



PO Box 1749
Halifax, Nova Scotia
B3J 3A5, Canada

Item No. 10.2.1
Halifax Regional Council
June 15, 2010

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY:

A handwritten signature in black ink, appearing to read "Stephen D. Adams".

Councillor Stephen D. Adams, Chair, Western Region Community
Council

DATE: June 1, 2010

SUBJECT: Western Common Wilderness Common Master Plan

ORIGIN

The Western Region Community Council meeting of May 31, 2010.

RECOMMENDATION

It is recommended that Halifax Regional Council approve the Western Common Wilderness Common Master Plan as recommended in the Western Common Wilderness Advisory Committee report dated May 13, 2010.

BACKGROUND

The Western Common Wilderness Advisory Committee was created by a motion of the Western Region Community Council on September 25, 2006, and given the mandate to advise the design team for the Wilderness Common on planning and development issues related to the Western Common Wilderness area lands. The Committee has completed their mandate and have brought forward the draft Master Plan for Regional Council's consideration as outlined in the attached report dated May 13, 2010.

DISCUSSION

As per the Committee report dated May 13, 2010 included as Attachment 1.

BUDGET IMPLICATIONS

As per the Committee report dated May 13, 2010 included as Attachment 1.

FINANCIAL MANAGEMENT POLICIES/BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

The completed community engagement process complies with the HRM Community Engagement Strategy. The completed process included the creation of a Western Common Wilderness Advisory Committee, on September 25, 2006 by the Western Region Community Council, to facilitate citizen involvement in developing and managing the Wilderness Common. Eleven (11) of the twelve (12) Committee members were community volunteers and the twelfth member was the area Councillor. The Western Common Wilderness Advisory Committee participated in data collection, including hosting public meetings, and analysis phases for the Wilderness Common Project and acted as a liaison with area community groups and organizations as well as with other organizations having a mandate, expertise or associated with the primary objectives of the Wilderness Common as outlined in the Western Region Needs Assessment Study. The Western Region Community Council also presented the information during a public Community Council meeting held on May 31, 2010.

ALTERNATIVES

1. The Western Region Community Council may choose not to endorse the Western Common Wilderness Common Master Plan. This is not the recommended option.

ATTACHMENTS

1. Western Common Wilderness Advisory Committee report dated May 13, 2010 with attached draft Western Common Wilderness Common Master Plan.
2. Western Common Master Plan Appendices and Maps may be obtained online at <http://halifax.ca/RealPropertyPlanning/WCWA/index.html>

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.html> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

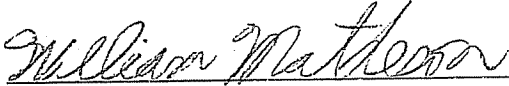
Report Prepared by: Chris Newson, Legislative Assistant, 490-6732



PO Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Western Region Community Council
May 31, 2010

TO: Members of Western Region Community Council

SUBMITTED BY: 
Mr. William Matheson, Chair, Western Common Wilderness Advisory
Committee

DATE: May 13, 2010

SUBJECT: Western Common Wilderness Common Master Plan

ORIGIN

Western Common Wilderness Advisory Committee meeting of May 10, 2010.

RECOMMENDATION

It is recommended that Western Regional Community Council endorse the Western Common Wilderness Common Master Plan, in principle, and request that the Plan be forwarded to Halifax Regional Council for consideration.

DISCUSSION

The Western Common Wilderness Advisory Committee was created by resolution of the Western Region Community Council on September 25, 2006. The Motion was;

1. *In October 2006 Real Property Planning staff advertise the selection process for the Western Common Wilderness Advisory Committee.*
2. *The Western Common Wilderness Advisory Committee membership be selected from the list of qualified interested individuals.*
3. *That the role of the Western Common Wilderness Advisory Committee be to advise the design team for the Wilderness Common on planning and development issues related to these lands.*

The Mandate of the Western Common Wilderness Advisory Committee is to provide advice to Halifax Regional Municipality staff and to the design team selected by HRM in the development of the Wilderness Common Master Plan as generally outlined in the Conceptual Land Use Plan of Western Region Needs Assessment Study document prepared by Environmental Design and Management (EDM) in 1999.

The Advisory Committee focussed on developing a level of environmental sustainability and protection in balance with existing and proposed municipal uses of the Wilderness Common area. These uses generally are; recreation, waste resource management and wind energy. The Committee also examined the Wilderness Common area in the context of current and proposed surrounding land uses including; residential development, business campus, institutional, recreational and resource uses. The advice and assistance focussed on the following specific issues;

- Planning vision for recreational land uses in the Wilderness Common portion of Western Common,
- Character and use of the designated sites for "Day Parks" in the Western Common,
- Opportunities and constraints for ATV activities in Wilderness Common,
- Integration of the large scale planning and development initiatives on the adjacent lands with the proposed land uses within the Wilderness Common,
- Water quality of lakes and waterways,
- Land acquisition opportunities and requirements,
- Operational impact of the existing Waste Resource Management Facility located within the Wilderness Common designation,
- Planning and development recommendations of the Wind Energy Generation Master Plan,
- Protection and improvement of the current wilderness character and values of the Wilderness Common,
- Heritage and cultural values located in the Wilderness Common area.

The Committee participated in data collection and analysis phases for Wilderness Common Project as generally outlined in the Master Plan Project Scope document.

The Committee acted as a liaison with area community groups and organizations as well as with other organizations having a mandate, expertise or associated with the primary objectives of the Wilderness Common as outlined in the Western Region Needs Assessment Study.

In order to reach its mandate, the Committee met on an ongoing basis since its inception. The Committee reviewed and at the May 10, 2010 meeting endorsed, in principle, the final draft of the Western Common Wilderness Common Master Plan making recommendation to the Western Region Community Council.

BUDGET IMPLICATIONS

None.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation.

ATTACHMENTS:

1. Western Common Wilderness Common Master Plan (Draft)

Additional copies of this report, and information on its status, can be obtained by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.
Report Prepared by: Melody Campbell, Legislative Assistant, 490-6517.



WESTERN COMMON WILDERNESS COMMON MASTER PLAN

Final Report



Prepared for:
Halifax Regional Municipality

Prepared by:
**EDM•Environmental Design and
Management Limited**

In Association With:
**Gordon Ratcliffe Landscape Architects
Dillon Consulting Limited
CRM Group Limited**

May 2010

**WESTERN COMMON WILDERNESS COMMON
MASTER PLAN**
Final Report

May 2010

Prepared for:
Halifax Regional Municipality

Prepared by:
EDM • Environmental Design and Management Ltd.

in association with
Gordon Ratcliffe Landscape Architects
Dillon Consulting Limited
Cultural Resource Management (CRM) Group Limited



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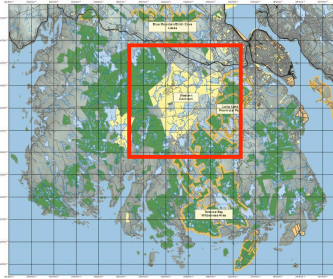
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EXECUTIVE SUMMARY



- The **Western Common** extends over lands owned by HRM between Highway 103 to the north and Highway 333 (Prospect Road) to the south. It extends from the Ragged Lake Business Park in the east to the Nine Mile River in the west.
- The **Wilderness Common** comprises the western half of the Western Common. It includes seven lakes, extensive rivers and streams, historical trails, special habitats and culturally significant areas complementing a variety of urban land uses in the south (Prospect Road and vicinity) and the Halifax Mainland in the east.
- Drawing up a **Wilderness Common Master Plan** was recommended as one of four major elements of the Western Commons Concept Land Use Plan presented in the 1999 EDM study *Planning for the Western Common*. Considerable change has occurred since the study was published. HRM was less than three years old when it was completed, and the Otter Lake Solid Waste Management Facility only began operations in 1999, as the report was being reviewed and presented to the public. The HRM Regional Plan consultation process began three years later, and the resulting plan was adopted in August, 2006.
- The **goals of the current study** are to review the 1999 Concept Plan, conduct a community consultation process, and develop a Wilderness Common Master Plan that provides a sustainable vision for future park development by preserving the ecological integrity of the Wilderness Common while supporting outdoor recreation activities, enhancing regional context, ensuring connectivity to other parks and open spaces, and adopting best management practices to maintain the integrity of edge relationships with human and wildlife communities bordering the park.
- As recommended in the 1999 study, an advisory committee, entitled the **Western Common Wilderness Advisory Committee**, was formed to facilitate citizen involvement in developing and managing the Wilderness Common. The committee's oversight has been key to the Master Plan's successful development.

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- **Chapters 1 to 4 of the Master Plan** were prepared between the project's late July 2008 inception and October 2008. In November 2008, the first phase of the master planning process was completed with the publication of the *Wilderness Common Situation Assessment Report*. It contains a thorough review of the 1999 study and associated land-use planning documents completed in the past decade. It includes an extensive collection and interpretation of geographical information system (GIS) site data, as well as field assessments of forest and archaeological site conditions. The report also documents information gained through consultations with a wide variety of stakeholders.
- The area was assessed using **Land Suitability Analysis**, which determines the fitness of land for a specific use. Chapter 5 outlines the analysis and its results.
- **In Chapter 6, the Master Plan is presented in five phases**, with an outline of park amenities, waterways and trail systems to be developed. The Plan also includes cost estimates and an implementation timeframe. Wilderness Common's development as a regional park will be phased over a period of twenty years, with the exception of areas currently occupied by the Otter Lake Solid Waste Management Facility, which will likely require a sixty-year operational and closeout monitoring period to enable it to be fully incorporated within the park.
- The ongoing operation of the **Solid Waste Management Facility** and an extended closeout monitoring period are considerations for the Master Plan. The new designation of "Regional Park Reserve" ensures that the facility and surrounding exclusion area lands will eventually become part of the regional park.
- The Master Plan also deals with **forest management**. The main recommendation is that a detailed forest management plan be prepared. Forest management planning for the Wilderness Common should be developed following principles of sustainable management such as those identified by the Canadian Council of Forest Ministers. Forest management standards for the Wilderness Common should be consistent with those adopted by HRM for the Point Pleasant Park Comprehensive Plan.

- **Conservation of cultural heritage** is a key element of the Master Plan. Further research concerning cemeteries and farmsteads in the former Greenhead Settlement will be conducted in order to preserve and interpret the area's cultural heritage. The potential of pre-contact archaeological sites will also be considered throughout the regional park's development.
- **Chapter 7 is an expansion to the Master Plan presenting a vision for the Chebucto Peninsula** that addresses some of the most pressing recreational and ecological issues on a significant portion of the Crown Lands on the Peninsula. Since it would require the Province's leadership, it is separate from the Wilderness Common Master Plan and is included for discussion purposes only. The Chebucto Peninsula Concept Plan could provide HRM and the Province of Nova Scotia with a world-class multi-use trail experience for tourist and local residents, while also protecting the habitat of the Mainland Moose, an endangered species—all within an area less than 30 kilometers from downtown Halifax. The expansion outlines a wider vision for the Chebucto Peninsula as it relates to the Wilderness Common. This vision, which has been presented to HRM staff, Provincial departments and NGOs, defines a possible solution to the divergent issues of OHV use in the area and the presence of the endangered Mainland Moose
- **Stakeholder groups** such as the Chebucto Wilderness Coalition, the St. Margarets Bay Safety Minded ATV Association, the Ecology Action Centre and the Canadian Parks and Wilderness Society have reviewed and shown support for the Concept Plan, and HRM's Western Common Advisory Committee has endorsed its further development.
- **The Chebucto Peninsula Concept Plan has four components:**
 - a) Wilderness Conservation Area,
 - b) Regional Park Reserve,
 - c) Regional Park,
 - d) Multi-Use Trail System.The trail system, which includes motorised and non-motorised sections, would allow access to communities throughout the Chebucto Peninsula, and would minimize human disturbance of the moose by gradually redirecting human activities to the periphery of the moose habitat area.

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The Concept Plan provides a pragmatic, integrated planning approach to accommodating human recreational needs while fostering survival of the Mainland Moose on the Chebucto Peninsula. Further cost/benefit analysis will be required to calculate natural capital costs associated with the potential loss of the Mainland Moose, as well as potential trail-related financial benefits such as tourism revenues.

ACKNOWLEDGEMENTS

EDM would like to thank all groups and individuals who contributed to the creation of this document. Groups such as the Chebucto Wilderness Coalition, CPAWS and the Safety Minded ATV Association provided information indispensable to the plan's creation. EDM would also like to acknowledge the dedication and guidance extended to us by the members of the Western Common Wilderness Advisory Committee. Your input has been appreciated.

The committee members are:

William Matheson (Chair)
Dusan Soudek (Vice Chair)
Councillor Reg Rankin
Phillip Cochrane
Darrell Cooling
Alan Kitz
Michael Lamplugh
Lorne Logan
Kelly Morrissey
Blake Maybank
Jane Sears
Susan Smith

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SITUATION ASSESSMENT 2008

1. INTRODUCTION

1.1 PROJECT BACKGROUND

Sections 1 to 4 of the Master Plan were prepared between the project's inception in late July 2008 and the following October. In November 2008, this first phase of the master planning process was completed with the publication of the *Wilderness Common Situation Assessment Report*. It contains a thorough review of the 1999 study and associated land-use planning documents completed in the past decade, and includes an extensive collection and interpretation of geographical information system (GIS) site data, as well as field assessments of forest and archaeological site conditions. The report also documents information gained through consultations with a wide variety of stakeholders.

EDM has pointed out in previous work for Halifax Regional Municipality (HRM) the benefits of the strategic conservation of valued lands.

"The lands of Point Pleasant Park, the Halifax Common, and the Dartmouth Common were set aside for varied purposes but have come to serve the recreational needs of subsequent generations. In following years municipal, provincial, and federal governments traditionally reserved many areas for heritage, recreation, and natural resource uses. Key lands include the Public Gardens, Fleming Park, Seaview Park, Hemlock Ravine, Long Lake Provincial Park, MacNab's Island Provincial Park, the Citadel, York Redoubt, and strategic waterfront lands around the harbour. The tradition has also guided the development of new areas with the commitment of extensive active recreation areas in the Western Common and in communities such as Sackville and Cole Harbour."¹

¹ EDM • Environmental Design and Management Limited, *Blue Mountain/Birch Cove Lakes Assessment Study*, Final Report, March 2006, p. 1.

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The Blue Mountain/Birch Cove Lakes Assessment Study (the source of the preceding quote) advanced the tradition further by encouraging designation of a major portion of the study area as a Wilderness Protected Area by the Provincial Minister of Environment.

The benefits of reserving lands for future public use have become apparent to the community in many ways. In addition to preserving environmental and cultural assets, these lands have become the foundation of the municipal recreation system. Ball fields, soccer pitches, swimming pools, arenas, sports centres, formal promenades and informal trails have been developed or have simply evolved through public use. Some have become key tourist attractions. All have augmented the character of the region and enhanced citizens' quality of life. All except the most recently designated area have come to be bordered by urban development that enjoys enhanced value thanks to the amenity and beauty of adjacent public lands.

The Western Common is the latest opportunity to advance the tradition. EDM's 1999 study *Planning for the Western Commons* put forth a long-term vision for the site that balanced the desires of the community, protected the natural environment and was financially pragmatic. The 1999 project involved:

- community consultation
- land-use assessment
- regional context review
- a real estate potential analysis for the site
- an ecological assessment for the Western Common.

The resulting plan tried to balance resource conservation, the desires of the local community, and the realities of the marketplace. Market assessment examined residential, office campus, eco-industrial park, golf course, cemetery and campground options; additional suitability analyses examined the subject lands' ability to support an urban wilderness park, views from each lake on the site, recreation and cemetery needs, and road suitability and erosion risk. The environmental capacity of the landscape was given extra weight, since it is the one constant in the face of changing market and community desires.

The study contained a Concept Land Use Plan proposing specific uses for the area based on land suitability analysis and financial assessment. It contained four major elements:

1. Mixed-use development around Ragged Lake and Blueberry Lake, including serviced residential and residential-commercial areas;
2. Large-scale recreational amenities, including soccer/baseball fields and an equestrian centre;
3. Community development and amenities for Hatchet Lake and Goodwood;
4. A Wilderness Common.

The fourth element, which is the focus of *this* study, was identified as the Wilderness Common and called for a Master Plan for the western half of the Western Common. The Wilderness Common includes seven lakes, extensive rivers and streams, historic trails, special habitats and culturally significant areas complementing an area of urban land uses to the east (see **Figure 1.1**).

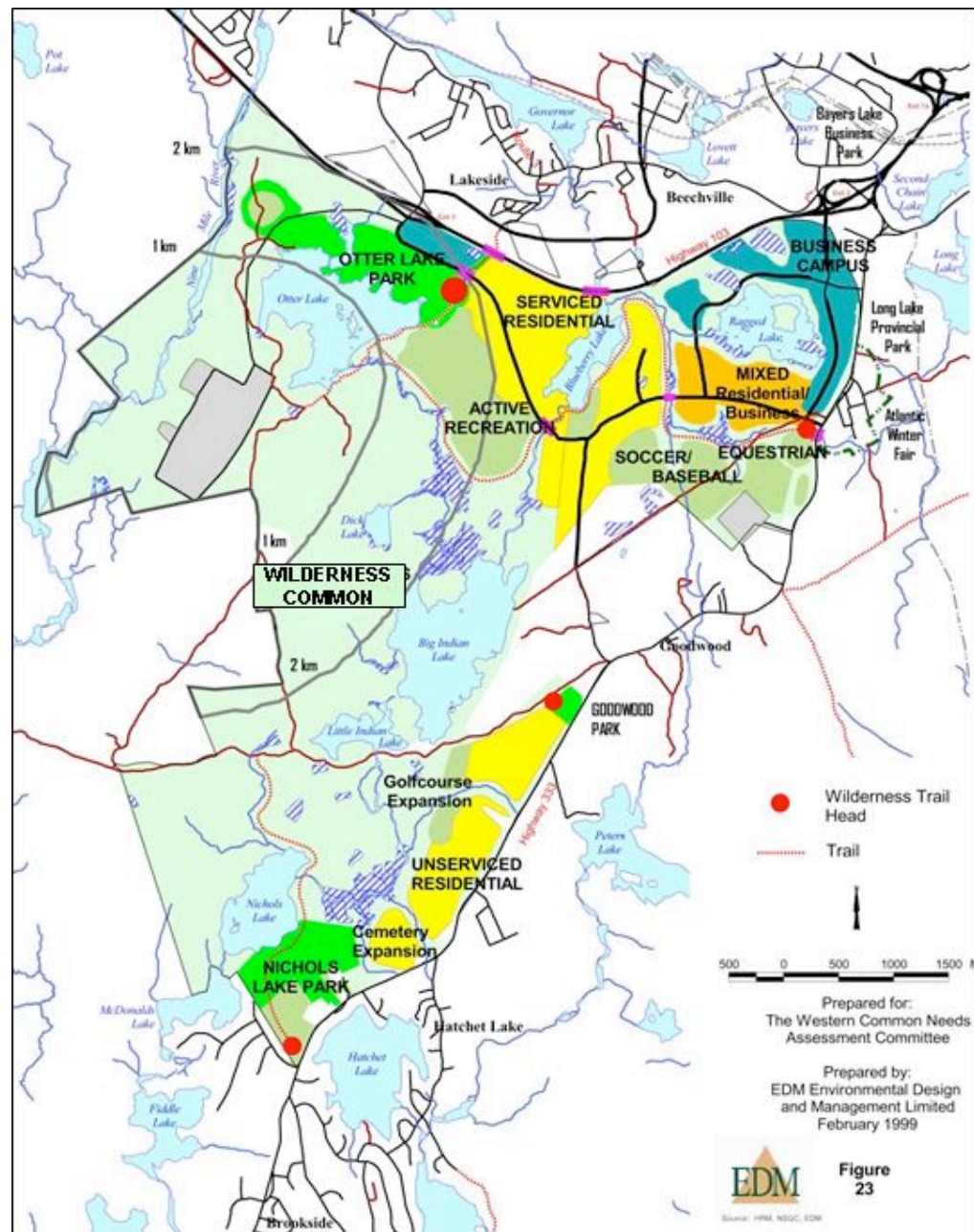


Figure 1.1: Western Common Conceptual Land Use Plan (1999) Showing Wilderness Common Area

HRM's Regional Municipal Planning Strategy (RMPS), adopted in July 2006, includes the Wilderness Common as a regional park in its park classification system, albeit without precise geographical boundaries. Its values are, however, clearly illustrated on several maps accompanying the RMPS (see **Figure 1.2**, particularly the map in the

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lower left-hand corner taken from RMPS Map 4 – Parks and Natural Corridors). The Master Plan is also part of HRM's Open Space Functional Plan, whose goal is to "help determine an economically and environmentally sustainable strategy for the equitable maintenance and distribution of parks and natural open space throughout the Municipality."

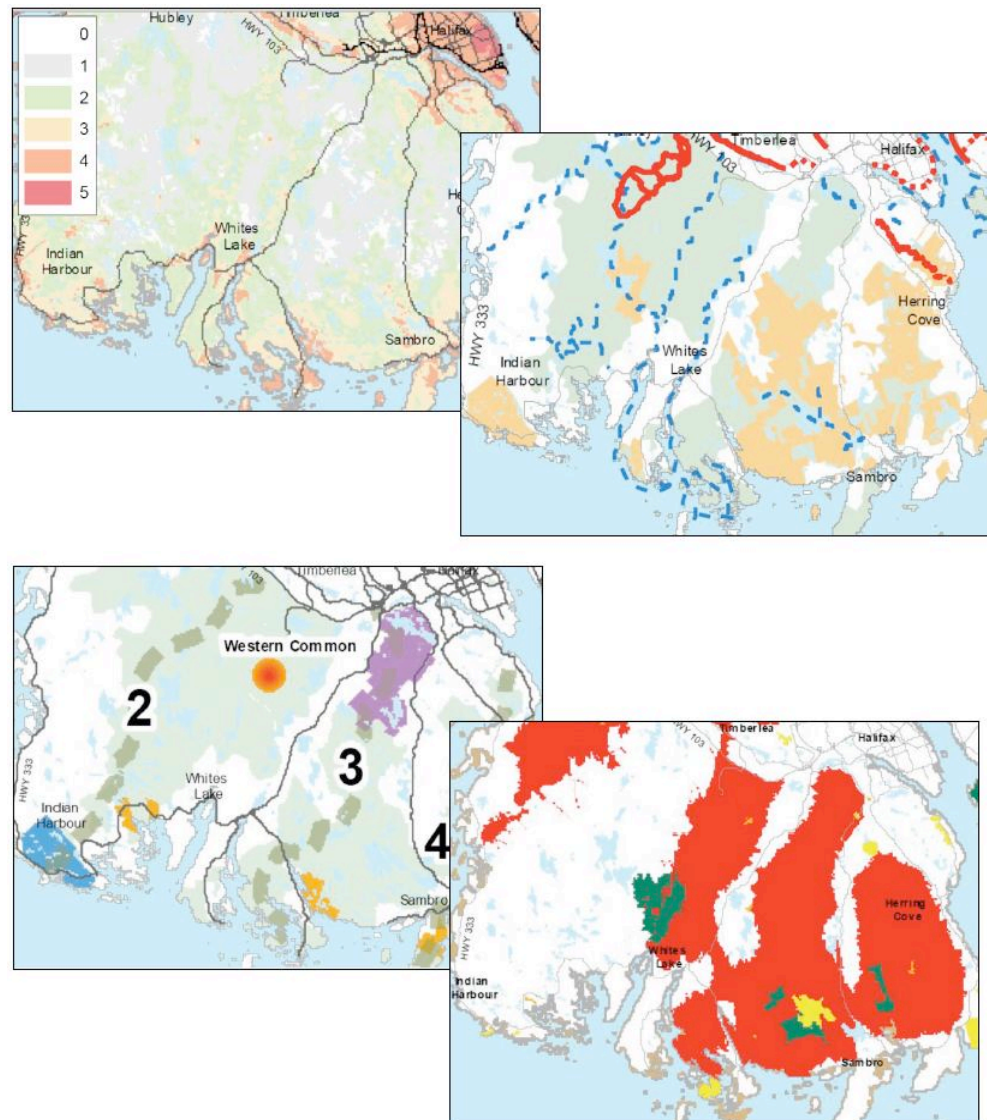


Figure 1.2: HRM Regional Municipal Planning Strategy Maps Showing Wilderness Common Area

Clockwise from top left: Cultural Significance, Trails and Natural Networks, Significant Habitats and Endangered Species, and Parks and Natural Corridors

1.2 PROJECT PROCESS

The primary goals of the current Wilderness Commons study are to conduct a community consultation, followed by a Master Plan with a sustainable vision for preserving ecological integrity while supporting outdoor recreation activities. The Master Plan, expected to be completed in 2009 [!], will enhance the regional context, ensure connections to other parks and open spaces, and manage edge relationships with other communities. To develop the plan, EDM will work closely with the Western Common Wilderness Advisory Committee (WCWAC), which was formed to facilitate citizen involvement consistent with EDM's recommendation in the 1999 project report.

Our proposal set out a three-phase work plan, portrayed in **Figure 1.3**, to address the scope of work specified in the Request for Proposals:

- Phase 1 – Research and Analysis;
- Phase 2 – Assessment and Visualization;
- Phase 3 – Setting the Direction.

We made an important change to the work program at the outset, moving Field Assessment work into Phase 1. This was done largely because of concerns about the completion of fieldwork, given that the project did not begin until late July. It also had the benefit of ensuring a sound baseline for consideration of the WCWAC in this Situation Assessment Report and prior to formal public sessions.

We also determined, in consultation with client representatives, to modify the stakeholder interviewing process—from individual interviews conducted in person or by telephone to a Stakeholder Workshop. The Stakeholder Workshop was held on October 27, 2008, after a draft Situation Assessment Report was submitted and reviewed by HRM staff. The new approach allowed the consultants to engage more stakeholders within considerably less time. Through a presentation based on the Situation Assessment Report, workshop participants received information that provided context for their discussions. Some additional direct interviewing garnered input from key stakeholders who were unable to attend. Input from the workshop session and additional interviewing, as well as stakeholder comments on the draft document, provided the basis for revising the report.

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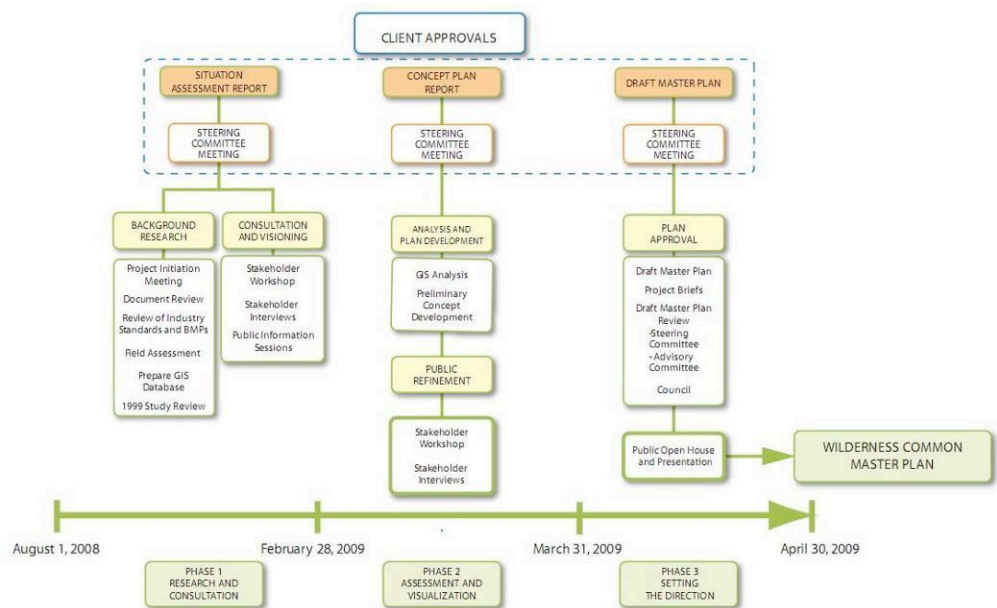


Figure 1.3: Proposed Project Plan with Amendment

HRM's RFP set a seven-month timeframe for completing the project. As depicted in **Figure 1.3**, we completed all tasks proposed for Phase One, including all basic fieldwork. Work is currently under way on developing the Concept Plan.

This Situation Assessment Report documents all aspects of Phase-One work. It was presented to the wider, interested public through three public open houses. Two were held simultaneously at Keshen-Goodman Public Library in Clayton Park and Brookside Junior High School on November 27, 2008, and a third at the Lakeside Firehall on December 3, 2008. This version of the report reflects input obtained at those sessions and from additional interviewing of key stakeholders in December and January.

Phase Two will conclude with submission of the Concept Plan Report, which will be refined in consultation with the advisory committee and HRM Staff at the end of the phase. These first two project outputs will build to the final Western Common Wilderness Common Master Plan, which will reflect the community's development priorities and HRM's priorities and goals.

The work includes a review and assessment of assumptions and recommendations contained in the 1999 plan, particularly in the face of ongoing changes such as the potential creation of a Blue Mountain-Birch Cove Regional Park; the establishment of the Beechside/Timberlea/Lakeside Trail; continued urban and residential subdivision development (e.g., Langbrae, Clayton Park West, Rockingham Ridge, Mount Royal, Stoneridge, and the Brunello Estates Golf Community); related expansion of Bayers Lake Business Park; and ongoing operation of the Otter Lake Solid Waste Management Facility. These changes have resulted in both increased opportunities for ecological and human connections to adjacent lands, and significant barriers.

1.3 REPORT ORGANIZATION

Including this introductory section, the report is divided into six chapters.

Chapter 2, following immediately, summarizes planning documents and past studies relevant to understanding the Western Common area and its potential. Materials reviewed include municipal planning documents and functional planning processes, and studies of parks and trail development pertinent to the Western Common and Wilderness Common, including the 1999 study of the Western Common.

Chapter 3 assesses the Western Common based on studies undertaken for this assignment, including GIS analysis of soils and landforms, biological and forestry screening, and archaeological assessment.

Chapter 4 concludes with a summary of issues identified in consultations undertaken by HRM in relation to adoption of recommendations in the 1999 study, and issues identified by current preliminary research and consultation, including our Stakeholder Workshop.

Chapter 5 contains the results of GIS-based analysis of the area in terms of its suitability for development. Suitability analysis determines the fitness of land for a specific use. The results were applied to development concepts created for the Wilderness Common.

Chapter 6 presents the Master Plan in five phases, with an outline of proposed park amenities and trail systems. The Plan also includes cost estimates and an implementation timeframe.

Chapter 7 expands on the Master Plan by presenting a vision for the Chebucto Peninsula that addresses some of the most pressing recreational and ecological issues on a significant portion of Crown Lands on the Chebucto Peninsula. Since realization of this vision would require the Province's leadership, **it is separate from the Wilderness Common Master Plan and is included for discussion purposes only.**

2. PAST STUDIES

In addition to the 1999 study of the Western Common Wilderness Common, an array of other studies is relevant to current work. These include the Halifax Regional Municipal Planning Strategy (RMPS) adopted in 2006, completed and ongoing functional plans pursuant to the RMPS, and other past studies, particularly those dealing with parks and trails development in Halifax West and the Chebucto Peninsula (see **Table 2.1**). The Wilderness Common Master Plan resulting from the current project will contribute to development of the Open Space Functional Plan.

