humber River. The dominant plant community includes a silver maple swamp with a moderately rich understory of various hydrophytic ferns, graminoids, and forbs. Other trees include scattered red maple, green ash (*Fraxinus pennsylvanica*), black ash (*Fraxinus nigra*) and balsam poplar. Common understory plants include ostrich fern (*Matteuccia*


Wetland nr. Phillips Lake. M. Taylor

struthiopteris), jewelweed, sedges (*Carex crinita, C. intumescens, C. lacustris*), sensitive fern (*Onoclea sensibilis*), wood nettle (*Laportea canadensis*) and Jack-in-the-pulpit (*Arisaema triphyllum*). W7 is the same type of wetland as W6 and has a similar species composition with local openings supporting thicket, meadow and marsh (Michael Michalski Associates, January 1999).

Wetlands W8 and W8a include a small pond supporting a stand of willows and other common hydrophytes, such as reed canary grass (*Phalaris arundinacea*), cut-grass (*Leersia oryzoides*) and sedge (*Carex vulpinoidea*). It is situated on an intermittent surface water conveyance, which provides limited surface drainage connection between W6 to W9 (Michael Michalski Associates, January 1999).

Wetland W9 is the same type of wetland as W6 and W7, with greater species richness. Dominant species include silver maple, with white elm, red maple, crack willow (*Salix fragilis*), black ash and balsam poplar. This wetland also includes some broad areas of shrub swamp and local areas of wet meadow and emergent marsh (Michael Michalski Associates, January 1999).

Wetland W10 is situated in a small depression with a weakly developed outlet. The dominant cover type is shrub swamp, consisting of a variety of willow species with scattered trees and a rich assemblage of herbaceous hydrophytes. Species include large pussy willow, shining willow (*Salix lucida*), crack willow, slender willow (*Salix petiolaris*), peach-leaved willow (*Salix amygdalloides*) and red-osier dogwood. Herbaceous plants include tall white aster (*Aster lanceolatus*), boneset, sedges (*Carex stipata, C, crinita*), water-parsnip, black bulrush (*Scirpus atrovirens*), marsh bedstraw (*Galium palustre*) and field horsetail (Michael Michalski Associates, January 1999).

Wetland W11 consists primarily of a broad ring of emergent marsh, dominated by narrow-leaved cattail (*Typha angustifolia*) with a small area of open water containing free floating and submerged aquatics. Herbaceous species within the marsh include swamp milkweed (*Asclepias incarnata*), rush species (*Juncus dudleyi*) (*Eleocharis erythropoda*), hooked buttercup (*Ranunculus recurvatus*), tufted loosestrife (*Lysimachia thyrsiflora*), tall white aster and hairy willowherb (*Epilobium ciliatum*) (Michael Michalski Associates, January 1999).

Wetland W12 contains an isolated, species rich wetland, which includes shrub swamp, emergent marsh and submerged aquatic plant communities. The shrub swamp is dominated by slender willow with red-osier dogwood and common elder (*Sambucus canadensis*). The herbaceous cover is a thicket and includes manna grass, sensitive fern sedges (*Carex retrorsa, C.lupulina, C. pseudocyperus*) water horehound (*Lycopus uniflorus*), mint (*Mentha arvensis*) red-stemmed aster (*Aster puniceus*) and forget-me-not (*Myosotis scorpioides*). The wetland includes a number of emergent marsh species dominated by wide-leaved cattail. Bur-reed (*Sparganium eurycarpum*) dominates the fringes along open water zones (Michael Michalski Associates, January 1999).

Wetland W13 is a small pond located on the western side of Yonge Street adjacent to Jefferson Side Road. It is a shallow feature, ringed with cattails and old-field habitat. It provides resting and feeding areas for waterfowl. To the west are two new storm water management ponds associated with the recent subdivision development and the surrounding ground is disturbed with newly graded soil. The whole wetland area is isolated with a silt fence barrier consisting of snow fence and erosion control fabric.

Wetland W14 is located east of Bayview Avenue and is dominated by herbaceous and shrub associations. The area contains three small depressions that appear to periodically overflow within the larger sub-basin. Common species observed include rice-cutgrass (*Leersia oryzoides*), dark green bulrush (*Scirpus atrovirens*), jewelweed and red-osier dogwood (ESG, 1999).

Wetland W15 is located east of Bayview Avenue. The edges of this patch are fringed with willow species and Manitoba maple. Sensitive fern also occurs along the edges. Duckweed dominates when shallow water is present (ESG, 1999).

Wetland W16 (a to c) is dominated by silver maple in association with red maple. Pockets of low white cedar and eastern hemlock also occur. The understorey is characterized by shrub thickets of red osier dogwood, winterberry and willow sp. (ESG, 1999). These small wetland pockets are presently realizing effects from neighbouring developments and associated erosion and sedimentation.

Wetland W17 is located east of Bond Lake. This small depression is characterized by cattail and bittersweet nightshade (*Solanum dulcamara*) (ESG, 1999).

The bog B1 is situated in a poorly drained depression immediately north of Bond Lake. (Michael Michalski Associates, 1999; OMNR, 2001; TRCA, 1982). The bog contains a number of distinct communities, including:


Bond Lake Bog. M. Taylor

- Four phases of bog, which contain several tree, shrub and herbaceous plants having northern affinities, such as tamarack, leatherleaf, three-leaved false Solomon's seal (*Smilacina trifolia*) and cotton grass (*Eriophorum virginicum*).
- A shrub swamp dominated by a variety of wetland shrub species, including winterberry, meadowsweet, large pussy willow and a range of herbaceous hydrophytic flora; and,

- An emergent, floating-leaved, and submerged aquatic community situated in the lagg zone (the moat that commonly develops along the margins of bogs and fens).

ESG (1999) describe the bog as being dominated by leatherleaf in association with other low shrubs. These include Labrador tea, bog rosemary and small cranberry. Scattered stands of tamarack and black spruce also occur near the center of the unit.

3.1.3 Old Field Habitats

Established Old Fields

Old fields OF1 to 4, OF8 and OF20 are located between Bathurst Street and Yonge Street. These old fields vary in their composition as to the amounts of grasses, weeds and herbaceous species such as goldenrods and asters. The soil types range from being very moist to dry and they represent significant habitat for grassland birds and insects as well as foraging areas for amphibians such as leopard frog (*Rana pipiens*) and American toad (*Bufo americanus*). Some areas are becoming invaded by shrubs and saplings such as hawthorn species and trembling aspen and may eventually become woodland.

Old fields OF5 to 18 are located between Yonge Street and Bayview Avenue. This series of old fields are characterized by open old fields separated by hedgerows. South of hedgerow (H5) are mature fields of goldenrod, aster and grasses. They are undisturbed and are unlikely to become invaded by trees and shrubs because of the allelopathic properties of the goldenrods. Old field OF19 is located east of Bayview Avenue.

Recent Old Fields

Recent old fields (NF1 to 4) are located between Bathurst Street and Yonge Street and were developed through restoration measures. They represent areas that have had approximately 25 cm of top soil evenly added to the agricultural fields then sown with a restoration mixture of grasses and legumes suggested by the TRCA (M. Lowe pers. Com.). The response of the mixture has been variable and in places there has been an excellent take of the clovers or grasses, but in other areas, thistles and other non-native weeds have grown well. There was no overall objective in the application of the restoration mix other than introducing a native groundcover community and promoting the prevention of a major growth of weeds. No long term maintenance program was considered such as mowing or grazing the fields. Because of the recent cultivation and seeding treatments, the fields are amenable to machine planting of either trees or grasses.

3.1.4 Hedgerows

Several of the agricultural fields are bordered by hedgerows which occur in varying states of continuity, age and cover. Hedgerows H1 to H4 are located between Bathurst Street and Yonge Street. Hedgerows H5 (a to g) and H6 and H6a are located to the east of Yonge St.


Trail East of Yonge St. M. Taylor

The hedgerow (H5) is mature and consists of native species, with a heavy understory of invasive, non-native common buckthorn. Dominant native species include bitternut hickory (*Carya cordiformis*), sugar maple, and black cherry with white pine, red oak, white birch, American basswood and white ash (Gartner Lee, 1999). The hedgerows connecting H5 to the Jefferson Forest to the south are substantial and contain many mature native trees that will provide a good seed source for afforestation.

3.1.5 Grassland

Many of the grassland patches may be considered as old fields though there may be a few locations where grasslands will predominate and will be self sustaining. Most grasslands occur on very well drained sandy soils and represent an analogue to tall grass prairie, though there is no evidence of burning to maintain a prairie community. G5 is located west of Yonge Street. G1 to 4 are located between Yonge Street and Bayview Avenue.

G1 is located east of Yonge Street and is characterized by pasture grasses (*Bromus inermis, Dactylis glomerata*, fescue species), asters (*Aster novae-angliae, A. lateriflorus*) and goldenrods (*Solidago canadensis, S. altissima*). Scattered stands of cedar and trembling aspen occur along the edges (ESG, 1999).


Grassland. M. Taylor

G2 is located east of Yonge Street, adjacent to Bond Lake. Most of this unit is dominated by Canada goldenrod, alfalfa (*Medicago sativa*), smooth brome grass and yellow bedstraw (ESG, 1999).

G3 is the steeply sloped valley running under the new Bayview Avenue Bridge. It is a heavily eroded series of slopes and gullies with various grasses and shrubs. Erosion sources include the heavy use of bicycles (motorized and non-motorized), as well as water erosion from runoff originating on Bayview Avenue.

G4 is located north of Bond Lake, and dominant species include asters and goldenrods (ESG, 1999). This area might best be considered as old-field.

G5 is a grassy area west of Yonge Street and may have been associated with residential areas in the past.

3.1.6 Agricultural Areas

AG1 to 5 are located between Yonge Street and Bayview Avenue and were planted with corn in 2005. AG6 is located to the east of Bayview Avenue and was under soybean cultivation. Information regarding current agricultural practices, such as the use of herbicides, should be determined from the farmer prior to retiring the land from active agriculture and initiating restoration efforts.


Corn field east of Yonge St. M. Taylor

3.2 Waterbodies

Natural Waterbodies


Bond Lake. M. Taylor

The largest bodies of water on-site are Bond Lake and Philips Lake. Several small ponds and associated wetlands are also present and dealt with under subsequent headings.

Bond Lake

Bond Lake (L2) is a small, deep lake with an open water surface area of 17.8 ha and a maximum depth of about 33.5 m with a mean depth of 6.9 m. It has a volume of 122.3 x 10^4 m^3. There is no surface water outlet from the lake. Temperature profiles indicate that the lake is strongly stratified throughout the summer months. Dissolved oxygen data indicates that by mid-summer, all waters below about 8 to 9 m of depth are low in oxygen content and below about 13m there was essentially no oxygen. The water temperatures and dissolved oxygen data confirm that Bond Lake cannot sustain cool or cold water species of fish. Bond Lake is on the borderline between oligotrophic or nutrient-poor and a mesotrophic or nutrient rich lake. Alkalinity values in surface waters ranged from about 68 to 79 mg/L. The lake has a pH which is well suited for aquatic life. Surface water hardness ranges between 74 and 80 mg/L and this is considered to be a moderately hard water lake. Conductivity is typical and consistent with values of other nearby lakes and streams. The slightly elevated colour of Bond Lake relates to the input of dissolved organics from the upgradient Bond Lake Bog. Suspended

solid concentrations are consistently low, reflecting clear water and good fish habitat. BOD_5 values averaged 1.3 mg/L, which are quite low.

The fish community is limited to the following fish species; northern pike (*Esox lucius)*, emerald shiner (*Notropis atherinoides)*, brown bullhead (*Ameiurus nebulosus)*, banded killifish (*Fundulus diaphanous)* and pumpkinseed (*Lepomis gibbosus*). Its low species diversity confirms its isolated nature, while its low productivity relates to a small littoral zone, limited species specific habitat and the effects of predation by northern pike (Michael Michalski Associates, January 1999).

Philips Lake

Philips Lake (L1) is a small lake (11 ha) with a maximum depth of 28.5 m and a mean depth of 6.2 m. It has a volume of 66 x 10^4 m^3. Water temperature and dissolved oxygen data confirm that Philips Lake cannot sustain cool or cold water species of fish. Warm water fish can survive in the upper levels of the lake. Temperature profiles indicate that the lake is strongly stratified throughout the summer months. The pH of the lake ranges from 7.2 to 8.7. Surface water hardness ranges between 65 mg/L and 100 mg/L, which reflects a moderately hard water lake. Conductivity decreases over the summer period, which relates to the sequestering of carbon dioxide from the water column by submergent and emergent macrophytes, resulting in calcium carbonate accumulations on bottom sediments. Suspended solid concentrations are consistently low for Philips Lake, reflecting clear water and good fish habitat. BOD_5 values averaged 1.3 mg/L which are quite low. On the basis of total phosphorus, chlorophyll and Secchi disc information, Philips Lake is considered to be oligotrophic or unproductive (Michael Michalski Associates, January 1999).

Philips Lake is characterized by a well-developed littoral zone, with moderate nearshore slopes, typically ranging from 1:7 to 1:10. Substrates are predominantly muck with lesser amounts of silt. There is also a man made sand beach along the eastern shore. Fish are abundant in the lake, but the community is only represented by five species; yellow perch (*Perca flavescens*), pumpkinseed (*Lepomis gibbosus*), largemouth bass (*Micropterus salmoides*), brown bullhead (*Ameiurus nebulosus*) and golden shiner (*Notemigonus crysoleucas*). The limited number of species appears to be fairly typical of small kettle lakes, where there is no surface drainage system to replenish stocks (Michael Michalski Associates, January 1999).

Artificial Ponds

There are a number of artificial ponds (W2f, W2g, W2j) located on the Bathurst Glen Golf Course. They have not been inventoried, though W2j was originally a part of the Radio Tower Wetland but was excavated and separated from the wetland by a berm (I. Buchanan, York Region pers. Com.). The draw down associated with irrigation is believed to be adversely affecting the hydrology of the Radio Tower Wetland (D. Lewis, TRCA pers. Com.).

3.3 Wildlife

West of Yonge Street

Forty eight birds, five mammals and nine amphibians/reptiles have been recorded between Bathurst and Yonge Streets. Passerine bird species, which prefer broad, open sites include killdeer (*Charadrius vociferous)*, American goldfinch (*Carduelis tristis)*, bobolink (*Dolichonyx oryzivorus)*, Eastern meadowlark (*Sturnella magna)*, European starling (*Sturnus vulgaris)*, common grackle (*Quiscalus quiscula)*, vesper sparrow (*Pooecetes gramineus)* and chipping sparrow (*Spizella passerine)*. Interior forest species include white-breasted nuthatch (*Sitta carolinensis)* and pileated woodpecker (*Dryocopus pileatus)*. Interior-edge bird species recorded include blue jay (*Cyanocitta cristata)*, black-capped chickadee (*Poecile atricapillus)*, gray catbird (*Dumetella carolinensis)*, northern flicker (*Colaptes auratus)*, common yellowthroat (*Geothlypis trichas)* and hairy woodpecker (*Picoides villosus)* (Michael Michalski Associates, January 1999).

The fauna that is associated with wetlands for all or significant parts of their breeding requirements include birds such as great blue heron (*Ardea herodias)*, pied-pilled grebe (*Podilymbus podiceps)*, swamp sparrow (*Melospiza georgiana)* and Canada goose (*Branta canadensis)*. Amphibians such as American toad (*Bufo americanus)*, spring peeper (*Pseudacris crucifer)*, gray tree frog, bull frog, green frog (*Rana clamitans)*, wood frog (*Rana sylvatica)*, and leopard frog (*Rana pipiens)* were observed. Painted turtle (*Chrysemys picta)* is the only reptile recorded.

Wood frog and spring peeper require forested habitats during the summer while leopard frog and American toad use meadows. TRCA has also indicated breeding territories for Virginia rail (*Rallus limicola)* (W1, W11, W12), pied-billed grebe (W11), sora (*Porzana Carolina)* (W1, W12), common moorhen (*Gallinula chloropus)* (W12), willow flycatcher (*Empidonax traillii)* (W12) and swamp sparrow (W9). Wetland W2 also provides staging habitat for various waterfowl, including mallard (*Anas platyrhynchos)*, blue-winged teal (*Anas discors)* and bufflehead (*Bucephala albeola)* (Michael Michalski Associates, January 1999).

Michael Michalski Associates (January 1999) observed mammals commonly associated with open sites woodchuck (*Marmota monax*), woodland and hedgerow eastern chipmunk (*Tamias striatus)* and grey squirrel (*Sciurus carolinensis)* and those adapted to a range of conditions such as white-tailed deer (*Odocoileus virginianus)* and raccoon (*Procyon lotor*).

East of Yonge Street

Fifty two birds, seven mammals, five amphibians and two reptiles were recorded between Yonge Street and Bayview Avenue in the summer of 1997. The species composition reflects a range of habitat preferences and qualities. Passerine birds prefer open sites and included eastern kingbird (*Tyrannus tyrannus)*, vesper sparrow, chipping sparrow, brown-headed cowbird (*Molothrus ater)* and American goldfinch. The closed-canopy upland deciduous, coniferous, and

mixed forest stands, and the wetland communities support distinct guilds of wildlife species. Interior forest species include yellow-rumped warbler (*Dendroica coronata)*, red-breasted nuthatch (*Sitta canadensis)*, white breasted nuthatch (*Sitta carolinensis)*, northern waterthrush (*Seiurus noveboracensis)*, golden-crowned kinglet (*Regulus satrapa)*, hairy woodpecker and pileated woodpecker. Interior-edge bird species recorded include blue jay, black-capped chickadee, northern flicker, northern cardinal (*Cardinalis cardinalis)*, gray catbird, eastern wood-pewee (*Contopus virens)*, yellow-bellied sapsucker (*Sphyrapicus varius)*, red-eyed vireo (*Vireo olivaceus)*, downy woodpecker (*Picoides pubescens)*, common yellowthroat, wood thrush (*Hylocichla mustelina)* and ruffed grouse (*Bonasa umbellus)* (Michael Michalski Associates, May 1999). ESG (1999) recorded 76 species of wildlife east of Yonge Street. These included 8 butterflies, 4 amphibians, 2 reptiles, 54 birds, and 8 mammals.

The lake and wetland environments provide habitat for species including great blue heron, mallard, blue-winged teal, kingfisher (*Ceryle alcyon)* and red-winged blackbird (*Agelaius phoeniceus)* (Michael Michalski Associates, May 1999). Resident populations of Canada goose also frequent these water bodies for nesting and roosting.

Five species of amphibians have been recorded on the site (American toad, spring peeper, green frog, wood frog and leopard frog). American toad and leopard frog commonly inhabit open fields during the growing season, while wood frog and spring peeper are commonly associated with woodlands over the same period (Michael Michalski Associates, May 1999). Jefferson salamander (*Ambystoma jeffersonianum)*, eastern redbacked salamander (*Plethodon cinereus)*, spotted salamander (*Ambystoma maculatum)* and northern redbelly snake (*Storeria occipitomaculata occipitomaculata)* have also been observed in the areas adjacent to the eastern part of the study area (Ecoplans, 2002). Jefferson salamander is protected in the federal Species at Risk Act (SARA). In Canada, the species is associated with mature, Carolinian forests, which have permanent or temporary ponds for breeding.

Mammals include species commonly associated with open sites (woodchuck), closed-canopy forests (eastern chipmunk, red squirrel (*Tamiasciurus hudsonicus)* and grey squirrel) and a range of conditions (deer, red fox (*Vulpes vulpes)* and raccoon) (Michael Michalski Associates, May 1999).

3.4 Human Heritage

3.4.1 Existing Buildings/Heritage

Historical Background

Cultural heritage resources within the study area were reviewed by Andre Scheinman, Heritage Preservation Consultant.

Settlement

The study area land base was opened up to European settlement with the establishment of Yonge Street, initially intended by Lieutenant Governor John Graves Simcoe as a military road, providing access to the Holland River. The road was surveyed in 1794 and, that same year, 111 settlers' lots were laid out on both sides of the road line. Initially, the Queen's Rangers constructed the wagon road as far north as Thornhill but their work stalled as the military personnel were called away to deal with a perceived threat from the United States. However, Simcoe worked out a scheme with master colonizer William Berczy to offer free lands in Markham Township in exchange for work on the road. By November 1794, the road extended almost to Bond Lake but this time, the settler builders' enthusiasm for the project waned. The task was then put into the hands of the original road surveyor, Augustus Jones, and with the renewed assistance of the Queen's Rangers was pushed through to the Holland River in two months (January and February 1796). Intended as a "straight" road in the Roman tradition, it still had to take into account certain natural features such as the western shore of Bond Lake. Though the road still remained something between a wagon trail and a forest path, its opening meant that prospective settlers could make their way to their hinterland allotments.

Augustus Jones' *Report on the Condition of Yonge Street, 1797* describes adjacent settlement activity and William Bond is noted as already having cleared 5 ha (12 acres) on both Lot 62 E and Lot 63 E, the lots around Bond Lake. The lands around the north end of the lake (Lot 63) had been granted to Joseph Bouchette, another legendary surveyor, by 1795, while the property to the south of the Lake (Lot 62), was assigned to Bond, a York based merchant. Bond seemed to have been mostly interested in speculation and had "flipped" his property by 1801, and seemed to have acted as an agent for Bouchette in transactions on that property. In any case, his name became attached to the lake.

Yonge Street land grants were associated with particularly stringent settlement duties including the erection of a "Dwelling House…and the same occupied within one year" (usually more time was allowed). Also, compared to other locations, the duties were strictly enforced, which became a disincentive to settlement.

At the southern edges of the study area (up to Stouffville Road) 22 lots were granted to a group of French Royalists under the Comte de Puisaye. This unlikely settlement (known as the Windham Settlement) of French aristocrats was virtually doomed from the outset as many members of the group soon grew disillusioned with the harshness of frontier conditions. One of the settlers, however, Quetton St. George, actually thrived, becoming a successful fur trader and later a York-based merchant who (as well as having a fine house in York) maintained a property, further north by Wilcox Lake on which his son developed a country estate known as Glen Lonely.

Gradually, through the first half of the 19th century other notable (often Family Compact associated) personages such as Robert Baldwin, and Chief Justice Robinson acquired lands in the area around Philips, Bond and Wilcox Lakes. Though some only considered their land as a

future sale or development opportunity, a number of these prestigious families built country homes there so that by 1860 it could be considered the “cottage country” of the York elite.

In 1859, the property, which included the north shore of Bond Lake (Lot 63, I, Whitchurch Twp.), was in the hands of Chief Justice Sir John Beverley Robinson (who has been called the “bone and sinew of the Family Compact”) while the south side of the Lake (Lot 62) was owned by James Legge. The Tremaine Map (1860) shows that each had a house east of the lake at that time. Somewhat later, the Robinson family seems to have built an imposing columned summer home (possibly the home of their estate manager) on a point of the lake. This building apparently survived up to the time of current ownership. The 1860 map also shows William Thompson with a house just north of the lake (Lot 64) in the approximate location of the extant cobblestone house.

Arriving directly from Scotland, Capt. Martin McLeod purchased Lot 61, I, King in 1845 and the following year he constructed the fine brick residence known as Drynoch on its banks, which became the centre of his 240 ha (600 acre) holdings. This highly significant residence, beautifully sited in relation to the lake, still survives in excellent condition with later additions. His son, Norman T. McLeod, had, by 1892, lost the estate to debt. Another of Captain McLeod’s sons, however, Colonel James Macleod, may be the most famous of the 19th century North-West Mounted Police. He is considered the founder of Calgary. Ft. McLeod is named after him and he may be the only white person who ever earned the trust of the great Sioux Chief Sitting Bull.

Recreation

By 1834, the Bond Lake Hotel had been constructed just to the east of Yonge Street in close proximity to the northwest corner of the lake. It was both a wayside inn and a holiday resort boasting 20 rooms and a ballroom, remarkable for that early period. The hotel remained in operation into the 20th century. The map in the County Atlas of 1878 shows a second hotel located on the southwest corner of Lot 63, on the west side of Yonge Street, at that time the property of Robert Marsh.

In 1896, the new electric railway reached Richmond Hill. In 1899, a new steam power house was built at the southwest corner of Bond Lake to allow the railway to extend to points north of Richmond Hill. By 1904, the line had become part of the *Radial Railway* network using street cars. Ready mass transportation was the catalyst for the development of *Bond Lake Park*. The Radial Railway Company (originally the Metropolitan Railway Company) purchased the lots around Bond Lake for their use. *Bond Lake Park* was developed by the railway in conjunction with its extending service past Richmond Hill. Stop 35 on the northern route led city dwellers to this amusement park and oasis which featured swimming, boating, fishing, ball fields, a carousel and concert/dance pavilion. Most of the amusement structures and the support service structures were built in close proximity to the eastern shore of the northern bay of the lake though little survives above ground at this time from what was the “first electric park”.

Extant Structures and Known Sites of Cultural Value within the Study Area

Bond Lake

- *The original portion of the Lebovic Sales Pavilion, 12611 Yonge Street*: The original section is a hipped roof framed cottage which, from the exposed section of the first floor structure, reveals hand hewn beams and reciprocally sawn floorboards, which would appear to date from the mid 19th century though it is not shown on either the 1860 or 1878 maps. C. 1920 it was the home of Michael Clarke, a relative of the long-standing area family, the Gambles (Gamble Road, etc.). Though much changed with additions, it retains a great deal of its original heritage fabric including 2/2/ wood windows.

- *Log House* (on point at east shore of junction with north bay): This extremely well built small log house has particularly fine, tight, dove-tailed joints. Though it could date very early, it's in relatively good condition, given that the windows and door are open to the weather, which suggests early 20th century construction. It was possibly used as a summer cottage.

- *The Dynamo House* (southwest corner of lake): This residential scale buff brick side gabled three bay building was actually associated with the power production process, housing the Dynamo for the generating station. It was constructed in 1899, gutted by fire in 2005 and was formerly tied in to the industrial scale brick smoke stack.


Dynamo House. A. Scheinman

- *Ruins of Stone Power House*: Only the stone foundations of the fine multi-arched Romanesque stone powerhouse constructed c. 1899 for the Metropolitan (later Radial) Railway exist. Ruins extend up to window sill height and are very evocative. Only the footprint remains of this large brick structure with stone detailing.


Power House Ruins. A. Scheinman

- *Remnants:* This was the columned house (apparently destroyed by fire) which has come to be associated with Judge Robinson. It appears to be identified as the home of Mrs. E. L. Gamble (neé Clarke) on the c.1920 sketch map of the site (formerly 12673 Yonge Street).

- *Other structures/built features* known to have occupied the site during the park period include: park gatehouse; park pavilions; park boathouses; rail platforms; wading pool; tennis courts; saw mill and street car tracks.

- *Other possible structures predating the park include*: The original Judge Robinson house shown east of the lake in 1860. The James Legge House shown east of the lake in 1860. The James Legge barn foundations, apparently still visible up to a decade ago.

- *Cobblestone House*: Cobblestone walled hipped roofed cottage with massive stone chimneys. Though its Arts and Crafts/ Craftsmen appearance suggests a c.1920 date, it occupies the site of the early home of William Thomson as indicated on the Tremaine 1860 map and may contain elements of that earlier structure. The stonework detailing includes the use of more regular stones to form quoins. The roof is leaking and has caused significant interior damage.


Cobblestone House. A. Scheinman

Philips Lake

- *Drynoch, c.1846 (McLeod Family*): The finest surviving structure within the study area (and of Regional Significance) is important for both its historical associations (see historical background) and the quality of its architecture/setting. Actually an early (for Ontario) Gothic Revival building in brick featuring twin gables around a central main entrance with window and door detailing associated with that style (e.g., labels), it has acquired a number of additions. It's setting overlooking the lake and its spacious grounds (now being encroached by housing subdivisions) make for a particularly gracious composition. The laneway with its avenue of shade trees is protected by the Town of Richmond Hill. It is


Drynoch. A. Scheinman

not expected to provide access to the house once the surrounding subdivision is completed but is identified as a park block on current plans.

3.4.2 Archaeology

A Stage 1 Archaeological Assessment between Bathurst and Yonge Streets was undertaken by Schaeffers Consulting (October 1998). Additional background research was undertaken throughout the study area by D.R Poulton & Associates Inc. Both studies identified that no known archaeological excavations have been carried out within the study area, however, a total of 38 archaeological sites have been registered within a 2 km radius of the site. Those sites range from two possible early Paleo-Indian components (ca. 9500 to 8000 B.C) to camps of the Archaic period (ca. 8000 to1000 B.C), Iroquoian villages of the Late Woodland period (ca. 1300 to 1550 A.D.) and Euro-Canadian homesteads of the mid 19th century. They also include several First Nations sites of unknown type. In general, humans have been living in the area of the ORCP for some 11,500 years, since about 9500 B.C. The first year round occupation of the area was by Iroquoian peoples during the Late Woodland period, ca. 1300 to 1550 A.D., and the initial pioneer Euro-Canadian settlement of the ORCP and the vicinity dates from the 1790's, which is extremely early in the Euro-Canadian settlement of Ontario.

3.4.3 Golf Course

Pond, Bathurst Glen Golf Course. M. Taylor

An assessment of the Bathurst Glen Golf Course was undertaken by UrbanMetrics (2005) in order to prepare a market and operational assessment related to the short, medium and long term operational plans of the facility. The golf course, which is approximately 40 ha (100 acres) in size and located at the western end of the study area is a short 18-hole "executive" length course, which is popular with senior, female, junior and casual golfers. It is the only executive course in the Town of Richmond Hill. The property also contains a large grass tee driving range on Bathurst Street. The course is well suited to serve the rapidly growing population in central York Region. Approximately 720,000 residents live within 30 minutes of the course. Over the next 10 years, this population is projected to increase by 30%. Based on forecast population growth and demographic trends, residents within a 30 minute drive to Bathurst Glen will demand over 575,000 new golf rounds over the next 10 years, which would be the equivalent of about 18 new golf courses. Almost one-third of these new rounds will be for persons over 65, which is a core market for Bathurst Glen. New golf course development opportunities in the vicinity of Bathurst Glen are limited by existing development and environmentally protected lands. In summary:

- Bathurst Glen Golf Course represents a significant revenue opportunity for the park;
- Future growth in the area and limited competition will result in increased revenues;
- Senior golfers will represent a significant portion of new demand; and,
- Bathurst Glen may be managed with higher environmental standards, therefore environmentally improving the course, to complement the vision for the park and still remain profitable.

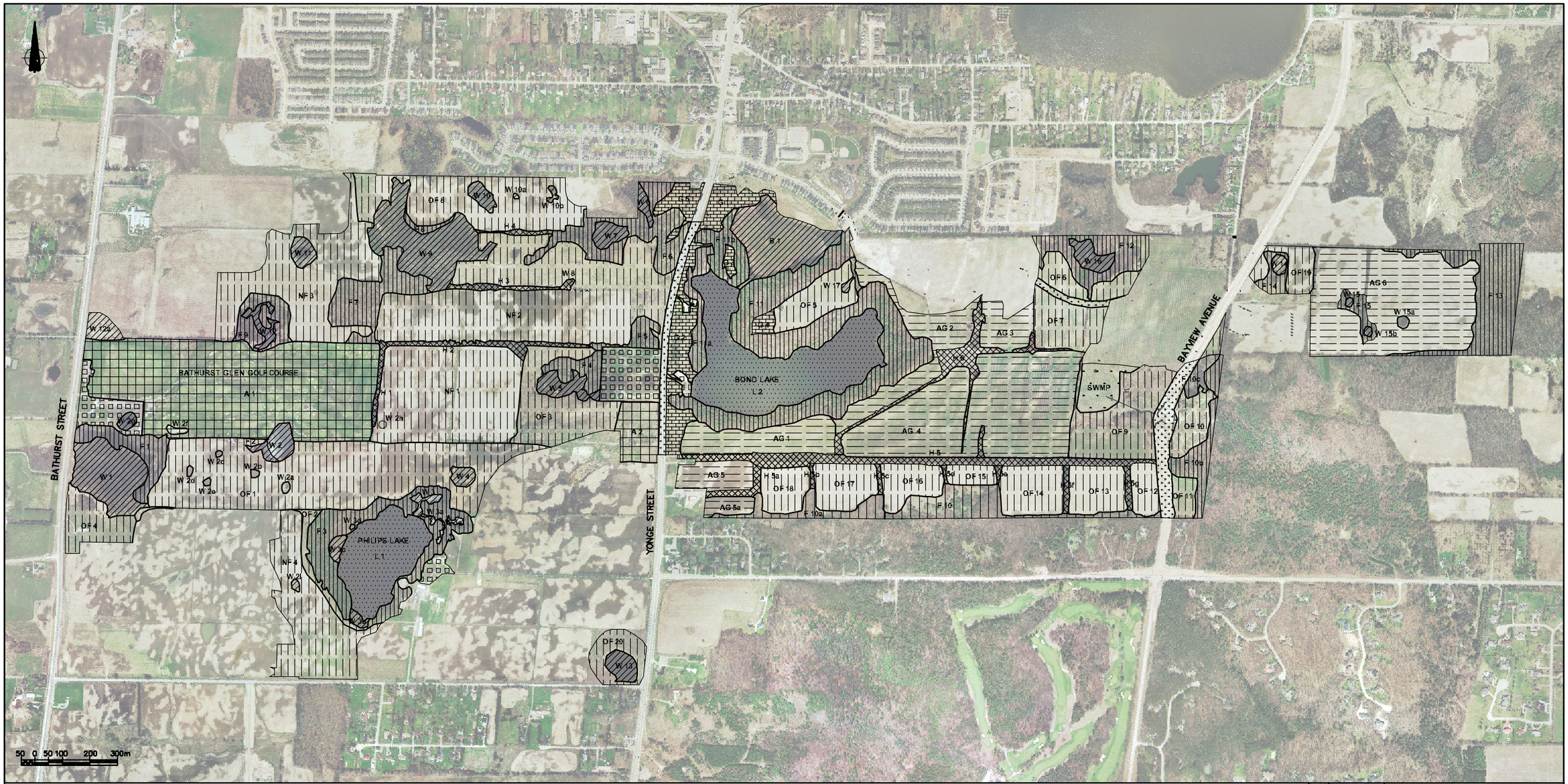
Therefore, it is proposed at this time that the golf course continue to be operated without major modifications.

3.4.4 Parking Lots

Existing parking is currently available within the study area at the Bathurst Glen Golf Course, located on Bathurst Street, and at the Lebovic Sales Pavilion, located on Yonge Street. A small temporary parking lot is proposed for the trail head at Old Colony Road. This will be removed when parking becomes available at the new Oak Ridges Community Centre, located at Lake Wilcox.

3.4.5 Roads

Bathurst Street forms the western study boundary, and Yonge Street and Bayview Avenue bisect the study area. Old Colony Road runs along part of the northern site boundary and bisects a relatively small area of the park. Silver Maple Road, Jefferson Side Road and Stouffville Side Road are located in relatively close proximity to the southern site boundaries.



LEGEND:

- BUILDING AND PARKING
- STORM WATER MANAGEMNET POND (SWMP)
- GRASSLAND (OLD FIELD) (OF 1 TO OF 20 & NF 1 TO NF 4)
- AGRICULTURE (AG 1 TO AG 6)
- FOREST (F 1 TO F 15)
- WETLAND (WETLAND/MARSH/SWAMP/BOG) (W 1 TO W 17 & B 1)
- CULTURAL MEADOW/THICKET (G 1 TO G 5)
- HEDGEROW (H 1 TO H 6)
- AMENITY (A 1 TO A 2)
- LAKE (L 1 TO L 2)
- ROAD

REV.	DATE	DESCRIPTION

REVISIONS

amec

OAK RIDGES CORRIDOR
PARK MANAGEMENT PLAN

FIGURE 3:
EXISTING NATURAL AREAS MAP

DATE: AUGUST 2008	SCALE: AS SHOWN	CHECKED BY: F. CHRISTIANSEN
DRAWN BY: N. RONDON	DESIGNED BY: F. CHRISTIANSEN	APPROVED BY: M. TAYLOR
PROJECT NO.: TC51410	DRAWING NO.: 3	REV.: 0

P:\EARD\PROJECTS\TC51410 Oak Ridges Corridor Park\Envision Drawings\ORT\natural areas-FEB08.dwg 07/28/2008 4:00:59 PM EST

4.0 SIGNIFICANT FEATURES

Prior to European settlement and land clearing, the study area was largely treed in hardwoods and mixed wood forests. The First Nations people in the area may have had small settlements that included patches of ground where they grew corn, beans and squash but these were usually small in extent. There are no known archaeological sites within the study area but it is probable that the people would have used the kettle lakes for fishing and camped nearby; there is such a site at Wilcox Lake to the north.

Much of the Oak Ridges Moraine was cleared for agricultural activities through the nineteenth century but, because of the preponderance of sandy soils unsuited for agriculture, many of these farms were abandoned as major wind storms and erosion removed the fragile topsoil (Richardson 1974). However, the study area lands were farmed for many years, which would indicate that the firmer soils are both moisture retaining and suitable for agriculture and forestry.

The existing natural vegetation communities within the park provide a clue to the flora and fauna species that should grow well on the site.

In 2005, the approximate land cover classes within the park were as follows (Figure 3):

- Forests 73 ha (180 acres) - 17%;
- Lakes 26 ha (64 acres) - 6%;
- Wetlands 33 ha (81 acres) - 8%;
- Grassland, old-fields 175 ha (430 acres) - 41%;
- Hedgerows 13 ha (32 acres) - 3%;
- Agriculture 65 ha (160 acres) - 15%; and,
- Buildings, parking areas, etc., - 45 ha (110 acres) - 10%.

The climate and soil type of the area results in a forested ecosystem (Great Lakes-St. Lawrence Mixed Forest) except for those wetlands around the lakes or in depressions. Therefore, if the restored new park is to be as natural as possible, it will be a forested landscape interspersed with kettle lakes and wetlands. It is for this reason that restoration activities will focus on restoring native forest cover. However, as grasslands are in relatively short supply in the area and because they support a quite different fauna, it is proposed that the restoration efforts attempt to recreate some natural grassland. This may need to be maintained by periodic mowing (every two years or so) to prevent it from being invaded by trees and shrubs. There will be no attempt to modify the existing lakes and wetlands, but several additional wetland pockets can be established in low lying areas to provide habitat for dispersing amphibians and additional habitat heterogeneity to the predominantly forested habitat.

4.1 Significant Natural Areas

The study area is located on the Oak Ridges Moraine and contains a number of Areas of Scientific and Natural Interest (ANSIs) and Environmentally Significant Areas (ESAs) (Figure 2).

The Wilcox-Lake St George Wetland Complex, which is provincially significant, is located to the north of the study area.

Bond Lake has been identified as an ANSI by MNR (OMNR 2001). In addition, Bond Lake, along with Philips Lake, Thompson Lake and other kettle waterbodies within the study area form part of the provincially significant Philips-Bond-Thompson Wetland Complex (OMNR 2001). A small part of the Jefferson Forest ANSI is located within the study area on the east side of Yonge Street.

Bond Lake bog is a non-provincially significant kettle bog wetland composed of three wetland types (21% bog, 72% swamp, 7% marsh). Many of the species found here are characteristic of more northerly sphagnum-based communities. It is designated as an ESA by TRCA (1982).