Document	Author	Availability
Municipal Planning Documents		
Halifax Regional MPS (2006)	HRM Regional Planning	www.halifax.ca/regionalplanning/index.html
City of Halifax MDP (1978-)	City of Halifax	Hard copy only
Halifax Mainland LUB (1978-)	HRM	http://www.halifax.ca/planning/map.html#HalifaxMainland
Functional Plans		
Active Transportation Functional Plan (2006)	SGE / Marshall Macklin Monaghan	http://www.halifax.ca/TDM/activetra nsportation/index.html
Bayers/Ragged Lake Functional Plan	Colliers International	Draft plan in preparation
Open Space Functional Plan	HRM Staff	In preparation
Urban Forest Functional Plan	HRM Staff	In preparation
Relevant Plans and Studies		
Planning for the Western Common (1999)	EDM	Hard copy only
Otter Lake RDF – Long Term Location Potential (2005)	Dillon Consulting	Internal document
HRM Community Facility Master Plan (2008)	Asbell Management Innovations Inc.	http://www.halifax.ca/facilities/CFM P/index.html
Blueprint for a Bicycle Friendly HRM (2002)	EDM	www.halifax.ca/cycling/bikeplan.html
Integrated Master Plan for Trails on the Western Side of Bedford Basin (2006)	Gordon Ratcliffe Landscape Architects	www.halifaxnorthwesttrails.ca
Draft Park Management Plan - Long Lake Provincial Park	NSDNR	www.gov.ns.ca/NATR/PARKS/long-lake.htm#plan/pdf/manplanjune1208.pdf
Blue Mountain/Birch Cove Lakes	EDM	www.halifax.ca/regionalplanning/index.html

Assessment Study (2006)

[x.html](#)

Table 2.1: Past and Current Studies Relevant to the Western Common Wilderness Common Master Plan

2.1 REGIONAL MPS

The RMPS notes that the commitment to a comprehensive, interconnected regional parks system was established in the 1975 Halifax-Dartmouth Regional Development Plan. The RMPS notes that substantial strides have been made toward creating the envisioned system; however, “the full scope of the plan was not completed.” It continues:

This, coupled with future population growth contemplated at higher densities for urban and suburban areas, requires additional areas to be preserved for future Regional Park development.

The Western Common Wilderness Area is identified as one of the additional areas to be considered along with Blue Mountain and Birch Cove lakes, Feely Lake, Jacks Lake, Second Lake, and Porters Lake.

The protection of existing and future regional parks is to be implemented through Policy E-4 of the RMPS:

E-4 Within all designations, HRM shall establish a Regional Park Zone under the land-use by-law. This Zone shall generally be applied to all Federal Parks, Provincial Parks, Provincial Park reserves, non-designated Provincial Parks and the new Regional Parks designated under this Plan. Within the Blue Mountain-Birch Cove Lakes Park, the zone shall only be applied to the publicly owned lands. This Zone shall permit recreational uses, park uses and other uses as provided by the existing secondary planning strategies for these areas.

The current land use and zoning for the Study Area is set in the City of Halifax Municipal Development Plan (MDP), the Timberlea/Lakeside/Beechville Secondary Planning Strategy (TLBSPS), and the Planning District 4 (Prospect) SPS, as well as the

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RMPS. Plan policy is implemented through the Halifax Mainland, Timberlea/Lakeside/Beechville, and District 4 Land Use Bylaws (LUB).

The bulk of the land within the Study Area is zoned WC (Western Common) or WCRPK (Western Common Regional Park) pursuant to the recommendations of the 1999 study. The zones are nearly identical in all three plans (see **Appendix A** for the text of the relevant zones) permitting parks and recreation uses, heritage uses and cemeteries.

With the adoption of the RMPS, a portion of the land abutting the Ragged Lake Business Park was rezoned to UR (Urban Reserve), which permits only single-family homes on existing lots with on-site services. The Ragged Lake area is one of seven Urban Reserve areas in HRM. These lands are considered to have long-term potential for servicing after other lands designated Urban Settlement, which HRM expects to service within 25 years. The designation is consistent with the 1999 Concept Plan, which calls for a mix of industrial, commercial, residential, and active recreation uses in this area.

Finally, some lands in the southeastern portion of the study area are zoned RA-1 (Residential A-1) and RB-1 (Residential B-1), permitting single-family development consistent with the 1999 Concept Plan recommendation for unserviced residential development in that area.

The other important zone within the study area is the I-3 (General Industrial) Zone applied to the Ragged Lake Park under the Halifax Mainland LUB. This zone permits “any industrial/ commercial enterprise, except when the operation of same would cause a nuisance or hazard to the public” (excepting billboards, massage parlours, and amusement centres).

2.2 FUNCTIONAL PLANS

The RMPS establishes the need for functional plans as management tools to guide the development and delivery of services across the region. The RMPS identifies more than 20 required functional plans in its table of contents, and through Policy IM-26 provides a mechanism to provide for more if necessary. As the policy makes clear,

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functional plans are intended to both establish service needs and recommend funding to satisfy identified needs:

IM-26 HRM shall consider adopting Functional Plans to address region-wide facility and service needs and recommended means of funding, consistent with this plan.

Municipal staff and consultants working on behalf of HRM have already completed several functional plans, and several more are currently in the works. Not all are relevant to the current study, but several clearly are. Most notable is the Open Space Functional Plan, which is currently being formulated by HRM staff and to which this study will contribute by defining the boundary of one of the key future regional parks identified in the RMPS. Some of these projects are complete, while others, such as the Bayers Lake Functional Plan, are in the midst of preparation, including ongoing public consultation. Consultation for the Open Space Functional Plan will wait until tributary studies such as this Western Common Wilderness Common Master Plan are complete.

The Active Transportation Functional Plan, completed in 2006, has similar relevance because it directly addresses the regional trails system. The developing regional trails network will serve the Western Common Wilderness Common, and should be augmented by new trails developed within the Wilderness Common. Much the same can be said for the Urban Forest Functional Plan, which is expected to establish management guidelines for native plant material and plants of heritage importance.

The draft Bayers/Ragged Lake Functional Plan was recently released. Development of both business parks is relevant for the Wilderness Common because they form the land-use context to the east and north of the Study Area. In that regard, Bayers Lake continues to grow notably as a retail power centre and business office campus. Ragged Lake, on the other hand, has grown haltingly and now faces challenges that were not foreseen when the Western Common was originally planned, as described in the RMPS:

The former City of Halifax developed the Ragged Lake Business Park as a suburban office campus at the same time as they serviced the Bayer's Lake Business Park. When the Western Common Plan was prepared in 1998, it

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was envisioned that the Ragged Lake Business Park would develop as an integrated office and residential campus. However, there is poor access into the park which makes it difficult to market the properties, and more recently, it has been determined that the provision of municipal services to the area may be problematic. These major infrastructure issues need to be addressed, and a coordinated vision for the park determined. Until that time, this area remains a long term development area.

The recently issued draft Functional Plan makes preliminary recommendations concerning the future of the Ragged Lake Business Park, including development of an improved highway connection between Ragged Lake and Bayers Lake Park.

2.3 OTHER STUDIES

In addition to functional plans directly addressing issues relevant to the Wilderness Common, additional plans and studies are pertinent to the current assessment. Most deal with parks and trail development, and related aspects of active transportation planning—all of which are likely to complement and be complemented by the Wilderness Commons. The Community Facilities Master Plan is pertinent to the development of active sports fields and related facilities proposed as transitional uses: first, between Ragged Lake and residential areas to the south and west; second, between the Solid Waste Management Facility and proposed residential lands immediately south of Highway 103, as well as the Wilderness Common to the west.

2.3.1 HRM Community Facility Master Plan

The Community Facility Master Plan by Asbell Management Innovations expanded and updated their 2004 Indoor Recreation Facilities Master Plan to address outdoor facilities as well as other issues across HRM. The new, comprehensive Master Plan suggests that existing sports fields in HRM are unevenly used and that there is a need to improve maintenance of existing facilities to increase their long-term usability. The report also points out the substantial benefits derived from five artificial fields in HRM, which are used much more heavily than natural fields. Improvements in artificial sports surfaces over the past decade have reduced injury concerns, which were a traditional limitation.

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The document does not make specific recommendations concerning recreation facilities in the Study Area, which is within the so called Mainland North Delivery Area, where outdoor recreation needs are primarily expected to be met by the Mainland Common. The Mainland Common is now under development to meet the needs of the 2011 Canada Winter Games, which Halifax has been selected to host. The recently submitted Master Plan for the area portrays an elaborate complex featuring a community centre, field house, pool complex, and an all-weather turf field (possibly enclosed), integrated with existing ball fields,

Source:

http://centre.prospectcommunities.com/wpcontent/themes/community_centre_2008/images/left_big.jpg

Halifax West High School, and Keshen-Goodman Library, as well as proposed natural reserves.²



Figure 2.1: Prospect Road Community Centre Concept Plan

Goodwood, Brookside, Hatchet Lake and other communities along Prospect Road will have access to the Mainland Common to meet higher-level recreation needs. At the same time, the area will have its own community centre to be completed in 2009. The Prospect Road Community Centre is to be located on a 15-acre parcel between the Hatchet Lake Fire Station and Prospect Road Elementary School, within a short distance of Brookside Junior High School. According to the HRM brochure publicizing the facility, which is now under construction, it will incorporate:

- a full-sized gymnasium and multi-purpose space
- a weight training and fitness room
- meeting rooms for local clubs and organizations
- administrative space.

Future phases could include expansion of the building and the addition of:

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- playground areas
- an outdoor basketball court
- an outdoor rink
- a skatepark (see **Figure 2.1**, above).

The Prospect Road Community Centre is being built ahead of the schedule envisioned by the 1999 study, which saw the facility as an appropriate addition to the community at the time residential expansion in the area is completed. Being positioned much earlier than expected, it offers a potential community gateway to the Wilderness Common.

2.3.2 Blueprint for a Bicycle-Friendly HRM

The 2002 Bicycle Plan proposes a bicycle route on St. Margarets Bay Road from the Armdale Roundabout through Timberlea/Lakeside/Beechville as a “near-term project” that will connect through the roundabout to a network of near- and medium-term bikeways providing access to nearly all significant areas within the region’s urban core. It also proposes a route on Highway 333 (past Goodwood and Hatchet Lake on the southeastern edge of the Study Area) that will provide access to and from areas such as Brookside, Prospect, and Shad Bay.

2.3.3 Integrated Master Plan for Trails

Gordon Ratcliffe Landscape Architect prepared the Integrated Master Plan for Trails on the Western Side of Bedford Basin on behalf of the Halifax North West Trails Association. The Master Plan addresses areas to the north and east of the Western Common Study Area; however, many of the trails dealt with are part of a network to which trails in the Western Common will connect. The Master Plan also offers important recommendations concerning the acquisition of trail rights of way and effective, safe development of trail links.

2.3.4 Draft Park Management Plan—Long Lake Provincial Park

Long Lake Provincial Park is a well-used natural park area extending from Northwest Arm Drive and the Old Sambro Road on the edge of Spryfield to the Terence Bay Wilderness Reserve, which extends across the interior of the Chebucto Peninsula to the Atlantic Coast. It is immediately south of the Western Common Study Area.

² Ekistics Planning & Design, *Mainland Common Master Plan*, June 2008, p. 29.

NSDNR prepared the Draft Park Management Plan for Long Lake in response to increasing use of the park that department staff feared would compromise its natural values. The Management Plan provides for:

- public parking and pedestrian access
- an interconnected system of trails
- a small picnic/ open space area
- carry-in access to Long Lake for canoes/kayaks
- interpretive/ orientation information.

To reduce impact on natural values, bicycle use in the park is to be limited to a proposed Multi-purpose Trail. Motorized vehicles will not be permitted on park trails except for approved emergency response or park management. Management planning for the southern portion of the park has been postponed subject to co-ordination with Nova Scotia Environment, which is responsible for the Terence Bay Wilderness Area abutting the southwest corner of Long Lake.

The issues addressed by DNR on Long Lake will undoubtedly be relevant to the Wilderness Common, particularly as residential development proceeds and if development along the edges of the study area gains momentum. The Wilderness Common will also promote connectivity to Long Lake Park via the Old St. Margarets Bay Road, which traverses both areas.

2.3.5 Blue Mountain/Birch Cove Lakes Assessment Study

The *Blue Mountain/Birch Cove Lakes Assessment Study* (2006, EDM) is primarily relevant as a model for the current study. The study applied GIS-based land suitability assessment to evaluate lands immediately west of Highway 103 that encompass the Birch Cove Lakes (i.e., Quarry, Suzies, Charlies, Washmill and Fox Lakes). Crown Lands within this area were designated as a Candidate Protected Wilderness in the wake of the study.* The proposed Wilderness Common will complement the Blue Mountain-Birch Cove Lakes area, offering a similar urban wilderness experience for the southern portion of Mainland Halifax.

***Note:** Blue Mountain-Birch Cove Lakes was formally designated as a Wilderness Area in 2009

3. ANALYSIS

The study area covers all lands between Highway 103 and Highway 333, from the Otter Lake Solid Waste Management Facility and Nichols Lake east to the intersection of the highways in front of Ragged Lake Business Park. The land is largely undeveloped but is fringed by urban land uses distributed along the two roadways.

3.1 WATER USE, LAND USE AND PROPERTY OWNERSHIP

The Western Commons area covers 7,868.2 acres of which 6,961.2 (88.5 per cent) is land and the balance (901.2 acres) is lakes and waterways (see **Table 3.1**). The historical role of the area as a water supply watershed is intrinsic to its current status and value. The lack of development is attributable to its time as part of the water supply system for the City of Halifax, when development was strictly limited. The

Land	Description	Acres	% of Land Area
Forested	Natural Stand	6,033.2	76.7%
Forested	Brush	31.0	0.4%
Forested	Partial Cut	21.5	0.3%
Forested	Old Field Returning to Forest	6.1	0.1%
Lake Islands	Natural Stand	17.3	0.2%
Lake Islands	Miscellaneous	0.3	0.0%
Lake Islands	Brush	0.3	0.0%
Lake Islands	Wetlands General	0.1	0.0%
Non Forested	Sanitary Landfill	196.3	2.5%
Non Forested	Barren	186.5	2.4%
Non Forested	Wetlands General	177.3	2.3%
Non Forested	Urban	153.2	1.9%
Non Forested	Treed Bogs	62.9	0.8%
Non Forested	Road / Rail Buffers	38.9	0.5%
Non Forested	Lake Wetland (Wetland Areas Defined within Lake Boundaries)	12.1	0.2%
Non Forested	Rock Barren	8.1	0.1%
Non Forested	Open Bogs	8.0	0.1%
Non Forested	Gravel Pit	5.6	0.1%
Non Forested	Miscellaneous	2.4	0.0%
Sub-Total Land Area		6,961.2	88.5%
Non Forested	Inland Water	901.2	11.5%
TOTAL		7,862.4	100%

Table 3.1: Land Use by Area, Western Common Area

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area subsequently became the site of the regional sanitary landfill, and urban development has sprung up at its edges on the north side of Highway 103 and along Highway 333.

3.1.1 Prospect River Watershed

Significant lakes in the area include:

- Ragged Lake, immediately west of the business park
- Blueberry Lake, west of Ragged Lake
- Otter Lake, northeast of the regional Solid Waste Management Facility
- Dick Lake, Big Indian Lake, Little Indian Lake and Nichols Lake in order south of Otter Lake.

These lakes all drain to the Prospect River watershed and ultimately to Prospect Bay on the Atlantic Ocean (see **Figure 3.1**).

Beginning in the 1950s, the area's lakes provided backup water supply to the City of Halifax when Chain Lake was the primary water supply under the auspices of the Public Service Commission (PSC, now Halifax Regional Water Commission or HRWC). When the Pockwock water supply was established in the late 1970s, the lakes and associated lands were transferred to the City of Halifax, which was the sole owner of the PSC and through which the study area lands became the property of HRM on amalgamation. Development in the area was therefore restricted over a long period to protect drinking water quality. While the area no longer provides drinking water, its lakes continue to benefit from this history of stewardship, and have generally good water quality as a result of relatively limited development.

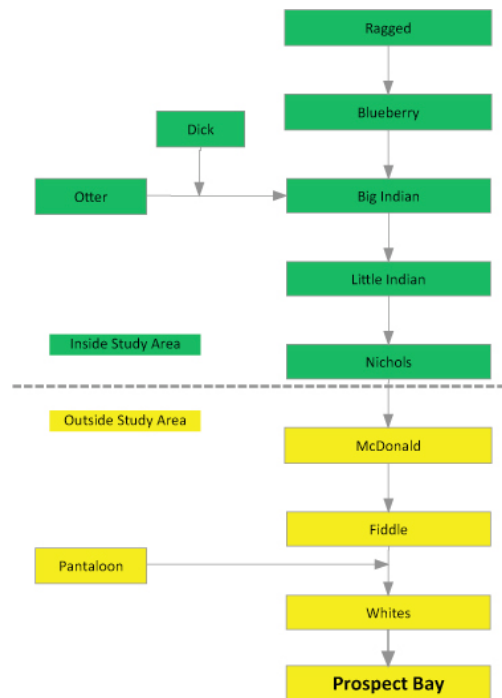


Figure 3.1: Prospect River Watershed Flow Chart

Source: www.chebucto.ns.ca/ccn/info/Science/SWCS//TPMODELS/PIC/prospectr.jpg

3.1.2 Nine Mile River Watershed

The Nine Mile River watershed is much larger than the Prospect River watershed, and comprises an extensive lake system. Nine Mile River is the largest river system on the Chebucto Peninsula, and contains one of the two waterway routes in the Western Common area. Nine Mile River flows along the western boundary of the Western Common, and provides north/south connectivity to the Wilderness Common through areas such as the Blue Mountain Birch Cove Lakes Regional Park and Governors Lake to the north, and the Atlantic Ocean to the south.³ For a schematic of the watershed, visit

<http://www.chebucto.ns.ca/ccn/info/Science/SWCS//TPMODELS/PIC/ninemrhx.jpg>.

³ Interview comments from Dr. Chris Miller, CPAWS, and Dusan Soudek, Canoe Kayak Nova Scotia.

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3.1.3 Land Use and Property Ownership

The legacy of the study area's role as a water supply is also reflected in the pattern of landownership.

The bulk of the land is accounted for by a small number of very large properties, most of which are owned by HRM. In fact, the Municipality owns the five largest holdings in the study area, accounting for more than 80 per cent of its area (see **Table 3.2**), with the biggest being the property containing the Otter Lake Waste Processing and Disposal Facility. In total, the 25 largest properties listed in **Table 3.2** encompass nearly 95 per cent of all land within the Western Common Study Area. Fourteen are owned by HRM.

No private individual appears to own more than 80 acres (just over one per cent) of the total area (see **Appendix B** for a detailed list of all properties comprising the study area).

Smaller private holdings are primarily located along the edges of the study area, either with frontage on Prospect Road or off

Owner	Acres	% of Land Area	Cumulative %
Halifax Regional Municipality	1,671.7	24.0 %	24.0%
Halifax Regional Municipality	1,596.5	22.9%	47.0%
Halifax Regional Municipality	1,163.6	16.7%	63.7%
Halifax Regional Municipality	892.7	12.8%	76.5%
Halifax Regional Municipality	478.0	6.9%	83.4%
Halifax Regional Municipality	141.0	2.0%	85.4%
Private Owner	79.5	1.1%	86.6%
Halifax Regional Municipality	45.4	0.7%	87.2%
Halifax Regional Municipality	43.6	0.6%	87.9%
Private Owner	40.9	0.6%	88.4%
Private Owner	35.8	0.5%	89.0%
Halifax Regional Municipality	35.7	0.5%	89.5%
Halifax Regional Municipality	35.0	0.5%	90.0%
Private Owner	33.9	0.5%	90.5%
Halifax Regional Municipality	31.1	0.4%	90.9%
Halifax Regional Municipality	31.1	0.4%	91.4%
Indian Lake Golf Course	26.2	0.4%	91.7%
Indian Lake Golf Course	24.9	0.4%	92.1%
Halifax Regional Municipality	23.8	0.3%	92.4%
Indian Lake Golf Course	22.1	0.3%	92.8%
Private Owner	21.2	0.3%	93.1%
Halifax Regional Municipality	21.1	0.3%	93.4%
Private Owner	20.6	0.3%	93.7%
Private Owner	20.6	0.3%	94.0%
Private Owner	18.2	0.3%	94.2%

Table 3.2: Twenty-five Largest Properties, Western Common Study Area

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minor tributary streets north of Highway 333 in the Goodwood/Brookside area (i.e., Evergreen Place, Mills Drive, Big Indian Road, and Old Coach Road). The interior of the area is primarily used for outdoor activities such as fishing (which is reportedly good), canoeing, kayaking, and hiking. The area is also intersected by trails generally corresponding to the historic Greenhead, Big Indian Lake Road and Old Coach Roads. Access points include a location near Exit 3 on Highway 103, and various

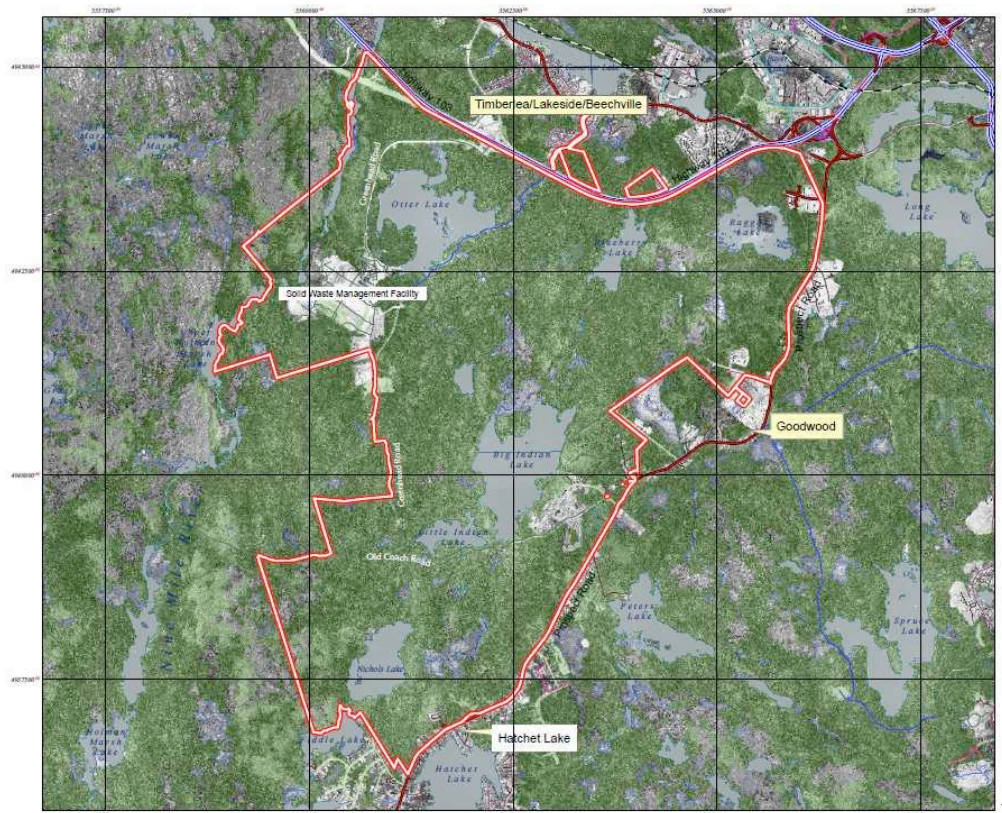


Figure 3.2: Western Common Study Area, Boundary and Key Features points on Highway 333 (see Figure 3.2).

3.2 ADJACENT LAND USE

In addition to having its own inherent values, the Western Common is surrounded by other valued natural areas, most notably Long Lake Provincial Park, the Terence Bay Wilderness Area, and the Blue Mountain/Birch Cove Lakes Area (see Figure 3.3). These areas together with the Western Common form a substantial fan to the west of urbanized and urbanizing areas of the former City of Halifax. In addition,

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roughly 21,000 acres of Crown Land to the west offer additional wilderness experiences and wildlife habitat.

3.2.1 Long Lake Provincial Park

Long Lake Provincial Park is located immediately west of Spryfield. The 5,175-acre park was designated by the Province in 1984 and is administered by the Nova Scotia Department of Natural Resources (NSDNR). Since the park was establishment, its use has grown due to developments in the surrounding area, such as Fairmount, Mount Royal, and Stone Ridge. Residents from the wider region also increasingly access the area for hiking and other outdoor experiences. This use has raised concerns with NSDNR that stimulated the preparation of the Draft Management Plan discussed in **Subsection 2.3.4**, above.

Long Lake Park abuts the proposed Wilderness Common area on its western edge, and will be a natural conduit for more ambitious hikers and others to access the Wilderness Common. With the Terence Bay Wilderness Area, discussed below, Long Lake is the first link in the potential chain of natural areas reaching from the urban core to the Atlantic coast of the Chebucto Peninsula.

3.2.2 Terence Bay Wilderness Area

Terence Bay Wilderness Area is a provincially protected area covering 11,125 acres of wilderness extending from Long Lake Provincial Park to the shore of Prospect Bay. The lands extend across roughly 20 kilometres between Routes 333 and 306 (Old Sambro Road) to the Atlantic Ocean at Pennant Bay. The area joins with Long Lake to form a 20-kilometre natural corridor between Spryfield and the coast. Its lakes, woodlands, and coastal environment offer outstanding opportunities for wilderness recreation in a near urban setting.

According to the Draft Management Plan for Long Lake Provincial Park, NSDEL has yet to begin a management planning process for the Terence Bay Area. If and when such a process begins, NSDNR staff clearly hopes that it will be coordinated with management planning for the southern portion of the provincial park.⁴

⁴ Terence Bay Wilderness Area, http://www.gov.ns.ca/nse/protectedareas/wa_terencebay.asp, last accessed on August 30, 2009

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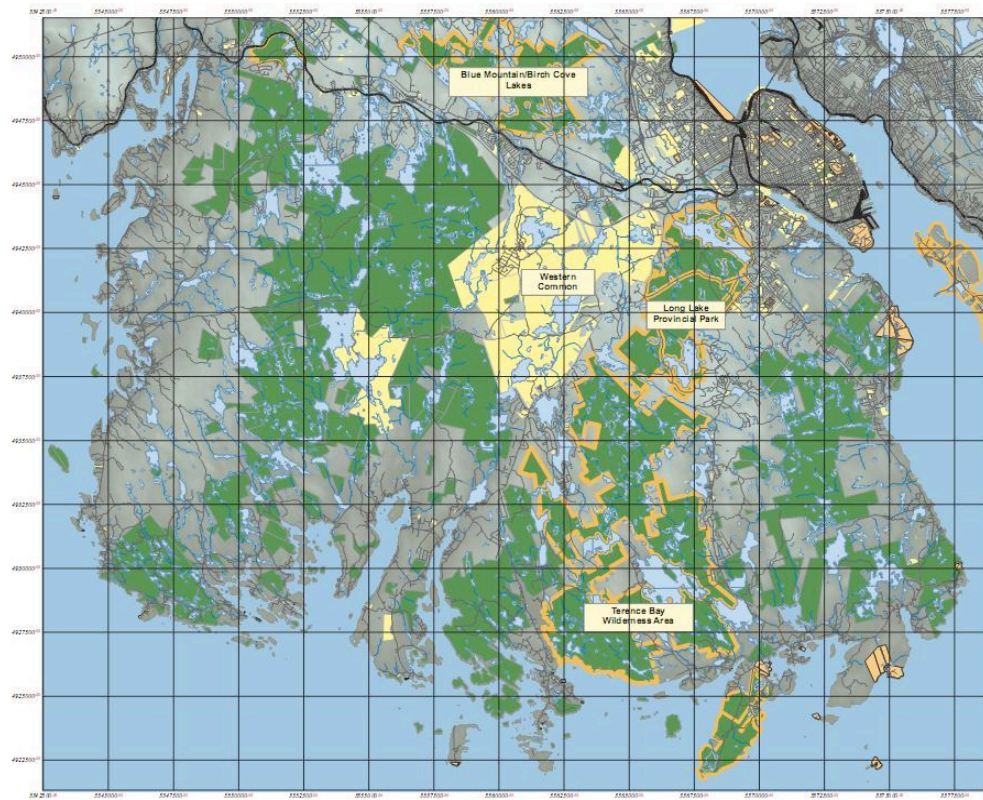


Figure 3.3: Provincial Parks and Protected Areas

3.2.3 Blue Mountain/Birch Cove Lakes Candidate Protected Area

In October 2007, the Province announced its intention to designate Crown lands in the Blue Mountain/ Birch Cove Lake Area as a wilderness protected area. The proposed designation reflects long-standing public interest in and advocacy for the preservation of this “near urban wilderness.”

The lands are considered a “Candidate Protected Area” until the designation is approved by Cabinet. As required by the *Wilderness Protection Act*, NSDEL undertook a public consultation this summer to consider the designation. The consultation closed on August 22, 2008, when NSDEL took the last comments through its Web site. We understand that private developers with substantial holdings in the area have raised some objections to the proposal.*

***Note:** Blue Mountain-Birch Cove Lakes was formally designated as a Wilderness

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Area in 2009.

The area covers 3,350 acres west of the Bicentennial Highway (Highway 102) and south of the proposed Highway 113. Like Long Lake and the Terence Bay area, the Blue Mountain/Birch Cove Lakes Area offers excellent outdoor recreation opportunities for nearby urban dwellers. Areas such as Suzie's Lake have, in fact, long been popular areas for swimming, skating, kayaking and canoeing.

3.2.4 Proposed Chebucto Wilderness Area

Representatives of the Five Bridges Wilderness Heritage Trust strongly asserted the importance of protecting the extensive Crown holding west of the proposed Wilderness Common. The group is committed to work with other community organizations "to preserve the public lands bounded by Highways 103 and 333 in their natural state through the legislative process provided by the Wilderness Areas Protection Act (WPA)."⁵

The Trust is a leader in the Chebucto Peninsula Wilderness Coalition (CWC), a group that has received the endorsement of over forty organizations in support of preserving the Crown holdings they refer to as the Chebucto Wilderness. Among key organization in the Coalition is the Woodens River Watershed Environmental Organization (WRWEO), which initiated efforts to conserve and protect the lands and waters in this area and later established The Bluff Wilderness Hiking Trail through the centre of the area. Other members of the CWC include the St. Margarets Bay Stewardship Association, the Beechville/Lakeside/Timberlea (BLT) Rails to Trails Association, the Safety-Minded ATV Association and the Resource Opportunities Centre.