Bond Lake, Philips Lake and Jefferson Forest all support regionally and locally rare species. In addition, as discussed above, the Bond Lake bog supports distinct vegetation communities with northern Ontario affinities.

Restoration provides opportunities to protect and enhance these designated areas such as increasing the size of Jefferson Forest. Buffers of 30 m are recommended around wetlands and woodlands (OMNR, 2004). Refer to Sections 5 and 10 for recommendations.

4.2 Significant Species

Jefferson salamander and its hybrids have been recorded south east of the park and may well occur within the park. The species is nationally significant and threatened (COSEWIC 2000). Jefferson salamander is also protected in the federal Species At Risk Act (SARA). The majority of species observed within the study area are ranked as provincially common (S4) or very common (S5) within Ontario and therefore are not considered to be significant species. The Yellow-billed Cuckoo is considered uncommon in the province (ESG, 1999).

Jefferson Salamander. Source: Environment Canada database

Michael Michalski (May 1999) reported the following species, located east of Yonge Street, are considered to be locally rare within the Region of York: large-leaved pondweed (*Potamogeton amplifolius*), pondweed (*Potamogeton illinoensis*), Richardson's pondweed (*Potamogeton richardsonii*), sedge (*Carex crinita*) and water marigold (*Megalodonta beckii*). These species were observed in the shallow, littoral, open water and riparian zone of Bond Lake.

Michael Michalski (January 1999) identified the following regionally rare species, west of Yonge Street: sedge (*Carex aquatilis, C. brunnescens, C. canescens, C. cephalophora, C. crinita, C. lasiocarpa, C. sychnocephala, C. tuckermanii, Aster ontarionis*), meadow horsetail (*Equisetum pretense*), bedstraw (*Galium trifidum*), northern manna grass, eastern manna grass, mountain holly (*Nemopanthus mucronata*), flat-stemmed pondweed, black willow (*Salix nigra*) and bog willow (*Salix pedicellaris*). The majority of these species occur within the wetland areas which constitute part of the Philips Lake Wetland Complex.

The TRCA identified regionally rare fauna breeding within W11 (pied-billed grebe) and W12 (common moorhen). These species are most strongly associated with emergent marshes, preferably dominated by cattails interspersed with open water channels. TRCA has also noted that amphibian species, such as spring peepers and wood frogs, are categorized as "Species of Conservation Concern" owing to their life history requirements for both wetland and forests. See Section 5.5 for other species of conservation concern.

Restoration provides opportunities to protect, enhance, and create habitats for these species. Refer to Sections 5 and 10 for recommendations.

4.3 Wildlife Movement

There are various ideas embraced by the ORCP Management Plan Advisory Committee one of which is the idea of connections for wildlife across the Oak Ridges Moraine and the other is the presence of a trail for people across the Moraine (Oak Ridges Moraine Conservation Plan 2002).

Many animals do not habitually use the same narrow path within the natural environment when moving about but exist within a general diffuse area or territory and undertake all of their life activities within this area. Examples of such animals include grey squirrel (*Sciurus carolinesis*), raccoon (*Procyon lotor*) and meadow vole (*Microtus pennsylvanicus*). Restricted corridors may form as a result of encroachment into natural habitat, for example through urbanization. As a result, encroachment may channel wildlife along the remaining natural areas/corridors for dispersal of immature animals searching out new territories.

Corridors are usually linear and are often defined as connections between larger areas, and in the case of natural heritage studies, between core areas. Core areas are generally large blocks of natural habitat (Geomatics International, 1993; OMNR, 1999; Riley and Mohr, 1994).

The following is a summary of the species guilds which use, or have the potential to use corridors within the study area:

- Amphibians – salamanders and frogs (requirements for connections between breeding pools and forests or grasslands);

- Reptiles – turtles and snakes (vegetated cover between hibernating areas and summer foraging areas);

- Small mammals – shrews, mice, voles (cover to avoid predators in their normal daily activities and to permit dispersal);

- Large mammals – white-tailed deer (movement between wintering areas and spring to fall foraging areas); and,

- Birds – many species will use river valleys and hedgerows as movement corridors or on migration.

Existing wildlife movement areas will be maintained and enhanced through restoration of the park and additional habitat continuity will be created with the aim of providing regional linkages.

4.4 Human Heritage

Though not readily discernible today, the lands encompassed by the study area are rich in cultural history. Their relatively early settlement and the choice of some notable 19th century figures to have their primary homes and/or country homes in the area is not that surprising, given that Yonge Street was created before the end of the 18th century.

Bond Lake has long been the focus of both local, and particularly during the age of the radial railway, regional recreational opportunities. Philips Lake is smaller and hidden from the road and, for much of the 19th century, was the private lake of the McLeod Family.

There are no reported archaeological finds within the study area to date. The areas chosen for the spine trail are primarily existing farm tracks, agricultural fields or have been already disturbed by construction activity.

There will be opportunities to maintain, protect and enhance the built heritage in the study area. Particular attention must be paid to the future of the Dynamo House next to Bond Lake. Refer to Section 5.6 for recommendations.

5.0 SITE PROTECTION AND RESTORATION

5.1 Protection and Restoration Goals

In order to meet the vision, goals and objectives identified in Section 2, there are a number of restoration and protection goals identified within the ecological framework for the park. They include:

- Protect existing natural habitats;
- Increase the amount of forested habitats;
- Provide interior forest habitat;
- Enhance wetland and forest distribution for connectivity;
- Provide grassland habitats; and,
- Reduce mortality of wildlife on roads by providing suitable crossing areas.

The overall targets for habitats to be protected and restored are based upon the existing natural environments discussed in previous sections of this report. Further guidance is provided in the Environment Canada (1998) Plan, Oak Ridges Moraine Conservation Plan (2002), The York Region Greening Strategy (2003), the TRCA Natural Heritage System Strategy (2004) and ORMCP Technical Papers (2004). Restoration targets suggest that the habitats and associated attributes should be preserved on the landscape as follows:

- York Region's goal is to increase forest cover from 18% to 25%;
- TRCA suggests that 42% of the Humber watershed be in natural cover; 30% is the regional forest cover target;
- Environment Canada (1998) suggests 30% of a watershed be in forest cover and 10% in wetlands;
- OMNR (2004) identifies grassland habitat patches >50 ha be preserved, enhanced or established;
- OMNR (2004) identifies rare amphibians (Jefferson salamander), and birds (pied-billed grebe) be protected; and,
- ORMCP (2002) provides general guidelines only.


Moorhen. Source: Environment Canada

The intent of this Management Plan is to provide a natural continuous east west corridor that protects the headwaters of two major watersheds — the Humber and Rouge Rivers. In general, the amount of forest will be increased at a regional level, maximizing biodiversity and providing

habitat for a suite of animals which would usually occur on the Oak Ridges Moraine, such as those identified in Section 3.0.

Based on the above goals and targets, it is recommended that the following targets for habitat should be: 48% forested; 6% waterbodies (Philips Lake, Bond Lake, Radio Tower Wetland, Golf Course ponds) and several other small intermittent waterbodies; 9% wetlands including bogs, fens, marshes, swamps and drainage ditches; and that approximately 15% be old-fields, meadows and grasslands (including the golf course). The balance is made up of buffers, roads, parking and buildings. Based on these overall goals, selected habitats have been delineated and will be actively restored within the park. It is expected that some of the habitats will evolve without interventions (Table 1). Specific site protection and restoration recommendations within this section of the Management Plan have been identified in bold and italicized. Short-term, medium-term, and long-term implementation actions are summarized in Section 10.

TABLE 1
EXISTING, PROPOSED AND RESTORED NATURAL AREAS

Habitat Type	Existing Area	Proposed Total Area	Restoration Area
Forest	73 ha (180 acres)	206 ha (510 acres) 48%	134 ha (332 acres)
Wetlands	33 ha (81 acres)	40 ha (100 acres) 9%	8 ha (19 acres)
Grasslands	174 ha (430 acres)	75 ha (186 acres) 17%	38 ha (93 acres)
Lakes	26 ha (64 acres)	26 ha (64 acres) 6%	0
Agriculture	65 ha (160 acres)	0	0
Buffers	0	>10 ha (25 acres) 2%	(25 acres)

Note: TRCA recommends a regional target of 30% forest cover for its area of jurisdiction

The above areas will be achieved through the restoration of the following habitats:

- Arable agricultural lands (in corn and soybean) → forests;
- Areas where topsoil has been added → forests and grassland;
- Some old field → forests and grassland;
- Hedgerows, boundaries and buffers → tree and shrub planting – buffers; and,
- Low-lying depressions in agricultural areas → wetlands.

Detailed descriptions of each of the habitat types to be restored, and the time frames for restoration are provided in the following sections (Tables 2, 3, and 4).

TABLE 2
RESTORATION OBJECTIVES

Objective	Aim	Mechanism
• Protect, maintain and enhance the biodiversity of the site utilizing TRCA Terrestrial Natural Heritage System Strategy. • Contribute to the implementation of Oak Ridges Moraine Conservation Plan.	**Forest** • Remediate soils contaminated by past agrochemical use. • Provide interior forest habitat. • Create habitat continuity. • Protect existing designated areas. • Promote colonization by native plants and animals. • Provide habitat for herptiles.	• Soil testing to determine Atrazine residue levels. • Control and remove invasive species. • Plant inter-connecting tree blocks - mechanical planting with native conifers (cost efficient, accomplished within a relatively short time frame and species are less susceptible than hardwoods, to grazing by herbivores). • Nodes of hardwood shrubs and trees should be used in small patches and as part of the buffers around areas mechanically planted with conifers. • Thinning of the conifer forests in the long term will permit the colonization by deciduous species. It may also be necessary to undertake additional planting of deciduous species among conifers. • Use species typical of the locality and soils, following York Region and TRCA guidelines. • Adopt a low maintenance regime for new woodlands after establishment to encourage establishment of woodland ground flora. • Use plants propagated from local seed sources. • Adhere to TRCA Pest Management Policy. • Adhere to TRCA Hazard Tree Policy.
	Wetlands • Protect and enhance existing kettle wetlands/designated areas. • Create variety of hydrological regimes. • Provide habitat for shorebirds and waterfowl, etc., and dispersal connections for amphibians and reptiles.	• Check water table and sediment profile prior to any potential grading. • Buffer plantings to protect wetlands. Minor grading to permit wetland creation. • Use plants propagated from local seed sources. • Create exposed mud flats for shorebirds. • Provide nesting structures and basking logs.
	Grasslands • Develop self sustaining grassland communities. • Provide habitat for herptiles.	• Maintain old field habitats. • Create grassland on well drained areas. • Mow the vegetation every 2 to 3 years to avoid scrub encroachment. • Work with the municipality and developers to repair valley slope erosion at the new Bayview Avenue bridge.
	Wildlife corridors • Create habitat continuity through the study area. • Provide safe crossing of Yonge Street for a range of species.	• Plant interconnecting blocks of habitat using material propagated from local seed sources. • Ensure spine trail allows for animal passage (e.g., underneath board walks or over gravel surface). • Monitor habitat change and species presence. • York Region monitoring of wildlife mortality within the park's Regional Road rights-of-way - in the event that vehicle/wildlife interaction becomes a significant concern, the Region should undertake an analysis of options to reduce the impact. • Improve culvert connections under Yonge Street. Ensure cover with additional plantings. • Apply TRCA nuisance animal management policies and guidelines to deal with natural and domestic animals, as required.
	Buffers • Protect existing natural features using 30 m minimum buffers. • Provide habitat continuity. • Control access and screen adjacent residential development, golf course and roads.	• Plant interconnecting blocks of trees and shrubs using material propagated from local seed sources. • Erect boundary fences and plant trees and shrubs using native species. • Adhere to TRCA Hazard Tree Policy.

Objective	Aim	Mechanism
• Maintain and enhance the landscape character and quality of the area.	Review existing vegetation communities to provide indication of past habitats.	• Restoration targets based on existing environment, therefore a forested landscape interspersed with kettle lakes and wetlands will be restored/enhanced using native stock propagated from local seed sources and appropriate species mixes. • Protect and enhance designated areas.
	Maintain open views across area of high landscape quality.	• Locate trail on areas of high ground where feasible.
	Remove/screen landscape detractors.	• Undertake screen planting to limit views of built residential features, golf course and roads. • Remove garbage/refuse.
• Encourage responsible use and informed access to the site along the proposed trail system.	Maintain trail system in good and safe condition.	• Maintain a 30 m minimum buffer from natural and restored areas. • Provide opportunities to experience diverse natural areas without intruding on them. • Accommodate pedestrians, baby carriages, bicycles and wheelchairs. • Use a minimum practical trail width to accommodate users. • Use granular material to surface trails. • Use boardwalk structures in wet areas. • Build trail to withstand occasional maintenance and emergency vehicle access. • Close existing trails that are in inappropriate locations. • Follow existing grades and contours to minimize need for grading. • Avoid placing trail close to residences and provide a vegetated buffer when this occurs. • Provide safe pedestrian crossing of Yonge Street. • Provide access to parking and washroom facilities. • Provide controlled access to neighbouring communities. • Provide a variety of signage: trail head maps, permitted uses, educational signage.
	Interpret existing site features of interest.	• Erect interpretive signage. • Produce a trail guide.
	Prevent unauthorized access and incompatible uses.	• Prevent motorized vehicular access. • Erect signage to discourage unauthorized access. • Monitor site. • Maintain boundaries in good state of repair.
	Education.	• Encourage involvement of local school groups, residents, local governments and research groups.
• Contribute to improving the environment of the local community, work collaboratively with representatives from government agencies, the community and non-profit environmental groups to implement the Management Plan.	Undertake environmental improvements in a manner which is supported by the local community.	• Consult with the residents and local interest groups. • Request assistance from local community - site clean-up, planting, removal of non-native species, stewardship, monitoring. • Develop a “Park Watch Program”. • Involve Citizens Environment Watch to monitor the property.
• Fund the implementation of the Management Plan from a variety of sources.	• Secure stable funding for the long-term management of the Park.	• Generate revenue from on-site facilities. • Secure grants from agencies and foundations. • Request corporate donations.

TABLE 3
RESTORATION AREAS

Habitat Patch	Size/Area (m^2)	Prescription (Refer to discussions in Section 5.4)	Timeframe/Priority (Year)
Buffers			
RB1	2,600	Special frontage for golf course, entrance to park	1
RB2	5,200	Trees to form boundary	5
RB3	14,700	Residential	2
RB4	6,500	Residential	2
RB5	9,000	Residential	2
RB6	2,050	Residential	2
RB7	12,950	Residential	2
RB8	1,950	Highway	5
RB9	2,300	Highway	5
RB10	5,850	Highway volunteer planting	1
RB11	8,450	Residential	2
RB12	3,200	Residential	1
RB13	5,000	Residential	1
RB14	3,350	Special frontage Old Colony Road and parking lot	1
RB15	2,750	Residential	1
RB16	3,500	Residential	1
RB17	3,550	Residential	1
RB18	2,850	Highway, wildlife to culvert	4
RB19	3,900	Highway	4
RB20	1,450	Highway, adjacent to wetland	4
RB21	14,325	Residential	1
RB22	4,200	Special	1
TOTAL 12 ha (29.6 acres)			
Grassland			
RG1	84,050	Contour and seed eroded areas	2
RG2	122,000	Review existing status, obtain quotation for preparation and seeding	1
RG3	21,550	Review existing status, obtain quotation for preparation and seeding	1
RG4	64,600	Review existing status, obtain quotation for preparation and seeding	1
RG5	30,750	Review existing status, obtain quotation for preparation and seeding	1
RG6	36,000	Clarify boundaries for area with soil tests	3
RG7	13,700	Grassland on either side of trail	1
TOTAL 37.3 ha (92.5 acres)			
***Forest**			
RF1b	5,950	Mixed forest, volunteer planting	1-3
RF2b	3,250	Mixed forest, volunteer planting	1-3
RF3b	27,725	Mixed forest, volunteer planting	1-3
RF4b	32,550	Machine plant B	1-3
RF5b	31,900	Mixed forest, volunteer planting	1-3
RF6b	92,400	Machine plant	1-3
RF7b	138,100	Machine plant	1-3
RF8b	55,800	Machine plant	1-3
RF9b	30,450	Machine plant	1-3
RF10b	39,500	Machine plant	1-3
RF11b	10,600	Machine plant	1-3
RF12a	7,750	Volunteer planting	1-2
RF13a	47,750	Machine plant	1-2
RF14a	23,850	Machine plant	1-2
RF15a	89,100	Machine plant	1-2
RF16a	37,300	Machine plant	1-2

Habitat Patch	Size/Area (m^2)	Prescription (Refer to discussions in Section 5.4)	Timeframe/Priority (Year)
RF17a	16,250	Machine plant	1-2
RF18a	65,025	Machine plant	1-2
RF19a	37,350	Machine plant	1-2
RF20a	5,050	Volunteer planting	1-2
RF21a	28,250	Volunteer planting	1-2
RF22c	27,200	Machine plant	1-4
RF23c	32,350	Machine plant	1-4
RF24c	34,700	Machine plant	1-4
RF25c	28,600	Machine plant	1-4
RF26c	12,700	Machine plant	1-4
RF27c	40,600	Machine plant	1-4
RF28c	35,500	Machine plant	1-4
RF29c	17,100	Machine plant	1-4
RF30c	11,500	Machine plant	1-4
RF31a	31,150	Machine plant	1-2
RF32a	59,200	Machine plant	1-2
RF33a	129,800	Machine plant	1-2
RF34a	4,550	Machine plant	1-2
RF35a	4,200	Machine plant	1-2
RF36a	21,550	Volunteer planting	1-2
RF37a	3,550	Volunteer planting	1-2
RF38c	11,850	Volunteer planting	1-4
TOTAL 133.2 ha (328 acres)			
Wetland			
RW1	8,300	Plant some shrubs and trees around wetland	4
RW2	2,350	Review options for pond as part of entrance treatment	1
RW3	17,600	Excavate one or two pockets, plant with shrubs	2
RW4	6,550	Buffer golf course	1
RW5	2,050	Excavate one or two pockets, plant with shrubs	2
RW6	1050	Review options for increasing size of perched wetland	2
RW7	4,600	Excavate existing low area, plant.	2
RW8	1,100	Create in existing low areas	2
RW9	3,050	Enhance this area if appropriate	4
RW10	3,000	Enhance this area	2
RW11	2,400	Enhance this area with excavation	2
RW12	3,800	Develop detailed landscaping plans for wetland and surrounding area	4
RW13	2,600	Develop small wetland	2
RW14	4,450	Develop detailed design associated with drainage	2
RW15	6,100	Enhance wetland created by TRCA if necessary, largely an expansion	2
RW16	11,200	Develop detailed plans for wetland preservation	3
TOTAL 7 ha (17.3 acres)			
Special Areas			
SA	-	Special treatment for eroded slopes adjacent to Bayview Avenue	1
SB	-	Special buffer around garden of Gray Estate	1
SC	-	Special buffer around Philips Lake	1

RB = restored buffer)
RG = restored grassland) Illustrated on Figure 4. The areas are in m^2 and the time frame is based in years with year 1
RF = restored forest) being 2006. The suggested time frame indicates the priority that should be given to the various
RW = restored wetland) areas
SA = special areas)
* Forest (areas a) = existing agricultural land which will be place under cover crop for 1 year
Forest (areas b) = existing areas which have been covered with topsoil which will be placed under cover crop for 2 years
Forest (areas c) = existing areas of goldenrod which will be tilled and herbicided and placed under cover crop for 2 years

TABLE 4
SCHEDULE FOR RESTORATION PLANTING WITH ESTIMATED AREA AND COSTS

Year	Prescription and Habitat Patch #	Area m^2 (ha)	*Cost ($)
1	***Buffer Planting*** - RB1, 10, 12, 13, 14, 15, 16, 17, 21, 22	48,325 (4.8)	48,000
	***Grassland* Seeding** – RG2, 3, 4, 5, 7	252,600 (25.3)	75,900
	Site Preparation for Forest Areas A & B (Cover Crop) – RF1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 31, 32, 33, 34, 35, 36, 37.	1,079,900 (108)	135,000
	Site Preparation for Forest Areas C (Tillage and Herbicide) - RF22, 23, 24, 25, 26, 27, 28, 29, 30, 38	252,100 (25.2)	31,500
	Wetland Excavation and Seeding - RW2, 4	8,900 (0.9)	4,500
	Special Areas – SA, SB, SC	-	331,900
Total		**1,641,825 (164.2 ha)**	**626,800**
2	***Buffer Planting*** RB3, 4, 5, 6, 7, 11	53,650 (5.4)	54,000
	Grassland Seeding – RG1	84,050 (8.4)	25,200
	Forest Planting Areas A) – RF12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 31, 32, 33, 34, 35, 36, 37	611,675 (61.2)	367,200
	Site Preparation for Forest Areas C (Cover Crop) - RF22, 23, 24, 25, 26, 27, 28, 29, 30, 38	252,100 (25.2)	31,500
	Wetland Excavation and Seeding – RW3, 5, 6, 7, 8, 10, 11, 13, 14, 15	44,950 (4.5)	22,500
Total		**1,046,425 (104.6 ha)**	**500,400**
3	***Grassland Seeding*** – RG6	36,000 (3.6)	10,800
	Forest Planting (Areas B) – RF1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	468,225 (46.8)	280,800
	Wetland Excavation and Seeding – RW16	11,200 (1.1)	5,500
Total		**515,425 (51.5 ha)**	**297,100**
4	***Buffer Planting*** – RB18, 19, 20	8,200 (0.8)	8,000
	Forest Planting (Areas C) – RF22, 23, 24, 25, 26, 27, 28, 29, 30, 38	252,100 (25.2)	151,200
	Wetland Excavation and Seeding – RW1, 9, 12,	15,150 (1.5)	7,500
Total		**267,250 (26.7 ha)**	**166,700**
5	***Buffer Planting*** – RB2, 8, 9	9,450 (0.9)	9,000
Total		**9,450 (0.9 ha)**	**9,000**
OVERALL TOTAL		**3,480,375 (347.9)**	**1,600,000**

*Assume: Buffers $10,000/ha
Forest $6,000/ha
Grassland $3,000/ha
Wetland $5,000/ha
Site preparation $1,250/ha
Special areas $110,000 each area

Note: The application of herbicides will follow the approved TRCA Pest Management Policy.