The proposed Chebucto Wilderness offers an excellent opportunity to complete the protection of the interior of the Chebucto Peninsula. Some studies have been conducted by the Five Bridges Trust, which is also committed to ongoing environmental monitoring. Additional work will, however, be required to justify the reservation of the area. Enhanced understanding of these lands would also help in the detailed planning of the Wilderness Common.

3.2.5 Other Land Uses

Although the Western Common will potentially become part of an extensive arc of preserved natural lands west of Halifax, the surrounding area is interspersed with urban developments. South of the Prospect Road, just beyond the entry to Ragged Lake Business Park, for example, is Exhibition Park. Farther south on the highway are the Hatchet Lake and Brookside communities, which flank the Prospect Road between the Terence Bay Wilderness Area and the Chebucto Wilderness lands.

To the north is Timberlea/Lakeside/Beechville, which extends the length of the St. Margarets Bay Road between Exits 2 and 4 on Highway 103. The community already has roughly 9,000 residents according to the 2006 Census. Brunello Estates, a large golf course community and previously known as Westgate, is under development within Timberlea, immediately north of the Solid Waste Management Facility. When fully developed, Brunello Estates should add roughly 5,000 residents, who will have good access to the Western Common area through Exit 3, which provides access to Brunello Estates to the north and the facility to the south.

Also to the north of Highway 103 is Bayers Lake Business Park, which has developed over the past 20 years as the primary large format retail area in Halifax as well as accommodating a variety of office and light industrial uses. Bayers Lake may well reach its capacity in the near future, which could lead to interest in the expansion of Ragged Lake. Certainly, there is interest in improving the connection between the Bayers Lake and Ragged Lake Business Parks, possibly with a flyover crossing Highway 103 as suggested in the draft Functional Plan.

More generally, the Western Common, Long Lake Provincial Park, and the wilderness areas discussed are immediately west of Mainland Halifax, which is occupied by more than 50,000 people. These areas, furthermore, surround another 20,000 or so additional residents in communities ranging from substantial concentrations of suburban development such as Hammonds Plains and Beechville/Lakeside/Timberlea, and smaller rural communities like Goodwood and Terence Bay. Mainland Halifax and the communities stretching along the primary roadways of the Chebucto Peninsula are all growing to varying degrees. Their

⁵ Prospect Communities.com, “333 – 103 public lands,”
<http://www.prospectcommunities.com/news-prospect-and-area/357-333-103-public-lands>

growth impacts environmental values in these wilderness lands but it also enlarges the constituencies drawing benefits from them.

3.3 NATURAL FEATURES

EDM's 1999 *Western Common Needs Assessment Study* identified typical flora and fauna species for the habitats in the study area. Even though the report was drafted in 1999 prior to the Brown Spruce Longhorn Beetle infestation and Hurricane Juan, Section 3 of the 1999 report provides a relevant background on the natural features of the study area. An excerpt has been included in **Appendix D**.

As a largely natural area, the Western Common Study Area offers habitat for a range of species of flora and fauna. The following representative natural habitats were also identified (see **Appendix C, Figure 1**):

- Balsam Fir/ Red Maple/ Black Spruce forest
- Red Maple/ White Birch/ Balsam Fir/ Black Spruce forest
- Red Maple/ White Birch/ Balsam Fir/ Black Spruce forest
- Spruce/ Balsam Fir/ Red Maple forest
- Red Maple/ White Birch/ Trembling Aspen forest
- Black Spruce/ Tamarack forest
- Barrens
- Wetlands

As noted above, these natural areas also include abandoned agricultural lands in which old orchards and representative agricultural species continue to be evident. As also noted, urban uses ranging from residential communities with minor commercial and industrial elements to the Ragged Lake Business Park to the Regional Solid Waste Management Facility are arrayed along the edges of the area.

3.3.1 Surficial Geology

Having been extensively reworked during the Wisconsin Glaciation, the entire Chebucto Peninsula was heavily eroded. This is evident in the predominance of scoured bedrock, especially to the southwest of the Western Common, outwards to the coast.

The Western Common area itself is split into two distinct surficial geological units (see **Appendix C, Figure 2**). The area south of Big Indian Lake is composed of a rapidly draining stoney till, with little surface cover and many boulders. To the north of Big Indian Lake, the terrain changes to finer glacial deposits, predominantly in the form of silty till plains, which are thick enough to mask underlying bedrock undulations. This northern land was farmed through the nineteenth century and into the twentieth century. Over a century of agricultural use extracted available nutrients from the soil. The relatively acidic soil remaining after this agricultural period now supports largely coniferous forest stands.

Several drumlinoid features are oriented in a northwest-southeast direction across the study area, indicating the direction of ice flow during glacial melting (see **Appendix C, Figure 3**). The area immediately around Big Indian Lake is the lowest lying in the area, and is dominated by several wetlands of organic deposits with a hummocky surface.

3.3.2 Soils

As with most of the Chebucto Peninsula, the area to the east of the Nine Mile River is predominated by Gibraltar soils, which account for over 80 per cent of the area encompassed by the Western Common (see **Appendix C, Figure 4**). To the west of the Nine Mile River, large areas of Rockland, the other dominant soil variety on the peninsula, are more common.

Roughly 300 hectares of land to the south and west of Otter Lake, bordering on the Nine Mile River, is Hantsport deposits. This well drained soil is well suited to the Solid Waste Management Facility located near Otter Lake. Smaller pockets of Hantsport soils are also found to the southeast between Nichols and Hatchet Lakes. Rockland is the third most dominant cover type, located in two distinct patches: one between Blueberry and Ragged Lake, and the other to the west of Nichols Lake.

3.3.3 Significant Wildlife Habitat

NSDNR has identified two Significant Species and Habitats for the study area⁶: Mainland Moose and Brook Trout.

⁶ NSDNR, "NS Endangered Species Act: Legally Listed Species as of 2007," www.gov.ns.ca/natr/wildlife/BIODIV/specieslist.htm

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Mainland moose (*Alces alces americana*) are listed as Endangered under the *Nova Scotia Endangered Species Act* (NSESA) and considered a Red (At Risk) species under the Status of Wild Species Rankings maintained by NSDNR. The mainland subspecies of moose are remnants of the original subspecies of moose native to Nova Scotia. They are currently limited to isolated sub-populations on the mainland with limited numbers of individuals. The population has declined greatly over 200 years with at least a 20 per cent decrease over the past 30 years. The decline is attributed to a variety of factors including land development and human activity, hunting, and interaction with the expanding provincial deer herd, which harbours a parasite (brain worm) that can cause more serious illness in moose.

A remnant pocket of this population, estimated at 24 to 50 animals, is found within the Chebucto Peninsula. The majority of this population is reported to be distributed between Highway 333 and St. Margarets Bay focusing in the Northwest of the Chebucto Peninsula generally bounded by the headwaters of the Woodens River, Five Island Lake and Big Five Bridge Lake. Habitat is identified in the DNR database for the entire Western Commons area, except in the immediate vicinity of development around Highway 333.

Brook trout (*Salvelinus fontinalis*) are considered a Yellow (Species of Conservation Concern) species under the Status of Wild Species Rankings maintained by NSDNR. Brook trout habitat is identified within the Western Commons area for the Nine Mile River system, but the species likely occurs in other watercourses in the area.

3.3.4 Wetlands

Wetlands are an important habitat scattered throughout the Western Commons area.

Table 3.3 summarizes the DNR-designated wetlands by the following seven generalized wetland types identified in the 1999 Western Commons report:

Anthropogenic Wetland—man-made flooded area

Basin Bog—dominated by shrubs (kalmia) and underlain by sphagnum and reindeer moss

Dry Treed Bog—dominated by black spruce trees and shrubs (leatherleaf, rhodora, kalmia) and underlain by sphagnum hummocks

Graminoid Dominated Stream Bog—dominated by shrubs (leatherleaf, rhodora, sweetgale) and underlain by sphagnum with sedges and cottongrass

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Low Shrub Dominated Stream Bog—dominated by shrubs (leatherleaf, rhodora, kalmia, sweetgale) and underlain by sphagnum

Stream Fen—dominated by sphagnum and sedges with sparse shrubs (black spruce, andromeda, sweetgale)

Wet Treed Bog—dominated by black spruce trees and shrubs (leatherleaf, rhodora, kalmia) and underlain by sphagnum near the water table.

In addition to the 40 wetlands listed, it should be noted that DNR's wetland database primarily identifies larger wetlands that are generally observable from air photos. Other smaller wetlands likely occur in low-lying locations throughout the area.	Wetland Category	Polygon Count	Acres
	Anthropogenic Wetland	2	2.3
	Basin Bog	12	42.5
	Dry Treed Bog	17	42.2
	Graminoid Dominated Stream Bog	13	39.4
	Low Shrub Dominated Stream Bog	20	62.0
	Stream Fen	1	3.5
	Wet Treed Bog	12	34.1
	TOTAL	77	226.1

Table 3.3: Wetland Types by Area, Western Common Area

3.3.5 Rare Flora

Potential for rare flora was investigated in 1999, focusing on barrens, wetlands, and rock outcrop habitats. Potential habitat was identified but no rare species observed. Since at-risk species status has changed since 1999, the screening methodology used in the 1999 study was revisited based on the current protocols. A screening of potential habitat for species identified by the Atlantic Canada Data Centre (ACDC) for a wide (approximately 100-km radius) study area was reviewed and a short list of potential species and their target habitat identified. The key potential species in this short list are:

Boreal Felt Lichen (Erioderma pedicellatum)—a coastal forest lichen species listed as Endangered under the Federal *Species At Risk Act (SARA)* and NSESA Endangered)

Greenland Sandwort (Minuartia groenlandica)—a small barrens plant typically in granitic ledges and gravel listed as Yellow by DNR

Southern Twayblade (Listera australis)—a small wetlands plant known for red maple swales listed as Red by DNR.

A reconnaissance field visit was undertaken on September 1 and 2, 2008, to collect information on habitats and the potential for rare plants and lichens, and to make some general observations of the area.

Although no rare vascular plants were observed at the time of the survey, two rare cyanolichens, *Leptogium laceroides* and *Pannaria conoplea*, were. While these species are listed as Yellow by NSDNR, recent surveys identified several new locations, and it appears that the species are much more widespread than originally thought. The prevalence of cyanolichens is of particular interest in the area, because they are sensitive to acid rain and air pollution and are consequently used to monitor for these conditions.

In addition, the Atlantic coast of Nova Scotia is the home of the endangered Boreal Felt Lichen, (*Erioderma pedicellatum*). This species was not observed during field surveys, but potential for habitat needs to be confirmed with NSDEL, which has potential habitat mapping for this species. The field surveys were not intended as a comprehensive botanical survey; further surveys will be required to complete a total list of vascular plant and lichen species as a part of detailed park planning.

3.3.6 Forest Cover

As noted at the beginning of this section, key vegetative habitats were previously identified and summarized based on forest type for the 1999 Western Commons study. NSDNR's digital forest cover data (developed primarily from air photo interpretation) was reviewed, and study area forests were visited by a consultant with AGFOR Inc. in September 2008. The field visit focused on stands identified as having older spruce potential but also included a general assessment of stand condition and composition. Key findings from this investigation are outlined below.

3.3.7 Current Forest Stand Composition and Origin

The forest present within the Western Commons Study Area reflects the underlying soil condition and productivity, a coastal climate and ecosystem, natural succession as well as historical disturbances both natural and manmade.

Roughly 80 per cent of forest stands in the study area are characterized by NSDNR as unspecified spruce with Balsam Fir. Based on the field visit it is likely these stands may actually contain more Balsam Fir in the overmature stage than spruce. The overmature stage is that in which trees experience decreased growth and overall standing volume, and decreased soundness as a result of old age and increasing mortality. This species composition is consistent with the consultant's observations on other sites in the area. Most of the remainder of the forest stands (about 19 per cent) are shade-intolerant hardwoods (tree species that need access to sunlight to flourish) made up primarily of Red Maple.

Forest species change over time (succession), depending on the type of environment. The Balsam Fir and intolerant hardwood species within the Western Commons forest stands are considered pioneer species that will invade larger openings in the forest cover. On the other hand, Old Forest candidates, with forest species and conditions that result in a climax development stage, will continually perpetuate themselves through gap replacement. Gap replacement involves smaller openings in the forest canopy with limited sunlight; Red Spruce regenerates well in these conditions. With time and successive gap openings, the forest develops an uneven-aged structure with a broad age representation, from seedlings to overmature trees.

In the Western Commons area, initial conditions of too much opening of the forest canopy and too much sunlight resulted in pioneer species and shade-intolerant hardwoods becoming the dominant forest species. Consequently, most of the current stands are even-aged, mature to overmature and dominated by Balsam Fir.

3.3.8 Key Historical Forest Disturbances

Throughout the area the most likely recent disturbance events influencing stand origin are historical agricultural land use and blow-down. There was little current evidence of forest harvesting such as stumps or access roads or of extensive fire disturbance. However, historical mapping (Fernow's 1912 Forest Distribution

Mapping) shows considerable areas of barrens and fire on the Chebucto peninsula, which are expected to have affected older stand origins.

White Spruce is often a successor to agricultural land use and was observed on the eastern side of Big Indian Lake. There, the mature and overmature White Spruce stands, like the Balsam Fir, are breaking up. Archaeological assessment for the current study suggests that apple trees, at least, are present in selected areas. Historic cultural influences on the study area are discussed further in Section 3.5, Cultural and Archaeological Resources.

Other sources of historic forest disturbance include damage from windstorms, such as Hurricane Juan. Hurricane Juan's September 2003 track was immediately west of the wilderness area, and some stands suffered blow-down while others had their deterioration accelerated. Damage and injury caused by wind may be exacerbated by insect damage to older or susceptible trees.

The recent invasion of HRM by the non-native, brown spruce longhorn beetle is an example of potential insect threats to forests. This beetle targets and kills otherwise healthy spruce trees and is known to occur within the Western Commons area. The study area is within the Brown Spruce Longhorn Beetle Containment Area covering central HRM (see **Figure 3.4**). Overall the combined effects of overmaturity and wind damage contribute to the image of a changing forest.

3.3.9 Direction of Future Forest Stand Composition

Many stands of Red or Black Spruce and Balsam Fir are generally 10 to 20 years past maturity and are breaking up; a new forest is in the making and augmenting stand species diversity. The general composition of the stands is expected to change over the next 50 years. As a result of widespread forest opening caused by the breakup of overmature stands, Balsam Fir will likely continue its dominance, but some stands show potential for additional diversity. This is found in the composition of the understory, which can have a significant spruce regeneration (younger trees expected to replace the older forest cover) and provides an important benefit in the context of a wilderness designation.

An example of a stand that has made the transition is apparent on approaching the Solid Waste Management Facility south of Otter Lake. There, the overstory (larger

trees) is almost gone and Red Spruce regeneration, which is an Old Forest candidate, is now well represented. Another example is found at the end of the road to McDonald Lake. There the overstory is still intact and the understory has a vigorous Red Spruce regeneration that should therefore be encouraged.

3.3.10 Old Forest

Overall, AGFOR's reconnaissance identified no old forest stands, although a local contact indicated that stands of large spruce (approximately 20 metres tall) on the western side of Big Indian Lake were blown down by Hurricane Juan. Areas where Red Spruce or White Pine are dominant or co-dominant species offer the greatest potential for old forest regeneration. The quality of Red Spruce regeneration, when it is present in the understory, will be a function of the current forest cover and its stage of development. Tall spruce and fir stands whose stand structure is reasonably intact are potential candidates.

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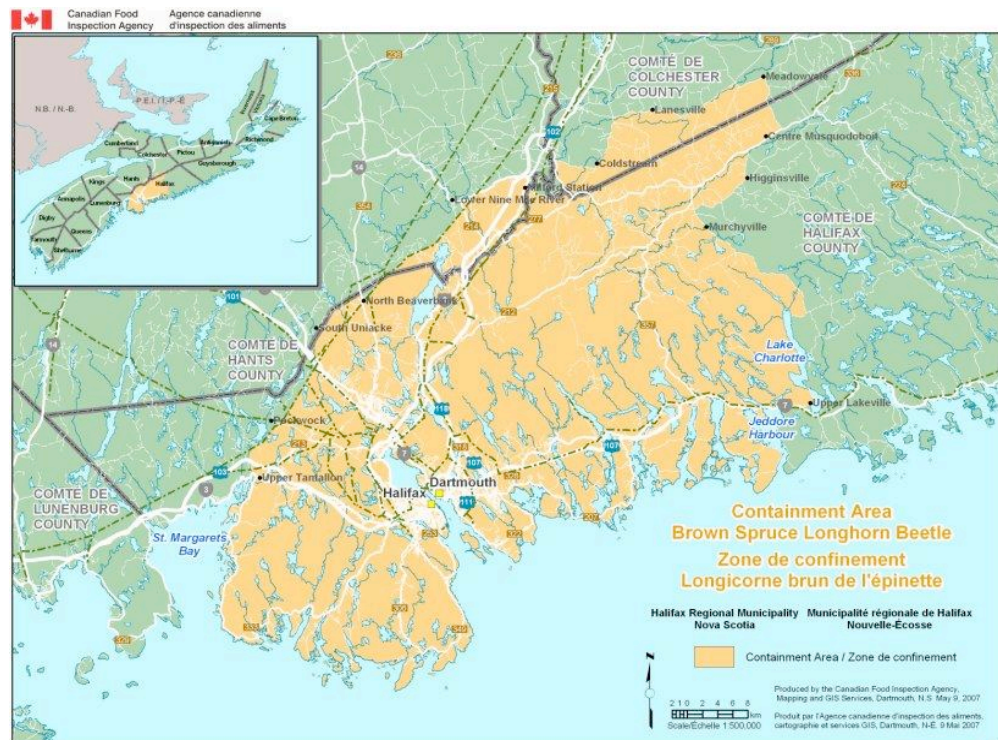


Figure 3.4: Nova Scotia Brown Spruce Longhorn Beetle Containment Area, 2007

3.3.11 Forest Diversity

Forest cover data for the study area indicate less diversity than in surrounding areas. As noted above, due to stand origin Balsam Fir stands at a fairly uniform and older age predominate.

In terms of overall forest diversity within the study area, some stands in buffers of poorly defined streambeds also add variety. White Pine, generally absent from the landscape, was observed in some of these areas during site visits by AGFOR staff. These low-lying areas may have other species of interest. In addition, the breakup of the mature and overmature stands has left significant coarse woody debris and dead standing habitat trees (snags), which add to overall habitat diversity.

3.3.12 Recommendations for Forest Planning

Identifying regenerating areas with old growth potential should be part of any activity screening; once identified, these stands should be protected for their regeneration and old forest potential. It would also be useful when preparing formal forest management plans to examine forest inventory data from 50 or 100 years ago to get a sense of the site's potential for species diversity. Information reviewed to this point combined with fieldwork is sufficient to identify the immediate origins of the stands and historical background such as agriculture.

3.4 OTHER ECOSYSTEM FUNCTIONS

In addition to the natural environment features noted above, the Western Commons Study Area provides other valued ecosystem functions. Key features are noted below:

- **Relationship with the surrounding landscape**—The area is part of a more contiguous wilderness area including the Birch Cove Lakes Wilderness Area to the north and Long Lake Park to the east. This provides habitat for some of the wider ranging wildlife species such as the endangered mainland moose and a larger refuge area for animals present in the habitat types.
- **Maintenance of species diversity and genetic diversity**—The area plays a role in maintaining natural species abundance and distribution and in providing habitat for native species.
- **Lake and stream systems**—Other key ecosystem functions are provided by the waterways that traverse the area. The quality of the surface water is important to aquatic life in the area. The intact streamside (riparian) habitat provides travel corridors for wildlife and is important as a buffer in maintaining water quality.
- **Soil development**—Soils within the Western Commons study contribute to the habitat present and are notable as much of the surrounding areas are dominated by rockland with little soil development.

- **Forest role in greenhouse gas uptake**—The presence of forested habitats contributes to carbon uptake and storage.

The various ecosystem functions provided by the study area should be assessed in relation to site values and considered in further planning for the property.

3.5 CULTURAL AND ARCHAEOLOGICAL RESOURCES

Although the Western Common Study Area appears to be in a “natural” state, it has a long history of human use, by aboriginal peoples in the pre-contact period and by Europeans from the late eighteenth century well into the twentieth century. The river systems of the Wilderness Common—approximately four kilometres of the Nine Mile River and the upper half of Prospect River system—likely served as transportation corridors for the Mi'kmaq and their ancestors for thousands of years prior to the arrival of European settlers. Pre-contact peoples would have been able to move rapidly to and from the Wilderness Common area by paddling these waters in the warm months, walking their iced surfaces in the cold months, and using relatively short portage trails to avoid problem areas.

From seasonal campsites (probably located on the shores of Wilderness Common lakes) inhabitants could have followed waterways with relative ease southward to Shad Bay and Prospect Bay or northward to the inner reaches of Halifax Harbour. Although no pre-contact cultural resources have been registered within the Wilderness Common, it is likely that pre-contact sites are dispersed along the river systems within the Common area (see **Appendix C, Figure 5**). The absence of registered pre-contact sites reflects the fact that the Wilderness Common has never been addressed by comprehensive archaeological assessment.

Formal European settlement came when land grants were first given in the area in 1775. In 1787, the Drysdale, Parker, and Nichols families came to Brookside to occupy a 1,550-acre grant. Their descendants and the Umlah family, which arrived in the 1860s, had a significant impact on Hatchet Lake, Brookside, Goodwood, and the

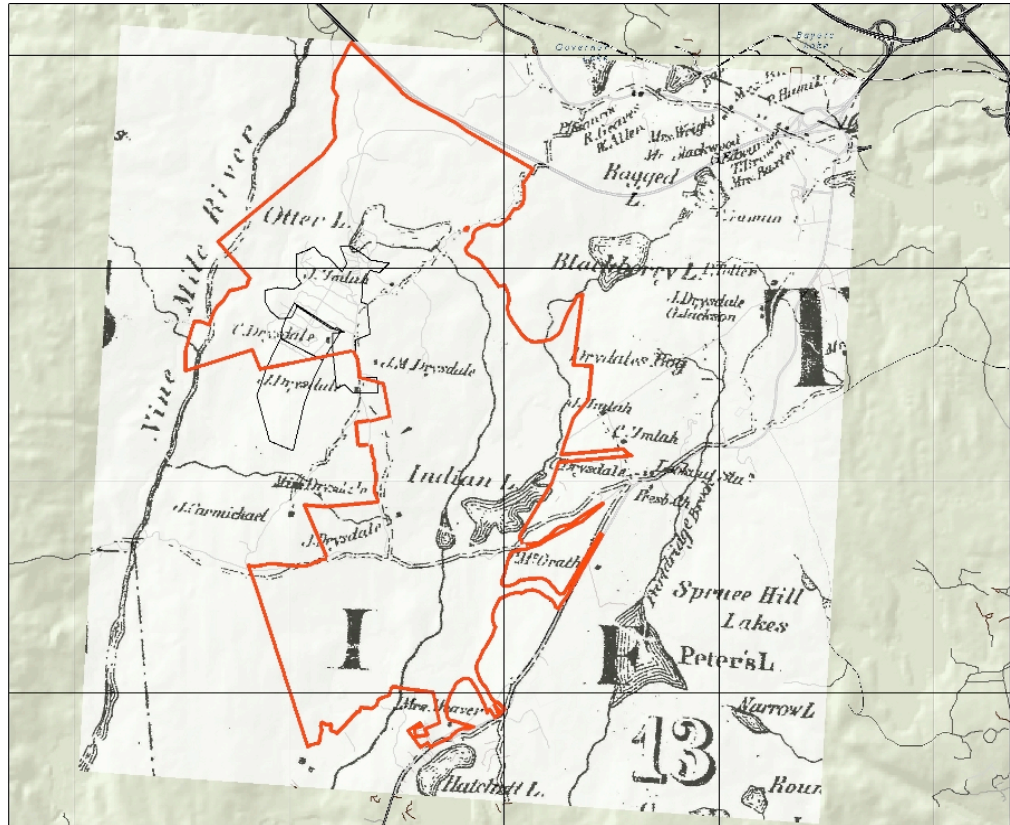


Figure 3.5: Landownership, Western Common Area, 1865

The Wilderness Common is criss-crossed by and partially bounded by historical roads built during this period. Some, such as Prospect Road, are traffic-bearing roadways. Others, such as the Greenhead Road, Big Indian Lake Road, and the Old Coach Road, are used as trails. Many more are abandoned and partially or completely overgrown with trees. Like local rivers during earlier times, these roads served as a focus for historical travel and settlement. The main area of settlement within the Wilderness Common was along Greenhead Road, where parcels of land

⁷ See: Resource Opportunities Centre, “Digital Histories,” <http://history.prospectcommunities.com/about/index.html>. Note links for Goodwood, Brookside, and Hatchet Lake.

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granted as early as 1811 became a cluster of farmsteads known as Greenhead Settlement (see **Figure 3.6**). Located approximately 12 kilometres west of downtown Halifax and three kilometres southwest of Lakeside, Greenhead Settlement had its own school and sawmill by the early twentieth century.⁸ Due to economic hardship, however, most of its homes were abandoned before the community was cut off by the construction of Highway 103 between Halifax and Mahone Bay in 1972. In 1942, the lands of the Western Common were expropriated by the then Public Service Commission for the purpose of establishing a water supply for the City of Halifax⁹. The lands served as water supply until decommissioning in 1985. The Ragged Lake Business Park lands were expropriated in 1984. Other pieces of land comprising the Western Common were added at various points, including a large parcel of land North and West of Big Indian Lake that was transferred to the Public Service Commission in 1961 for \$1.00. These lands have been transferred to HRM ownership with the exception of two parcels that have not had clear title established.

Surviving traces of Greenhead Settlement within the Wilderness Common include two farm sites that are now registered archaeological sites and several others that have not yet been reported. They also include the Greenhead Settlement (Drysdale) Cemetery, the Umlah Cemetery and, potentially, the Carmichael Cemetery. Completed archaeological studies shown on **Appendix C, Figure 5** are restricted to areas in the vicinity of Otter Lake, and were undertaken in association with establishment and operation of the Waste Processing and Disposal Facility. The studies were as follows:

A 1991 archaeological screening for the siting of the Solid Waste Management Facility, conducted by Porter Dillon Limited in accordance with the terms of Heritage Research Permit A1991NS21;¹⁰

⁸ E. R. Faribault, *Province of Nova Scotia, Halifax County (City of Halifax Sheet, No. 68)* Geological Survey Branch, Canada Department of Mines, 1908. [PANS GSC Map 68, V / 10 No. 68]

⁹ Property search results and deeds from NS Property Online.

¹⁰ Porter Dillon Limited, *Metro Landfill Preliminary Report*, Report for Heritage Research Permit A1991NS21, 1992 (on file with the SPP-HD).

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A 1995 archaeological impact assessment for the proposed development of the Solid Waste Management Facility, conducted by Jacques Whitford Environmental Limited (JWEL) in accordance with the terms of Heritage Research Permit A1995NS27;¹¹

A 1997 archaeological assessment of the Boulder Site and Iron Wheel Site for the proposed expansion of the Solid Waste Management Facility, conducted by JWEL in accordance with the terms of Heritage Research Permit A1997NS28 (JWEL 1997);¹²

A 2001 archaeological reconnaissance of historical cemeteries in the vicinity of the Solid Waste Management Facility, conducted by CRM Group in accordance with the terms of Heritage Research Permit A2001NS30.¹³

No archaeological assessment has been conducted in either the northeastern or southern thirds of the Western Common (northeast or south of Big Indian Lake).

¹¹ Jacques Whitford Environmental Limited, *Archaeological Assessment of the Goodwood Landfill Site*, Report for Heritage Research Permit A1995NS27, 1996 (on file with the SPP-HD). Annex G in Porter Dillon Limited's *Halifax Regional Municipality Residuals Disposal Facility Final Design Report (Revised): Site A*, Manuscript, 1997.

¹² Jacques Whitford Environmental Limited, *Report to Porter Dillon Limited on Archaeological Assessment of the Boulder Site and Iron Wheel Site, Otter Lake Landfill*, 1997, Report for Heritage Research Permit A1997NS28 (on file with the SPP-HD).

¹³ Sanders, Mike and W. Bruce Stewart, *Archaeological Reconnaissance of Historic Cemeteries in Proximity to the Otter Lake Waste Management Facility, Halifax Regional Municipality*, Report for Heritage Research Permit A2001NS30, on file with the SPP-HD, 2001.

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Figure 3.6: Land Grant Index Map

Source: <http://www.gov.ns.ca/natr/land/indexmaps/056.pdf>

3.5.1 Registered Archaeological Sites

The proposed Common area includes two registered archaeological sites, both of which were identified during archaeological projects undertaken between 1991 and 2001 in conjunction with the establishment and operation of the regional Solid Waste Management Facility. Both sites are farmsteads associated with the Greenhead Settlement near Otter Lake.

Both registered archaeological sites are farmsteads of this type. They are as follows:

J. Drysdale Farm Site (BdCw-6)—three drystone foundations and a linear earthen mound (PDL 1992) labelled ‘J.M. Drysdale’ on an 1865 map¹⁴ and ‘J. Drysdale’ on a 1908 map.¹⁵

Old Brunswick Site (BdCw-8)— site covers an area of approximately 1.5 hectares featuring fields overgrown with trees, linear stone piles, the remains of a small wooden shed, and a twentieth century midden (PDL 1992). An infilled cellar is suspected because the dwelling of ‘C. Drysdale’ is depicted at the site on an 1865 map.¹⁶

3.5.2 Known Cemeteries

Archaeological assessments conducted by Dillon in 1992 and Jacques Whitford in 1996 and 1997) in preparation for the construction of the Solid Waste Management Facility noted the existence of three cemeteries near Greenhead Road, two of which appear to be within the proposed limits of the Wilderness Common. The cemeteries are family burial plots established within the former Greenhead Settlement and are identified in the archaeological report prepared for the current study as Carmichael Cemetery, Greenhead Settlement (Drysdale) Cemetery and Umlah Cemetery. Carmichael Cemetery is outside the edge of the study area but its extent is not fully delineated.

3.5.1 3.5.3 Unregistered Archaeological Sites

Past archaeological assessments addressed less than a third of the Western Common, being limited to the area of the Solid Waste Management Facility and its immediate environs. Undocumented archaeological resources likely exist in many other areas within the Western Common. In fact, archaeological examination identified three examples during cursory inspections for the current study:

John Carmichael Farm Site—reforested clearings, a house cellar with drystone walls, a possible barn foundation, a stone-lined well, linear

¹⁴ A.F. Church, *Topographical Township Map of Halifax County, Nova Scotia*, A.F. Church & Company: Bedford, 1865.

¹⁵ Faribault, *op cit.*

¹⁶ Church, *op cit.*

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stone piles, and the remains of an apple orchard.

Greenhead Road East 1—a house cellar and clearings now reforested with mature trees.

Greenhead Road East 2—a surviving clearing approximately 100 metres long (north/ south) and 80 metres wide (east/ west), a house cellar, and a probable barn foundation.