5.2 Opportunities and Constraints

There are a range of restoration opportunities and constraints, which can be used for the protection/enhancement of the significant areas, the vegetation communities, and the associated functional attributes. These opportunities and constraints are shown in Table 2 and should be considered in the preparation of detailed design plans for habitat restoration, trail development, signs and site interpretation based on priorities and recommended phasing set out in the following sections.

Opportunities

- Existing habitat network;
- Protect and enhance the local vegetation cover and local interior forest; and,
- Protect and enhance structural habitat qualities for a range of species.

Constraints

- Property requirements;
- Disturbance (noise, air quality, sight lines);
- Existing road network;
- New residential development adjacent to park boundary; and,
- Pollution/contamination (residual pesticides/herbicides).

In accordance with the ORMCP (2002), specific enhancement measures have been identified which will protect the structure and function of the core area and ensure that natural linkage corridors are maintained and improved.

In accordance with TRCA's Terrestrial Natural Heritage System Strategy (TRCA 2004), restoration objectives for the study area include maintaining and enhancing the biodiversity, ecological integrity and landscape character and quality of the Oak Ridges Moraine, and contributing to improving the environment for the local community. In general, these objectives can be achieved by increasing forest habitat, promoting the colonization by native plants and animals and creating habitat continuity through the study area where opportunities are available, preferably in areas where they are presently occurring or where they can be effectively promoted.

In general, the above objectives have been accommodated through application of the following:

- Creating a potential link to the Jefferson Forest ANSI and the Philips-Bond-Thompson Wetland Complex for interior forest habitat and enhance habitat continuity;

- Protecting existing natural areas, such as the kettle wetlands using 30 m buffers;

- Maintaining and enhancing existing habitat continuity; and,

- Creating linkages for wildlife to cross roads safely (e.g., large culverts and appropriate grading with plant cover).

Based upon the analysis of collated data, broad objectives have been identified and described in Table 2.

5.3 Timeframes

This Management Plan assumes that the land exchange involving the 428 ha (1,057 acres) of privately owned lands in Richmond Hill covered by this plan and provincially owned lands in Pickering will occur by spring 2006.

Management decisions will be influenced by the time it takes for each restored vegetation community to develop. For example, forests will take approximately 15 to 20 years to develop sufficiently to achieve canopy closure, wetland plantings will take approximately 5 years to mature, and grassland and buffer plantings will take approximately 5 to10 years to develop.

A general summary of the restoration activities within each time frame is as follows. The majority of habitat restoration will occur in the short-term:

- Short-term (1 to 5 years) – transition current cropland to cover crops prior to tree plantings; fence park from residential areas (fencing should be done as per subdivision agreement conditions and in a manner that does not impede wildlife movement), site clean-up and start buffer plantings, establish hardwood nodes in enclosures, develop nursery stock if necessary, sow grasslands, invite community volunteers for planting in key areas, determine building use, establish Park Management Advisory Committee and sub committees;

- Mid-term (5 to10 years) – Undertake remedial plantings where necessary. Review fiscal park management and golf course operations, review trail usage, review grassland management, develop forest and lake management plans, evaluate potential for a pedestrian bridge over Yonge Street and potential for installing a large culvert (3 to 4 m) for wildlife passage connecting a low lying area on the west side of Yonge Street with a wooded area between Bond Lake Bog and Bond Lake, continued monitoring; and,

Long-term (>10 years) – Thinning of conifers and additional planting of deciduous species among conifers, review forest and lake management plans, monitoring and review of Yonge Street crossing options.

5.4 Habitats to be Restored

The primary habitats to be restored are forest habitats. Because forests take a long time to grow, the time frame for reforestation will be measured in decades. Consequently, if tree planting starts in 2006/2007, one cannot expect to see complete canopy closure in less than 15 to 20 years. The Plan increases the size of Jefferson Forest both east and west of Bayview Avenue, enhances wetland pockets, and creates grassland on higher ground west of Yonge Street. The success of the restoration activities depends largely on soils, climate and aspect, and ensuring proper site preparation and management in the early years. The areas to be restored have been given a prefix (R) on Figure 4 to distinguish restored habitats from existing habitats. A summary of the prescribed habitat restoration treatments and time frames for each restoration area within the park is provided in Tables 5 and 6.

5.4.1 Forests

The existing forest communities within the study area have been described in an earlier section of this report. A key restoration goal is to increase the amount of interior forest in the region. Interior forest habitats are forest areas which are at least 100 m from a forest edge and provide conditions in which certain plants and animals can grow and reproduce with minimal disturbance. It has been found that a number of bird species prefer to breed in interior forest habitats, where they are more successful in raising young. Generally, the larger the forest block the greater the amount of interior habitat though this is related to the shape of the forest patch (OMNR 2000, Riley and Mohr 1994). Forest patches that are circular to square provide more interior habitat than patches that are elongated (Riley and Mohr 1994 TRCA 2004). The Management Plan identifies areas where existing forest blocks, such as the Jefferson Forest, can be enlarged, providing habitats for interior forest species. Restored forest habitat will eventually be composed of mixed or deciduous forest though this will not be achieved in less than 60 years.

It is advisable, given the long-term nature of the restoration activity and the relatively large areas to be restored, that ***local seed and plant material should be acquired by TRCA and grown into plugs, seedlings, or whips, as appropriate, for replanting***.

Forest restoration guidelines described in the TRCA's Terrestrial Natural Heritage System "Appendix A – Natural Heritage Restoration Guidelines" (TRCA 2004) should be followed. All areas should be promoted as low maintenance landscape features, such that they can evolve and expand naturally. Final species mixes would be developed in co-ordination with York Region and TRCA prior to planting.

The current active agricultural land should be permitted to continue until required for reforestation. Soil testing for residual agricultural chemicals will occur prior to tree planting to ensure the area is appropriately prepared and suitable for forest establishment. Soil characteristics will also need to be determined to assist in decision making for species selection (OMNR 2000). Attempts to establish hardwood forests directly on abandoned agricultural lands have had mixed results. In some cases, fast growing poplar plantations have been successful as have some walnut plantations. In other cases, hardwoods are difficult to establish and their growth is slowed down by competition from weeds and invasive species that can only be reasonably controlled with herbicides and tillage. Deer and rodent browsing can also limit planting/restoration success. Some old fields with established goldenrod populations prove very difficult to reforest.

Because of the weed problems that are inherent in converting agricultural land to forest, ***cover crop treatments will be used for one or two years prior to tree planting.*** Priorities for cover crops may need to be refined based on the availability of plant stock and soil status. ***Tilling may be used to reduce the weed crop*** but often it will not eradicate the most persistent species. ***In some cases herbicide application may be required***. Details for treatments are available in Silv-Econ, Appendix A (2004). Glyphosphate is a non-selective acceptable herbicide

which has a relatively low toxicity to birds, mammals and fish. ***A glyphosphate herbicide should be applied by a licensed applicator with experience in herbicide application in a natural setting.***

The Town of Richmond Hill does not have a pesticides by-law but they are currently implementing a pesticides reduction strategy which calls for limiting pesticide use where no other alternative management practice is feasible. TRCA's pest management policy, dated February 2006, also applies which considers the use of pesticides as an option only when no other satisfactory solution is available. Application of herbicides must be in accordance with the approved TRCA pest management policy.

In general, ***native conifers will be used to establish forest conditions*** as rapidly as possible as they are less susceptible to grazing by herbivores than hardwoods. The conifers will also help in developing the soil and climatic conditions for subsequent colonization by native deciduous trees and help to eliminate the weed seed bank. As the majority of the area is relatively flat or gently undulating and has been farmed, it will be possible to use ***mechanical planting***. This option is cost efficient and can be accomplished within a relatively short time frame. There will be some areas that are relatively inaccessible for mechanical planting and it is proposed that volunteer groups that wish to be involved in restoration be encouraged to plant these areas by hand.

The nodes of hardwood shrubs and trees should be used in small patches and as part of the buffers around existing large areas that will be mechanically planted with conifers. A mixture of approximately 10 tree species and an equal number of shrub species is recommended. With regard to species mixes, it is important to think ahead about potential problems, e.g., ash is susceptible to the Ash Borer. Beech is difficult to establish, but it may seed in at a later date. ***The buffer plantings will, in general, be wide (>10 m)*** so that they act not only as visual buffers and windbreaks but also as strips of forest that provide habitat for wildlife. It is recommended that ***a variety of shrubs typical of forests and hedgerows also be planted within and around the forest tracts. Species such as dogwoods, nannyberry, highbush cranberry, rose, and alder provide food for wildlife, and will increase the biodiversity in the area*** (MOE, 2004; OMNR, 2000a, 2000b; TRCA, 2004).

The following tree species are recommended for forest restoration:

- ***Hardwood species: red oak, white oak, sugar maple, basswood, silver maple, trembling aspen used largely in hardwood nodes and in buffers; and,***

- ***Softwood species: red pine, white pine, tamarack, eastern white cedar, white spruce used largely in mechanical planting.***

Woody species will be planted using bare root stock generally planted at 3 m on centre. Planting can be done in the spring or fall. Spring plantings should be late enough to avoid frost, and fall plantings should be early enough to allow some root establishment prior to freeze up.

Management of the planted forests will be an ongoing task and some weed control or modification of some areas may be necessary where survival of trees is low. Aftercare will involve weeding and mulching, staking and replacement of dead material. Competition from weed species should be controlled for approximately 2 to 3 years after planting. Mulch mats can be placed around the base of newly planted material to prevent the growth of weed species and aid in local soil moisture retention. Young plantings could also be protected from damage by deer and rodent browsing by using tree guards. These should be inspected annually to ensure they remain in contact with the ground. Temporary fencing and signage may also be required to prevent human access during restoration. Staking of larger caliper sized trees may be necessary if wind is a concern.

The mid-term will largely involve management activities associated with weed control. ***There may be some areas that require replanting***.

The long-term Management Plan would see the completion of the reforestation program with the ***thinning of the conifer forests between 20 and 30 years***, promoting the colonization by deciduous species. It may be necessary during this period to undertake ***additional planting of deciduous species among conifers*** to add diversity and also to introduce nodes of herbaceous ground cover when the conditions permit. This will depend upon proper monitoring of the success of the plantings and the success of the buffer plantings to produce viable seed sources.

Forest restoration will cost approximately $3,000 - $6,000/ha depending upon the amount of site preparation and the requirement for hardwood nodes (Silv-Econ 2004, B. Davis in litt.).

5.4.2 Wetlands

The ***existing established ponds, marshes, bogs and swamps will be fully protected***. Some of the depressions which have been altered by agricultural or other activities may be enhanced by removing topsoil that has washed or been ploughed in. ***Prior to excavation the water table should be checked along with sediment profiles to establish past site history. It is recommended that a variety of hydrologic regimes be established across the study area***, which will depend on the local drainage area and their location relative to other wetlands.


Reeds, Bond Lake. M. Taylor

Drawing water for irrigation should not be permitted if it impacts wetland habitats and the animals dependent on these habitats.

In some cases, ***minor grading can provide small depressions that allow water accumulation***. Such areas can then be planted as either marshes or swamps with the aim of providing dispersal connections for amphibians and reptiles, as well as providing habitat for shorebirds, waterfowl and other fauna requiring riparian habitats (Hagan 1996). These new wetlands would provide "stepping stones" for amphibian dispersal across the landscape.

A standard wetland seed mixture has been provided in Table 5. Final species mixes should be developed in consultation with TRCA and York Region.

TABLE 5
WETLAND SEED MIX

Standard OBL Wetland Mix (Sow 16 kg/ha (15 lbs/acre)*	
Cosmos Sedge (*Carex comosa*)	15%
Lurid Sedge (*Carex lurida*)	3%
Bottom Bush (*Celphalanthus occidentalis*)	30%
Blue Flag (*Iris versicolour*)	1%
Boneset (*Eupatorium perfoliatum*)	1%
Wool Grass (*Scirpus cyperinus*)	5%
Soft Stem Bulrush (*Scirpus validus*)	5%
Giant Bur Reed (*Sparganium eurycarpum*)	30%
Soft Rush (*Juncus effusus*)	10%

* Source: Ontario Seed Company (OSC), success depends on how clean the soil is prior to seeding

5.4.3 Grassland

Grassland habitats are particularly important for a number of open country species and, while it is unlikely that there was any natural grassland in the park area prior to European settlement, there may be opportunities to provide some prairie habitats. Details for evaluating areas for grassland restoration are available in Delaney et al. (2000).

Because grasslands in southern Ontario normally occur on well-drained sandy soils, the best way to identify potential grassland areas would be to identify well-drained upland sites. The largest such area is in the vicinity of Philips Lake and much of the area was seeded as a grassland mix after topsoil was spread. Natural grasslands are either maintained by fire or grazing. Since the task of managing fires in an urban area is fraught with difficulties, it is recommended that only areas that could be maintained with sporadic mowing (late summer) be considered, such as those on the west side of Yonge Street. Grassland restoration will cost

approximately $3,000/ha. ***A suggested grassland seed mix is provided in Table 6.*** Final species mixes should be developed in consultation with TRCA and York Region.

TABLE 6
GRASSLAND SEED MIXTURE

Native Prairie Grass Mix – medium height (Sow 16 kg/ha (15 lbs/acre)*	
Little Bluestem (*Andropogon scoparius*)	15%
Indian Grass (*Sorghastrum nutans*)	25%
Side Oats Grama (*Boutela curtipendula*)	15%
Big Bluestem (*Andropogon gerardii*)	20%
Switchgrass (*Panicum virgatum*)	25%

* Source: Ontario Seed Company (OSC), success depends on how clean the soil is prior to seeding

Old fields are present in many areas throughout the site and comprise stands of largely non-native grasses, asters and goldenrod. They provide habitat for a variety of wildlife and are valuable in their own right. ***It is suggested that many of these be left as distinctive habitat patches within the park. Other areas of grassland will be seeded in the short term (years 1 to 5).***

Maintaining a large area of grassland will require some management activities such as mowing, which should be undertaken every two years, and perhaps a reseeding with some other grass species depending on the success of seed germination.

As mentioned in Section 3.1.6, valley erosion has been created by runoff and heavy motorized and non-motorized vehicle use. Enforcement and remedial work is recommended.

5.4.4 Buffers

Buffers have a number of roles in a restoration plan. They serve to:

- Provide a transition zone between two very different land uses;
- Control access to a particular area;
- Prevent the incursion of non-native species into an area;
- Protect a defined natural area from the impacts of an adjacent area; and,
- Provide an aesthetic (visual) transition between two areas.

In general, the buffers proposed in this Plan are greater than 10 m wide (Table 3). Management of buffers will adhere to the TRCA Hazard Tree Policy.

Buffers Adjacent to Residential Areas

There are many new homes being built in the vicinity of the ORCP. For the most part these residents are new arrivals to a community that has no established interactions with the local

environment. The Town of Richmond Hill and TRCA have developed design guidelines for the creation of buffers between residential areas and natural areas including species and spacing. A number of developers have also provided information packages to new home owners about caring for the natural features on adjacent natural lands.

It is recommended that the boundaries of the park be fenced by adjacent developers where the park is next to residential areas and permit entry points only at approved designated areas. In addition, a buffer of trees and shrubs should be planted immediately after erection of boundary fences in the first phase of the park establishment. These buffers should support privacy while continuing to provide opportunities for good park surveillance. These areas will need to be checked on a regular basis to ensure plantings become established and that incursions from residential areas do not occur.


Residential Development. M. Taylor

In order to assist in safeguarding the ecological significance of the Philips Lake lands, ***the Province and the landowners agreed to the creation of a special panel whose mission would be the protection of the Philips Lake lands from undesirable environmental impacts and the oversight of proper environmental stewardship practices.*** Within the context of this Management Plan, the Philips Lake Stewardship Panel, with representation from the landowners and the Province, shall monitor the access and usage (both existing and proposed) of the Philips Lake lands and consult with and advise the Province as to the environmental impact of such access and usage.

Buffers Adjacent to Existing Natural Features

The Corridor Park has many sensitive natural features. In particular, there are many kettle wetlands, the Bond Lake bog and a number of mature wooded areas. In the past, agricultural practices have tended to plough to the top of bank of water bodies and forest edge drip lines. It is advisable to establish a greater buffer zone adjacent to the existing forests and wetlands in these formerly disturbed zones if agricultural use is going to continue for some period of time. They may be planted with typical species of the adjacent feature depending upon the slope, moisture conditions and aspect. Each site will be considered separately and ***it is recommended that the buffer zones be distinguished conceptually as a series of patches, each patch having its own planting plan.***

Buffers Adjacent to Roads

Buffers are also a useful way of screening roads from natural areas. Options to be considered are **constructing earthen berms from clean soil imported from areas outside the park**, ***fencing or installing shrub and tree plantings***. It should be noted that where buffer plantings occur near major roads such as Yonge Street, salt spray from winter de-icing has a major impact on many shrubs and trees. Salt tolerant species should be used nearest the road.

Other Buffers (Golf Course, Yonge Street)

It is recommended that ***a wooden screening fence be installed between the 18th hole of the golf course and the trail***. This will act as a safety feature for pedestrians and also serve to limit any distraction to golfers using the course. Also, ***wetland buffers between the manicured greens and fairways and the wetlands should be installed, particularly around wetlands (RW4 and W11).***

These buffers will be equivalent to two rows of conifers and one row of hardwood species but planted in a random pattern to avoid straight rows. Large calliper trees and species of shrubs are recommended at 3 m on centres. Shrubs should include rose, hawthorn and serviceberry.