4. ISSUES AND OPPORTUNITIES

Considerable change has taken place since EDM prepared the Western Commons Master Plan in 1999. The regional Solid Waste Management Facility only began operations at Otter Lake in 1999, as the EDM report was reviewed and presented to the public. The RMPS consultation began three years later, and the resulting plan was not adopted until three years ago.

Development prospects in the area have also shifted. As Bayers Lake has continued to expand, the possibility has arisen of integrating the largely dormant Ragged Lake Business Park. In addition, residential development is beginning in earnest at Brunello Estates, which, like Ragged Lake, suggested considerable potential but showed modest activity since approval of a Stage I development agreement in 2003. Ongoing operation of the Otter Lake facility, a new community centre about to be built on Prospect Road, the construction of a wind turbine, shifting requirements for recreation facilities, and planning for wilderness reserves and park facilities discussed above are additional factors that have arisen in the past ten years and need to be considered in relation to the 1999 recommendations.

4.1 PREVIOUS CONCERNS

The 1999 EDM study sought to reconcile land use development in the study area. At the time, as today, the key established land uses were the Otter Lake Solid Waste Management Facility, Ragged Lake Business Park, and the Goodwood community stretched along Prospect Road south from the Exhibition Park site. The primary concerns at the time were providing a buffer around the new Solid Waste Management Facility and the Business Park, and improving services in the Goodwood area.

Up to 1998, the study area was generally difficult to access as it was wedged between two highways, including Highway 103, a limited-access arterial with no exit in the vicinity. The construction of Exit 3 to serve the new Solid Waste Management Facility significantly improved access, although much of the area remains accessible only on foot through the bush or via traditional roadways such as Greenhead Road.

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EDM's recommendations in the 1999 study were taken forward to Regional Council in 2000. Council approved consideration of plan amendments for the area that were subsequently approved and became part of the plans discussed in **Chapter 2** above. Minutes from Public Information Meetings held on April 3, April 26, and May 3, 2000, as part of the prescribed process, provide considerable insight into the issues that concerned citizens at the time. Among the most important were:

- The impact of proposed regulations on lands' potential development
- Improved access to Ragged Lake Business Park
- Traffic congestion on Prospect Road/Highway 333
- Potential conflicts from designating the Wilderness Common with traditional activities, notably hunting
- The need to buffer lakes
- The appropriate use of trails, particularly with respect to providing access to the area for motorized vehicles
- Protection of eight cemeteries scattered throughout the area
- The location of roads proposed in the 1999 Concept Plan
- The addition of nine holes to the Indian Lake Golf Course
- Suggested creation of a canoe route from Otter Lake to Nichols Lake.¹⁷

4.2 CURRENT ISSUES

Current issues have been identified by the consultants through review of documents completed since 1999, GIS and field assessment, and consultation with client representatives and members of the WCWAC, as well as collaboration with a wider group of stakeholders through the Stakeholder Workshop held on October 27, 2008 and the three public Open Houses held on November 27 and December 3, 2008.

Key issues for current consideration in relation to the 1999 Concept Plan include:

- Ongoing operation of the Otter Lake Solid Waste Management Facility
- Possible improvement of connections to Ragged Lake Business Park and related expansion of the park

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- The requirement for active recreation facilities within the Western Common
- The development of trails and water routes
- ATV/OHV use
- The market for residential development proposed for lands within the Western Common
- Enhancement of buffers around watercourses
- Provision of wildlife passage in relation to adjacent designated areas and candidate designated areas
- Issues pertaining to the preservation of historical cemeteries and the potential for creation of a new cemetery.

These issues are discussed below in consideration of input at the Workshop and Open House sessions. The Open House sessions included a questionnaire / mapping survey through which interested attendees were asked to identify features of the Wilderness Common area they valued, and to indicate their degree of support for land uses and activities that might be incorporated in a future wilderness park.

¹⁷ Halifax Regional Municipality, "Project 00112 – Western Common," May 31, 2000 (Staff Report to Regional Council, June 13, 2000). Attachments V, VI, and VII.

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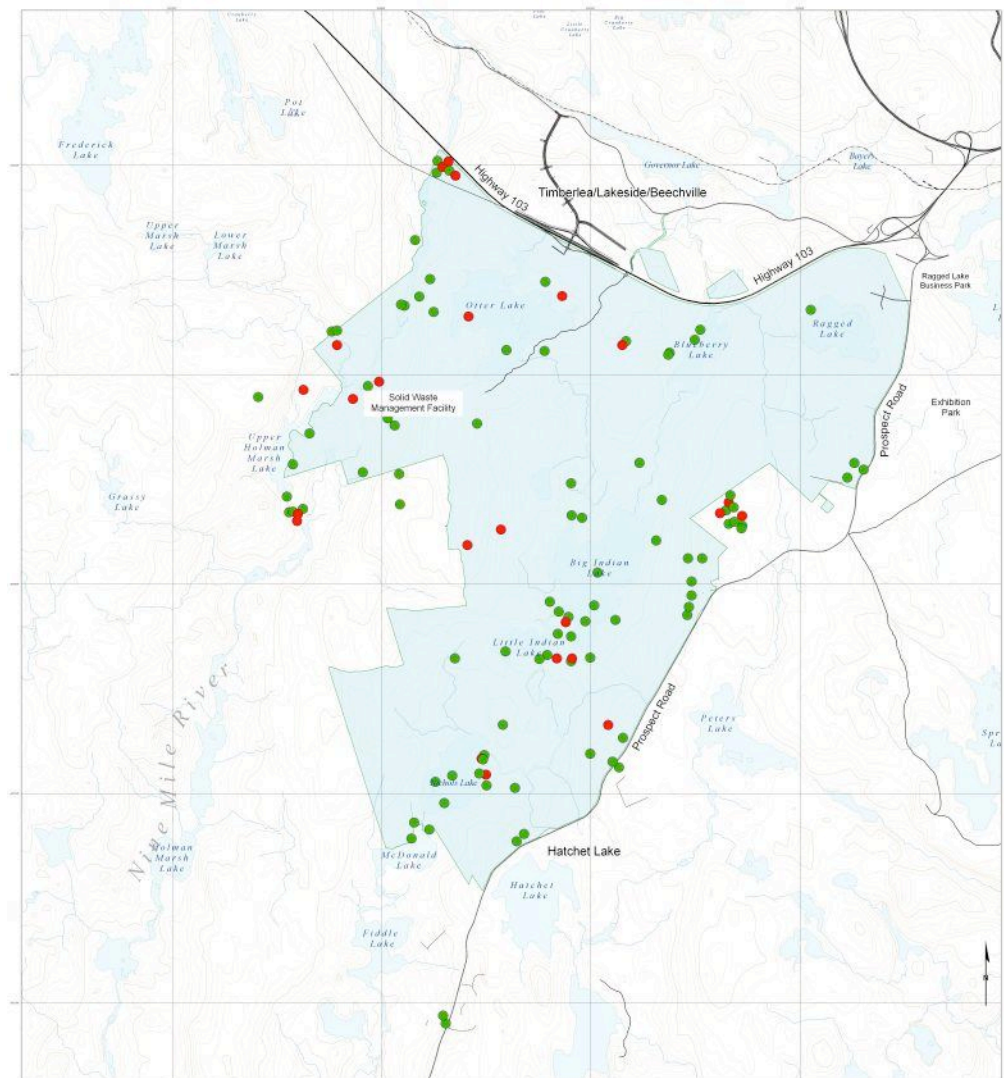


Figure 4.1: Valued Features, Western Common Lands, 2008

Figure 4.1 portrays the results of the mapping exercise. Respondents were asked to place up to five green dots in locations that they currently value and/or use within or adjacent to the Wilderness Common area. They were also given a single red dot to place in a location they considered to have the greatest future value (i.e., “the feature [the respondent would] consider the most significant loss from the area if it were missing in 80 years”). Review of the map suggests that respondents most strongly valued the watercourses located through and adjacent to the Wilderness Common area. Notable clusters include:

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Drysdale Bog—Respondents were concerned about the potential of proposed industrial development to compromise this valued wetland between Ragged Lake and Big Indian Lake.

Big Indian Lake and Little Indian Lake—Both lakes are valued as recreation areas, particularly the lands between the two lakes and along the Big Indian Lake Road, which are favoured for their walking trails.

Nichols Lake—Nichols Lake is also valued as a recreation area, particularly along its eastern shore where it can be accessed via trails originating at the end of McDonald Lake Drive.

Nine Mile River—Nine Mile River is particularly valued by paddlers and walkers. Others noted that it facilitates wildlife connectivity.

Some smaller numbers also indicated areas they were concerned for, such as the Solid Waste Management Facility and locations near Blueberry Lake and Prospect Road where development was proposed in EDM's 1999 plan.

Potential Land Use	Average Rating
Community parklands	1.37
An expanded Ragged Lake Business Park	3.90
Serviced residential development between Otter Lake and Blueberry Lake	3.68
Sportsfields/active recreation areas	2.48
Equestrian centre	3.04
New golf courses	3.59
Development of unserviced residential land on Prospect Road	3.55
New/expanded cemeteries	3.26
Other	3.47
1 – Completely Support	
3 – Neither Support nor Oppose	
5 – Completely Oppose	

Table 4.1: Support for the Location of Specific Features Adjacent to the Wilderness Common

Potential Park Feature/Activity	Average Rating
Picnic areas with benches, tables, waste receptacles	2.50
Public washrooms	2.55
Public swimming areas	2.22
Skating	2.17
Walking/hiking trails	1.50
Trails permitting bicycles	2.35
Trails permitting horses	2.54
Trails permitting snowmobiles	4.04
Trails permitting ATVs	4.04
Kayaking/Canoeing	1.53
Motorized boating	3.95
Camping	2.64
Fishing	2.10
Hunting	3.46
Other	4.00
1 – Completely Support	
3 – Neither Support nor Oppose	
5 – Completely Oppose	

Table 4.2: Support for Specific Features Within the Wilderness Common

Ratings for future uses and activities strongly favoured the wilderness park concept, emphasizing non-motorized recreation and modest development (see **Table 4.1**). Walking/hiking was the highest-rated activity, followed very closely by canoeing/kayaking and then bicycling (see **Table 4.2**). Middling ratings for picnic areas and washrooms suggest they would be welcomed by some but are not essential. The lowest ratings were given to motorized boat, snowmobile and ATV use.

4.2.1 Otter Lake Solid Waste Management Facility

The creation of the Otter Lake Solid Waste Management Facility was a key reason for the conduct of the 1999 Western Common land use study and the resulting proposal for the Wilderness Common. The 1999 study assumed maintenance of a two-kilometre buffer between the Solid Waste Management Facility and residential areas recommended in the 1999 Concept Plan within which the Wilderness Common was positioned.

Participants in the October 27 Workshop and the subsequent Open House sessions expressed concern over Solid Waste Management Facility expansion and its potential to inhibit wildlife connectivity through the area. As noted in **Table 2.1**, above, Dillon prepared an internal report on the Solid Waste Management Facility expansion that is confidential because it addresses land acquisition in the area. We understand that a public report will be issued in the near future addressing potential expansion of the facility.

The RMPS furthermore addresses the potential requirement to expand the landfill in its Policy SU-22 as follows:

SU-22 HRM shall through a public consultation process as defined by Council, consider all options for a new regional waste processing and disposal facility, extending the life of the existing facility, and exploring waste diversion initiatives.

The public, therefore, will be consulted concerning any proposal to expand the landfill. Any such process will be separate from the current project, although the impacts and opportunities created by potential expansion will most definitely be

considered in the development of the Wilderness Common Master Plan.

4.2.2 Ragged Lake Business Park

As noted above, Ragged Lake Business Park has only seen modest development to date. According to the HRM Business Parks Web site, Ragged Lake is currently home to five businesses with more than 100 employees. Its leading occupants are the Nova Scotia Power Control Centre, and a multi-bay commercial and light industrial building. Currently, 504.6 acres are developed and 695.4 acres remain undeveloped; however, the Web site indicates that “no lots in the Ragged Lake Park available for sale at this time.”¹⁸ Nevertheless, the park was recently approved as the site of the new HRM Transit Garage, which will include a 130,000 square-foot building and parking for 120 to 135 buses.¹⁹

The past slow growth of Ragged Lake has generally been attributed to poor connection of the park to major roadways. The 1999 Concept Plan proposed an internal road network in the eastern portion of the study area that among other things would have connected Ragged Lake to Exit 3 on Highway 103. While this type of connection would have facilitated access, it probably would not have done much to improve the visibility of Ragged Lake Park, which is roughly 2 kilometres from Exit 3. The recently posted Draft Bayers Lake Functional Plan focuses on a more direct connection between the two business parks via an overpass extending from Lakelands Boulevard (see **Figure 4.2**). The overpass will presumably integrate the two parks and transfer to Ragged Lake the benefits of the position that Bayers Lake has established for itself.

The area to be covered by Ragged Lake Park in this new plan is not much different from the area suggested for “Business Campus” and “Mixed Residential Business” in the 1999 Concept shown on **Figure 1.1**, above (p. 3). The Business Campus is now, however, designated for light industrial use and the Residential Business lands are envisioned as a “Mixed Use Commercial” area without a residential component. The extent of this Mixed Use Commercial area is more limited than in the 1999 plan, but

¹⁸ Halifax Regional Municipality, “Business Parks: Ragged Lake,” www.halifax.ca/business_parks/parks/raggedlk.html

¹⁹ See: “Site Selection for Satellite Transit Garage,” Staff Report, Halifax Regional Council, September 30, 2008

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buffer areas around Ragged Lake and wetlands to the north appear to be more constrained.

The road network is now also more contained. Its main element is a loop that encircles Ragged Lake as in the 1999 plan. It does not, however, provide for connection to Exit 3. It does, on the other hand, portray a more generalized connection represented by an arrow at the bottom of the plan that is labeled “access to Possible Mixed Use Commercial and Residential Development with Associated Retail Node.” This presumably could extend to Exit 3 or curve south to reach Prospect Road, as well as connect to both.

Development in this area raises concern over impacts on Drysdale Bog, which is within the southern portion of the I-3 Zone containing Ragged Lake. Substantial opposition was mounted to a proposal to build an asphalt plant in this area in 2006.²⁰ The Five Bridges Wilderness Heritage Trust continues to express concern over potential industrial development in the land,²¹ and several Open House participants attributed a high value to the area in the mapping exercise discussed above.

Harmonizing the protection of the Wilderness with the recommendations of the Bayers Lake Functional Plan will be an important goal of the Master Plan that will result from this study. The Draft Generalized Future Land Use Map presented in **Figure 4.1** may benefit the Wilderness Common by providing a more definitive boundary for Ragged Lake Business Park. However, if more substantial expansion is contemplated through the loosely defined extension of the road network, it may infringe on adjacent areas that were designated for active recreation facilities and serviced residential development in 1999. These areas may be affected, or moved farther west and/or south, conceivably affecting the Wilderness Common reserve; however, cooperative efforts between planners working on the Bayers Lake/Ragged Lake Functional plan and the Wilderness Common Master Plan could resolve this to mutual benefit.

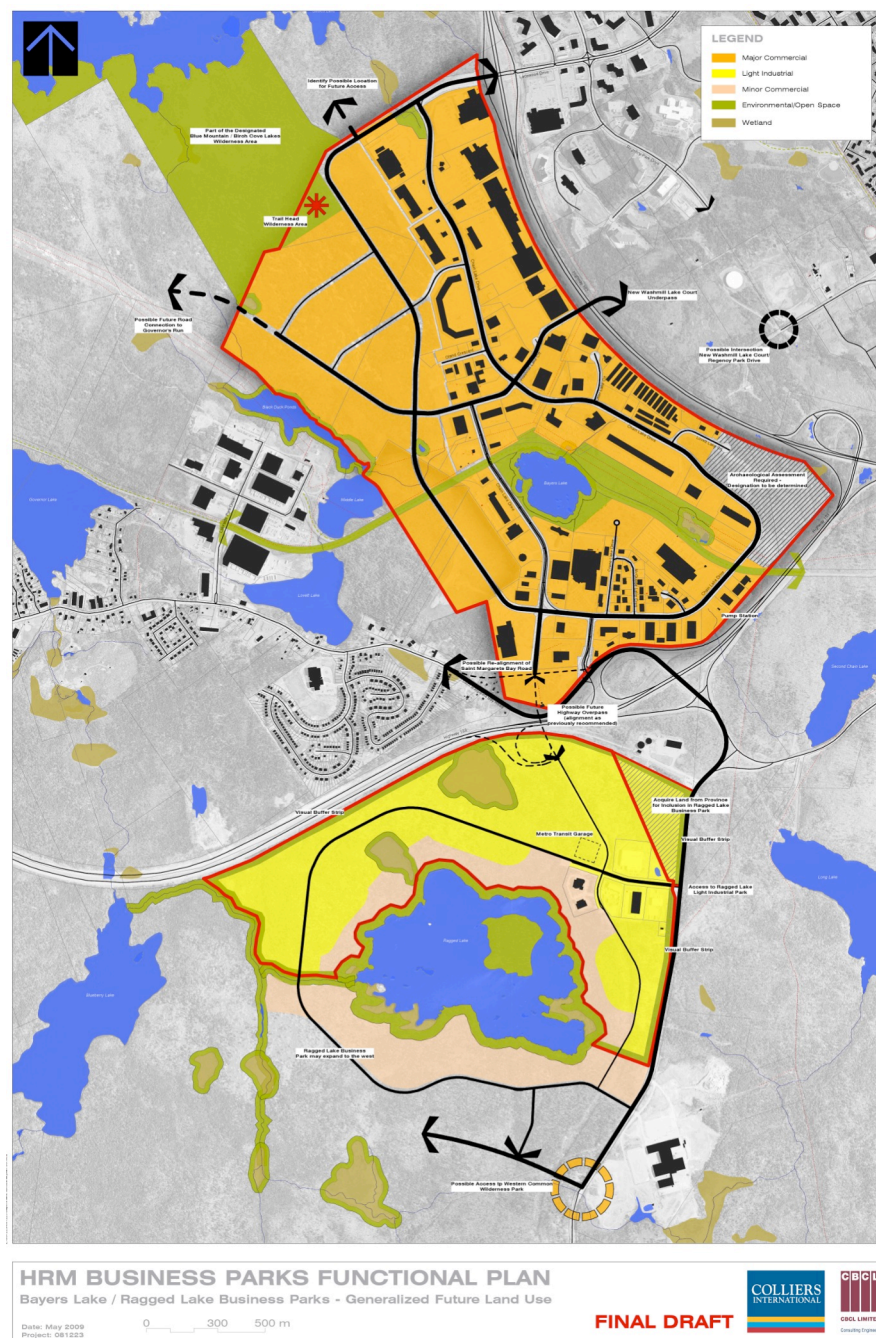
²⁰ Peter McInroy, “Drysdale Bog wetlands proposed for Heavy Industrial Park,” *The Sandpiper*, Winter 2006, pp. 1 and 6.

²¹ Five Bridges Wilderness Heritage Trust, “Drysdale Bog,” *The Bridge*, March 2007, p. 2.

4.2.3 Active Recreation Facilities

As noted, the recent Community Facility Master Plan suggests that HRM outdoor facilities should be consolidated into a small number of locations. For the Mainland North Delivery Area within which the study area is located, the primary centre for large-scale athletic facilities is being established in the Mainland Common preparatory to the coming Canada Winter Games as discussed in **Section 2.3.2**, above. The study area is benefiting from current development of the Prospect Road Community Centre, which will provide excellent indoor facilities to the Prospect Road area, as well as future community-oriented outdoor facilities.

In other words, the justification for a substantial centre for active recreation facilities in the Western Common area appears to be waning. The proposed facilities are being developed elsewhere in the Mainland North area, where they will be closer to major population concentrations. The anticipated development of artificial surfaces should also allow for more intensive use of facilities so that a few fields will be able to provide many more hours of use. Phase Two of this project will investigate this issue.



FFigure 4.2: Draft Bayers Lake/Ragged Lake Generalized Future Land Use Map

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The equestrian centre envisioned in 1999 may, however, continue to make sense, since, to our knowledge, no other location has been proposed for an equestrian centre in HRM. The location across from the Exhibition Park site, furthermore, seems ideal for the proposed use. The same might be said for the proximity of the Wilderness Common, where trails could be developed for horse riding. That being said, the proponents who pushed for an equestrian centre when the previous work was done are not currently in evidence, raising the question of whether there is sufficient current interest.

4.2.4 Trails Development and Off Highway Vehicle Issues

As with most wilderness areas adjacent to the urbanized core of HRM, the Western Common and Wilderness Common areas are interlaced with a network of frequently used and occasionally used trails. Greenhead Road, Old Coach Road and Big Indian Lake Road are popular routes into and through the Wilderness Commons lands. A recent edition of the Five Bridges Wilderness Heritage Trust newsletter, *The Bridge*, touts the Old Coach Road as a connection from Harrietsfield to Seabright and proposes the development of a brochure to “give distances, a history of the old road, a description of those who lived there and anecdotes that would make the area more attractive for recreational use,” to make the road “a venue that hikers, snowshoers, cross-country skiers, orienteering groups, geocaching groups, and ATV riders will use.”²²

We understand that at least portions of the Old Coach Road, Greenhead Road and Big Indian Lake Road are popular with ATV users.²³ ATV use is also apparent in other areas that have been visited by the consultants. The use of ATVs and snowmobiles, which are collectively known as Off Highway Vehicles (OHV), is controversial in Nova Scotia. On the one hand, the Province of Nova Scotia is working with ATV owners to develop new multi-use trails through the Off-highway Infrastructure Fund. The fund is being built through the compulsory contribution of

²² Five Bridges Wilderness Heritage Trust, “A Hike Down the Old St. Margarets Bay Road,” *The Bridge*, January 2008, p. 3.

²³ Mapping provided by Mel Smith, Safety Minded ATV Association.

\$40 from each annual OHV registration. Funds are distributed on a matching basis to trail development groups that must contribute at least 50 per cent of the cost.²⁴

On the other hand, hikers and others who oppose motorized vehicle use on trails express concern for their safety on trails shared with OHVs. Adjacent landowners also complain about land-use impacts, most notably noise.²⁵ Both groups—including interview contacts and participants in our stakeholder workshop—also point out that there are impacts on the environment caused by OHVs fording watercourses and wetlands, damaging the natural landscape, and frightening and disrupting native wildlife. Views on the subject have unfortunately become polarized,²⁶ but some stakeholders have suggested that a compromise can be achieved by restricting ATV use to primary routes such as Old Coach Road and Greenhead Road.

Mike Marriott, President of the Safety-Minded ATV Association and a Director with the ATV Association of Nova Scotia (ATVANS), has indicated that connectivity across the Wilderness Common lands is important to his organizations.²⁷ Of particular note is the Old Coach Road. The need for access across the area on the Old Coach Road is important to allow riders to connect to the wider network of established trails west of the Wilderness Common. The Safety-Minded ATV Association is a member of the Chebucto Wilderness Coalition, and has been working to ensure that OHV users will continue to have access to the large Crown Parcel located west of the Wilderness Common should it be designated a Wilderness Area by the Provincial Government. Mr. Marriott expressed the notion that perhaps similar solutions could be found in the Western Common by keeping the Old Coach Road right-of-way as Crown land. Funding could then be obtained and the trail improved to allow for OHV access across the Wilderness Common. In this way, OHV use would be restricted to the Old Coach Road only. Mr. Marriott also indicated that this strategy has worked well on the Crown Parcel. Access would not be restricted to OHVs; instead, a mixed-use trail would be established that would be open to OHVs,

²⁴ Natural Resources/Health Promotion and Protection, "Off-highway Trails Receive Another Funding Boost," June 11, 2008, www.gov.ns.ca/news/details.asp?id=20080611007.

²⁵ "Unhappy Trails," October 27, 2008, The ChronicleHerald.ca, <http://thechronicleherald.ca/Editorials/1086957.html>.

²⁶ Gordon Delaney, "Morse: ATV rules work: Coalition believes off-highway vehicle use damages land, people," The ChronicleHerald.ca, <http://thechronicleherald.ca/NovaScotia/1087897.html>.

²⁷ Personal comments from interview with Mike Marriott, January 2009.

hikers, and cyclists. Mr. Marriott indicated that policing of the trail would be the responsibility of the Nova Scotia Trail Patrol Program.

It is clear that future trail development within the Western Common requires further consideration. OHV use within the park would not be permitted under HRM By-Law P-600, which states that motorized vehicles are not permitted in HRM Parks. It appears, based upon consultation to date, that those representing both sides of the issue may be able to find compromises; however, it is clear that this issue will be a key component of Phase 2 of this project. **Appendix C Figure 10** has maps showing the wider network of OHV trails on the Chebucto Peninsula.

4.2.5 Water Route Development

The extensive waterways in the Western Common area provide excellent opportunities for canoeing and kayaking. Dusan Soudek, Chair of the Environment and Portage Committees of Canoe Kayak Nova Scotia and a member of WCWAC, identified two primary water routes within the area: the Nine Mile River and the Otter Lake Brook-Prospect River waterway. Sites on both routes were given high valuations by participants in the mapping exercise at the Open House sessions. **Appendix C Figure 10** has maps of Mr. Soudek's water routes for the Chebucto Peninsula.

Nine Mile River is an extensive route navigable from Cox's Lake near Yankeetown, all the way to Shad Bay. Mr. Soudek notes that a 3-km stillwater bisected by Highway 103 in the northwest corner of the proposed Wilderness Common is particularly popular with paddlers. He adds that:

Its only road access point is near its NNE end through a small HRM-owned neighbourhood park, located next to the sewage plant on River Road. The creation (or re-creation?) of a 600-m portage would not only create access to this stillwater from Otter Lake Drive, but would also connect [Otter Lake to Nine Mile River].²⁸

²⁸ Personal interview comment, Dusan Soudek, Also, document "Waterways of the Western Common Wilderness Area," undated, provided to EDM, November 9, 2008.

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Mr. Soudek also notes that there are several other points of interest within and near the Wilderness Common, and that there may have been a trail along the “entire eastern shoreline of Nine Mile River at one time.” He goes on to say:

The area is highly scenic; the river’s rapids generate considerable white noise, which acoustically insulates the area from human-induced noise. Moreover, there are remnants of old forests along the river. One may consider establishing (or re-establishing) a riverside trail here.

The Otter Lake-Prospect River route differs from the generally fast-flowing Nine Mile River, but offers special features of its own:

The Otter Lake Brook–Prospect River waterway ... is a classical lake-and-portage canoe route with negligible whitewater opportunities. It can be travelled either upstream or downstream and even in low-water conditions. Its upstream end is near the outlet of the inconspicuous “stump pond” near the northern shoreline of Otter Lake. It is accessible via a 50-m portage from Otter Lake Drive.

From Otter Lake, the waterway falls through ponds, stillwaters, marshes and portages, reaching Big and Little Indian lakes and Nichols Lake before leaving the study area. Mr. Soudek describes Otter Lake as the most attractive of the three lakes on this run, but recommends the addition of picnic tables and “tenting sites” on all three to enhance their use. He also suggests development of “adequate road access [to Big Indian and Nichols lakes] for visiting canoeists and kayakers” similar to the access already available to Otter Lake.

4.2.6 Residential Development

The 1999 Concept Plan provided for serviced residential development immediately south of Highway 103 between Ragged Lake and Otter Lake, and unserviced residential development in Goodwood/Brookside. The northern land is now zoned WCRPK (Western Common Regional Park) under the Land Use Bylaw for Timberlea/Lakeside/Beechville. As noted above, the WCRPK Zone, which is reproduced in **Appendix A**, permits only conservation and recreation uses. In

addition, the area is subject to servicing limitations that would no doubt have to be resolved before any portion of the lands could be rezoned for development. The Brookside/Goodwood area is already an established residential community; lands in the area are generally zoned to permit single and two-unit housing with on-site servicing under the LUB for Planning District 4 (Prospect).

Regardless of zoning provisions, residential development in the area may face challenges. The RMPS identified two primary centres for residential development within HRM—Morris-Russell Lake and Bedford West—along with four other areas also considered appropriate locations for “new urban growth”:

- Bedford South
- Port Wallis
- Sandy Lake
- the Highway 102 corridor between Clayton Park and the Blue Mountain/Birch Cove lakes area.

These areas are all separated from the Western Common such that their development is unlikely to encourage the extension of services or infrastructure that will support development in Western Common. While growth can be expected to continue in the Brookside/Goodwood/Hatchet Lake areas, it will naturally be limited by the absence of water and sewer services, and by ongoing congestion on Prospect Road. It may also be limited by economic and demographic factors such as generally slowing growth and the tendency of our aging population to locate in the urban core—a trend that is being encouraged by recently adopted RMPS policy.

For good measure, some stakeholders asserted that development along Prospect Road exemplifies urban sprawl and should be discouraged on principles that guide the RMPS. Others pointed out that areas suggested for residential development in 1999 feature red spruce stands of relatively high ecological value that they feel should be preserved. Another area containing stands is the active recreation land proposed between Blueberry and Otter Lakes in 1999.

4.2.7 Watercourse Buffers

Given the large number of lakes and rivers within the Western Common Study Area, and the desire to preserve the quality of their waters, the buffering of watercourses

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has been an ongoing concern. The RMPS instituted a municipal policy in 2006 requiring riparian buffers around all watercourses as follows:

EC-10 HRM shall, through the applicable land use by-law, require the retention of a minimum 20 metre wide riparian buffer along all watercourses throughout HRM to protect the chemical, physical and biological functions of marine and freshwater resources. The by-law shall generally prohibit all development within the riparian buffer but provisions shall be made to permit board walks, walkways and trails of limited width, fences, public road crossings, driveway crossings, wastewater, storm and water infrastructure, marine dependent uses, fisheries uses, boat ramps, wharfs, small-scale accessory buildings or structures and attached decks, conservation uses, parks on public lands and historical sites and monuments within the buffer. In addition, no alteration of land levels or the removal of vegetation in relation to development will be permitted.

All three LUBs pertinent to the study area were amended to provide this basic protection pursuant to policy EC-10. Furthermore, within zones applied to the Western Common the provision has been considerably fortified to extend the buffer distance to 91.4 metres (i.e., approximately 300 feet) and specify stringent restrictions on development and use as exemplified by the following subsection of Section 4.19 of the Planning District 4 LUB:

(e) Notwithstanding clause (a) [setting buffers at 20 metres], the required buffer from any watercourse within the WC Zone shall be 91.4m. No excavation, infilling, tree, stump and other vegetation removal or any alteration of any kind shall be permitted within this buffer. Activity shall be limited to the placement of board walks, walkways and trails, conservation uses and buildings and structures for conservation related uses, wilderness campsites or non-motorized water related recreation uses.

The provisions (repeated in similar form in the Timberlea/Lakeside/ Beechville and Mainland LUBs) should provide substantial protection to watercourses in WC and WCRPK Zones (see **Appendix A**). This protection will obviously be further enhanced by the designation of the Wilderness Common, which will place many of the lakes in the Prospect River watershed in an extensive “no build” area in which alteration of the natural environment will be severely limited.

Ragged Lake and the eastern shore of Blueberry Lake are in a UR Zone, however, and are only protected to 20-metre buffers. Increased buffering of Ragged Lake and wetlands associated with it would seem particularly appropriate considering the proximity of the Business Park. Ragged Lake is a tributary to Big Indian Lake and other downstream lakes into which it and Big Indian Lake feed (see **Figure 3.1** above). Detailed land suitability assessment in the next phase of this project should provide guidance as to the most appropriate distance buffer around both Blueberry and Ragged lakes.

4.2.8 Wildlife Passage

Mapping of the Western Common Study Area indicates no significant natural areas within its boundaries, although areas of scenic and ecological value can be found just outside its limits, particularly in relation to the Nine Mile River corridor (see **Appendix C, Figure 6**). Notwithstanding the absence of major distinguishing values, the Western Common and Wilderness Common areas constitute a significant large patch in the landscape mosaic of the Chebucto Peninsula. The Wilderness Common, in this context, will provide such valued characteristics in a near urban environment as natural beauty, quiet, and species diversity and richness, much like the Blue Mountain/Birch Cove Lakes Candidate Protected Area to the north.

The several thousand acres of forest stands within the proposed Wilderness Common also provide habitat to the Mainland Moose, a designated species at risk. Like the Blue Mountain/Birch Cove lakes area, the Wilderness Common lands also provide passage for larger mammals moving north and south on the peninsula. While Timberlea/Lakeside/Beechville intervenes between Blue Mountain/Birch Cove lakes, a 300-foot wide buffer next to Nine Mile River is planned for the Brunello Estates development that should assist with connectivity from the Terence Bay Wilderness Protected Area and the lower reaches of the Chebucto Peninsula through to Blue Mountain. Additional improvements will no doubt be required to facilitate the crossing of Highway 103 and to overcome other potential obstacles in Timberlea/Lakeside/Beechville.

4.2.9 Cemeteries

The 1999 Concept Plan gave considerable attention to cemeteries within the Western Common and the potential to create a new cemetery in the area. The final study

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report for the 1999 project suggested that there was demand for a new cemetery in Halifax and that there was interest from a cemetery operator in the Prospect Road area. The study further noted that the drumlinoid feature southwest of Ragged Lake was well-suited to a cemetery (now zoned UR) and that a 25-acre facility would supply Halifax for 50 years.

As with the equestrian facility, recent consultation did not reveal interest in such a project. A cemetery might, however, provide a transitional area between the Ragged Lake Business Park and the Wilderness Common. Further consultation will explore this potential.

In addition, as noted in **Section 3.4.2** above, the Western Common area features several historic cemeteries or burial places of interest. Many of these locations are now in disrepair and require clean-up and restoration.²⁹ In our Workshop session, stakeholders mentioned the importance of recognizing and preserving these sites.

4.2.10 Hunting & Fishing

Hunting in the Western Common Wilderness Common is not permitted within the 2-km exclusion zone around the Solid Waste Management Facility, in the area north of Big Indian Lake, and signage at the entrance to the Greenhead Road off of Highway 103 indicates as much. Nevertheless, hunting is most likely occurring but the extent is not known. The primary concern with respect to hunting is risk of injury to worker at the Solid Waste Management Facility. Signage approaches should be examined in greater detail in Phase 3. As with any City Park, the area will be off limits to hunting; however, public education and communication should be addressed in the master plan.

The high quality of the water in the Wilderness Common has resulted in excellent fishing conditions in all lakes.³⁰ The Nova Scotia Department of Fisheries and Aquaculture stock two of the lakes in the Wilderness Common.³¹ Otter Lake and Big Indian Lake are part of the provincial fish-stocking program for sport fishing. Access from the ocean is currently blocked to migratory fish, such as sea trout, salmon, and gaspereau, by the dam at Big Indian Lake.

²⁹ Five Bridges Wilderness Heritage Trust, "Cemetery Cleanup," *The Bridge*, June 2007, p. 3.

³⁰ Interview comments, Jack Mitchell, March 2, 2009

³¹ NSFA, <http://www.gov.ns.ca/fish/sportfishing/stocked/list.shtml>

There are dams in the Wilderness Common at Otter Lake and Big Indian Lake. The two dams were constructed as part of the area's previous role as water supply for the City of Halifax. The Otter Lake dam functions as water supply for the Solid Waste Management Facility. The Big Indian dam, however, is no longer required for water supply purposes,³² and stops fish from accessing the Prospect River from the Ocean. The dam provides water levels required for recreation. Opportunities for a fish ladder or decommissioning the dam should be explored.

4.3 SUMMARY

While HRM's commitment to protecting the Wilderness Common area is well established in municipal planning policies and LUB provisions, the appropriate boundary for the area is in flux owing to a combination of land use pressures and opportunities in the Western Common area. While the focus of the current study is on planning the Wilderness Common, effective planning cannot be done in isolation from surrounding land use.

This report is the result of the first phase of work on the Wilderness Common Master Plan—it is not the Wilderness Common Master Plan. Further research and consultation will focus on the fit between future land-use possibilities and development of the Wilderness Common, as well as on the unique features of proposed Wilderness Common lands that should be accounted for in the Master Planning process. This will result in a Concept Plan in Phase 2 of the project that will be refined in consultation with the interested public and included in the final Master Plan, detailing access points, trails, facilities and other features of the future parklands.

³² Halifax Water report *Dams and Other Water Control Structures Inventory*, MECo Project P7009, Final Report, January 9, 2009.

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THE MASTER PLAN 2009

5. LAND USE SUITABILITY

5.1 SUITABILITY ANALYSIS METHODOLOGY

Suitability analysis determines the fitness of land for supporting a specific use. It is an interactive Geographic Information System (GIS) modelling process that allows analysts to spatially explore development options, protection criteria, and community and financial issues before any change in land use takes place. The input layers comprise mapped information from various sources. Input data, such as topography or forest inventory information, are given values based on a ranked set of criteria or an equation. Layers of input information are modelled or ranked to produce a map showing the most suitable or important locations in relation to the attribute being considered. The process allows analysts to assess a variety of potential land uses from commercial development to residential development to preservation in a natural state (see **Figure 5.1**).

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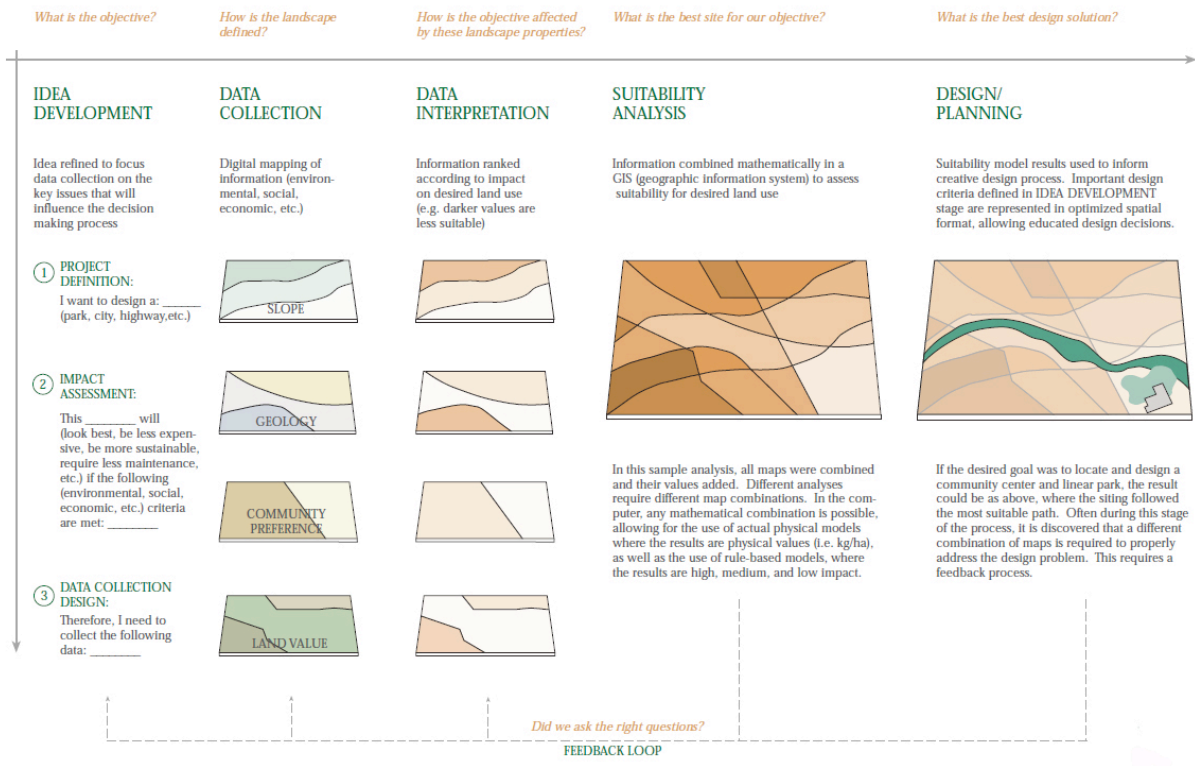


Figure 5.1: Suitability Model Illustration

The methodology combines GIS data management with multi-criteria decision-making techniques. GIS facilitates the assembly and presentation of essential data for assessing alternative locations. To assess the overall implications of the data, scores are assigned to the individual criteria being considered in a data layer. Data layers are then combined as appropriate to the individual model. The resulting overlay model provides an objective and repeatable assessment of the landscape. Put simply, the process is:

Layer 1 + Layer 2 + Layer 3 + Layer 4 + Layer 5 = Model Result.

To aid in the definition of the potential location of the Wilderness Common Regional Park, maps were prepared for a variety of park values such as viewplanes, forest types, watercourses, wetlands, soil types and species richness. Model data representing the ideal configuration or boundaries of the Wilderness Common Regional Park resulted from a cumulative view of the area from the perspective of

the characteristics of each attribute.

5.2 ATTRIBUTES FOR CONSIDERATION

The suitability attributes to be included in the modelling were determined by the HRM Wilderness Common Advisory Committee and HRM staff. The list included the following:

- Cultural considerations
 - i. Pre-contact archaeological potential
 - ii. Cemeteries, K Class Roads, and foundations of homesteads
 - iii. Other identified attributes (community stakeholders)
- Watercourse protection
- Residential suitability
- Species richness
- Views from the Prospect River system
- Active recreation suitability

Each attribute was modelled to simulate its relation to the study area. GIS data used for attribute modelling was provided by different levels of government and assembled by EDM from government data or from information provided by the public. The documented attributes (see **Figures 12-20** in **Appendix C**) culminate in a comprehensive model shown in **Figure 21** of **Appendix C**.

5.2.1 Cultural Considerations

Archaeological Potential

The potential existence of pre-European-contact archaeological sites was modelled based on proximity to watercourses, the slope of the land, and proximity to previously identified sites. In particular, archaeologists have identified watercourse intersections (where rivers flow into lakes or the ocean) as higher-potential locations. Slope acts as a predictor insofar as it determines areas suitable for campsites (i.e., with slopes less than 8 per cent). The model used to perform the analysis is the Pre-European Contact Predictive model developed for the Special Places Program of NSTCH and HRM. **Figure 5** in **Appendix C** provides the model outputs, where areas

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of higher potential are in green and yellow. Not surprisingly, the various pools and stillwaters comprising the Prospect River system rank highly in the predictive model. Of particular note are the areas of transition from stream to lake, as can be seen on Blueberry, Big Indian and Little Indian lakes.

Known Cemeteries, K Class Roads, and Homestead Foundations

As discussed in **Section 3.5**, the study area contains a variety of known Archaeological sites, concentrated on the Greenhead Road, south of the Solid Waste Management Facility (see **Figure 5** in **Appendix C**). **Figure 12** in **Appendix C** displays building locations from the 1865 A. F. Church mapping and 1908 mapping produced by the Federal Department of Mines. These building locations coincide with the known foundations in the study area and provide an historical context to them.

Similarly, abandoned (K Class) roads figure heavily in the current land use as trails and OHV routes. Of note are Greenhead Road, Big Indian Lake Road, Old Coach Road and Pipeline Road. Most of these roads can be found on the historical mapping cited above, the notable exception being the Pipeline Road constructed in the early 20th Century. These cultural features, together with the building foundations and cemeteries, further enhance the historical context in the greater task of defining the Wilderness Common.

Other Identified Attributes

Figure 12 in **Appendix C** also contains information gathered through public workshops and consultation. Items deemed important in the 1999 study were also included because their significance was identified by public or scientific sources.

5.2.1 Watercourse Protection

The primary development-related threat to watercourses is sedimentation resulting from soil erosion. The watercourse protection model evaluates the land's sensitivity to erosion and the potential for eroded soil to reach a receiving watercourse.

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To assess the potential impact of sedimentation, the model divides the Study Area into land cells. It measures the erodibility of each cell by applying a Universal Soil Loss Equation (USLE), assuming that vegetation has been removed from the land during development. A Sediment Delivery Ratio map is then applied to evaluate the potential for eroded soil to reach a particular watercourse. The model was first developed by EDM for Environment Canada and the Government of Newfoundland and Labrador, which subsequently published it in the *Watershed Management Plan for Gander Lake and Its Catchment*, February 1996.

The model also accounts for the sensitivity of receiving water bodies to the effects of soil erosion. For example, a cell with a high potential for soil erosion that drains into a marine system could be designated as less sensitive than a cell that has lower erosion potential but directly affects a wetland.

Figure 13 in **Appendix C** provides a visual summary of areas within the study area that are key to watercourse protection. Areas in blue and purple identify lands with high erodibility with the potential to affect sensitive water bodies. Concentrations of sensitive land are notable around the Nine Mile and Prospect River systems. Mitigation measures should not be required.

5.2.2 Residential Suitability

EDM has developed the residential suitability model over many years to support planning and development projects. Residential suitability is a function of the desirability of an area based on typical residential preferences and the feasibility of land development. Factors influencing desirability are vegetation cover, quality of viewplanes, and south-facing slopes. In addition, areas of hardwood or mixed-wood stands tend to be more desirable for residential development than softwood stands, scrub, barrens or marshland.

Development feasibility is related to till thickness, soil drainage, terrain (i.e., slope), and erosion potential. Till thickness and soil drainage are important considerations for unserviced residential development since they influence the suitability of the lands for installation of wells and on-site sewage disposal systems. In addition, areas of thin till require topsoil to be imported as part of development and afterwards as

part of typical suburban landscaping. Such soils tend themselves to be highly erodible and pose a threat to watercourses.

Some areas with high scores for all other factors were designated as low potential for residential development because of these feasibility factors. **Figure 14** in **Appendix C** illustrates low potential in much of the study area. Much of the area is characterized by bedrock with a thin till cover, making installation of on-site sewage disposal systems costly. The exception is the interior of the Wilderness Common around the Solid Waste Management Facility, extending southward along Nine Mile River.

5.2.3 Species Richness

The Species Richness model was initially developed by EDM for the Big Cove First Nation in New Brunswick during the course of a community planning project. The model is published by Kluwer Academic Publishers in the 2003 text *Landscape Interfaces – Cultural Heritage in Changing Landscapes*. **Figures 15** through **17** in **Appendix C** present the potential species richness of the study area broken down by three animal-type habitats: mammal (**Figure 15**), bird (**Figure 16**), and reptile/amphibian (**Figure 17**). Considerably more bird species are likely present within the study area than mammal species, and mammal species in turn are more likely to outnumber reptile/amphibian species. To adjust for this factor, species richness was scaled into the five categories provided on the respective maps for each group so that, for example, areas with five to six reptile/amphibian species were treated as equivalent to areas with 19 to 27 bird variants. The final species richness figure (**Figure 18**) consequently portrays ratings that are the average of ratings for the three animal groups.

For the purpose of species richness modelling, data was derived from species models developed for New Brunswick, where individual species were associated with specific habitat/vegetation types. While the species and habitats in HRM are similar to those found in modelled areas of New Brunswick, the accuracy of this assumption has not been field verified.

5.2.4 Views from Prospect River System

This model assessed the preservation of natural views experienced from canoe routes identified by canoeing organizations that frequent the area. Areas within viewplanes

along identified canoe routes were highlighted as sensitive to development that could disrupt the natural setting preferred by wilderness enthusiasts.

On the other hand, views of development and human activity were acceptable in the launch areas. Places with visible human use provide a sense of safety compared with places where users park and deploy in remote, isolated areas with no surrounding communities to go to in the event of an emergency. **Figure 19** in **Appendix C** shows the model output, where the green areas reflect lands that are visible from the Prospect River system.

5.2.5 Road Density

Measuring the density of roads can be used to assess connectivity of habitat for wildlife, and to measure the effects of development on habitat. For example, research is ongoing on this topic in the Tobeatic Wilderness Area in southwestern Nova Scotia.³³ Since the endangered Nova Scotia Mainland Moose are a consideration in our study area, a road density analysis was performed. **Figure 20** in **Appendix C** gives the analysis output.

The model measured the number of road roads per 4-hectare hexagon. Hexagons were selected for because they provide the best geometrical shape. The results indicate that the Chebucto Peninsula has a relatively low density of roads, with overall density patterns focused on the coastal perimeter; the exception is the Old Coach Road running between the Western Common and Seabright.

5.3 USING THE MAPS AND MODELS

5.3.1 Accuracy of the Maps

The value of evaluation models depends on the quality of input data. This study had a limited field program. Model data was provided to EDM by government and other sources and was not field verified. The biggest data input weaknesses arose from the coarseness of the data or the difference between the intended use of the data and its integration into the models described above. For example, soil data used in the USLE equation was refined for agricultural purposes and was not specifically developed

³³ Website: http://www.merseytobeatic.ca/projects/project_connectivity_toad.html, last visited March 20, 2009.

for use in erosion modelling. Forestry data was developed primarily for use with forestry management practices. These factors may influence the accuracy of the maps.

5.3.2 The “Model” Composite

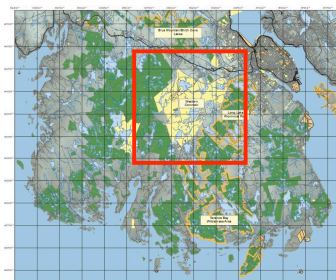
The results of each individual suitability model provide information on key landscape characteristics considered desirable within the park. Each model portrays where these features can be found in the landscape. A successful park will include many areas with high parkland suitability. The Model Composite (see **Figure 21** in **Appendix C**) is a combination of all models used, without applying any weighting to any individual feature. Areas shown as yellow in the Model Composite have more of the attributes considered desirable for a park than those shown in purple (see **Figure 21, Model Composite, in Appendix C**).

The Model Composite is a useful test of any proposed configuration of the future Park, since it should include primarily areas that embody the desired attributes.

5.3.3 Using the Maps and Models in Constructing a Concept Master Plan

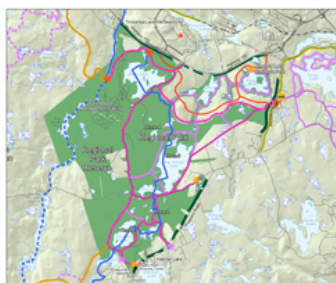
The primary purpose of each individual attribute model is as input to the overall Wilderness Common planning process. How the model is used depends on the overall design intent. The models produced to support the Master Plan have provided useful input on the ultimate configuration of the park boundary and configuration. For example, the viewshed analysis provided information that informed the linear park configuration, as well as decisions around the trail layout. Ultimately, all of the analysis provided input into development of the Master Plan. The design intent is described in the following chapter.

6. WILDERNESS COMMON MASTER PLAN



6.1 THE MASTER PLAN

In this chapter, the Master Plan is presented in five phases, with an outline of park amenities and trail systems to be developed. The Plan also includes cost estimates and an implementation timeframe. Development of the Wilderness Common as a regional park will be phased over a period of sixty years. Areas currently occupied by the Otter Lake Solid Waste Management Facility will likely require the 60-year timeframe for an operational and closeout monitoring period to be fully incorporated within the park.



This chapter also contains references to a Chebucto Peninsula Concept Plan, which is discussed in Chapter 7. It is an addendum to the Master Plan that presents a visionary approach to address some of the most pressing recreational and ecological issues on a significant portion of the Crown Lands on the Chebucto Peninsula. Because it requires the Province's leadership, it is separate from the Wilderness Common Master Plan and is included for discussion purposes only.

6.1.1 Role of the Park

The Wilderness Common's designation as a Regional Park differs from the 1999 plan, which outlined two neighbourhood parks at Otter and Nichols lakes, with the Wilderness Common joining them. This master plan combines neighbourhood parks with wilderness to create opportunities for the types of outdoor recreation experiences valued by communities. The designation as Regional Park clearly defines the role and future for the Wilderness Common. This area will provide excellent outdoor recreation opportunities such as hiking and canoeing, while also serving local needs for swimming and community trails.

The regional park offers wilderness experience through a trail system with regional, community and neighbourhood access. The plan reflects a focus on water quality by protecting lakes and watercourses with forested areas. There is opportunity for the construction of a fish ladder on the Big Indian Lake dam, allowing for the eventual re-establishment of migratory fish species. This opportunity should be examined in detail. Ecological and recreational connectivity is also a goal, as is seen in the

Wilderness Common's close proximity to Long Lake Provincial Park. Similar opportunities for connectivity are possible along Highway 333, but are made difficult by existing development.

6.1.2 Adjacent Community Development and Designing for Crime Prevention

For the Regional Park experience to be secure, facilities and services must be nearby. The basic and overlapping principles guiding CPTED—Crime Prevention Through Environmental Design—in practice are:

- natural surveillance
- reinforcement of territory or “defensible space”
- access control
- provision of alternative routes.³⁴

Implementing CPTED will require an area of community development adjacent to the wilderness park area.

The study area boundary is primarily 100 series and secondary highways and roads. While these major highways and roads have served to protect the study area from development encroachment, they also restrict the area's visibility and accessibility.

Development of adjacent private and HRM Business Park lands may require adjusting the ultimate park boundaries to optimise for the stated goal of a Regional Park. These minor changes would likely not significantly alter the intent or nature of the Regional Park and will bring many new users to the park, including people who take pride of ownership and offer surveillance for safety and security.

6.1.3 Managing Edge Relationships

The relationship between community development and a wilderness park is complex. Development cannot be felt to be impinging on the park, yet development must be accessible. The recommended boundary of the edge wilderness area should, therefore, be a curvilinear shape interspersed with areas of community development. The final boundary should be determined while simultaneously considering the ideal

³⁴ See: City of Vancouver, “Designing Safer Urban Environments,” <http://vancouver.ca/commsvcs/planning/infoful3.htm>, Last Visited September 2, 2009.

community build-out, such that both the park and community perform well. Supporting commercial operations, such as canoe/kayak rental facilities, might be included in the community areas that develop adjacent to the park. Detailed planning should consider, where possible, a public street frontage bordering the park as opposed to the backyards of homes. Point Pleasant Park Drive provides such an example, creating a very public and secure interface between the South-end neighbourhood and the park.

In addition, the location of Active Recreation and Cemetery elements in the 1999 Concept could be consistent edge uses. While no immediate need has been expressed for sports fields, the Wilderness Common edge could provide future space for this use. Similarly, a cemetery would provide an edge use consistent with the Wilderness Common. Any edge use must not interfere with the two guiding principles that define the Wilderness Common: landscape connectivity and water quality. Any use contrary to the two principles should not be considered.

6.1.4 Trails

The master plan calls for creation of 61 kilometres of trails within the Regional Park. These trails would be built to an accessible standard, and would be similar to trails found in locations like Point Pleasant Park. The trail types examined for this Master Plan are:

1. Shared-Use Trail (Motorized)
2. Shared-Use Trail (Non-Motorized)
3. Shared-Use Trail (Barrier Free Trail)
4. Shared-Use Trail (Back Country Hiking Trail)

Appendix F contains profiles of potential trail types. Most of the trails will be constructed using the Back Country Hiking trail profile. This trail type is a 2-foot-wide hiking trail constructed from site materials. A large section of trail will be a 6-foot-wide Barrier-Free Trail (see **Figure 6.1**).

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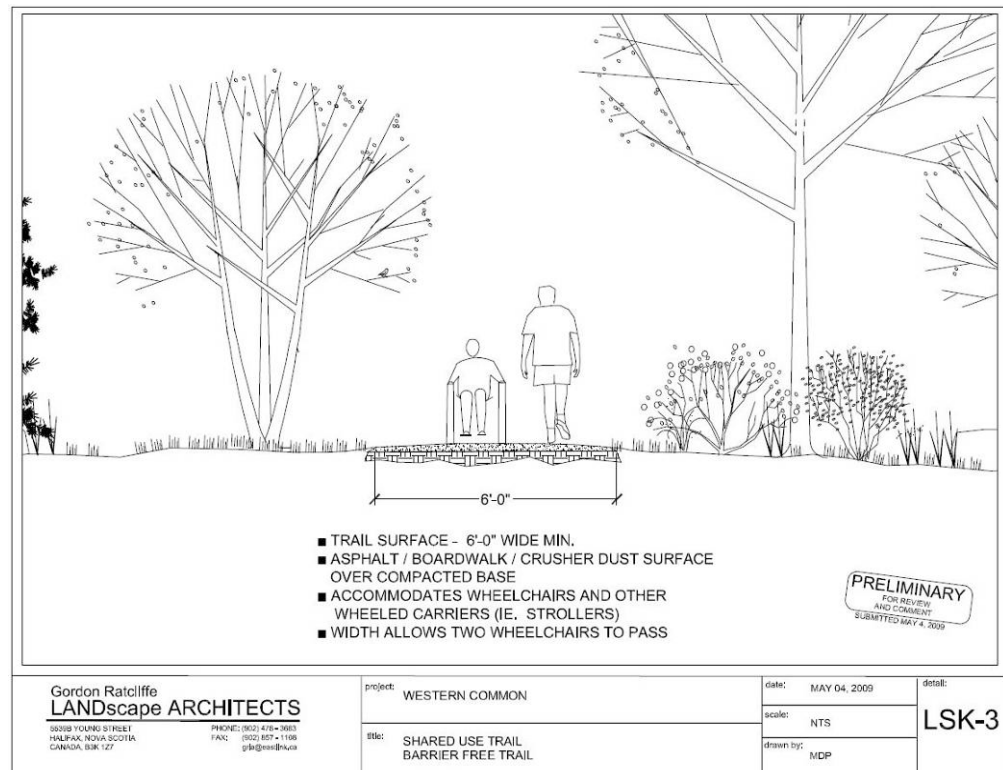


Figure 6.1: Trail Profile for Trails in the Wilderness Common

The trails will run throughout the park, taking advantage of watercourses and lakes, as well as the terrain and land cover. A section of Barrier-Free Trail will connect the new Prospect Road Community Centre with Goodwood and the Ragged Lake Business Park. Total cost of construction amounts to approximately \$1.8 million, phased over the next 60 years. Phasing and costs are discussed in detail in **Section 6.2.6**.

Should the wider vision for the Chebucto Peninsula trail system be adopted (See Chapter 7), there would be considerable change to the trail type and length being constructed and maintained by HRM. **Figure 22** in **Appendix C** shows a version of the master plan consistent with the vision in **Chapter 7** (Chebucto Peninsula Concept). There are no changes to the park or its trail layout, only changes to the trail classification and use. The primary change is the designation of the westernmost trail running north/south as multi-use. This section will either provide a link to the Chebucto Peninsula ring trail system, or function as a back-country trail. The trail section connecting Otter Lake and Exhibition Park is also designated as multi-use in this scenario, allowing for the use of Exhibition Park as a staging area for OHV and

cycling traffic. These changes would actually reduce HRM's cost to about \$1.5 million over the next twenty years, as sections of trail for motorised use would be constructed under provincial funding for OHV trail construction.

6.1.5 Park Amenities

The regional park will require only a few amenities, since its intent is to provide a wilderness experience with a few recreational opportunities. A recommended list is as follows:

- A trail system made up of the Barrier-Free Trails and primitive Back-Country Hiking Trails. This system will connect Nichols lake area, the Prospect Road Community Centre, Goodwood and the Ragged Lake Business Park, and will provide land linkages to the lake system (see **Section 6.2.3**).
- Canoe launches. Access to Otter, Ragged, and Big Indian lakes should be established. This allows for access to the Prospect River Canoe Route, and day-trip access to the largest lakes in the park.
- The existing Canoe / Kayak route on the Prospect River (including Otter Lake Brook) should be formalised with improvements made to portages. There is about 4.8 km of portage present on the system, assuming that the river is not passable by canoe for most of the season. Portages should be adequately signed and the trail should be brought to the Back-Country Hiking Trail standard (see **Appendix F** and **Phase 3**) (Budget: \$160,000).
- Lifeguard service at Nichols Lake beach. No improvements to the beach are recommended, but this amenity will complement the activities running out of the Prospect Road Community Centre. A small grassed area for sitting or picnics could also be part of this modest upgrade.
- Preservation of historical cultural resources of the area. As detailed previously, several cemeteries and old homestead foundations are located in the park. These features should be incorporated into the park as opportunities for education and points of interest. Interpretative signage would be the only required amenity.

6.2 ISSUES AND PHASING

6.2.1 Zoning

The Master Plan area is currently zoned WC (see **Appendix A**). With the plan being phased over a 60-year period, a series of re-zonings will have to occur to accommodate the plan. In addition, a designation of Regional Park Reserve will be overlain on the Master Plan Area. Rezoning of the RPK zone will be required as each phase comes online (every five years except the Solid Waste Management Facility area). In this way, uses inconsistent with the RPK zone will be phased out gradually, while the Regional Park and amenities are phased in over the life of the Master Plan.

The Master Plan considers the ongoing presence and possible expansion of the Solid Waste Management Facility. The mandatory 2-kilometre exclusion zone around the facility encompasses most of Phase 5 of the plan, and also places the designation of that phase in the 60-year range. Designation as Regional Park Reserve defines the future use of the facility's lands, while the exclusion zone limits land use. At the end of the 60-year period, all lands defined by Phases 1 through 5 of the Master Plan will be Regional Park.

6.2.2 Greenhead and Old Coach Road Land Uses

The Greenhead Road and the Old Coach Road are popular hiking, mountain bike and OHV routes into and through the Wilderness Commons lands. Significant improvements to the grading and surfacing of these routes are anticipated in the Master Plan (Section 6.2.5) however they will not be fully developed and consolidated within the regulations of the Regional Park until 2024. In the interim, the current land uses of these popular routes will continue.

The Five Bridge Lakes Wilderness Area located to the West of the Wilderness Common will likely be formally designated by the Provincial Government in 2011. The Greenhead and Old Coach Roads are important access routes from the Wilderness Common to connect to the wider network of established trails in the Five Bridge Lakes Wilderness Area.

While it is evident that these key routes are vital to trail users it is also clear that current land uses of the roads may be causing environmental damage. The road

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grades of several sections of the trails have been eroded to the point that they are periodically flooded. In addition, many secondary ad hoc trails radiating from the Greenhead and Old Coach Roads have been developed. Although these impacts will eventually be mitigated when the Master Plan is implemented there is a present need to address these issues.