It is proposed to distinguish and define the park by the use of oak trees at entrance ways to the park. *This will require some formal plantings around the parking lots where oak trees can provide shade and a source of food for wildlife.*

5.5 Wildlife

The Management Plan attempts to diversify the habitats to maximize the number of species that will use the area. Species of conservation concern, as identified by TRCA, are of particular importance to guide specific restoration activities. The fauna species of conservation concern in the Oak Ridges Corridor Park are as follows:

TRCA Species of Conservation Concern

-American redstart
-American woodcock
-bobolink
-common moorhen
-chestnut sided warbler
-pied billed grebe
-ruffed grouse
-scarlet tanager
-sora
-spring peeper
-vesper sparrow
-virginia rail
-wood duck
-wood frog
-wood thrush

As discussed in previous sections of this report, the following species provide a summary of those that may be present in the general area. Many of the species (*) are common in suburban and urban areas. Some of these species are nocturnal, rarely seen, move small distances or are tolerant of people:

- **Mammals -** White-tailed deer*, coyote*, red fox* raccoon*, skunk*, ermine, mink, muskrat, beaver*, woodchuck*, eastern cottontail*, eastern chipmunk*, grey squirrel*, red squirrel*, star-nosed mole, meadow vole* and deer mouse*.

- **Reptiles -** painted turtle*, snapping turtle*, garter snake*, brown snake*, redbelly snake.

- **Amphibians -** American toad*, green frog* wood frog, tree frog, spring peeper*, chorus frog, leopard frog*, bullfrog, spotted salamander, jefferson salamander and hybrids, eastern newt, and red-backed salamander*.

- **Birds -** Eastern kingbird, vesper sparrow*, chipping sparrow*, brown-headed cowbird*, American goldfinch*, yellow-rumped warbler*, red-breasted nuthatch*, white breasted nuthatch*, northern waterthrush, golden-crowned kinglet*, hairy woodpecker* and pileated woodpecker, blue jay*, black-capped chickadee*, northern flicker*, northern cardinal*, gray catbird, eastern wood-pewee, yellow-bellied sapsucker, red-eyed vireo*, downy woodpecker*, common yellowthroat*, wood thrush and ruffed grouse.

Some species within the park may already experience disturbance from domestic animals and traffic, resulting in road mortality. Many of the bird species listed are migratory but are often found breeding in suburban areas and can be expected to breed within the park.


Salamander Underpass. M. Taylor

The requirements of animals to disperse vary and methods to ensure their safe crossing of roads have been proposed and implemented in various parts of Canada, the United States and Europe (Forman et al, 2003; Hubbs and Boonstra, 1995; MTO, 2005). For the purposes of this study, only local species are being considered that are known to occur in the area and may be killed as they try to cross major roads.

The existing culvert connection under Yonge Street between Old Colony Road and the Lebovic Sales Pavilion should be reviewed for potential improvement (enlarged) to provide safe crossing opportunities for wildlife. This will be based on monitoring undertaken during the first five-year period.

If wild or domestic animals pose a management issue, the Park Manager will deal with such issues in accordance with TRCA policies and guidelines.

5.5.1 Large Mammals - Ungulates

The only ungulate present in the area is white-tailed deer, although moose have moved a long way south and have been seen on the Oak Ridges Moraine. In the future, moose could conceivably be found within the study area. Deer are usually killed at night on roads and many factors contribute to this mortality including the type of habitat on either side of the road, speed of vehicles and field of view of drivers. Various warning signs to increase vigilance of drivers assist in mitigating mortality rates.

Despite the existing and proposed traffic lights along Yonge Street and the speed of vehicles (70 to 100 km/hr), some mortality is likely to occur. However, since deer typically move at night, reduced traffic and the calming effect of another stoplight may reduce animal mortality. ***A large culvert (3 to 4 m) connecting a low lying area on the west side of Yonge Street with the wooded area between Bond Lake Bog and Bond Lake would provide for the safe passage of deer and other wildlife. The value of installing such a culvert should be evaluated based on monitoring of wildlife deaths on Yonge Street, evaluating ground water levels and locating utilities buried within the right-of-way which will have a bearing on the cost of such a retrofit.***

It is recommended that York Region monitor wildlife mortality within the park's Regional Road rights-of-way and that, in the event that vehicle/wildlife interaction becomes a significant concern, the Region will undertake an analysis of options to reduce the impact. The presence of a lit intersection at the location of the Lebovic Sales Pavilion would also permit drivers to see wildlife that cross the road and further reduce wildlife mortality.

At the easterly end of the park, there is a valley system under the new Bayview Avenue Bridge that allows deer to pass between the forested areas to the east and the present agricultural fields.

5.5.2 Small and Medium Mammals

Most small and medium sized mammals will have no problem traversing the park lands. Additional cover will be provided by buffers between residential areas and the park and as reforestation occurs, additional cover will be provided for wildlife. Enhanced buffers around the golf course and storm water management (SWM) facilities will also provide cover and food for wildlife.

Large and small culverts that either currently exist or will be built in the future (under Yonge Street) will provide some safe crossing locations for small and medium mammals. ***The monitoring plan should provide information for the requirements of wildlife crossings of Yonge Street.***

5.5.3 Amphibians

It is proposed to create wetland pockets in two low-lying areas (RW10 and RW11) that occur between Sandbanks Kettle wetlands and Bond Lake for amphibian breeding and dispersal. ***These areas have been avoided for agriculture use and could be deepened slightly to provide standing water for a longer period. It is recommended that shrubs and trees be planted around these wetland pockets.***

5.5.4 Reptiles

In order to improve habitat for reptiles, it is proposed to ***leave some rubble on site (following the confirmation of existing building and historic foundation uses)*** which can be used for snake hibernacula. In addition, ***beaches can be created within the wetland restoration areas*** for turtle nesting habitat and ***emergent logs can be placed in wetlands*** for turtles to bask.

5.6 Human Heritage

5.6.1 Existing Buildings/Heritage

The Dynamo house adjacent to Bond Lake has been severely vandalized and would require considerable capital expenditure to restore or stabilize the structure as it is hazardous in its present state. It is recommended that ***TRCA approach Richmond Hill to determine whether the Town wishes to retain the structure***. The building was not insured and will probably cost several hundred thousand dollars to restore. Once restored, a use would have to be found for it with continuous occupancy, otherwise vandalism may well occur again.

It is recommended that all options be considered for the use of the heritage structures and that the Richmond Hill Local Architectural Conservation Advisory Committee (LACAC) be contacted before any change in the use of the buildings is made. In doing so, potential users should be consulted to assess the suitability of the structures to meet identified public or other needs in the area. In the interim, heritage structures should be secured to prevent vandalism and structural deterioration. Particular attention must be paid to the future of the Dynamo House next to Bond Lake.

A summary of the recommendations for protection and restoration of the human heritage component of the ORCP are as follows:

Bond Lake

- *The original portion of the Lebovic Sales Pavilion, 12611 Yonge Street:* The ***original section of the building should be preserved***. In its current state, it would seem possible to ***incorporate it as a functioning building within the park such as a small meeting place, trailhead, base for research, restaurant, or arts/crafts store. The history of the building should be more fully researched. It should be used on a continuous basis to avoid vandalism.***

- *Log House:* ***This structure should be preserved***. Its simplicity and use of natural material allow it to blend in seamlessly with the woodland setting. ***It should be made weather tight with a sound roof, appropriate wood windows and door.*** When repaired, it should be possible to ***incorporate it as a functioning building within the park such as a lunch and/or warming hut***.

- *The Dynamo House:* (southwest corner of lake). ***This structure should be preserved.*** This would make the ideal location to interpret the Radial Railway/First Electric Park history of the site. ***At minimum, expose the exterior brick, stabilize roof and floor structures, board window openings, make secure and weather tight. It is estimated that several hundred thousand dollars are needed to restore the structure. Due to its remoteness, occupancy is key to avoid ongoing vandalism.***

- *Stone Power House:* ***Retain the ruins and interpret in association with the Dynamo House.***

- *Remnants of the columned house:* Possible associations with Robinson make this a potentially important site. ***Confirm history/provenance of this former building.*** If truly associated with Robinson, archaeology should be undertaken.

- *Cobblestone House:* ***This structure should be preserved***. The basic structure seems to be sound though the interior is in poor condition due to a persistent roof leak from unattended and deteriorated flashings around the chimney. This needs to be repaired immediately to prevent further interior deterioration. Its modest scale and natural materials make it appropriate to the park setting. Located close to Yonge Street and at the edge of the park, ***it could be rented out to suitable tenants. On the other hand, it could house a live-in site supervisor or provide a park maintenance office***. ***It needs to be used regularly to avoid further vandalism.***


Cobblestone House. A. Scheinman

Philips Lake

- *Drynoch, c.1846:* This is an extremely important and fine property. ***Finding a suitable occupant for the primary residence and boat house is imperative.*** In order to assist in safeguarding the ecological significance of the Philips Lake lands, ***the Province and the landowners agreed to the creation of a special panel whose mission would be the protection of the Philips Lake lands from undesirable environmental impacts***

and the oversight of proper environmental stewardship practices. Buffer the estate from the surrounding development.

5.6.2 Archaeology

There are no reported sites within the study area to date. The areas chosen for the spine trail are primarily existing farm roads, agricultural fields, or areas already disturbed by past construction. Trail construction will not disturb the sub-soil. ***Should human remains be identified during trail construction, all work in the vicinity of the discovery should be suspended immediately. Notification should be made to the York Region police, who will conduct a site investigation. Should other cultural heritage values be identified during trail construction activities, all activity in the vicinity of the recovery should be suspended and the TRCA archaeologist or Ministry of Culture archaeologist contacted***. ***It is recommended that a Phase 2 archaeological survey east of Yonge Street be commissioned***.

5.6.3 Golf Course

It is recommended that the golf course be permitted to operate for the next five years. Thereafter, the golf course should be re-evaluated based on its environmental and fiscal contribution to the park. The golf course must be compatible with the goals of the park.

A wooden screening fence should be installed between the 18th hole of the golf course and the trail.

Details on the fertilizer and herbicide regimes for the golf course and agricultural lands have not been obtained. It is recommended that ***a golf course management plan be developed which follows, at least, the Audubon standards.*** Certification as an "Audubon Cooperative Sanctuary", within the "Audubon Cooperative Sanctuary Program" (ACSP) for golf courses is designed to recognize and support golf courses that have worked to ensure a high degree of environmental quality for both people and wildlife. Certification demonstrates a course's leadership commitment in high standards of environmental management. In order to become fully certified, members must properly plan, implement and document their efforts in six environmental quality areas:

- Environmental planning (inventory of property – size on in-play and out-of-play areas, types and sizes of various habitats, site history, plants and wildlife present and other resources – information is used to develop an Environmental Plan);

- Outreach and education (resource advisory group made up of course personnel, members, local naturalists, experts. This group will plan and implement the various projects within the different certification categories and help to ensure the long-term success of environmental management practices);

- Wildlife and habitat management (the management of non-play areas, and perhaps some in-play areas, to provide habitat for wildlife on the golf course – maximize the use of the available space on the course to provide the best possible habitat given course location, size, layout and other characteristics of the property e.g., installing nest boxes, planting wildlife gardens);

- Integrated pest management (employs proper cultural and pest management practices, educates workers and members about responsible plant management and safety, ensures a clean and professional maintenance complex e.g., responsible turf management, monitoring for insects and disease);

- Water conservation (maximizing irrigation efficiency, determining proper irrigation times and rates, reducing res irrigated, recapturing and re-using water and incorporating drought tolerant plant species), avoiding conflicts with natural water features; and,

- Water quality management (Best Management Practices to eliminate nutrient loading and minimize water quality problems, pond, stream and wetland management, proper equipment and chemical storage and handling, and close monitoring to ensure good water quality in surface and ground water).

A “Certificate of Achievement” is granted upon completion of each category. When certification in all six categories is achieved, the course is designated a “Certified Audubon Cooperative Sanctuary”.

The management of the golf course, and associated facilities, will follow the TRCA approved operating procedures, guidelines and policies that are in effect at any given time for active use conservation parks. The Park Manager will establish a committee to assist with the necessary inventory work, management recommendations and implementation to have the golf course certified an Audubon Cooperative Sanctuary.

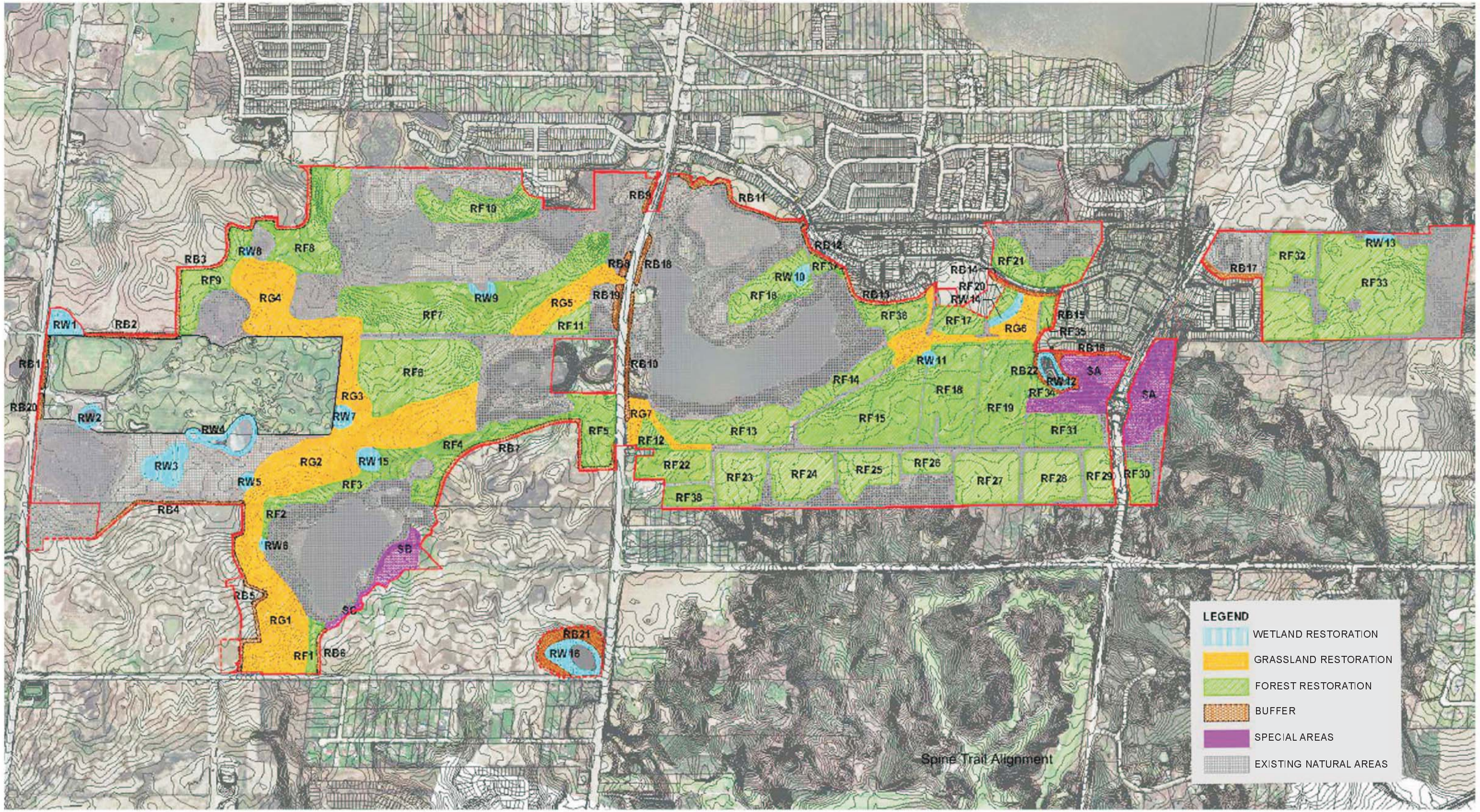


Figure 4 - Restoration Areas

Oak Ridges Corridor Park Management Plan

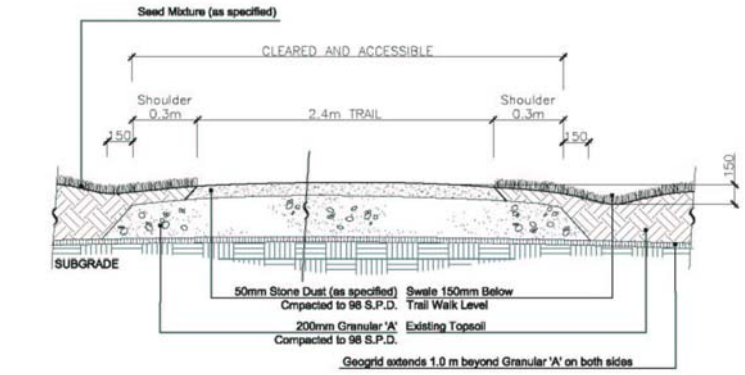
Toronto and Region Conservation Authority

AMEC Earth & Environmental
ENVision - The Hough Group
Suzanne Barrett

urbanMETRICS inc.
D.R. Poulton & Associates
Andre Scheinman Heritage Preservation Consultant

6.0 TRAILS

A major objective of the Management Plan is to produce an alignment for a "spine trail" which will form a major east west link through the park (Figures 5 and 6). The alignment and details for the spine trail were developed in consultation with all the parties (Figure 5) and by walking alternative routes. A complete set of drawings were prepared for contractors, and a context plan of the spine trail alignment was provided. The necessity of crossing Yonge Street in a suitable location was explored in detail and a request to York Region for pedestrian controlled lights at the Lebovic Sales Pavilion was made. Staff at York Region developed a request for this crossing which went before Council in October 2005 and was approved.



GRANULAR TRAIL ON COMPACTED SUBGRADE LD-02
N.T.S.

A Trail Backgrounder information sheet was produced in November 2005 which provided the guidelines for trail construction (Section 6.1) along with the rationale for the trail and an evaluation of the Yonge Street crossing options (for pedestrians and wildlife). Bridges, tunnels and traffic lights were considered as potential crossing options; however, traffic lights were considered to be the only financially viable option in the short term. Three locations were evaluated as potential pedestrian crossing points with traffic lights (1) Old Colony Road, just north of the park, (2) Lebovic Sales Pavilion, central location and (3) Silver Maple Road, just south of the park. The following evaluation criteria were considered for the three crossing options; Natural Environment (potential effects on the natural environment – air, land, water, plants and animals), Socio Economic (potential effect on municipal services, heritage resources, residences, recreation) and Economic (ease of construction/technical considerations, estimated capital cost). Option 2 was selected by the Advisory Committee as the most appropriate location, in the short term, for the pedestrian crossing based on the assessment of positive and negative aspects.

If funding is available in the future to install a pedestrian tunnel or bridge, the central location is appropriate for a bridge location but a tunnel would have to be constructed in a different location due to utilities and groundwater considerations. However, it would be relatively inexpensive to re-locate the granular trail to link to the new crossing.

There are no reports of major movements or wildlife road kills on the portion of Yonge Street which bisects the park. In order to facilitate wildlife movement in the future, it is proposed to enlarge an existing culvert north of the Lebovic Sales Pavilion to provide a crossing that will be

large enough for most of the wildlife likely to be present within the park, with the exception of deer. The existing culvert is located approximately 100 m north of the proposed pedestrian crossing.

The trail offers a tangible start to the creation of the park and an opportunity for the public to experience the diverse landscapes of the corridor lands. The trail alignment resulting from this study is consistent with the vision, goals and objectives established for the park. The trail alignment selection process considered the protection and setbacks from areas of ecological sensitivity; controlled lookout areas that limit shoreline access at waterbodies; opportunities for scenic lookouts and views; connecting trails and neighbourhood access; locating trailheads to serve local community and regional visitors; setbacks and buffers to residential areas; opportunities to experience the diverse landscape character; and resolution of key access and crossing points (Figure 6). Spine trail construction will commence in early 2006.