A near term opportunity to address these issues has been presented by the Safety Minded ATV Association of St. Margaret's Bay. The Association is a member of the Chebucto Wilderness Coalition and has been working with the Province to develop a Trail Management Memorandum of Understanding (MOU) to ensure that OHV users will continue to have access to trails in the Five Bridge Lakes Wilderness Area. The Province is working with OHV owners to develop new environmentally sustainable multi-use trails through the Off-highway Infrastructure Fund. The fund is financed by a compulsory contribution of \$40 from each annual OHV registration. Funds are distributed to formally organized groups on a matching basis for trail development for mixed use trails open to OHV's, hikers, and cyclists. These groups are also responsible for trail maintenance, enforcement (in cooperation with the Nova Scotia Trail Patrol Program) and issuing trail passes to club members.

The Safety Minded ATV Association of St. Margaret's Bay is not currently organized in communities adjacent to the Wilderness Common however, if a branch of the association was organized, funding could be obtained for the Old Coach and Greenhead Road to mitigate environmental impacts and allow for improved access across the Wilderness Common. This would require a trail management MOU between the local chapter of the association, HRM and the Province. The Safety Minded ATV Association has indicated that it would be a key partner in this initiative and would assist in organizing a local branch.

If a local association is not formed it is likely that the current land uses of the Greenhead and Old Coach Roads will continue to lead to negative environmental impacts. Although the Master Plan will eventually address this issue an interim public education program should be developed for users of the Greenhead and Old Coach Roads. Signage should be placed at road entrances to indicate that trail users are expected to be stewards of the environment and to not cause undue damage to the trails or to adjacent areas. If trail users do not demonstrate compliance to these measures HRM should consider access restrictions.

It is clear that future trail development within the Western Common will have to consider OHV access and connectivity given the wider context in which the study area exists, as well as the number and popularity of OHV trails on the Chebucto Peninsula. It appears that a compromise position around the Greenhead and Old Coach Routes routes and an accompanying trail management MOU could provide a solution that all trail users would accept.

6.2.3 The Solid Waste Management Facility

The Regional Park's configuration is partially defined by the current and future operations of the Otter Lake Solid Waste Management Facility. The facility, which opened in 1999 to replace the Sackville Landfill, occupies about 200 acres within the boundaries of the Western Common.³⁵ Its presence (and continued operations) must be considered by the Master Plan.

Information provided to EDM indicates that the facility has an expected lifespan of at least 25 years. Due to contractual monitoring requirements on the facility operator, the area will be excluded for any development for 30 years afterwards, making any plans for recreational or other uses a long-term consideration. For this reason, the Regional Park Reserve land use classification should be applied. This would demonstrate the intention for the Solid Waste Management Facility exclusion area to be designated as Regional Park in the future, while allowing for current uses not consistent with the Regional Park zone to occur in the area.

With respect to the ultimate closing of the Otter Lake Solid Waste Management Facility, it is noted that the individual Solid Waste Management Facility cells once closed are currently being covered with 18 to 20 inches of soil and a grass/clover mix. Cover density has been enhanced by seasonal mowing. Additional cover that could be added to these areas would likely be limited to native wildflowers or other shallow-rooted plants. If more significant plantings were envisioned, significant additional soil would have to be imported to allow growth of woody plants. It is anticipated that the cell areas and associated post-closure infrastructure (such as the sedimentation ponds) will always have restrictions on access. Within the larger

³⁵ Website: <http://www.halifax.ca/wrms/otterlake.html> , Last visited July 27, 2009.

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buffer areas, natural re-vegetation will be managed according to the overall forest management objectives.

The potential for redeveloping the area for recreation and wilderness uses should not be discounted, and further study and consultation should be completed to determine acceptable redevelopment. It may be possible to create a recreational trail experience in the area sooner than 60 years in the future. This would, of course, need to be negotiated with the facility operators and the provincial regulators. There are many examples of active and retired solid waste management facilities being used in this manner.

As an example, the solid waste from San Francisco was used in Mountain View, California, to create a regional wildlife and recreational area (see **Figure 6.2**).³⁶

Opened progressively as cells were closed, park amenities include:

...a 50-acre small boat sailing lake operated by Silicon Shores; an 18-hole golf course; Michaels clubhouse and banquet facilities; historic Rengstorff House; irrigated meadowlands; wildlife and habitat areas, a self-guided interpretive sign system and eight miles of paved trails. Extensive wetlands include two tidal marshes, two sloughs, a seasonal marsh and storm retention basin, two creeks and five irrigation reservoirs on the golf course. Passive recreational activity opportunities include jogging, walking, bird watching, kite flying and sailing.³⁷

³⁶ Website: http://en.wikipedia.org/wiki/Shoreline_Park,_Mountain_View, Last visited July 27, 2009

³⁷ Website: http://www.mountainview.gov/city_hall/comm_services/shoreline_regional_wildlife_area/default.asp, Last visited July 27, 2009.



Figure 6.2: Shoreline Regional Wildlife and Recreation Area

Work was done on the Mountain View Project in the early 1990s, specifically plans for siting the Rengstorff House, an historic building located within the waste facility. The house has been fully restored, and is now part of a much larger recreation and conservation area. This example illustrates the potential of solid waste facilities for redevelopment as recreational and conservational areas. The redevelopment has been so successful and integrated with the community that the GooglePlex, world headquarters of Google Inc., sits adjacent to the park (see **Figure 6.3**).

Integrated planning is critical to the success of this approach. For example, with Rengstorff House, the plans were done in advance of opening cells in that area, allowing driveways, parking areas and areas for foundations to be set aside and built up with structural fill, and the grounds then prepared as landfill cells. Similarly, in the case of the Western Common, with its long-term use now determined, future trails could be accommodated in the area now occupied by the Solid Waste Management Facility.



Figure 6.3: Google Earth Image Showing Shoreline Park. (GooglePlex Bottom Centre)

6.2.4 Avoiding Visual Impacts of Borrow Pit Excavations

The commencement of operations of the Otter Lake facility in 1999 included the location of deposits of soil, which have been used for new cell construction and or cell closure/capping. The quantity of soil has been almost exhausted and new borrow pits will be necessary. The utilization of soil located at the Otter Lake site for cell construction, final closure and capping is a significant financial savings for HRM, as opposed to purchasing and importing soil from areas such as the Annapolis Valley or Stewiacke.

Figure 26 in Appendix C depicts the extent of scenic views from various points of origin on Big Indian Lake that could be impacted by proposed borrow pit activity. Areas shown in green are visible from Big Indian Lake. New borrow pit construction in the vicinity of an area directly east of the Greenhead Road could disrupt scenic views from lakes and nearby trails in the Wilderness Common. In order to preserve these views HRM Solid Waste Resources and the Mirror Group Ltd., the operators of the facility, have agreed to avoid borrow pit construction in areas that could

potentially disrupt these scenic views. In addition the de-commissioning of the borrow pits will involve landscaping, soil replenishment and planting of native trees .

6.2.5 In-holdings

There are a number of properties in the Western Common not owned by HRM. HRM wishes to purchase these lands, but not all have been successfully acquired to date. This issue is actively being pursued by HRM. The few remaining properties are largely located in the core of the Wilderness Common (see white areas on **Figure 6.4**).

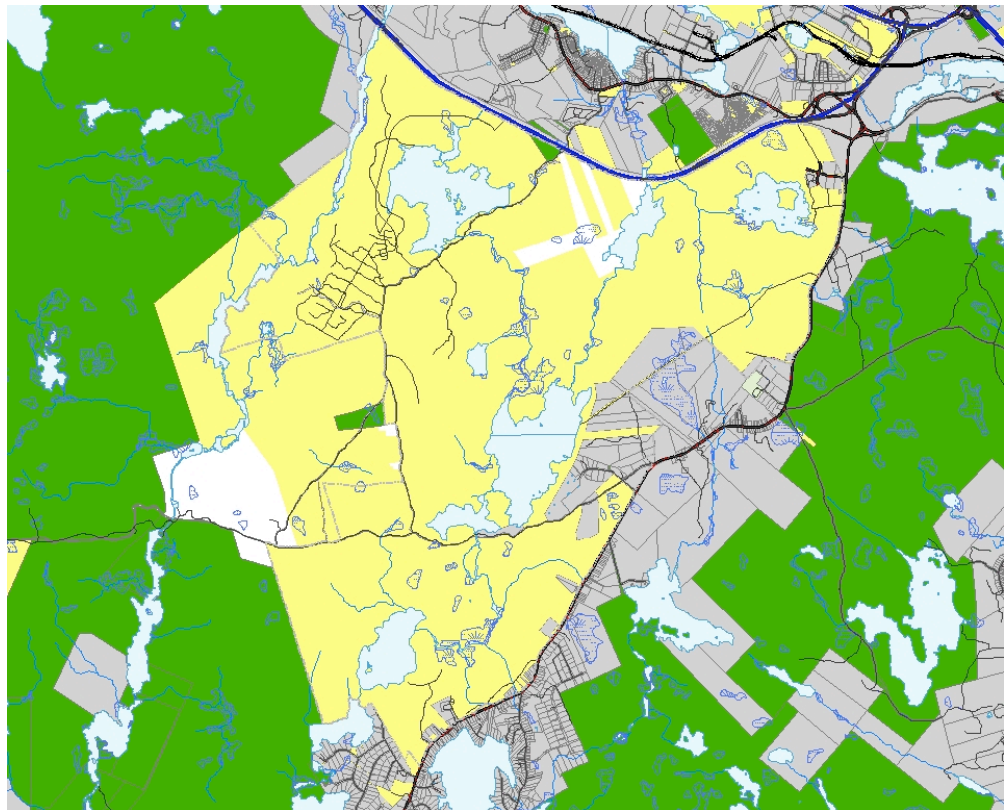


Figure 6.4: In-holdings

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6.2.6 Phasing and Costs

As Stated in **Section 6.1.4**, **Appendix F** contains the trail profiles corresponding to the trail types shown on the figures. Four levels of trail hierarchy have been developed for the Master Plan, based on designs widely used in other jurisdictions. The four levels, widest to narrowest, are, 12-foot-wide Shared-Use Trail Motorised, 10-foot-wide Shared-Use Trail Non-Motorised, 6-foot-wide Barrier-Free Trail, and the 2-foot-wide Back-Country Hiking Trail. Portages noted on the mapping will be built to the Back-Country Hiking Trail profile.

Development of the wilderness common as a regional park will be phased over 60 years (see **Figure 23** in **Appendix C**). Phase One (2010-2014) will be in the area of Nichols Lake and is light green on the map (see **Figure 6.5**). This first phase will happen over the next five years and will focus primarily on trail development and connection to the Prospect Road Community Centre (currently under construction).

Section	Width	Trail		
		Cost (\$/m)	Length (m)	Total
Barrier-Free Trail	6'	\$80.20	1,530	\$122,706.00
Back-Country Hiking Trail	2'	\$32.08	3,485	\$111,798.80

Budget: \$235,000.

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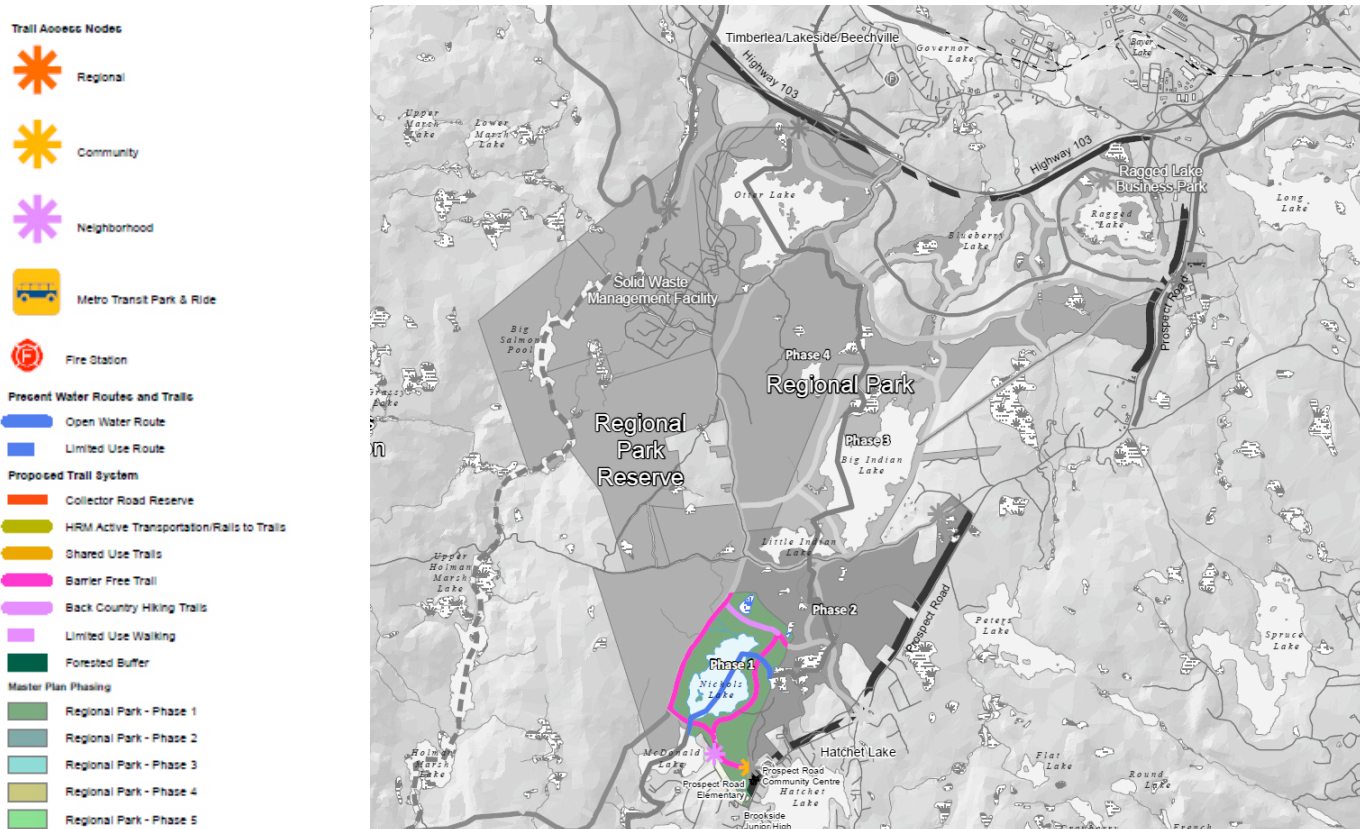


Figure 6.5: Master Plan, Phase 1

Phase Two (2015-19) of the proposed regional park, represented as mid-green, will be the area north and east of Phase One, and will extend north to the Old Coach Road and Little Indian Lake (see **Figure 6.6**). The primary trail connection in this area is a neighbourhood gateway / staging area for Goodwood. Since the Old Coach Road is to be at least partially phased out of use, only limited improvements to this access trail are recommended.

Section	Width	Cost (\$/m)	Trail	
			Length (m)	Total
Barrier-Free Trail	6'	\$80.20	3,240	\$259,848.00
Back-Country Hiking Trail	2'	\$32.08	575	\$18,446.00

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Budget: \$279 000.

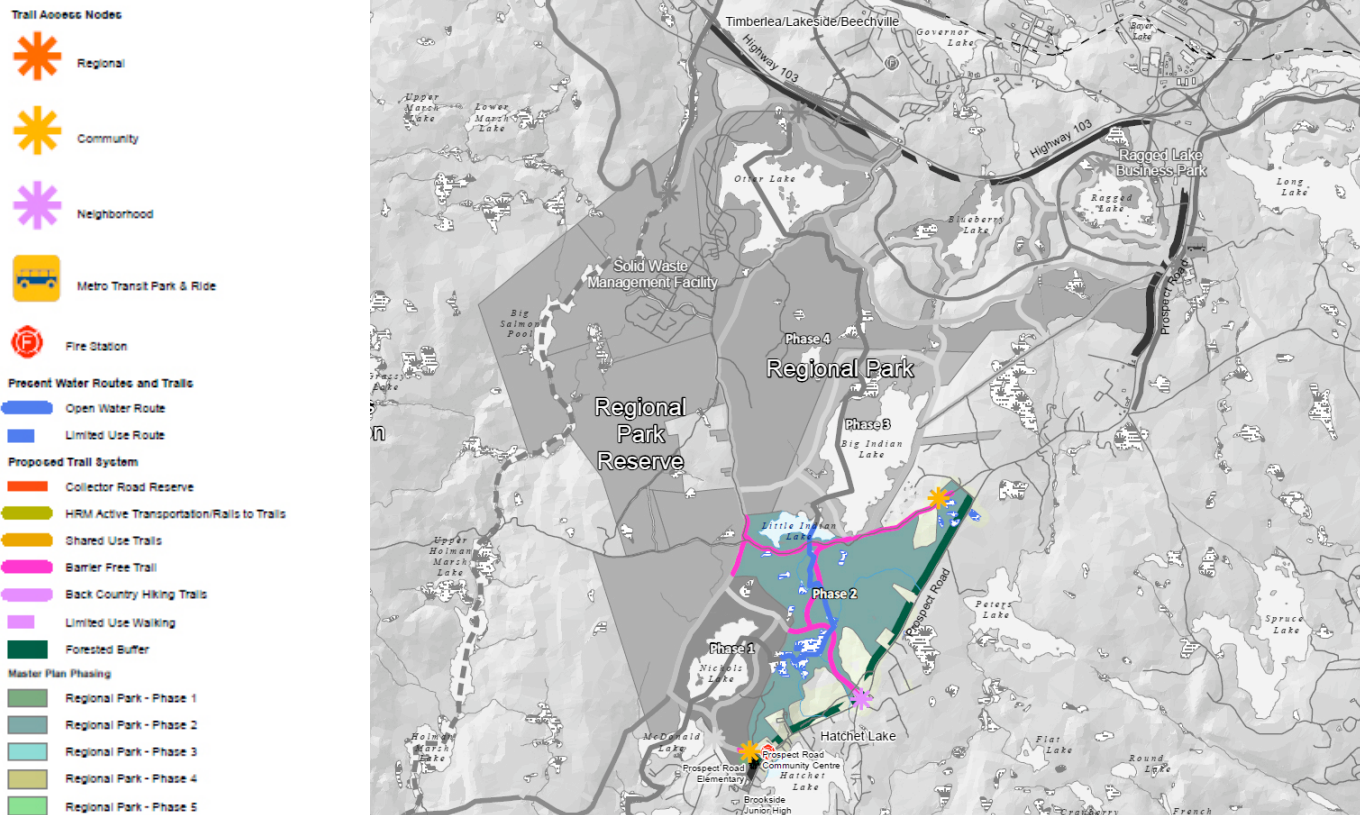


Figure 6.6: Master Plan, Phase 2

Phase Three (2020-24) of the Master Plan is the area surrounding Big Indian Lake (see **Figure 6.7**). Trail development is the primary requirement in this phase, and will concentrate of the system of trails bordering the lake. Included in this phase will be development of the canoe/kayak portages on the river system as listed in **Section 6.1.5**. Also in this phase, the construction of a fish ladder on the Big Indian Lake dam should be considered. Such a structure would likely allow reintroduction of native migratory fish species to the Prospect River system. The cost of this structure could

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likely be covered by a program such as the Federal Environmental Damages Fund,³⁸ which is administered by Environment Canada.

Section	Width	Trail		
		Cost (\$/m)	Length (m)	Total
Barrier-Free Trail	6'	\$80.20	1,450	\$116,290.00
Back-Country Hiking Trail	2'	\$32.08	4,360	\$139,868.80

Budget: \$256 000 + \$160,000 for portages.

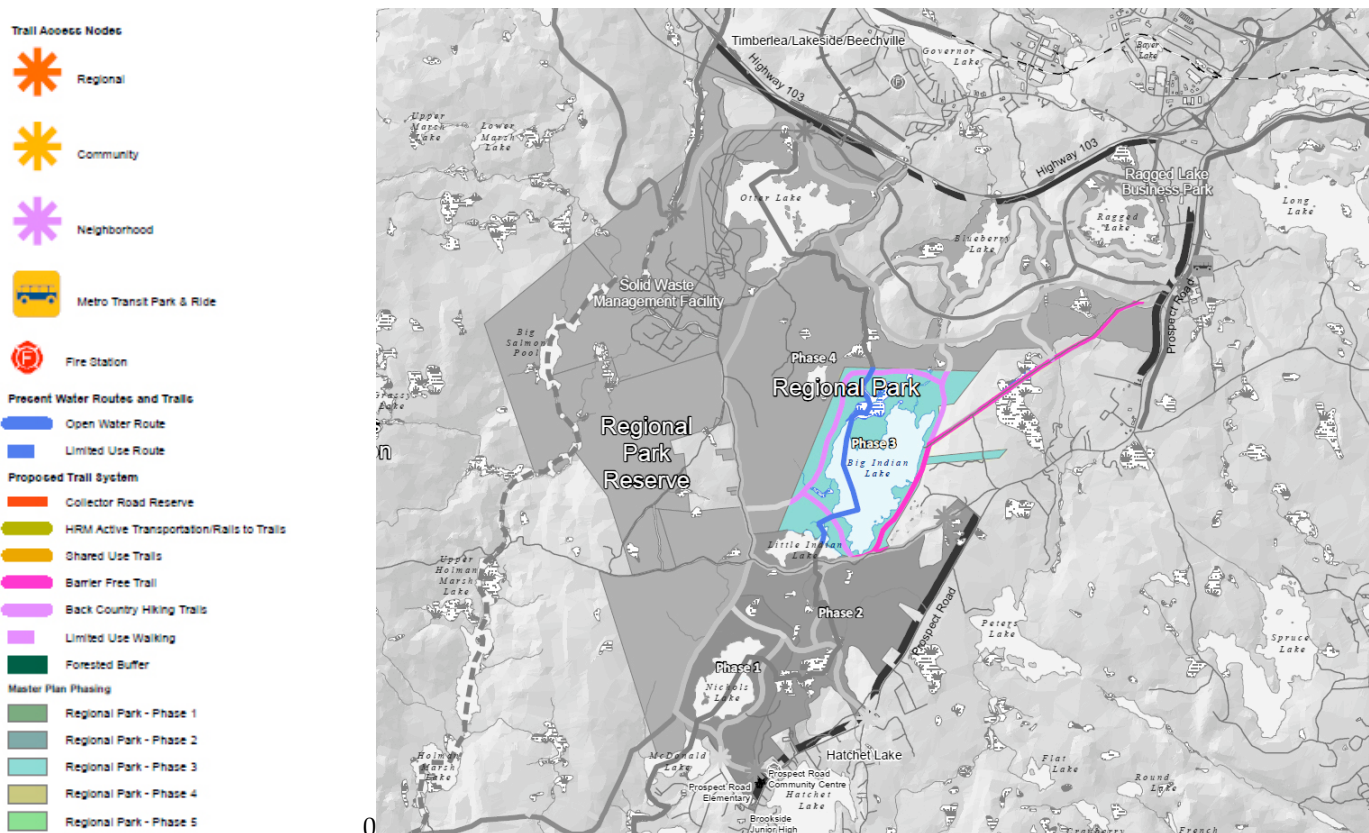


Figure 6.7: Master Plan, Phase 3

³⁸ Website: <http://www.ec.gc.ca/edf-fde/>. Last Visited November 10, 2009.

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Phase Four (2025-29), represented as dark green, includes the area of future development of Ragged Lake Business Park (see **Figure 6.8**). The primary feature of the park in this area is the linear park connecting Ragged and Blueberry lakes to the larger Prospect River System. Running through the linear park will be a trail network providing connections between areas of the business park and the larger regional park system. There is also a continued connection with the pipeline road running through Drysdale Bog connecting to the Phase-Three trails.

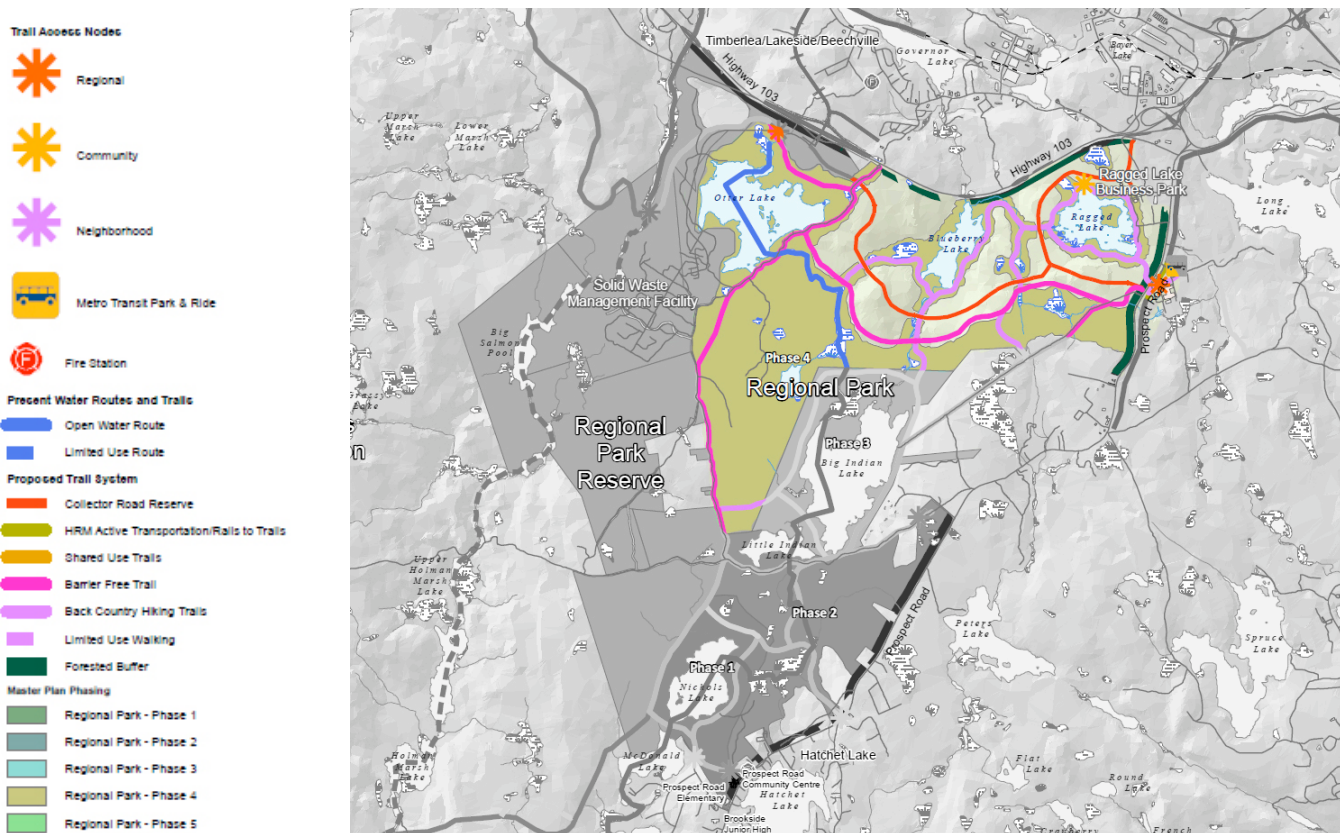


Figure 6.8: Master Plan, Phase 4

There will also be lake access points established with a boat/canoe launch and parking at Ragged Lake and Otter Lake. Precise locations for these access points depend somewhat on the final detailed trail design, but in general terms the access points will be close to roads and the lakes (indicated on the mapping with asterisks).

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The area will also function as a gateway, with a trail connection and crossing to the Exhibition Grounds and Long Lake Provincial Park.

As with Big Indian Lake, a fish ladder could be constructed at the Otter Lake dam. Discussions with the Solid Waste Management Facility on the ramifications of such a structure for the facility and its operation should be undertaken.

Section	Width	Trail		
		Cost (\$/m)	Length (m)	Total
Barrier Free Trail	6'	\$80.20	2,930	\$234,986.00
Primitive Hiking	2'	\$32.08	12,450	\$399,396.00

Budget: \$650,000.

6.2.7 Phase Five—Solid Waste Management Facility

The final phase of the park is contingent upon closure of the Solid Waste Management Facility. As the facility requires a 30-year period of post-closure monitoring by the operator, any park development in the area will take place after this period has expired. This is likely 60 years in the future, and any recommendations on amenities would be difficult to make at this early stage. The intent of the Master Plan is to ensure this area eventually becomes part of the Regional Park; therefore, it has been designated as a Regional Park Reserve (see **Section 6.2.1**). The area extends from Highway 103 South to the Nichols Lake area (see **Figure 7.9**).

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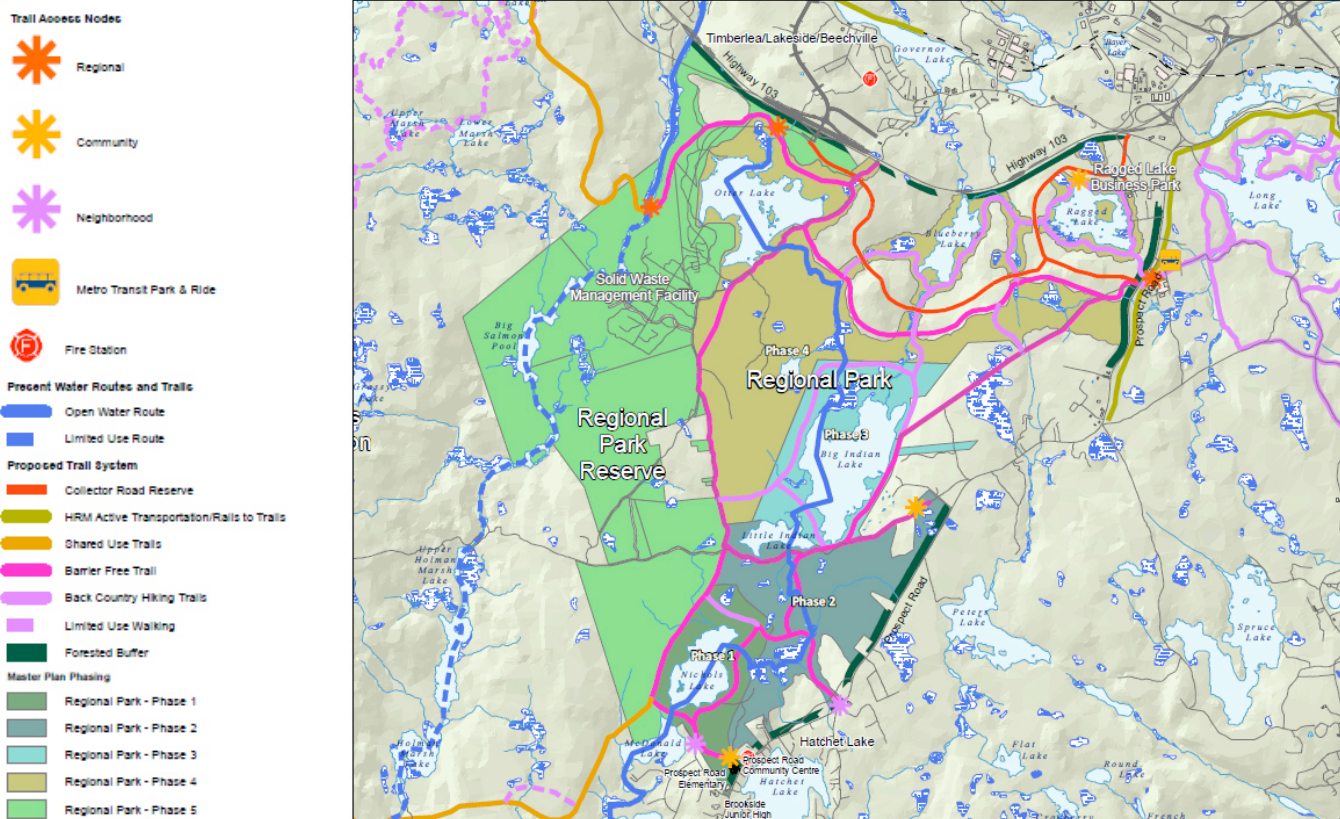


Figure 6.9: Master Plan, Phase 5

6.3 FOREST MANAGEMENT

The primary recommendation regarding forest management in the Regional Park is the drafting and implementation of a detailed forest management plan. To that end, the following points should be considered:

- Forest management planning for the Regional Park should be developed following principles of sustainable management such as those identified by the Canadian Council of Forest Ministers. Key elements should involve determination of management values associated with the area and those adjacent to the area as part of public and other stakeholder discussions. Planning should consider the context of the existing ecosystem condition and potential climax forest for the landscape type, as well as integration with other park goals. Forest management standards for the Wilderness Common should be consistent with those adopted by HRM for the Point Pleasant Park Comprehensive Plan (see **Appendix G**).

Sustainable forest management criteria applicable to this proposed wilderness park area include:

- Biological (Ecosystem, Species and Genetic) Diversity—Typically, diversity goals maximize forest diversity inherent in the natural ecosystem, focusing on native species, protecting “special habitats or species”—including at-risk species—and controlling invasive or other non-native introduced species.
- Ecosystem Condition and Productivity—Management should enhance the system’s ability to rebound from natural disturbances, such as hurricanes, insect infestation, fire or long-term climate changes, or man-made disturbances such as historical agriculture or development. Productivity goals should reflect the natural ecosystem’s productivity.
- Soil and Water—The role of the forest in protecting natural soil and water quality should be understood and maintained.
- Role in Global Ecological Cycle—Similarly, maintaining or enhancing the natural Western Commons forest’s ability to absorb and store greenhouse gases (particularly CO₂) is a consideration in sustainable forest management.

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For each of the five phases outlined by the Master Plan, the following steps should be considered:

- Develop forest management objectives and targets—Identify public and other stakeholder values associated with the forest/habitats and land uses.
- Determine existing forest conditions—Conduct complete forest inventory in each area prior to development of a specific management plan (required because the inventory will improve our baseline information/ data in light of the objectives and targets; i.e., objectives and targets should shape the inventory) (see **Figure 24** in **Appendix C**).
- Identify and protect significant forest and other habitat features—Conduct at-risk species surveys in each area prior to development of a specific management plan and identify “no-go” and “limited access” or “special management” areas.
- Identify wetlands, watercourse buffers and wildlife corridors—Survey wetlands and protect them, and determine watercourse buffer requirements consistent with water quality objectives and wildlife corridors to promote biological diversity. Although numerous distinct wetlands have been identified for the property, it is important to note that many other smaller wetland features are likely present and should be protected.
- Determine management related to non-native invasives—Determine if plants deleterious to the natural ecosystem are present, and develop appropriate management actions for each area.
- Determine areas where forest management intervention may be required for public safety reasons, such as blow-down or fire risk, and areas where the natural diversity needs protection from invasive plants or insects.
- Identify forest areas of significant natural value (such as potential red spruce climax stands) or educational value (such as old field white spruce that may be highlighted by the park).
- Identify areas where viewplanes may be a significant forest value, such as along lakes and waterways.

General management approaches to issues identified during the 2007 forest walkover assessment include the following:

- Maintenance of forest stand diversity and forest health—The current forest stands in most of the park areas have limited species diversity compared with

inventory (NSDNR) data for the surrounding area. This condition is due in part to the prevalence of overmature balsam fir stands. These stands are in the process of breaking up and may result in widespread openings or gaps in the short- to medium-term. During natural forest succession/regeneration, this condition will likely be repeated, creating successional opportunities for other species. Controlling or guiding the extent and location of these openings to promote targeted succession should reflect the overall management goals. Typical interventions may include selective harvesting in some areas to allow shade-tolerant hardwood and softwood species to become established, or cultivation of seed-bank trees of the climax forest type. Insect infestation may also require active intervention to prevent further deterioration of forest stands. Areas with extensive blow-down are not expected to benefit from re-plantings, as natural regeneration is evident.

- Old field white spruce—The field trip revealed that some areas of old field white spruce were also overmature and subject to stand breakup. The temporary loss of these stands will facilitate natural regeneration.
- Sustainability of forested buffers—Maintenance of isolated buffer zones is difficult, as these areas are subject to blow-down. The policy of a minimum buffer width of 100 metres should contribute to the integrity of these stands, but approaches such as creating zones of high trees along edges and encouraging windfirm species may be considered to increase the chances of maintaining the buffer zones. The proposed 100-metre buffer offers an excellent physical management opportunity, because accessing the areas would have little impact. Management activities could sustain the buffer's effectiveness and the road corridor's visual appeal (see **Figure 6.10**).

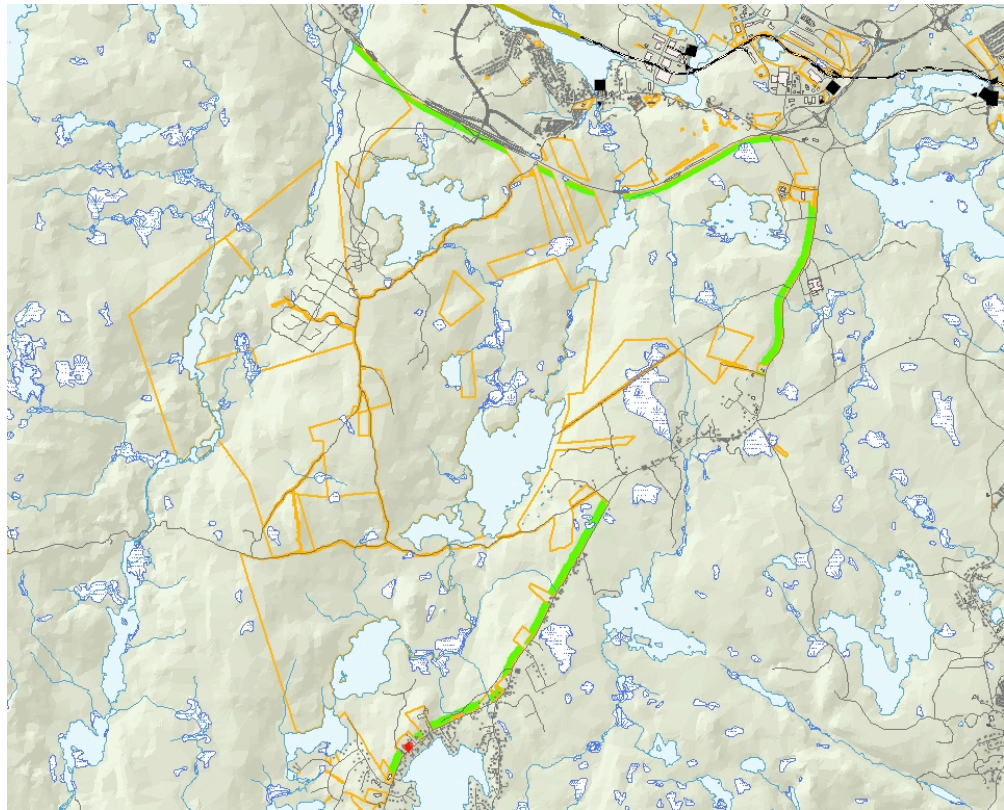


Figure 6.10: Forested Buffers

6.4 CULTURAL HERITAGE

Conservation of cultural heritage is a key element of the Master Plan. Further research concerning cemeteries and farmsteads in the former Greenhead Settlement will be conducted in order to preserve and interpret the cultural heritage of this area. The potential of pre-contact archaeological sites will also be considered throughout the development of the regional park.

As identified in **Section 3.5**, there are several known cultural heritage sites in the area, with three new archaeological sites identified during the course of this study (see **Figure 6.11**). The exact location of and details about the sites are protected by the provincial *Special Places Act*, and cannot be discussed in further detail at this time. These important locations will be included in trail development, as the opportunity for interpretation and public education exists, and will likely be supported by the *Special Places Program*. The identified sites are of local importance and should be included in the Master Plan. A detailed archaeological study in accordance with

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provincial legislation should be undertaken to facilitate the development of these cultural resources.

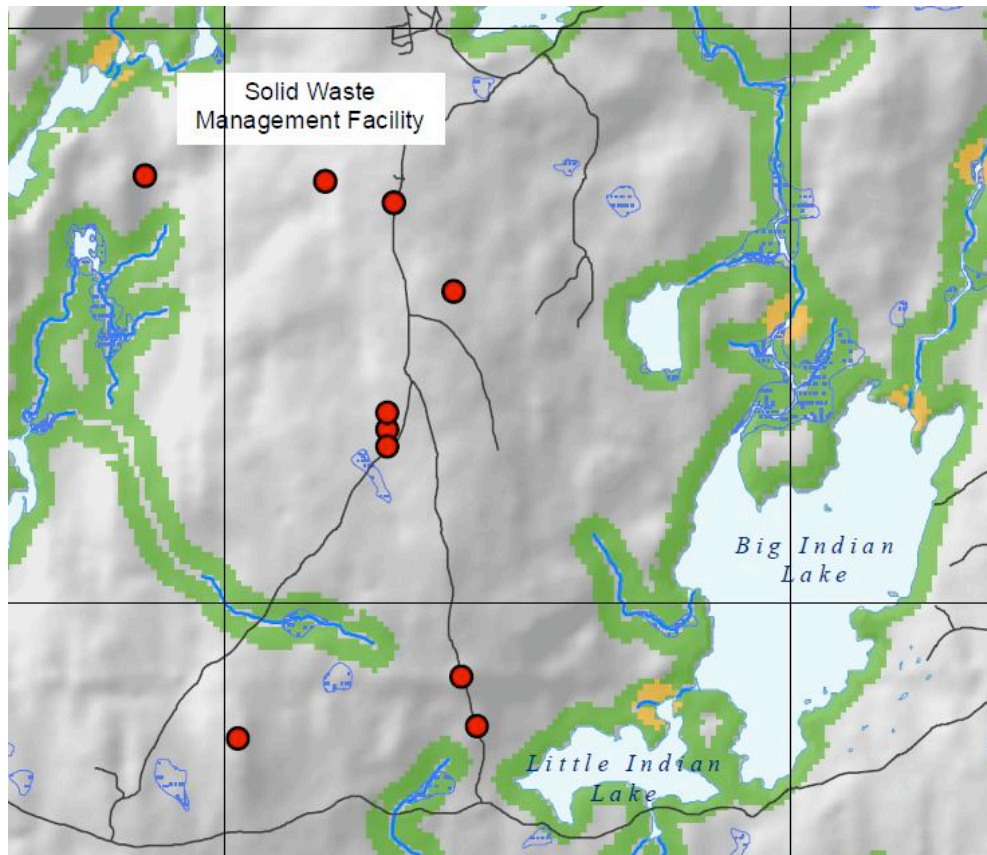


Figure 6.11: Known Registered and Non-Registered Cultural Heritage Sites

6.5 SUMMARY

The Master Plan for the Wilderness Common originated with the 1999 Concept Boundary, and has been refined and updated based upon consultation and landscape analysis. The Master Plan is augmented by Chapter 7, which provides a concept plan for the wider context of the Chebucto Peninsula. The Master Plan is not contingent upon this vision, but is enhanced by it.

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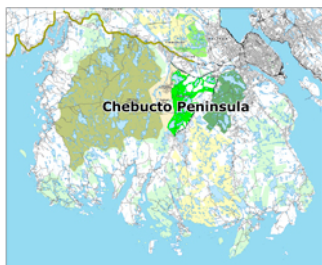
The Master Plan provides a promising opportunity for the development of a Regional Park. The plan's five phases, based upon trail development, landscape, and population distribution, offer a practical approach to park development. As mentioned, the restrictions placed upon the landscape by the proximity of the Solid Waste Management Facility, as well as the existing WC Zone, provide a level of protection to the land until the phased development is complete.

Cooperation and involvement of the public is an important aspect of this Master Plan. It is therefore recommended that an advisory committee be established for the long-term stewardship of the Wilderness Common Regional Park. The complexity of issues surrounding this landscape makes the task of implementing the Master Plan a challenge. Close proximity and likely expansion of the Solid Waste Management Facility and expansion of the Ragged Lake Business Park are just two of the many challenges.

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THE CHEBUCTO PENINSULA CONCEPT PLAN

7. CHEBUCTO PENINSULA CONTEXT



Chapter 7 is an expansion to the Master Plan that presents a vision for the Chebucto Peninsula, addressing some of the most pressing recreational and ecological issues on a significant portion of the Crown Lands on the Chebucto Peninsula. Since it requires the Province's leadership, it is separate from the Wilderness Common Master Plan and is included for discussion purposes only.

Any future planning concerning Crown Lands in western areas of the Chebucto Peninsula will require the leadership of the provincial government. The Province and HRM have been active in integrated planning approaches since the advent of the HRM Regional Plan. As discussed in this chapter, it is possible that this cooperative arrangement could continue for public lands on the Chebucto Peninsula. Although maps and rationales for the high-level concept plan outlined in the following sections have been presented to the provincial Department of Natural Resources (DNR) and Nova Scotia Environment (NSE), further detailed research and consultation will be required before any decisions can be made. Given that Crown Land management and OHV trails are under DNR jurisdiction, planning for the area would be coordinated by DNR. While the concept plan could provide an effective solution for some of the issues facing the Crown lands, it should only be considered as a hypothesis at this time.

Although the 3,500-hectare HRM Wilderness Common is a significant patch of landscape, it lies close to the centre of over 26,000 hectares of Provincial and Crown lands on the Chebucto Peninsula. While the information and suggestions included in this chapter appear to stray from the scope of a Master Plan for the Wilderness Common, they provide a necessary geographical, ecological and human-use context for the Wilderness Common. The stakeholder interviews for the Master Plan involved over thirty individuals and organisations with extensive knowledge of and interest in the Wilderness Common and the Chebucto Peninsula. It became clear during these interviews that many felt the importance of the Wilderness Common lands was based as much or more on its relationship with the rest of the Chebucto Peninsula than to any specific characteristics of the Common itself.

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This is what we heard and learned. The Western Common lands provide connectivity for people and wildlife. People use the Western Common as a gateway to the Chebucto Peninsula. They travel by bicycle, foot, OHV, and canoe/kayak. Many wildlife species (including bear and moose) range through the Commons. It provides important habitat connections to the large Crown holdings to the west, and the Long Lake/Terrance Bay Wilderness Protected Area to the southeast.

Although centred on the theme of connectivity, the research and interviews revealed two diametrically opposed land uses that in turn defined two key issues related to the Wilderness Common and the Chebucto Peninsula. From one perspective, the Common was viewed as an important staging ground for travel to and from local communities, the Greenhead and Old Coach Roads. The Western Common is used to gain access to nearby Crown lands valued for hunting, fishing, camping and other recreational uses. Travel throughout both areas is mostly by way of OHVs, followed in frequency by hiking and water route access. From the other perspective, the area habitat was also highly valued as the homeland of about thirty Mainland Moose, an endangered species threatened with local extinction by increasing levels of human incursion. Any plan for the area must consider the wider context and try to balance recreational use and environmental sustainability, especially when an endangered species is present. These considerations have made it evident that a concept plan is required that considers the relationship between the Wilderness Common and the rest of the Chebucto Peninsula.

Government policies support the preliminary concept plan developed to address these issues. DNR's Recovery Plan for Moose in Mainland Nova Scotia states that "Nova Scotians value moose as part of the Province's identity and have a stake in the recovery of mainland moose."³⁹ It also states:

The introduction of snowmobiles in the 1960s and ATVs in the 1970s has led to increasing popularity of OHV travel in areas where traditional motor vehicles such as cars and trucks cannot easily travel. OHV numbers have continued to rise, resulting in increased access for humans into the backcountry. OHV owners have cut mosaics of trails over the landscape often in remote areas with the highest quality occupied habitats remaining,

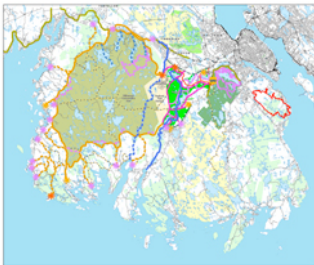
³⁹ NSDNR, *Recovery Plan For Moose (Alces Alces Americana) in Mainland Nova Scotia*. 2007, piii

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increasing opportunities for poaching. OHVs and their impacts have not been adequately studied to fully understand and discern what direct and indirect impacts they may be having on moose.⁴⁰

HRM's Regional Plan also anticipates the challenges of protecting the natural environment from harmful human influences and points to the benefits of integrated planning approaches to achieve environmental sustainability. HRM's Regional Plan states:

Encompassing Atlantic Canada's largest urban centre, HRM's natural environment is under constant pressure from the impacts of urban development. Despite these impacts, HRM's natural environment continues to support large mammal populations such as moose and bear, provides groundwater resources to one quarter of HRM's population for drinking water supply, and supports numerous natural features such as lakes, rivers, estuaries, and forest systems that are worth preserving...



Many of the lands within the natural network are under federal or provincial jurisdiction. Private landowners and non-governmental organizations also have an important stewardship role in protecting the natural network. This Plan promotes the cooperation of other government agencies, private landowners, and non-government organizations to achieve good environmental management and planning that supports a more environmentally sustainable form of development in HRM.⁴¹

Given the framework indicated above, the Chebucto Peninsula Concept presents a potential vision using a principled approach for the wider context of this study (see **The Chebucto Peninsula Concept, Appendix E**). While this peninsular vision frames the outcome and provides guidance as a corollary to the Master Plan, adopting the concept plan would not interfere with the specific courses of action for the Wilderness Common laid out in the Master Plan.

The concept envisions an integrated planning approach between the Province and HRM that would include opportunities for active representation by individual

⁴⁰ *Ibid.*, p.15.

⁴¹ HRM, *Regional Municipal Planning Strategy*. August 2006, p. 19.

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citizens and non-governmental organisations. The system of open space and trails proposed by the concept should be seen as a single system, optimised for connectivity, environmental sustainability and cost effectiveness. The Provincial and Municipal lands are contiguous in boundary, landform, and ecosystem, making an integrated approach desirable.

7.1 THE MAINLAND MOOSE AND ECOLOGICAL CONNECTIVITY

Two principles shaped the concept plan. First, connectivity for people and wildlife is the underlying thread identified by interviewing and research for the Western Common Wilderness Common. The Wilderness Common's proximity to HRM's Urban Core presents both opportunities and challenges for balancing wildlife and connectivity requirements, and recreational use. In addition, the Common is located in the centre of the Chebucto Peninsula between large Crown Parcels, one of which is a designated Provincial Wilderness Area. The Wilderness Common connects these areas.

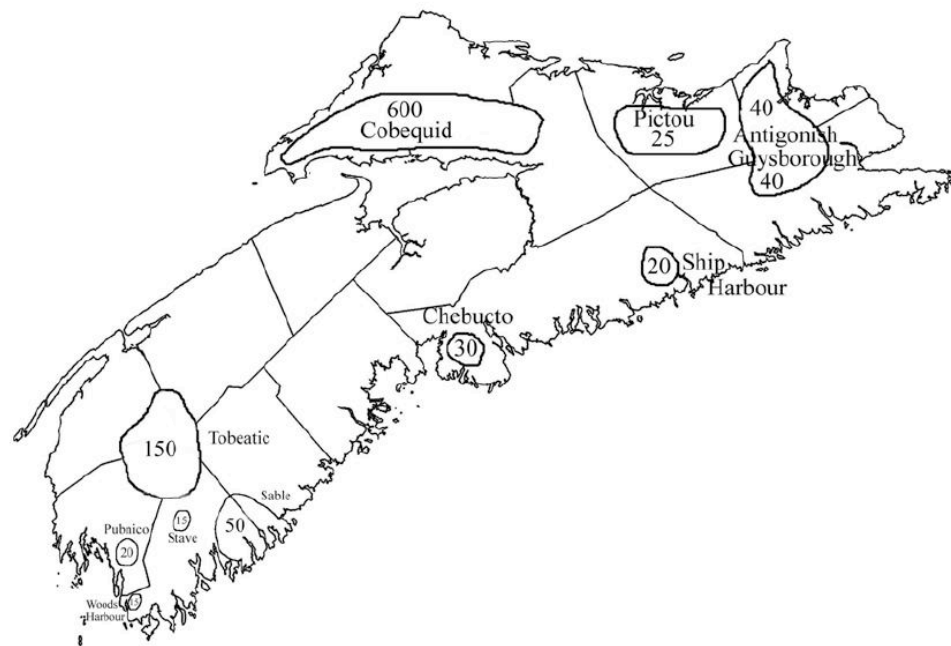


Figure 7.1: Core Distribution of Mainland Moose

The second principle is consideration of the presence of the endangered Mainland Moose on the Chebucto Peninsula. The Mainland Moose (*Alces alces americana*) was designated an endangered species under the *Nova Scotia Endangered Species Act* (1998) in 2003, which provides guidance for any plans for the area, stating that any

proposed use of the area may not interfere with the moose or its habitat.⁴² Spatial distribution of the Mainland Moose populations in Nova Scotia are identified in the status report drafted as part on the Moose Recovery Program under the Act. An estimated population of 30 moose has been identified on the Chebucto Peninsula (see **Figure 7.1**).⁴³

DNR wildlife biologists recently used Global positioning system (GPS) technology to track the movement of mainland moose on the Chebucto Peninsula. A few moose have been humanely captured and fitted with temporary collars that transmit radio signals. Research compiled by DNR implies that the remaining moose population has likely been stressed by increasing levels of human activity and has retreated to one of the last unfragmented patches of Crown lands roughly northwest of the Wilderness Common.⁴⁴ Other researchers in Nova Scotia have shown that the detrimental effects of road and trail access into wilderness areas are contributing factors to the decline of moose populations. Increased access not only stresses moose through further human contact, it can also facilitate poaching.⁴⁵ The need for increased research and investigation into the Mainland Moose and associated recovery efforts is an ongoing concern, as pressing environmental issues such as climate change have emerged that could further threaten the viability of the species.

7.2 OHVS AND HUMAN USE OF THE CHEBUCTO PENINSULA

The Chebucto Peninsula likely contains over 300 km of ad-hoc OHV trails created over the past two decades. About 175 kilometres of these trails have been mapped,⁴⁶ as well as a variety of other hiking and cycling trails. With over 20 canoe and kayak routes also found in the area, recreation-based human intrusion is extensive.⁴⁷ These trails form a vast unregulated network that provides human access to virtually every part of the Chebucto Peninsula. Abandoned road right-of-ways (K Class Roads) still owned by the Province provide the backbone of the system, with smaller spurs

⁴² *Nova Scotia Endangered Species Act (1998)*, c. 11, s.13

⁴³ Parker, Gerry, *STATUS REPORT on The Eastern Moose (Alces alces americana Clinton) in Mainland Nova Scotia*, June 6, 2003, p.63.

⁴⁴ Doug Archibald, Tony Nette, DNR Wildlife Biologists, Personal Comments

⁴⁵ NSDNR, *Recovery Plan For Moose*, p.15.

⁴⁶ Safety Minded ATV Association, *GPS Map*, 2008. (Does not include the trails running through the Terence Bay WPA.)

⁴⁷ Soudek, Dusan (Canoe/Kayak Nova Scotia). *NTS Map 11D12 with Canoe Routes*, 2008.

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running to various communities around the peninsula over Crown lands and private lands through land-use agreements.

The existing system of ad-hoc OHV trails serves two purposes. First, the trails provide a recreational transportation link between communities on and beyond the Chebucto Peninsula. Second, OHVs are used to access hunting and fishing camps. The Old Coach Road, Greenhead Road and the Lewis Lake fire road are the principal routes (see **Figure 7.2**).

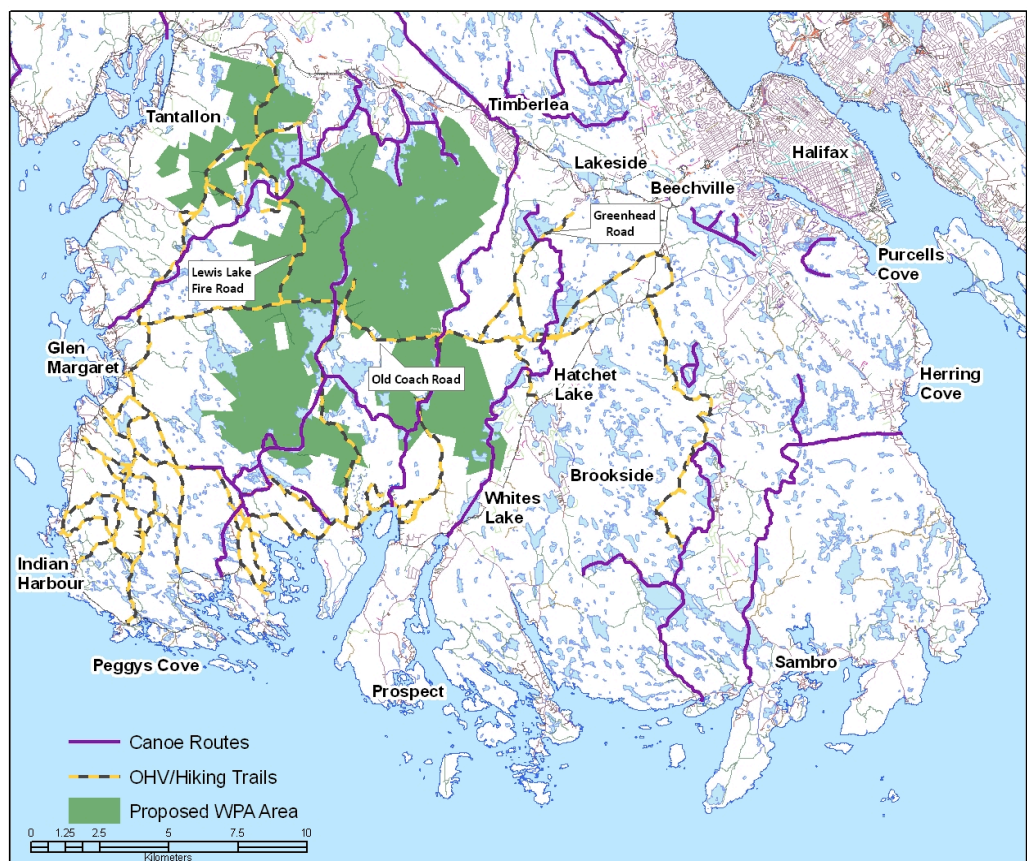
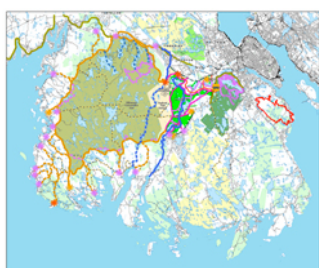


Figure 7.2: OHV and Water Route Trails

These existing routes have not been maintained for many years. The roadbeds have become seriously eroded, to the point that many sections are below grade and nearly impassable. The St. Margarets Bay Responsible ATV Association recently proposed upgrading the Old Coach Road and Lewis Lake fire road corridors, using the Off-

Highway Vehicle Infrastructure Fund administered by NSDNR and NS Health Promotion. While these upgrades would improve access to and across Crown lands, they would also permanently divide the landscape into several pie-shaped fragments (see **Figure 7.2**). Should these improvements be made, subsequent improvements and expansion of the ad-hoc trail network feeding those access trails would also likely take place.



7.3 THE CHEBUCTO PENINSULA CONCEPT PLAN

The concept plan developed for the Chebucto Peninsula provides a big- picture view using a principled approach that considers both the presence of an endangered species and the recreational needs of outdoors enthusiasts. Ecological connectivity and human access are factors critical to the success of this initiative. The Chebucto Peninsula Concept plan addresses these issues by incorporating opportunities in the Wilderness Common and on Crown lands for a comprehensive trail system running around rather than through the habitat of an endangered species. The approach is consistent with provincial and municipal policies. Although the following framework focuses on spatial planning issues, it does not address timelines and phasing. Suffice it to say that the vision may take decades to achieve and will require an integrated effort from citizens, the Province, and HRM.

The concept plan has four components:

- a) Wilderness Conservation Area
- b) Regional Park Reserve
- c) Regional Park
- d) Multi-Use Trail System

To serve as a guide to the concept plan, we adapted the Parks Canada approach to managing landscapes and recreational activities in national parks. Areas are generally designated for “front country,” “back country” and conservation purposes. Front country areas in the Wilderness Common Regional Park will feature developed trails and formal park gateways that could include amenities such as parking lots, potable water and washrooms. Back-country areas in the Regional Park Reserve will be less intrusively developed to provide rudimentary amenities such as trail systems

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and canoe route portages. Conservation areas on portions of the Crown lands will be devoted to habitat and wildlife preservation, species restoration and scientific study.

7.3.1 Wilderness Conservation Area



According to research completed to date, the effects of human incursions on Mainland Moose habitats are highly complex. It is thought that their decline could be linked to a combination of factors unknown at this time. Further research is needed to discover ways for the recovery of this species. For this reason, a wilderness conservation area could be established over time that would gradually limit access to the area for recreational activities and instead focus on habitat restoration and scientific research. The area could provide an excellent laboratory for much-needed scientific research on the moose and other species, and its proximity makes it ideal for scientists from local universities and government agencies. It is also conceivable that the area could become an educational resource for schools and the community through interpretation centres and collaborative citizen science research opportunities.

The exact mechanism for developing the conservation area has not been defined in this document; however, existing provincial mechanisms, such as the Wilderness Protected Area (WPA) designation, can be considered. A WPA designation for this area would be unlikely to provide the breadth of protection required for moose recovery as low-impact activities such as hiking, camping and canoeing are permitted. As conditions permit, limited amounts of hunting and trapping could also be allowed. There is also the possibility under the WPA designation for OHV trails to be included, as they would trisect the peninsula, resulting in further habitat fragmentation. Should the concept plan be adopted, it will be the responsibility and jurisdiction of the provincial government to define the appropriate moose recovery program for the management of the Commons area.

Most of the Provincial landholdings comprising the Wilderness Conservation Area were recently designated as a Provincial Candidate Protected Area by Nova Scotia Environment. This designation, made on October 16, 2009, complements the vision of the concept plan.



7.3.2 Regional Park Reserve

This area would have limited access and amenities, and would be left mostly untouched. Recreational uses such as hiking and possibly camping would be allowed, but not extensively. The area includes HRM's Otter Lake Facility, which will eventually become a functioning part of the Reserve. In time, it is intended that the Reserve will be designated as a Regional Park.