6.1 Trail Design Guidelines

In order to address the challenge of sustaining a sanctuary for nature in an urban setting while including public uses that provide opportunities for passive recreation, access for local residents and visitors must be provided in a manner that focuses human activity in the most appropriate locations, allowing the park to function as a nature sanctuary. Accordingly, the planning process to identify the route for the spine trail, as well as the connecting trails and loops, is based on the following guidelines:

- ***Maintain a 30 m minimum buffer from natural and restored areas***;
- ***Provide opportunities to experience diverse natural areas without intruding on them;***
- ***Accommodate non-motorized uses only including pedestrians, baby carriages, bicycles and wheelchairs;***
- ***Use a minimum practical trail width to accommodate users;***
- ***Use granular material to surface trails;***
- ***Use boardwalk structures in wet areas;***
- ***Build trails to withstand occasional maintenance and emergency vehicle access;***


Trail. I. Dance

- ***Close existing trails that are in inappropriate locations;***

- ***Follow existing grades and contours to minimize the need for grading;***
- ***Avoid placing trails close to residences but, where this occurs, provide a vegetated buffer;***
- ***Provide safe pedestrian crossing of Yonge Street;***
- ***Provide access to parking and washroom facilities;***
- ***Provide controlled access to neighbouring communities;***
- ***Provide a variety of signage that illustrates the route, identifies permitted uses and provides educational value; and,***
- ***Provide benches or other forms of seating at appropriate locations along the trail.***

6.2 Primary Trails

The primary trail proposed for the park is the east-west spine trail. The spine trail is to extend, approximately 5 km, from a trailhead at the future Oak Ridges Community Centre proposed on the east shore of Lake Wilcox to the Bathurst Glen Golf Course at the west end of the park. In the future, the spine trail is intended to connect the Oak Ridges Trail east of Bayview Avenue and west of Bathurst Avenue.

A relatively high volume of pedestrian and cyclist use is anticipated on the spine trail and therefore the trail width and construction must be substantial enough to allow safe passing and a consistent and even surface. The standard width for trails in and around Richmond Hill is 2.4 to 3.0 m. Since it is an objective of the park to minimize impact, ***a width of 2.4 m has been chosen as the maximum width of the spine trail***. ***The surfacing is to be compacted granular limestone fines on a compacted granular base. The granular base will have a maximum width of 3.0 m.*** Compaction of the granular base may be a problem in some areas due to topsoil that has been distributed over the site. In order to avoid digging deep into the soil profile to reach compacted sub grade, thereby necessitating fill and possible disturbance of potential archaeological features, ***a geogrid web will be employed to distribute the weight of the compaction evenly***.

The alignment of the spine trail primarily follows the height of land through areas that are currently in agricultural use or old field. Where low lying pockets, south of the golf course, need to be traversed, a ***boardwalk will be used to facilitate the movement of people, while allowing water and amphibian movement underneath***. North and south of the Dynamo house require facilitating movement up and down slopes. In these areas, a ***maximum slope of 8% is employed to keep the trail accessible for most users***. These sloped walkways are equipped with armour stone retaining walls, railings, and drainage weirs to minimize erosion.

Three options for crossing Yonge Street were investigated: Old Colony Road intersection, mid-block at the Lebovic Sales Pavilion, and at the future Silver Maple Drive intersection. It was determined that the most economic, environmental and social benefits would be derived from the mid-block crossing at the Lebovic Sales Pavilion. Approval for traffic lights at the Lebovic Sales Pavilion location was approved by York Regional Council on October 27, 2005. ***Installation of the traffic lights will occur in the short-term (1 to 5 years), subject to available money.***

6.3 Secondary Trails

Secondary trails are proposed to link the neighbouring communities to the spine trail; the total length of proposed secondary trails is 2.8 km. People living adjacent to open space have a natural desire to access these areas. If formal access points are not provided, residents will make their own paths which can be much more detrimental to the sensitive environments than a formalized path in a pre-determined location.

As these secondary trails are providing access to local residents, a more moderate level of use is anticipated and therefore, it should be possible to accommodate users on paths that are narrower than the spine trail. ***A maximum width of 2 m with a granular surface is recommended for these trails***.

6.4 Tertiary Trails and Lookouts

Tertiary trails provide links to lookout points proposed at Philips Lake and Bond Lake. It is important to provide these lookout points in order to satisfy the curiosity and interest of visitors and discourage the creation of paths through sensitive areas. These tertiary trails start and end at the same point in order to ensure that these spur trails do not become primary trails for through traffic. ***A maximum width of 1.2 m and soft surface of woodchips should be used for the tertiary trails***.

Where trail users are brought close to Bond Lake, a platform/dock structure with a railing should be provided to allow visitors to view the lake safely. The structure should allow students and school groups to access the water for the purpose of safely taking samples for studies, yet discourage visitors from physically entering the water.

6.5 Trailheads

A system of trailheads and amenity areas are to be provided within the trail system. ***Amenities to be provided at the future Community Centre*** includes an Oak Ridges Moraine interpretive centre, parking, washrooms, views to Lake Wilcox, and, possibly, a library. ***An***

interim trailhead will be provided on Old Colony Road, south of Sandbanks Park in order to provide parking to trail users until the Community Centre has been built.

The ***Bathurst Glen Golf Course will provide parking and washrooms*** at the westerly end of the spine trail. ***Once the Lebovic Sales Pavilion is transferred for park use, it may also serve as a trailhead and provide restroom facilities***.

6.6 Decommissioning Existing Trails

The area surrounding Bond Lake has many informal trails and footpaths that have introduced undesirable uses such as bike jumps and illegal dumping. In order to discourage further use of these trails and maintain a 30 m undisturbed buffer, ***closing these trails will be necessary.*** In order to effectively close trails, they must be visually inconspicuous and difficult to travel, both by foot and bike. Placing wood debris perpendicular across the trail will make trail use difficult, and planting young trees and thorny shrubs at trail junctions will eventually close the visual corridor. If trail use continues, wooden rail fencing may have to be used. Signage and monitoring are two other tools that can be used to discourage use of decommissioned trails; these are discussed in Sections 6.7 and 6.8.

6.7 Trail Maintenance/Operation and Park Prohibited Activities

The trail will require occasional addition of granular fines and the repair of pot holes. In order to accommodate maintenance vehicles, the primary and secondary trails will have a sub-base that is a maximum of 3 m wide in order to support occasional use by trucks. No snow ploughing will occur on the trails. Trails will not be illuminated at night.

Vegetation will also require occasional maintenance. Vegetation planted adjacent to trails should be located to prevent low hanging branches and protect sightlines, particularly at curves and hills and periodic inspection and trimming of trees and vegetation should be undertaken to ensure trail safety and to maintain minimum clearing widths.

Routine trail and natural area maintenance should occur during construction and operation. Operational monitoring for environmental damage should occur twice yearly. Input from trail users and local residents should also be solicited. Specific areas of concern include:

- Destruction of understory vegetation and slopes as a result of trail breaking, “hang-out” areas, mountain biking, etc.;

- Lakeside erosion and destruction of riparian vegetation as a result of public access to the water’s edge; and,

- Encroachment into natural areas from adjacent land-uses. The presence of public trails within buffer zones and natural areas, which are accessible to maintenance staff, may

reduce the occurrence of environmentally detrimental activities such as dumping, expansion of gardens, etc.

There was considerable discussion about the level of use by people in the park and potential activities. ***The following are prohibited and controlled recreational activities in the park:***

Prohibited Uses

- Swimming;
- Motorized recreational vehicles;
- Horseback riding;
- Camping;
- Cutting and removal of native vegetation; and,
- Dogs off leash.

Controlled Uses

- Recreational boating; and,
- Fishing.

Note: Recreational boating and fishing may be permitted on a limited and controlled basis for research, education and other special purposes. **Water-based activities must follow the approved TRCA operating and management procedures.** Proposals must be approved by the Park Manager.

Note: Only vehicles which would have a minimal environmental impact such as light duty trucks and ATV's will be used for park management activities.

6.8 Signage

Signage for the trail system should be designed as a comprehensive family of signs with a consistent identifying graphic style, image or trail logo (5 trailhead, 15 distance, and 12 to 18 interpretive signs are recommended; their location is shown on Figure 7).

The following general guidelines apply to all signage types:

- ***Consistency of design and graphic communication;***

- ***Clarity in conveying the desired message to a range of users, from adults to children;***

- ***Vandal and weather resistant materials with long-term durability;***

- ***Of a size and design that is clearly visible and understandable to the targeted trail user, i.e., cyclists and pedestrians; and,***

- ***Compatibility with surroundings, in use of colour, materials, size and placement.***

Signage should be designed to address general trail information, regulatory and directional information, and interpretation/education.


Example of Park Sign. I. Dance

6.8.1 Trail Identification/Information Signs

These signs would be provided at trailheads and access points, and could include:

- ***Trail identification including: trail name, trail identity logo and local information. Trails that are components of a larger regional system (i.e., Oak Ridges Trail) should also carry the logo of the parent trail;***

- ***Trail route map, showing trail loops and distances, degree of difficulty, and any notable hazards such as steep slopes;***

- ***Trail user code of conduct;***

- ***Notice board for promotion of trail related events or activities, habitat sensitivities, purpose of the property;***

- ***Areas for patron recognition or sponsors; and,***

- ***Trail management contact information.***

6.8.2 Directional Signs

Directional signs should be located at trail junctions and access points throughout the system, directing users to nearby facilities or other trail routes, and may include:

- ***Trail system logo, styling and colours compatible with trail information signs;***

- ***Trail name and/or distinctive logo, distance marker and directional arrows; and,***

- ***Simple post markers with graphic or colour coding that identify the trail or trail loop and correspond with an overall route map at trailheads or on brochures.***

Directional Sign. I. Dance

6.8.3 Regulatory Signs

Regulatory signs display prohibitions, warnings and cautions. ***Areas where these signs may be needed include: natural areas where access is discouraged; potential hazard areas (e.g., steep slopes, or bridges) restoration areas, and changes in trail type (e.g., multi-use to walking trails).*** Temporary trail closures due to conditions, wildlife considerations or environmental restoration should also be signed.

Signage directing trail users to carry out their garbage to promote 'no trace' activity, coupled with the provision of receptacles, including recycling, at trail access points shall be provided for non-drivable trail segments.

Regulatory signs should be designed as part of the overall signage system using compatible styling, however, the message should be easily recognized from a distance (e.g., international symbols). Use of metal signs and posts typical of roadway signs is a cost effective approach.

Prohibitive information should include brief, informative explanations with reasons for the restriction, encouraging co-operation, and noting whether the situation is temporary or permanent.

6.8.4 Awareness Signs

For trails in secluded locations, i.e., through valley corridors, signage should be posted at trailheads and entrance points noting the remoteness and distance to the next access point.

6.8.5 Interpretive/Educational Signs

These signs may be used in conjunction with special feature areas along the trail. Possible themes include wildlife and natural ecosystems, landscape or human heritage. The information presented should be both interesting and informative, and in natural areas, be oriented to building stewardship and responsibility for environmental management.

Interpretive/educational signs should be located within a widened trail node, at viewing locations or rest areas, to allow for unimpeded use of the trail. Sign design and construction may vary according to the trail setting or storyline. A consistent design should be used within each trail loop, and each sign series should be compatible with the overall Oak Ridges trail system identity.

The presentation of information should be suited to a wide range of users, including adults and children. The message should be both interesting and informative, oriented to educating trail users.

6.9 Emergency Access

It is anticipated that, in the case of an emergency, ***only vehicles which would have a minimal environmental impact (such as light duty trucks/ATV's) will be used to reach the trail user in need of help***. Access for light duty trucks/ATV's is accommodated by building the trail with a 3 m granular base in order to support vehicles. The trail has not been designed to accommodate full-size fire trucks or ambulances. The ordinary points of access and portions of the trail not suited to truck access are depicted on Figure 8.

The need for staging areas will be available at the Bathurst Glen Golf Course parking lot, Lebovic Sales Pavilion, Old Colony Road parking lot, Grovewood Park, Trish Avenue cul-de-sac, future school and park block on the south side of Old Colony Road and the future Oak Ridges Community Centre.

Existing fire hydrants and natural sources of water are close to the major access points. Distance markers will be located along the spine trail to assist emergency services.

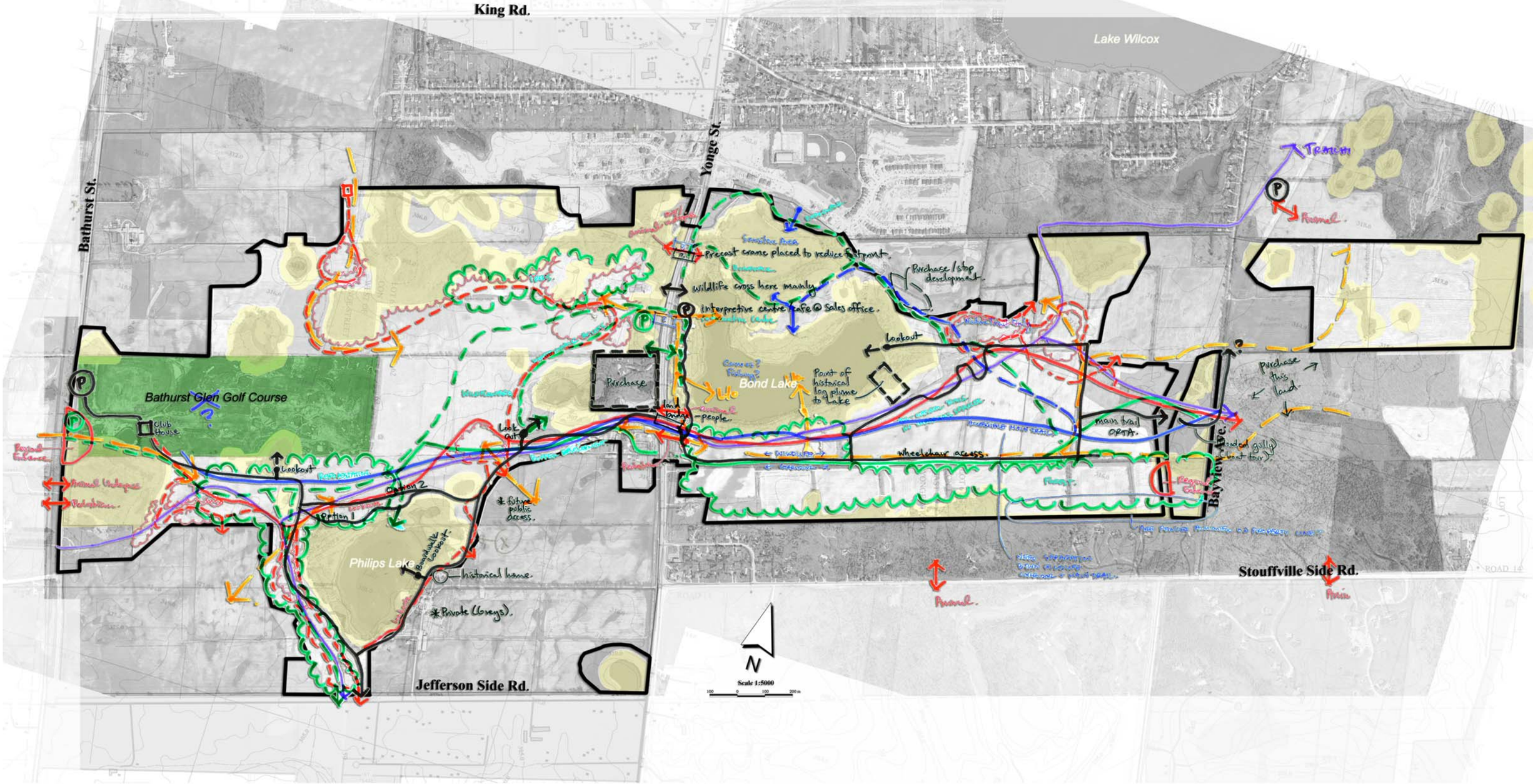


Figure 5 - Trails Planning Workshop Summary: Trail Locations Suggested in Public Workshop

Oak Ridges Corridor Park Management Plan

Toronto and Region Conservation Authority

NOTE: Each colour represents a different working group

AMEC Earth & Environmental
ENVision - The Hough Group
Suzanne Barrett
*urban*METRICS inc.
D.R. Poulton & Associates
Andre Scheinman Heritage Preservation Consultant

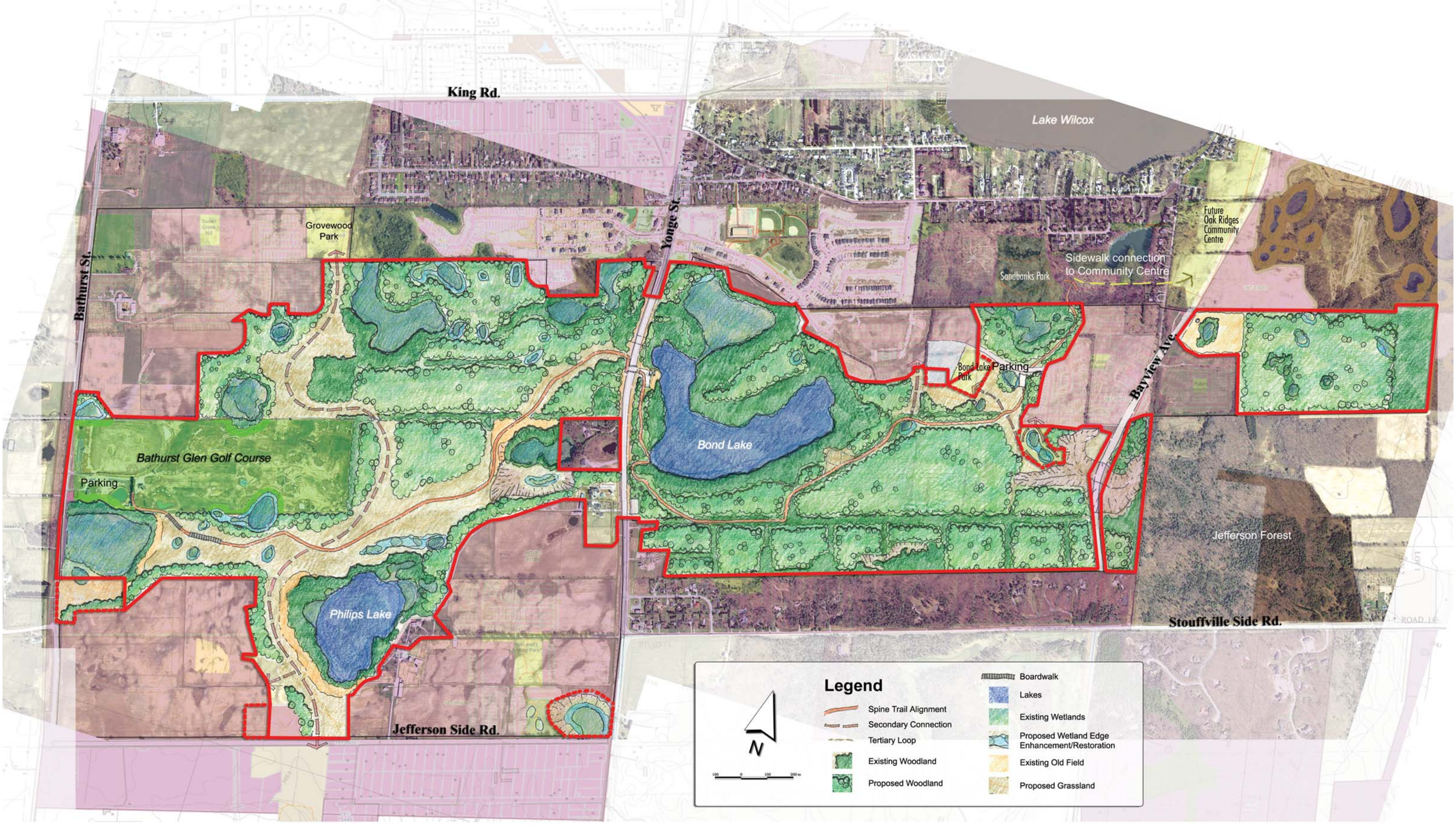


Figure 6 - Trails Master Plan

Oak Ridges Corridor Park Management Plan

Toronto and Region Conservation Authority

AMEC Earth & Environmental
ENVision - The Hough Group
Suzanne Barrett
*urban*METRICS inc.
D.R. Poulton & Associates
Andre Scheinman Heritage Preservation Consultant

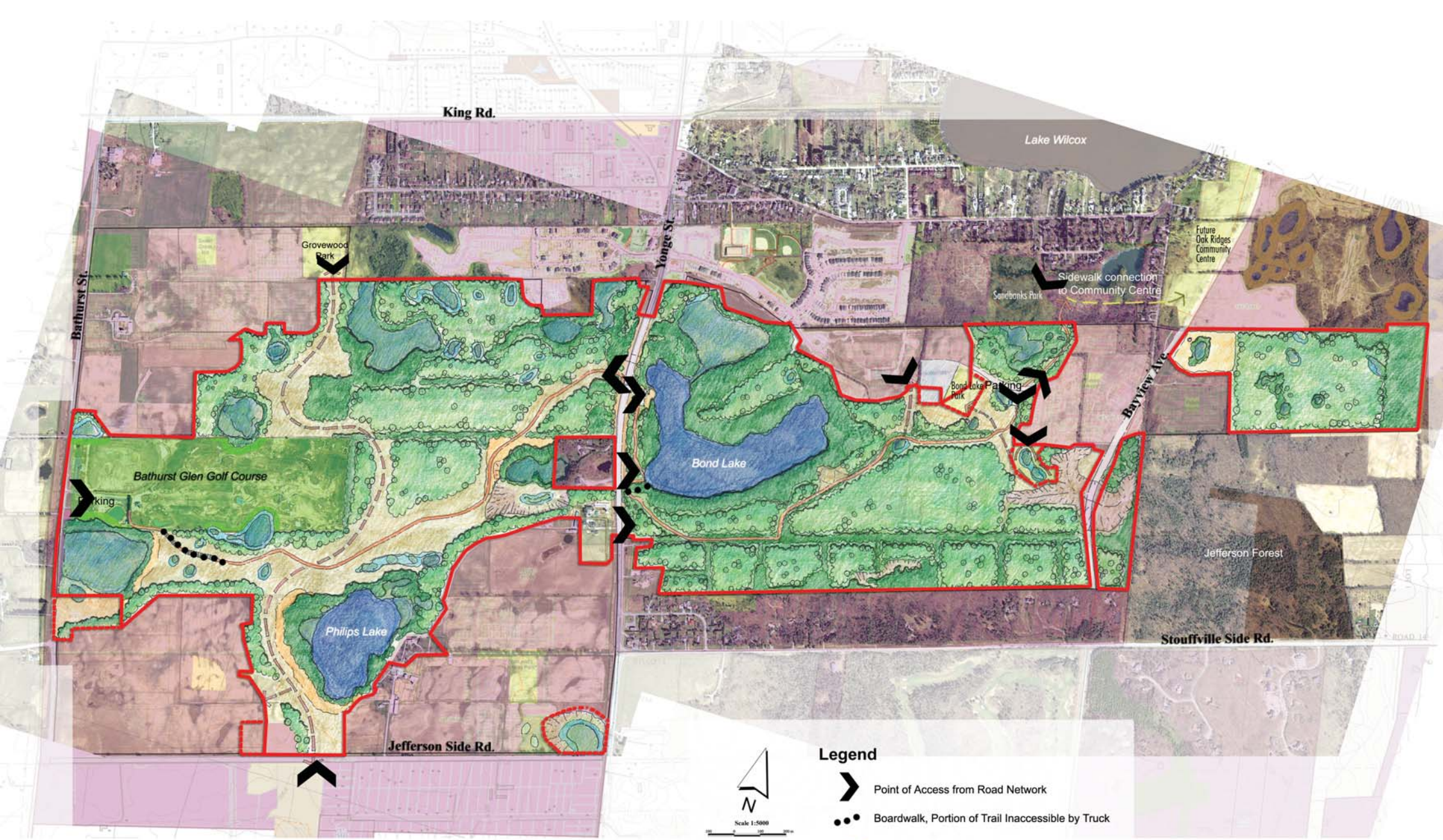


Figure 7 - Emergency Access

Oak Ridges Corridor Park Management Plan

Toronto and Region Conservation Authority

AMEC Earth & Environmental
ENVision - The Hough Group
Suzanne Barrett
urbanMETRICS inc.
D.R. Poulton & Associates
Andre Scheinman Heritage Preservation Consultant

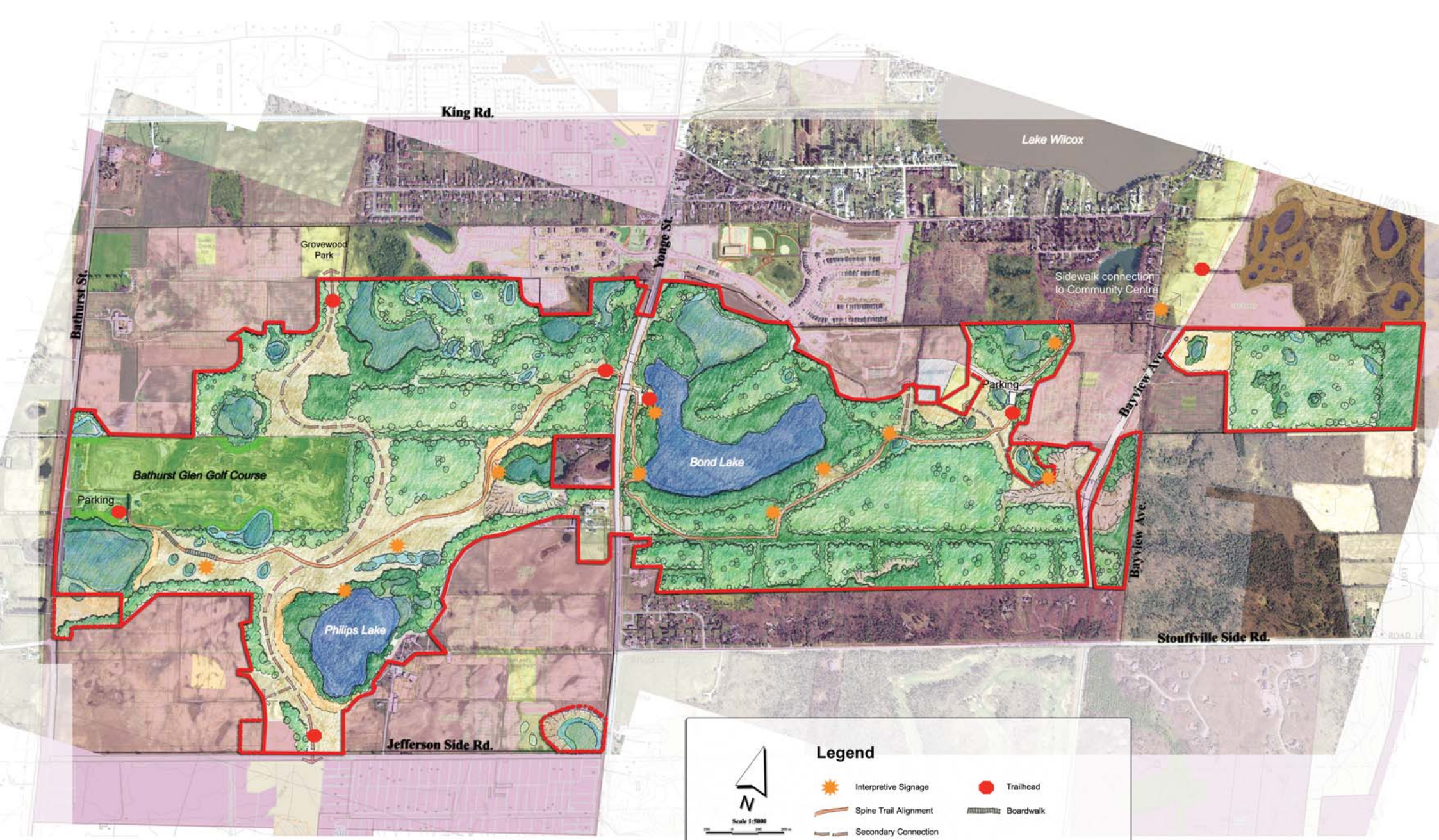


Figure 8 - Recommended Signage Locations

Oak Ridges Corridor Park Management Plan

Toronto and Region Conservation Authority

AMEC Earth & Environmental
ENVision - The Hough Group
Suzanne Barrett
urbanMETRICS inc.
D.R. Poulton & Associates
Andre Scheinman Heritage Preservation Consultant

7.0 EDUCATION AND OUTREACH

The proposed outreach and education program addresses the vision, goals and objectives of this plan by focusing on activities that are compatible with the natural and cultural values of the park, providing experiential learning opportunities and fostering partnerships for stewardship. This will help to instil respect for the environmental integrity of the park while enriching the experience of park users. Programs, which will be co-ordinated by the property manager, will include interpretation to promote appreciation of the natural and cultural heritage of the Oak Ridges Moraine, school/university education programs, monitoring and research, and community stewardship activities. The property manager will need to determine how to integrate an outreach and education program within TRCA's current framework of programs, and that of the Town of Richmond Hill.

7.1 Public Orientation & Interpretation

Example of Interpretive Information. I. Dance

Trail heads, including parking and large signs with maps, regulations and information about the features of the park, are proposed along the spine trail at Bathurst Glen Golf Course, Yonge Street, Old Colony Road and Sandbanks Drive. ***Within the park itself, signs will be strategically located to avoid visual clutter in the landscape***. A trail guide would provide added value to the trail experience.

It is expected that the Oak Ridges Community Centre will provide opportunities for interpretive displays and programming related to the ORCP. Some of the themes that could be interpreted include the origins of the Oak Ridges Moraine; its importance in south central Ontario; its aquifers, kettle lakes, habitats, flora and fauna; First Nations and the history and impacts of farming and more recent human settlement. It will also be important to explain the processes of natural regeneration and human-assisted habitat restoration that will be occurring in the park.

Guided walks can be an enriching experience for park users and could be provided through "Walks on the Wild Side (WOWS)", an existing partnership between The Optimist Club of Richmond Hill and the Town of Richmond Hill Parks, Recreation and Culture Department. ***Additional avenues for interpretation outside the park include articles in newspapers and magazines, displays at local events and cultural activities such as plays or art exhibits featuring Moraine themes***.

7.2 Education and Research

The park is situated within an increasingly urban context. It can provide an accessible place for students of all levels to learn about natural processes and wildlife on the Oak Ridges Moraine. ***Programs can be developed in partnership with the York Region District School Board and York Catholic District School Board and co-ordinated to ensure that education activities are kept at a level that protects the natural values of the park***.


Bird Watchers. M. Taylor

Monitoring work (Section 8.0) can involve high school or university students, as well as community volunteers, co-ordinated by the Park Manager.

The sales pavilion on Yonge Street has been identified as a potential trailhead or base for research activities. The building will be available as a public space in approximately four years. The crushed stone trails in the park will be accessible to people with mobility restrictions and there is an opportunity to provide a small platform for controlled access to Bond Lake for pond studies.

7.3 Stewardship/Community Outreach

A number of ***community organizations have already expressed an interest in participating in stewardship of the park. They include Oak Ridges Friends of the Environment, Oak Ridges Trail Association and the Richmond Hill Naturalists. In addition, it would benefit the park to establish a specific "Friends of the Park" group.***

Community participation can provide assistance with garbage removal, removal of non-native species, restoration plantings, closure of inappropriate trails, monitoring, nesting boxes, guided hikes, and repair of eroded slopes. In addition, it will be important to reach out to residents in the communities adjacent to the park with information about healthy yards (reduction of water use, chemical free gardening, inclusion of native plants, reduction of light pollution, etc.) and the need to control access to the park by pet cats and dogs. ***Such information could be part of the welcome package provided to new residents.***

A telephone hot-line or web-site could be provided for park users or neighbours to contact the Park Manager to report any problems, illegal uses, or management issues.

One staff person will implement community outreach program activities and prepare proposals to ensure additional funding. A community stewardship program will require a minimum of three years' funding to ensure the project develops some momentum and works towards sustainability within the community. Activities could include, but are not limited to, the following:

- Restoration - seasonal community and school plantings for wetlands, woodlands, meadows, habitat creation projects, volunteer monitoring to evaluate outcomes of restoration efforts e.g., amphibian monitoring using TRCA's Marsh Monitoring Protocol;

- Infrastructure - trail, boardwalk, viewing area structures (some of these can be successfully implemented with skilled community volunteers);

- Outreach education – trail guide, youth activity/learning books, and interpretive signage to complement trail development and outreach programs, kiosks to promote programs and engage passive recreation activities e.g., bird sightings book. Programs could include self guided tours, family nature events, school programs following a living city spaces model; and,

- Stewardship committee - nurturing ownership and involvement of local stakeholders in developing and implementing the program.

8.0 MONITORING AND REVIEW

To ensure that the Management Plan provides appropriate guidance to meet the objectives outlined in Section 2, it is necessary to have a suitable monitoring program that provides the information essential for sound park management.


Pileated Woodpecker. M. Taylor

Monitoring also allows us to learn about the successes and failures of restoration. ***Short-term monitoring will involve site inspections undertaken at 6 to 8 week intervals.*** Qualitative observations regarding the overall health of the site should be made, with particular attention paid to any signs that might suggest failure of vegetation establishment. ***A more comprehensive and quantitative evaluation of the site should be conducted at or near the end of one full growing season***.

Long-term monitoring will include annual site inspections and a photographic record of vegetation communities with GPS co-ordinates to analyze changes in the vegetation cover. Wildlife monitoring should also be undertaken to evaluate the success of the restoration and the use of the restored habitats. Citizens Environment Watch, in cooperation with Save the Oak Ridges Moraine (STORM), has a new Monitoring the Moraine Program. Bird Studies Canada offers programs such as the Christmas Bird Count. Participation by community groups is recommended to broaden knowledge about the park. A potential flora and fauna TRCA monitoring program, and associated costs, is provided in Table 7.

A series of inspections and detailed surveys will provide data regarding the site conditions, wildlife activity, etc. This data will be used to modify and, if necessary, review management activities as required. Regular surveys of the trails and trail use, such as numbers of people using the trail, should also be undertaken to identify adaptive management requirements. Operational monitoring should occur twice yearly with input from trail users and local residents being solicited. The ***results should be considered within the context of the Oak Ridges Moraine Conservation Plan and other TRCA management plans***.

TABLE 7
FLORA AND FAUNA MONITORING ACTIVITIES AND ASSOCIATED COSTS

Year	Survey Type	Cost ($)
Year 1	Salamanders (minnow traps)	**26,000**
	Amphibian tunnels (monitor 2 of the 5 tunnels that are along Bayview Avenue that are within the study area using pitfall traps)	
	Amphibian surveys (visit site to capture early spring, late spring and summer breeders)	
	Breeding birds (June/July) total of 25 hours in 3 visits	
	ELC/flora species (approximately 5 weeks - visits include spring and summer)	
	Invasive species	
	Road kill surveys (targeting species movements - spring and fall)	
Year 2	Salamanders (minnow traps) Amphibian surveys	**7,000**
Year 3 – Repeat of Year 1	Salamanders	**28,000**
	Amphibian tunnels	
	Amphibian surveys	
	Breeding birds	
	ELC/flora species	
	Invasive species	
Year 4	Salamanders	**8,000**
	Amphibians	
Year 5 - Repeat of Year 3	Salamanders	**30,000**
	Amphibians	
	Breeding birds	
	ELC/flora species	
	Invasive species	
	Road kill surveys	

The Management Plan should be reviewed informally every year and formally every five years. The purpose of the annual review will be to discuss and document any concerns or issues that have been noticed that relate to the condition or quality of the park. The results of these reviews should be documented and used for input into a more formal five year review and update. The five-year review should address any new management issues which may have arisen and need to be addressed. ***In particular, the golf course should be reviewed after five years to determine whether its presence is compatible to the overall goals and objectives of restoring the natural landscape.*** A review report should be produced which updates the issues and management actions and reports on the overall fulfillment of the Management Plan.

9.0 FINANCIAL

The management costs for the park are estimates only and are distinguished from the one-time costs that are expected to be covered by the funds ($3.5 million) provided by the developers to the Province. Revenue will be generated from the Bathurst Glen Golf Course, agricultural land rentals, and from residential leases.

Park management will require at least one full-time staff person identified in this management plan as the site supervisor. There will be various administrative and operating costs associated with the functions of this person. It is expected that such a person would require some part-time and seasonal help equivalent to another full time position.

9.1 One-Time Costs

There will be a number of one-time costs associated with establishing the park and some estimates are as follows:

• Site preparation (including garbage/refuse removal)	$200,000
• Forest and Grassland Restoration	$1,600,000
• Yonge Street crossing	$125,000
• Spine Trail	$940,000
• Secondary and Tertiary trails	$230,000
• Signage (5 trailhead, 15 distance and 12 to 18 interpretive)	$75,000
• Rehabilitating Cobblestone House	$25,000
• Lookouts (Philips Lake - $25,000, Bond Lake $50,000)	$75,000
• Audubon Cooperative Sanctuary Certification	$150,000
Total Estimate	**$3,420,000**

As these are estimates, it is expected that the restoration and clean-up costs will be higher. Also, no estimates have been provided for dealing with the Dynamo House at Bond Lake which is something that needs to be discussed by the proposed Management Committee at an early stage.

9.2 Annual Costs

• Staffing (site supervisor and assistants)	$78,200
• Material & Equipment	$42,100
• Enforcement – Contract Services	$17,000
• Hazard Tree Maintenance – Contract Services	$5,000
Total	**$142,300**

9.3 Annual Revenue

- Bathurst Glen Golf Course is expected to generate approximately $400,000 per annum (UrbanMetrics 2005);
- Former Gray estate $12,000 per year (Kozman pers. com.);
- The Cobblestone House on Yonge Street (potential to be determined);
- Sales Pavilion on Yonge Street (potential to be determined);
- Rental of club house at golf course and 3-bedroom superintendent's house on Bathurst Street (potential to be determined); and,
- Agricultural land rentals (potential to be determined).

Any surplus money generated from the golf course will be used for park purposes. If the golf course ceased to operate, some revenue could be generated from the superintendent's house on Bathurst Street and potentially from the golf club house, if it were retained.

9.4 Partnerships

There are many examples of partnerships that have been undertaken by the TRCA and other organizations to lever additional monies for tree planting and other community-supported activities. Many organizations prefer to see multiple partners involved as it indicates wide support for the activity and spreads the risk. York Region is committed to increasing the amount of forested lands within its jurisdiction and has money set aside for tree planting each year. The Oak Ridges Moraine Foundation also has money available for restoration and community initiatives and so it is recommended that the park management advisory committee establish some priorities for applying for funding and developing partnerships with other groups at an early stage. ***Partnerships should be developed to assist in the management of the park***

The following partnerships have been identified:

- Province – site restoration (eg. CFIW);
- TRCA – habitat management;
- York Region – Yonge Street crossing and site restoration;
- Richmond Hill – recreation (e.g., WOWS program) education and site maintenance;
- Environmental Citizens Watch, Monitoring the Moraine Project – monitoring/community involvement;

- Oak Ridges Moraine Foundation - site restoration/monitoring;
- Oak Ridges Trail Association – trail construction/operation;
- Evergreen Foundation - site restoration/monitoring;
- Trees Ontario Foundation - site restoration;
- Toronto Dominion Friends of the Environment - site restoration/monitoring; and,
- Richmond Hill Naturalists – site restoration, monitoring, community education.

10.0 RECOMMENDATIONS AND IMPLEMENTATION

This Management Plan is focused primarily on the first five years, to be initiated in 2006, after which time the various activities, costs and successes will be reviewed and new plans developed for successive five year periods. The following chapter summarizes the recommendations and implementation actions identified in previous sections of this report.

10.1 Park Management Advisory Committee

The success of the park will depend largely upon the various stakeholders' support and continuing involvement in translating the goals and objectives into reality. To this end, the immediate establishment of a Park Management Advisory Committee is recommended. It should be chaired by the TRCA and have representatives from the Provincial government, the regional government, and the Town of Richmond Hill. There should also be representatives from local non-government organizations such as the Oak Ridges Trail Association and the Richmond Hill Naturalists. The committee should be kept to between five and eight members for ease of scheduling meetings and making decisions in a timely manner. A number of sub-committees are recommended that would report to this management advisory committee and would include people with experience relevant to the objectives of the group.

10.1.1 Short-term Priorities for Park Management Advisory Committee (Years 1-5)

The first five year period will focus on the mobilization of administrative duties and responsibilities, site preparation and habitat restoration activities. Once the project elements are implemented, maintenance programs and monitoring will be initiated. Details with respect to the outlined tasks and their objectives are further described in Sections 5 to 9. The habitat patches and restoration areas are illustrated on Figure 4.

The Advisory Committee will assist the Park Manager as follows:

a. Establish priorities and objectives for the first five years;

b. Review annual management prescriptions and ensure competitive costs;

c. Identify roles and responsibilities of partner agencies and organizations such as Town of Richmond Hill, York Region, MNR, Oak Ridges Trail Association, Citizens Environment Watch, and Richmond Hill Naturalists;

d. Identify roles and responsibilities for Philips Lake Stewardship Panel;

e. Establish subcommittees to guide activities (Financial/Fundraising, Education/Outreach, Built Heritage, Restoration, Monitoring, Trails);

f. Assist with developing an educational and community outreach program in conjunction with the Town of Richmond Hill;

g. Assist with securing heritage structures and investigate their future use and maintenance requirements;

h. Assist with determining locations of trails, trail decommissioning, signs, maps and guides;

i. Assist with developing natural environment/monitoring activities;

j. Provide input into environmental audit of the golf course with an objective to achieve Audubon certification;

k. Review subcommittee tasks and amend accordingly; and,

l. Formally review management plan, progress and priorities for medium and long term actions and amend accordingly.

YEAR 1

1. General Administration

    a. Create a Park Management Advisory Committee.

2. Habitat Areas Site Preparation and Restoration

    a. Site clean up – determine schedule and priorities and approximate costs;

    b. Undertake soil testing from agricultural areas to determine Atrazine levels or presence of other herbicides;

    c. TRCA to acquire local seed and plant material to be grown into plugs, seedlings or whips for replanting (recommended species for hardwood nodes and buffers include, but are not limited to, red oak, white oak, sugar maple, basswood, silver maple and trembling aspen. Recommended species for mechanical planting include red pine, white pine, tamarack, eastern white cedar and white spruce;

    d. Co-ordinate with developers the installation of fencing around park boundaries adjacent to residential areas and golf course (between 18th hole and trail). The cost should be covered by developers.

    e. Cover crops – Habitat patch #RF1 through #RF21 and #RF31 through #RF37 – approximate area 108 ha, approximate cost $135,000;

f. Tillage/Herbicide (glyphosphate) areas – Habitat patch #RF22 through #RF30 and #RF38 – approximate area 25.2 ha, approximate cost $31,500;

g. Buffer planting (>10 m wide, based on the equivalent of 2 rows of conifers and 1 row of hardwood species, using larger calliper species at 3 m centres) – Habitat patch #RB1, #RB 10, #RB12 through #RB17, #RB21 and #RB22 – approximate area 4.8 ha, approximate cost $48,000;

h. Grassland seeding (see Table 4 for suggested seed mix) – Habitat patch #RG2 through #RG5 and #RG7, approximate area 25.3 ha, approximate cost $75,900;

i. Check water table, wetland excavation and seeding (see Table 3 for suggested seed mix) – Habitat patch #RW2 and #RW4 – approximate area 0.9 ha, approximate cost $4,500; and,

j. The park will be defined by the use of the oak trees at entrance ways in the buffers and in the overall planting of land. This will entail some formal landscaped planting plans – Habitat patch #SA, #SB and #SC, approximate cost $331,900.

3. Trail Construction

a. Spine trail construction and monitoring (5 km), early 2006 (follow recommended guidelines in section 6.1), approximate cost $940,000;

b. Install signage – 5 Trailhead, 15 distance and 12 to 18 interpretive (follow recommended guidelines in Section 6.8), approximate cost $75,000;

c. Install lit intersection across Yonge Street, approximate cost $125,000.

4. Maintenance

None required.

5. Monitoring

a. Monitoring – salamanders (minnow traps), amphibian tunnels, amphibian surveys (spring/summer capture), breeding birds (June/July – 25 hrs, 3 visits), ELC (spring/summer), invasive species, road kill surveys (spring/fall), approximate cost $26,000;

b. Site inspections at 6-8 week intervals;

c. Annual site inspection (comprehensive quantitative evaluation of site).

Total Approximate Cost for Year 1 $1,792,800

YEAR 2

1. General Administration

   a. Review tasks of Park Management Advisory Committee and subcommittees.

2. Habitat Areas Restoration

   a. Cover crops – Habitat patch #RF22 through#RF30 and #RF38 - approximate area 25.2 ha, approximate cost $31,500;

   b. Forest planting (bare root stock planted at 3 m on centre) – Habitat patch #RF12 through #RF21 and #RF31 through #RF37 – approximate area 61.2 ha, approximate cost $367,200;

   c. Buffer planting – Habitat patch #RB3 through #RB7 and #RB11 – approximate area 5.4 ha, approximate cost $54,000;

   d. Grassland seeding – Habitat patch #RG1 – approximate area 8.4 ha, approximate cost $25,200;

   e. Wetland excavation and seeding – Habitat patch #RW3, #RW5 through #RW8, #RW11, #RW13 through #RW15 – approximate area 4.5 ha, approximate cost $22,500; and,

   f. Secondary and Tertiary Trail Construction – approximate cost $230,000.

3. Trail Construction

   a. Trail lookouts – approximate cost $75,000;

   b. Close/decommission existing trails;

   c. Rehabilitate Cobblestone House – approximate cost $25,000;

   d. Site inspections at 6 to 8 week intervals; and,

   e. Annual site inspection (comprehensive quantitative evaluation of site).

4. Care and Maintenance

Generally not required although touch up to spine trail may be required.

5. Monitoring

a. Monitoring – salamanders (minnow traps), amphibian survey – approximate cost $7,000; and,

b. Operational trail monitoring for environmental damage (twice yearly).

Total Approximate Cost for Year 2 $837.40

YEAR 3

1. General Administration

a. Review tasks of Park Management Advisory Committee and subcommittees.

2. Habitat Areas Restoration

a. Forest planting (bare root stock planted at 3 m on centre) – Habitat patch #RF1 through #RF11 – approximate area 46.8 ha, approximate cost $280,800;

b. Grassland seeding – Habitat patch #RG6 – approximate area 3.6 ha, approximate cost $10,800; and,

c. Wetland excavation and seeding – Habitat patch #RW16 – approximate area 1.1 ha, approximate cost $5,500.

3. Care and Maintenance

a. Aftercare – weeding, mulching, staking and replacement of dead material, mow grassland every two years.

4. Monitoring

a. Site inspections at 6 to 8 week intervals;

b. Annual site inspection (comprehensive quantitative evaluation of site);

c. Monitoring – salamanders (minnow traps), amphibian tunnels, amphibian surveys (spring/summer capture), breeding birds (June/July – 25 hrs., 3 visits), ELC

(spring/summer), invasive species, road kill surveys (spring/fall) – approximate cost $28,000; and,

d. Operational trail monitoring for environmental damage (twice yearly).

Total Approximate Cost for Year 3 $325,100

YEAR 4

1. General Administration

   a. Review tasks of Park Management Advisory Committee and subcommittees.

2. Habitat Areas Restoration

   a. Buffer planting – Habitat patch #RB18 through #RB20 – approximate area 0.8 ha, approximate cost $8,000;

   b. Forest planting (stock planted at 3m on centre) – Habitat patch #RF22 through #RF30 and #RF38 – approximate area 25.2 ha, approximate cost $151,200; and,

   c. Wetland excavation and seeding – Habitat patch #RW1, RW9, RW12 – approximate area 1.5 ha, approximate cost $7,500.

3. Care and Maintenance

   a. Aftercare – weeding, mulching, staking and replacement of dead material.

4. Monitoring

   a. Site inspections at 6 to 8 week intervals;

   b. Annual site inspection (comprehensive quantitative evaluation of site);

   c. Monitoring – salamanders (minnow traps), amphibian survey – approximate cost $8,000; and,

   d. Operational trail monitoring for environmental damage and public use of trail (twice yearly).

Total Approximate Cost for Year 4 $174,700

YEAR 5

1. General Administration

   a. Review tasks of Park Management Advisory Committee and subcommittees.

2. Habitat Areas Restoration

   a. Buffer planting – Habitat patch #RB8 and #RB9 – approximate area 0.9 ha, approximate cost $9,000.

3. Care and Maintenance

   a. Aftercare – weeding, mulching, staking and replacement of dead plant material, mow grassland every two years in late summer.

4. Monitoring

   a. Monitoring – salamanders (minnow traps), amphibian tunnels, amphibian surveys (spring/summer capture), breeding birds (June/July – 25 hrs., 3 visits), ELC (spring/summer), invasive species, road kill surveys (spring/fall) – approximate cost $30,000;

   b. Operational trail monitoring for environmental damage and public use of trail (twice yearly);

   c. Site inspections at 6 to 8 week intervals; and,

   d. Annual site inspection (comprehensive quantitative evaluation of site);

Total Approximate Cost for Year 5 $39,000

FIVE YEAR TOTAL $3,169,000

10.1.2 Medium Term Priorities (Years 5 to 10)

1. General Administration

The Advisory Committee will assist the Park Manager as follows:

   a. Assist with an environmental audit of golf course and review Management Plan – potential development of a resource advisory group for golf course to implement Audubon Cooperative Sanctuary Program certification;

b. Review the development of trail guides/maps;

c. Review the potential to manage grassland by burning;

d. Continue community contact and education/outreach programs – subcommittee;

e. York Region to monitor wildlife mortality within the park's Regional Road rights-of-way;

f. Evaluate potential for installing a large culvert (3 to 4 m) connecting a low lying area on the west side of Yonge Street with a wooded area between Bond Lake Bog and Bond Lake (monitoring of deer activity, evaluate groundwater levels, locate utilities);

g. Continue monitoring with subcommittee involvement;

h. Develop forest management plan with subcommittee involvement;

i. Develop lake management plan with subcommittee involvement; and,

j. Review of fiscal management with subcommittee involvement.

2. Habitat Areas Restoration

a. The initial planting should be completed by this time.

3. Care and Maintenance

a. Undertake remedial plantings, where necessary.

4. Monitoring

a. Review trail usage and determine whether the surface is appropriate for permitted activities and whether secondary trails meet the community expectations and conform to the original vision statement.

10.1.3 Long-term Priorities (>10 Years)

1. General Administration

The Advisory Committee will assist the Park Manager as follows:

a. Review long-term pedestrian and wildlife crossing options for Yonge Street (overpass/underpass – size, shape, etc);

b. Continue community contact and education/outreach programs with subcommittee involvement;

c. Continue monitoring and assessment of restoration activities with subcommittee involvement; and,

d. Review forest management plans and rectify plantings, where necessary.

2. Habitat Areas Restoration

a. Thinning of conifers may be required to allow for the introduction or self-seeding of deciduous species among conifers.

CONCLUSIONS

It is hoped that this management plan, which is the result of considerable work and cooperation between numerous stakeholders, becomes a dynamic document that is used to provide the vision and direction for the Oak Ridges Corridor Park. It should be a living document and subject to modification because many factors may change in the decades to come. Nevertheless, the wish of the many stakeholders was made very clear during the meetings that this should be a natural area park and it is hoped that the preceding recommendations provide sufficient guidance for this vision to be achieved.

11.0 REFERENCES

Austen, M.J.W., M.D. Cadman and R.D. James. 1994. Ontario birds at risk: status and conservation needs. Federation of Ontario Naturalists. Don Mills.

Beier, P. and R.F. Noss. 1998. Do habitat corridors provide connectivity? Conservation Biology. 12:1241-1252.

Buckley, G. P. Ed. 1989. Biological Habitat Reconstruction. Bellhaven Press. London

Burbrink, F.T., C.A. Phillips and E.J. Heske. 1998. A riparian zone in southern Illinois as a potential dispersal corridor for reptiles and amphibians. Biological Conservation. 86:107-115.

Burke, V.J. and W. Gibbons. 1995. Terrestrial buffer zones and wetland conservation: a case study of freshwater turtles in a Carolina Bay. Conservation Biology. 9:1365-1369.

Cosburn Patterson Mather Limited. 1999. Master Environmental Servicing Plan Volume One. For the Town of Richmond Hill. Appendix A Vegetation Species, Appendix D.1. and D.2. Ecological Analyses.

Delaney, K., L. Rodger, P.A. Woodcliffe, G. Rhynhard and P. Morris. 2000. Planting the Seed. A Guide to Establishing Prairie and Meadow Communities in Southern Ontario. Minister of Public Works and Government Services. 56 pp.

ESG International Inc., January 1999. Ecological Analysis Bond Lake Park Homes Town of Richmond Hill.

Environment Canada, Ontario Ministry of Natural Resources, and Ontario Ministry of Environment. 1998. How much habitat is enough? A framework for guiding habitat rehabilitation in Great Lakes Area of Concern. Canada-Ontario Remedial Action Plan Steering Committee.

Fahrig, L. 2001. How much habitat is enough? Biological Conservation. 100:65-74.

Forman, R.T.T. et al. 2003. Road Ecology: Science and Solutions. Island Press. 481 pp.

Friesen, L.E., P.F.J. Eagles and R.J. MacKay. 1995. Effects of residential development on forest-dwelling neotropical songbirds. Conservation Biology.9:1408-1414.

Garter Lee. 1999. An Ecological Analysis of Bond Lake

Geomatics International, 1993. Natural Heritage System for the Oak Ridges Moraine Area: GTA portion. Background Study No. 4 to the Oak Ridges Moraine Planning Study. Prepared for the Oak Ridges Technical Working Committee. 62 pp.

Geomatics International 1998. Richmond Hill Corridor Study. Prepared for: The Town of Richmond Hill. 157 pp.

Hagan, A. 1996. Planting the Seed: A Guide to Establishing Aquatic Plants. Environment Canada, Downsview. 24 pp.

Houlahan, J.E. and C.S. Findlay. 2003. The effects of adjacent land use on wetland amphibian species richness and community composition. Can J. Fish. Aquat. Sci. 60:1078-1094.

Hubbs, A. H. and R. Boonstra. 1995. Study design to assess the effects of highway median barriers on wildlife. Research and Development Branch, Ministry of Transportation, Ontario. 49pp.

Kettle, A. 1999. Southern Ontario Woodlands: the Conservation Challenge. Published by Federation of Ontario Naturalists. 164 pp.

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. SCSS Field Guide FG-02.

Marsh, D. M., K.A. Thakur, K.C. Bulka and L.B. Clarke. 2004. Dispersal and colonization through open fields by a terrestrial, woodland salamander. Ecology. 85:3396-33405.

Matlach, G.R. 1993. Sociological edge effects: spatial distribution of human impact in suburban forest fragments. Environmental Management. 17:829-835.

McCormick Rankin Corporation and Ecoplans Limited. 2002. Bayview Avenue (Y.R. 34) Jefferson Complex Salamander Migration Study and Road Mitigation Design Review. 64 pp.

McHattie, B., Taylor, M., Hoysak, D., Seburn, C., Seburn, D., Dennis, D., Bishop, C.A., Ewins, P.J. and Weseloh, D.V. 1995. Habitat rehabilitation in the Great Lakes: techniques for enhancing biodiversity. Environment Canada, Ontario Region. 102 pp.

Michalski Associates. January. 1999. Natural Features Evaluation and Impact Anaylsis Drynoch Estates.

Michalski Associates. January. 1999. Oak Ridges Farm Co-Tenancy Natural Features Evaluation and Impact Analysis

Michael Michalski Associates. May 1999. Bond Lake and Its Watershed Natural Features and Trophic State

Ministry of the Environment. 2004. Oak Ridges Moraine Conservation Plan: Recreation Plans and Vegetation Management Plans: Guidance Document.

Ministry of Transportation. 2005. Wildlife and Transportation Reference for the Oak Ridges Moraine. Issued by Provincial and Environmental Planning Office, St. Catherines.

Morrison, M.L., B.G. Marcot, and R.W. Mannan. 1992. Wildlife-Habitat Relationships: Concepts and Applications. University of Wisconsin Press. Madison, WI. 343pp.

Oak Ridges Moraine Conservation Plan. 2002.

OMNR. 2000. A silvicultural guide to managing southern Ontario forests, Version 1.1. Ont. Min. Nat. Resour. Queen's Printer for Ontario, Toronto. 648 pp.

OMNR. 2000. Significant Wildlife Habitat Technical Guide. 151 pp.

OMNR. 2001. Inventory of Five Areas of Natural and Scientific Interest on the Oak Ridges Moraine, Town of Richmond Hill, Ontario. Aurora District.

OMNR. 2004. Oak Ridges Moraine: Technical Papers: including Significant Wildlife Habitat, Connectivity, Significant Woodlands, ANSIs.

Region of York. 2002. Official Plan. Office Consolidation. www.region.york.on.ca

Riley, J.L. and P. Mohr. 1994. The natural heritage of southern Ontario's settled landscape. A review of conservation and restoration for land-use and landscape planning. OMNR. Southern Region, Aurora 78 pp.

Schaeffer & Associates Ltd. 1998. Oak Ridges Farm Co-Tenancy: Master Environmental Servicing Plan. For the Town of Richmond Hill.

Silv-Econ Ltd. 2004. Technical Specifications for Aforestation Regional Municipality of York. Draft. 30 pp.

Sutherland, W.J. and D.A. Hill (Eds) 1995. Managing habitats for Conservation. Cambridge University Press. 399 pp.

Sutherland, W.J.(Ed.) 1996. Ecological Census Techniques. Cambridge University Press. 336 pp.

The Richmond Hill Naturalists *et al.* 1999. Proposal for the Creation of the Kettle Lakes Park, Town of Richmond Hill.

Town of Richmond Hill. June 1999. Master Environmental Servicing Plan Yonge East Secondary Plan Area.

Town of Richmond Hill. November 1998. The Master Environmental Servicing Plan, Oak Ridges Farm Co-Tenancy.

Toronto and Region Conservation Authority. 2004. Toronto and Region Terrestrial Natural Heritage System Strategy. Draft. 55 pp.

Wilson, D.E., F.R. Cole, J.D. Nichols, R. Rudran and M.S. Foster. Eds. 1996. Measuring and monitoring biological diversity. Standard methods for mammals. Smithsonian Institution, Washington.

York Region. 2003. York Region Greening Strategy 2002 Program and Achievements Update. Clause 7 in Report No. 2 of the Transportation and Works Committee.