7.3.3 Regional Park

The area designated as Regional Park would function somewhat like the front county in a National Park, with various active recreation amenities and improved access trails. Ecological goals of this designation would be connectivity with Long Lake Provincial Park and the Conservation Area, as well as preservation of the water quality of the Prospect River system. Community recreation facilities and access points would be included, as well as regional access to the wider Chebucto Peninsula.

7.3.4 Multi-Use Trail System

The Multi-use trail system proposed for the Chebucto Peninsula ties the three land components of the concept plan together. The primary challenge in realising the plan's goals was redirecting users away from the conservation area core to the periphery, while creating an integrated trail system for bicycle, hiking and OHV access to and from the various communities around the peninsula. The result is a proposed 98-kilometre multi-use dual carriageway trail that runs along the edge of the Crown parcels, along K Class roads or along established OHV routes (see **Figure 7.3**). As proposed, there are only two small sections that will require land acquisitions. Please note that while the trail alignment depicted was designed using available terrain and ownership information, further detailed planning will be required prior to construction. Timelines for development and project phasing will also require further planning.

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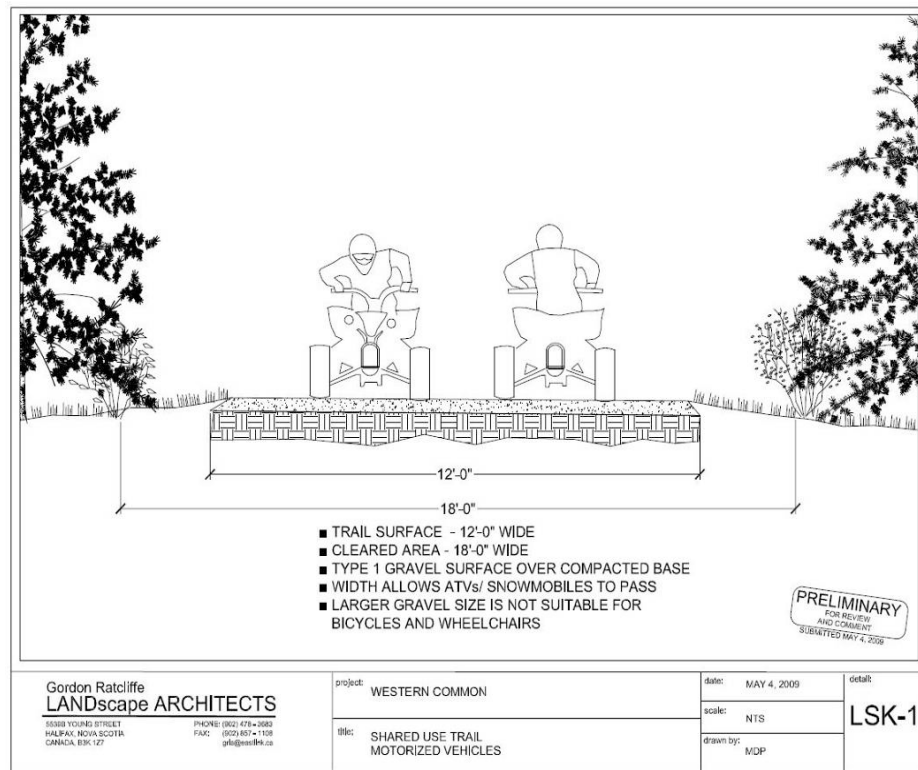


Figure 7.3: Proposed Multi-use Trail Profile

Dual carriageway entails the construction of a smaller 2-foot-wide hiking trail running parallel, but not necessarily directly adjacent to, the larger 12-foot-wide motorised trail. Note that a standard non-motorised multi-use trail is 10-foot-wide. This small increase in width will accommodate motorised use by OHVs, while providing an excellent trail for use by cyclists and hikers. This increased standard may only be necessary at trailheads and intersections, and trail sections heavily used by hikers. In fact, development of the trail systems will likely be phased over time, with trails being established by volunteers and OHV clubs. The resulting trail profile will likely start narrow and develop gradually, and will be widened according to need. The dual carriageway design should be a template for the ultimate build-out of the trail system, but should not constrain trail development by requiring a wider profile than is initially feasible.

Construction of the main ring of the new trail system will likely be funded from provincial sources, primarily the Off-Highway Vehicle Infrastructure Fund administered by NSDNR and NS Health Promotion (see **Trail Profiles** in **Appendix**

F). The cost could be reduced significantly through use of community volunteer labour. The communities along the trail route will be able to access it through local spurs. There are at least six fire stations with direct access to the trail, providing emergency response to any incident on the trail, and fire fighting in the event of forest or brush fire. Since the multi-use trail is design for motorised use, it is also an effective fire road and potential fire break.

OHV use of the trail system will be subject to the Off-Highway Vehicle Infrastructure Fund guidelines requiring OHV owners to register and insure their vehicles, and to have proof of membership in a recognised OHV club. Additional measures requiring exhaust silencers and speed limits could also be established. Enforcement of regulations would be a DNR responsibility.

As new alternate connecting routes are established on the multi-use trail, phasing of trail development will include eventual decommissioning of trails within the conservation area.

7.3.5 Additional Benefits of the Plan

The tourism potential of the trail system is substantial. Not only could it become an attractive trail for cyclists and OHV enthusiasts, but it would provide a safe active transportation link to Peggy's Cove, one of the main tourist destinations in Nova Scotia. In addition, trail users will have access to all the communities and their businesses along Highway 333 from the Western Common to Tantallon. Cyclists, for example, could start at Otter Lake for a ride to Peggy's Cove. They would then be able to access B&B's, restaurants, stores, and other businesses from the trail system, all while travelling through a beautiful landscape of forests, barrens, lakes and streams

Current Active Transportation options for getting to and from Peggy's Cove are limited to the shoulder of Highway 333. There have been paved-shoulder upgrades to limited sections of this road, and more are being considered. Transportation researchers, planners and Active Transportation (AT) advocates have examined the best practices of how to bring motorised vehicles and AT users into close proximity safely and efficiently. Several key strategies are common in these studies, most notably the relationship between vehicle speed, driver response time and the injuries sustained by AT users. Similarly, rural roads are ill-suited to shoulder bike lanes in

speed zones over 50 km/h, where drivers do not have adequate time to brake or avoid collisions. (Appendix H discusses these findings in more detail.) The option in this plan for an AT corridor separate from the road avoids the significant safety problems posed by the Highway 333 option.

The proposed trail system is successful because it lets users go where they want to go. The fact that 18th Century British Army engineers saw the Old Coach Road as a direct marching route for the efficient military defence of Halifax's west flank does not mean the road provides a great trail experience, nor that it is efficient in getting people where they want to go today. Many existing trails connect with coastal communities on the Chebucto Peninsula; the proposed trail connects all of those communities. The trail also pays attention to the terrain and points of interest, not just the shortest path from A to B; however, while the trail is designed for recreational use, it still provides efficient access to communities along its route. This is something the existing collection of ad-hoc trails does not and cannot accomplish.

The Chebucto Peninsula Concept Plan accomplishes the following objectives:

- Facilitates implementation of the Moose Recovery Plan
- Enhances and preserves ecological connectivity for wildlife and restores the landscape to an unfragmented state
- Provides a world-class multi-use recreational trail resource
- Allows trail users to access communities, food, fuel, and accommodations on the Chebucto Peninsula
- Provides OHV users with a challenging and beautiful trail system designed to accommodate motorised use
- Is consistent with the Regional Plan and Provincial Wildlife Policies
- Meets the Western Common Wilderness Common requirements for trails and connectivity
- Provides for continued OHV transit on multi-use trails that will border the Wilderness Common Regional Park, rather than fragmenting the park as they currently do

7.3.6 Support for the Plan

The plan offers solutions to the most pressing recreational and ecological issues on the Chebucto Peninsula. It provides HRM and the Province of Nova Scotia with a multi-use trail experience for tourist and local residents, and protects the habitat of

an endangered species—all in an area less than 30 km from downtown Halifax. Stakeholder groups such as the Chebucto Wilderness Coalition, the St. Margarets Bay Safety-Minded ATV Association, the Ecology Action Centre and the Canadian Parks and Wilderness Society have reviewed and shown support for the concept plan. The HRM Western Common Advisory Committee has also endorsed further efforts to develop the concept plan.

7.3.7 A Laboratory, Education Centre, and World-Class Trail

The Chebucto Peninsula Concept is a principled approach to a challenging set of circumstances. The ring trail defragments landscape and offers an unprecedented opportunity to establish a research laboratory in support of the Moose Recovery Plan, as well as educational opportunities for the public. The proximity of key governmental and university scientists and researchers makes the Chebucto peninsula ideal for studying the recovery of the Mainland Moose and other species in the area.

Establishment of the habitat laboratory offers great potential for educational opportunities. The following benefits and possibilities for the area have been discussed with community stakeholders, DNR and HRM:

- The ring trail would divert people from the core habitat
- Educational opportunities include:
 - Satellite-collar, real-time display on the web
 - Use by schools for field trips
 - Display downtown at a “Moose Kiosk” along a street such as Spring Garden Road
 - Kiosk similar to falcon display by University of Calgary in Regina⁴⁸
 - Solar-powered web cams at moose hot spots for display at the kiosk
 - Interpretative centre providing pertinent information

⁴⁸ Website: <http://falcon.unibase.com/>, lasted visited July 24, 2009.

8. APPENDICES

Appendix A: Western Common Zoning

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Timberlea/Lakeside/Beechville LUB

PART 20A: WCRPK (WESTERN COMMON REGIONAL PARK) ZONE (Change in name of zone - RC-June 27/06;E-Aug 26/06)

20A(1) WCRPK USES PERMITTED

No development permit shall be issued in any WC (Western Common) Zone except for the following:

- Conservation related uses
- Trails, picnic areas and wilderness campsites
- Public and private parks and playgrounds
- Recreation uses with the exception of golf courses
- Historic sites and monuments
- Churches and cemeteries

20A(2) WCRPK ZONE REQUIREMENTS

In any WC Zone, no development permit shall be issued except in conformity with the following:

- (a) Minimum Lot Area 100,000 square feet (9,289 m²)
- (b) Minimum Building Setback from any lot line 30 feet (9.1 m)
- (c) Maximum Lot Coverage 35 percent
- (d) Maximum Height of Main Building 35 feet (10.7 m)
- (e) No buildings, structures or parking areas shall be located within 300 feet (91.4 m) of the rim of any watercourse or waterbody except for buildings or structures intended for conservation related uses, wilderness campsites, or non-motorized water related recreation uses.

20A(3) SETBACK EXEMPTION

Notwithstanding Clause 20A(2)(b), no building setback shall be required from the Highway 103 right-of-way lot line." (RC - July 4, 2000 / E - August 5, 2000)

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PART 21E: UR (URBAN RESERVE) ZONE (RC-June 27/06;E-Aug 26/06)

UR USES PERMITTED

21E.1 No development permit shall be issued in any UR (Urban Reserve) Zone except for the following:

Single unit dwellings, on existing lots provided that a private on-site sewage disposal system and well are provided on the lot

Passive recreation uses

Uses accessory to the foregoing uses

UR ZONE REQUIREMENTS

21E.2 In any UR Zone, no development permit shall be issued except in conformity with the following:

Minimum Front or Flankage Yard: 9.1m

Minimum Side Yard: 2.5m

Minimum Rear Yard: 2.5m

Maximum Lot Coverage: 35%

Maximum Height of Main Building: 11m

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Halifax Mainland LUB

WC ZONE

WESTERN COMMON ZONE

62AA (1) The following uses shall be permitted in any WC Zone:

- (c) Conservation related uses;
- (d) Trails, picnic areas and wilderness campsites;
- (e) Public and private parks and playgrounds;
- (f) Recreation uses with the exception of golf courses;
- (g) Historic sites and monuments;
- (h) Churches and cemeteries;
- (i) Uses accessory to the foregoing.

62AA(2) No person shall in any WC Zone carry out, or cause or permit to be carried out, any development for any purpose other than one or more of the uses set out in subsection (1).

62AA(3) No person shall in any WC Zone use or permit to be used any land or building in whole or in part for any purpose other than one or more of the uses set out in subsection (1).

62AA(4) WC ZONE REQUIREMENTS

In any WC Zone no development permit shall be issued except in conformity with the following:

- (a) Minimum lot area 100,000 square feet (9,289 m²)
- (b) Minimum building setback from any property line 30 feet (9.1 m)
- (c) Maximum lot coverage 35 percent
- (d) Maximum height (main Building) 35 feet
- (e) No buildings, structure or parking areas shall be located within 300 feet (91.4 m) of any watercourse except for buildings or structures intended for conservation related uses or non-motorized water related recreation uses.

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UR (URBAN RESERVE) ZONE (RC-June 27/06;E-August 26/06)

61AA(1) The following uses shall be permitted in any UR Zone:

- (a) Single family dwellings, on existing lots provided that a private on-site sewage disposal system and well are provided on the lot
- (b) Passive recreation uses
- (c) Uses accessory to the foregoing uses

61AA(2) No person shall in any UR Zone use or permit to be carried out, any development for any purpose other than one or more of the uses set out in subsection (1).

61AA(3) No person shall in any UR Zone use or permit to be used any land or building in whole or in part for any purpose other than one or more of the uses set out in subsection (1).

REQUIREMENTS

61AA(4) Buildings erected, altered or used for UR uses in a UR Zone shall comply with the following requirements:

Minimum Front or Flankage Yard: 9.1 m

Minimum Side Yard: 2.5 m

Minimum Rear Yard: 2.5 m

Maximum Lot Coverage: 35 per cent

Maximum Height of Main Building: 11 m

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District 4 (Prospect) LUB

PART 34A: WC (WESTERN COMMON) ZONE

34A (1) WC USES PERMITTED

No development permit shall be issued in any WC (Western Common) Zone except for the following:

Conservation related uses

Trails, picnic areas and wilderness campsites

Public and private parks and playgrounds

Recreation uses with the exception of golf courses

Historic sites and monuments

Churches and cemeteries

34A (2) WC ZONE REQUIREMENTS

In any WC Zone, no development permit shall be issued except in conformity with the following:

(a) Minimum Lot Area 100,000 square feet (9,289 m²)

(b) Minimum building setback from any lot line 30 feet (9.1 m)

~~(c) Maximum Lot Coverage 35 percent Deleted (RC June 27/06; E-Aug 26/06)~~

(d) Maximum Height of Main Building 35 feet (10.7 m)

(e) No buildings, structures or parking areas shall be located within 300 feet (91.4 m) of the rim of any watercourse or waterbody except for buildings or structures intended for conservation related uses, wilderness campsites or non-motorized water related recreation uses.

~~34A(3) Exception: Indian Lake Golf Club~~

~~Notwithstanding the provisions of 34(A)(1), the Indian Lake Golf Club, located on LMIS Index No. 40696650, shall be permitted to expand on to the WC zone provided that all requirements of Section 34A(2) are satisfied.~~

~~(RC July 4, 2000 / E August 5, 2000) Deleted (RC-June 27/06; E-Aug 26/06)~~

Appendix B: Property Ownership and Land Use

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PID	Owner	Predominant Land Use	Area (ac.)
00379487	SCS - Soundco Limited	Non Forested - Road/ Rail Buffers	0.8
00380170	Halifax Water Commission	Forested - Natural Stand	1.7
00380410	Private Owner	Forested - Natural Stand	1.1
00380626	Private Owner	Forested - Natural Stand	0.9
00380766	Private Owner	Non Forested - Urban	0.3
00380774	Private Owner	Forested - Natural Stand	0.3
00380816	Private Owner	Forested - Natural Stand	0.7
00380923	N A Brown Holdings Limited	Non Forested - Urban	0.2
00380956	Private Owner	Forested - Natural Stand	1.1
00381194	N A Brown Holdings Limited	Non Forested - Urban	0.3
00381251	Private Owner	Non Forested - Road/ Rail Buffers	1.9
00381335	Shell Canada Products	Non Forested - Road/ Rail Buffers	1.1
00381533	Private Owner	Forested - Natural Stand	0.7
00381541	Private Owner	Forested - Natural Stand	0.8
00381558	Private Owner	Forested - Natural Stand	0.7
00381566	Private Owner	Forested - Natural Stand	0.5
00381582	Private Owner	Forested - Natural Stand	0.8
00381590	Private Owner	Forested - Natural Stand	0.9
00381608	Private Owner	Forested - Natural Stand	0.6
00381624	Private Owner	Non Forested - Road/ Rail Buffers	1.2
00381665	Private Owner	Forested - Natural Stand	0.7
00381764	Private Owner	Forested - Natural Stand	1.2
00381772	Private Owner	Non Forested - Road/ Rail Buffers	0.4
00404640	Private Owner	Non Forested - Road/ Rail Buffers	13.0
00404657	Private Owner	Non Forested - Road/ Rail Buffers	20.6
00404665	Private Owner	Forested - Natural Stand	33.9
00568238	Private Owner	Forested - Natural Stand	40.8
00568253	HRM	Non Forested - Sanitary Landfill	31.0
00589846	HRM	Forested - Natural Stand	23.7
00589986	HRM	Non Forested - Sanitary Landfill	1,671.0
00596726	HRM	Non Forested - Road/ Rail Buffers	1,163.0
00624973	HRM	Non Forested - Barren	892.0
00656405	Private Owner	Forested - Natural Stand	9.1
00656439	Private Owner	Forested - Natural Stand	3.1
00656454	Private Owner	Forested - Natural Stand	3.3
00656462	Private Owner	Non Forested - Urban	0.2
00656470	Private Owner	Non Forested - Urban	0.2
40025546	Private Owner	Non Forested - Road/ Rail Buffers	5.4
40111601	Private Owner	Forested - Natural Stand	17.7
40271603	Private Owner	Forested - Natural Stand	79.4
40271611	Private Owner	Forested - Natural Stand	12.6
40271769	Private Owner	Forested - Natural Stand	16.1
40271777	Private Owner	Forested - Natural Stand	21.2
40283160	Private Owner	Non Forested - Urban	0.2
40297376	Private Owner	Forested - Natural Stand	18.2

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PID	Owner	Predominant Land Use	Area (ac.)
40356891	NS Natural Resources	Non Forested - Road / Rail Buffers	10.9
40382525	Security Trust Properties Incorporated	Non Forested - Urban	3.3
40382533	Eastside 2008 Equities Inc	Non Forested - Urban	3.4
40424319	Nova Scotia Power Incorporated	Forested - Natural Stand	5.6
40456360	Bell Aliant Communications Regionales Inc	Forested - Natural Stand	0.5
40506701	Private Owner	Non Forested - Sanitary Landfill	0.3
40506784	Private Owner	Forested - Natural Stand	0.3
40506792	Private Owner	Non Forested - Inland Water	35.7
40506818	Private Owner	Forested - Natural Stand	0.8
40506826	HRM	Forested - Natural Stand	0.6
40506834	HRM	Non Forested - Road / Rail Buffers	34.9
40506842	HRM	Non Forested - Road / Rail Buffers	45.4
40506859	Private Owner	Forested - Natural Stand	1.0
40506933	Private Owner	Forested - Natural Stand	13.2
40506941	HRM	Non Forested - Inland Water	10.8
40515116	Sunrise Park Cemetery	Forested - Natural Stand	3.2
40544942	Private Owner	Forested - Natural Stand	1.0
40544959	Private Owner	Forested - Natural Stand	10.0
40544967	Private Owner	Forested - Natural Stand	8.1
40544983	Private Owner	Forested - Natural Stand	4.5
40544991	Private Owner	Forested - Natural Stand	3.5
40577249	HRM	Non Forested - Urban	0.4
40598500	HRM	Non Forested - Road / Rail Buffers	0.9
40599888	HRM	Forested - Natural Stand	43.6
40599896	HRM	Forested - Natural Stand	21.1
40614380	Private Owner	Forested - Natural Stand	3.3
40614398	Private Owner	Forested - Natural Stand	3.3
40647125	Private Owner	Non Forested - Urban	2.3
40647174	Private Owner	Non Forested - Urban	1.4
40647182	Private Owner	Non Forested - Urban	2.3
40647190	Private Owner	Non Forested - Urban	2.3
40647208	Private Owner	Non Forested - Urban	2.3
40665481	NSTPW	Non Forested - Urban	0.1
40665499	NSTPW	Forested - Natural Stand	0.3
40665507	NSTPW	Non Forested - Urban	0.0
40665515	NSTPW	Non Forested - Urban	0.2
40673469	Private Owner	Non Forested - Urban	0.9
40680928	Private Owner	Forested - Natural Stand	2.6
40682825	Irving Oil Limited	Forested - Natural Stand	2.3
40690778	Private Owner	Non Forested - Urban	1.7
40696650	Indian Lake Golf Course	Non Forested - Urban	22.0
40702367	HRM	Non Forested - Road / Rail Buffers	3.6
40716128	HRM	Forested - Natural Stand	31.1
40716144	HRM	Non Forested - Open Bogs	8.8
40731564	Private Owner	Forested - Natural Stand	3.4
40749707	Indian Lake Golf Course	Non Forested - Urban	26.2

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PID	Owner	Predominant Land Use	Area (ac.)
40798514	Private Owner	Non Forested - Urban	3.1
40799538	Private Owner	Non Forested - Urban	2.0
40832990	HRM	Non Forested - Road / Rail Buffers	35.7
40883662	HRM	Forested - Natural Stand	4.0
40888976		Non Forested - Inland Water	115.0
40888984		Forested - Natural Stand	7.0
40888992		Forested - Natural Stand	1.8
40889008		Forested - Natural Stand	0.3
40889016		Non Forested - Inland Water	0.6
40894792	Road Parcel Owner Undetermined	Forested - Natural Stand	0.9
40894800	Road Parcel Owner Undetermined	Non Forested - Urban	5.3
40894818	Road Parcel Owner Undetermined	Non Forested - Inland Water	7.2
40895948	Road Parcel Owner Undetermined	Forested - Natural Stand	2.3
40895955	Road Parcel Owner Undetermined	Non Forested - Urban	2.7
40895963	Road Parcel Owner Undetermined	Non Forested - Urban	4.8
40895971	Road Parcel Owner Undetermined	Forested - Natural Stand	7.0
40896003	Road Parcel Owner Undetermined	Non Forested - Inland Water	16.4
40896011	Road Parcel Owner Undetermined	Non Forested - Sanitary Landfill	7.1
40896029	Road Parcel Owner Undetermined	Non Forested - Sanitary Landfill	13.3
40896383		Non Forested - Inland Water	95.3
40896391		Non Forested - Road / Rail Buffers	66.4
40896409		Forested - Natural Stand	17.0
40896417		Non Forested - Wetlands General	1.3
40896425		Forested - Natural Stand	0.5
40896433		Forested - Natural Stand	1.0
40896441		Forested - Natural Stand	0.8
40896458		Forested - Natural Stand	0.2
40896466		Non Forested - Inland Water	268.0
40896474		Non Forested - Inland Water	47.3
40896524		Non Forested - Wetlands General	3.1
40896540		Forested - Natural Stand	1.5
40896557		Forested - Natural Stand	1.1
40896565		Forested - Natural Stand	5.8
40896581		Non Forested - Inland Water	224.0
40896599		Forested - Natural Stand	10.7
40896607		Non Forested - Road / Rail Buffers	39.7
40897167		Non Forested - Barren	0.4
40897886		Forested - Natural Stand	0.2
40898983	HRM	Non Forested - Road / Rail Buffers	4.4
41016668	M J Web Real Estate Inc	Non Forested - Urban	11.0
41017716	Private Owner	Non Forested - Urban	20.6
41034166	Imprimeries Transcontinental 2003 Inc.	Forested - Natural Stand	5.7
41034687	Indian Lake Golf Course	Non Forested - Urban	2.6
41034695	Indian Lake Golf Course	Forested - Natural Stand	24.9
41076142	Web Atlantic Ltd	Non Forested - Urban	1.7
41108101	Private Owner	Non Forested - Urban	2.1

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PID	Owner	Predominant Land Use	Area (ac.)
41108119	Private Owner	Non Forested - Urban	1.4
41119488	Sunrise Park Cemetery	Non Forested - Road / Rail Buffers	9.1
41140476	3008017 Nova Scotia Limited	Non Forested - Road / Rail Buffers	3.2
41176330	Private Owner	Forested - Natural Stand	6.6
41184011	Private Owner	Non Forested - Urban	0.8
41253915	New Life Baptist Church	Forested - Natural Stand	7.2
41253923	HRM	Non Forested - Inland Water	1,596.0
41256033	HRM	Forested - Natural Stand	141.0
41256041	HRM	Forested - Natural Stand	9.6
41256058	HRM	Non Forested - Inland Water	478.0
41256066	HRM	Non Forested - Inland Water	11.0
41256173	HRM	Non Forested - Urban	7.1
		TOTAL	7,849.01

Appendix C: Study Area Mapping

Figure 1: Primary Forest Species

Figure 2: Surficial Geology

Figure 3: Eco-Sections

Figure 4: Soil Types

Figure 5: Archaeological Resources

Figure 6: Significant Locations and Protected Areas

Figure 7: Government Controlled Property

Figure 8: 1865 Church Map Overlay

Figure 9: Air Photo Overlay

Figure 10: Trails and Water Routes

Figure 11: Western Common Zoning

Figure 12: Wetlands, Habitats and Areas of Interest

Figure 13: Watercourse Protection

Figure 14: Residential Suitability

Figure 15: Potential Mammal Habitat

Figure 16: Potential Reptile/Amphibian Habitat

Figure 17: Potential Bird Habitat

Figure 18: Species Richness

Figure 19: Prospect River Views

Figure 20: Road Density

Figure 21: Model Composite

Figure 22: Wilderness Common Master Plan

Figure 23: Phasing

Figure 24: Forest Inventory - Current Conditions

Figure 25: Community Centre Connector Trails

Figure 26 – Big Indian Lake Viewshed with Borrow Pit
Locations

Appendix D: Excerpt from Planning for the Western Common (1999)

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The following is an excerpt of **Section 3** from the *Western Common Needs Assessment Study*, EDM, 1999. Please note that only Section 3 is contained in this appendix.

3.1 TOPOGRAPHY

The site is characterized by a deep, broad valley which runs down the middle of the Western Common. Otter Lake to the west and Ragged Lake to the east sit on top of broad, flat ridge tops. Both drain down into the valley which contains the other study area lakes, including Blueberry, Big Indian, Little Indian and Nichols lakes. Refer to Figure 6, Topography (Shaded Relief). Slopes in the Western Common tend to be gentle. Drumlins can be seen in Figure 6 by comparing it to **Figure 8, Soils**.

3.2 BEDROCK AND SURFICIAL GEOLOGY

Granite bedrock of the South Mountain Batholith underlies the entire study area. As it is resistant to erosion, granite tends to form the highest ground in an area of eroded landscape like the Atlantic Interior (i.e., higher than the slates of peninsular Halifax and downtown Dartmouth). The granite landscape is one of broad, formless ridges and depressions with scattered knolls. The bedrock, which outcrops frequently, consists of devonian aged quartz monzogranite and averages 5 km thick. Areas of large, known bedrock outcrops are shown as pink in **Figure 7**.

The granite bedrock is overlain by a shallow, predominantly granitic till, consisting of a silty sand till with an abundance of gravel, cobbles and boulders (45% gravel, 41% sand, and 13% silt and clay fraction). Figure 7, Surficial Geology generally classifies the landscape according to the thickness of the till cover. (Note: Thickness information shown in this figure was derived primarily from vegetation habitats and has not been adequately field truthed for more than land use-level decision making.)

Sandy clay till consistent with the Lawrencetown till sheet that covers some of Nova Scotia (Stea and Fowler 1981) sporadically occurs throughout the area as northwest-southeast-oriented drumlin hills and local areas of sandy clay and clayey silt basal till (15% gravel, 40% sand, and 45% clay and silt fraction). These drumlin areas can be seen on the soils map (see **Figure 8**) as Wolfville and Hantsport soils.

3.3 SOILS

The major soil series in the study area is the Gibraltar series. Gibraltar soils are derived from granite and are coarse textured, well drained, gravely, sandy loams, generally shallow, highly leached and quite acidic (Davis and Browne 1996). Gibraltar soils cover most of the western half of the Western Common. They tend to be very thin, till with many large boulders and bedrock outcroppings.

Bayswater series soils cover the majority of the eastern half of the study area. Similar to Gibraltar soils, they nevertheless tend to be a bit deeper, formed on generally deeper till (although not consistently deeper) and support richer plant communities with more hardwood in the mix.

Hantsport and Wolfville soils are the best soils in the study area. The large Hantsport drumlin is the site of the new Resource Management Facility to the north, and the location of the best abandoned farmstead on the south. An excellent deposit of Wolfville soil lies adjacent to the new compost facility. These soils are deeper, on deeper till, and most suitable for development.

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3.4 CLIMATE

The study area is located at the boundary between the Atlantic Coast theme region and the Atlantic Interior theme region, consequently the moderating influence of coastal waters would be more pronounced here than in areas farther inland (winters less cold; summers less warm than further inland). The nearest meteorological station is located at Shearwater, approximately 12 km from the study area. The climate of the area is generally cool and wet. The climate suggests that locations which receive solar gain (e.g., southern slopes) and those which are not in low frost pockets should be preferable for human habitation (see **Aspect, Figure 8**).

3.4.1 Temperature

Mean daily temperatures in the study area range from -4.1 °C in January to 17.8 °C in August. Extreme minimum temperatures as low as -26.1 °C have been measured in January and extreme maximum temperatures reaching 33.3 °C have been recorded in July.

3.4.2 Precipitation

Shearwater experiences an average of 150 days with measurable precipitation. Total average annual precipitation is 1,361.4 mm, including rain and the water equivalent of snow and all other forms of frozen precipitation. Maximum and minimum monthly total precipitation occurs in December (147.7 mm) and June (83.9 mm), respectively. For a 30-year period of available data, the greatest recorded precipitation event (i.e., rain and/or the water equivalent of snow and all other forms of frozen precipitation) over a 24-hour period was 184.9 mm.

3.4.3 Wind

The available data for wind encompass a 26-year period from 1955-1980 (Environment Canada 1982a-e). During the spring and summer months (May to August), winds are predominantly from the south to southwest. During the fall and early winter (September to December), prevailing winds shift from the southwest to the northwest. Through the winter months (January to April), winds are predominantly out of the west to northwest.

Monthly mean wind speeds range from a maximum of 20.9 km/h in January to a minimum of 12.7 km/h in July. Maximum gust speeds of 146 and 148 km/h have been recorded in February and March, respectively.

3.4.4 Frost

Shearwater has an average of 170 frost days per year, although this period may range from 134 to 201 days. The last spring frost may occur as early as 17 April or as late as 28 May, with an average occurrence of 5 May. The first fall frost may occur between 7 October and 14 November, with an average occurrence of 23 October.

3.5 VEGETATION (TERRESTRIAL) HABITATS

The vegetation patterns found in the study area only partially correspond to this regional pattern, described in the **Vegetation Context, Section 2.1.2**. Within the study area balsam fir (*Abies balsamea*), black spruce/red spruce hybrids (*Picea rubens* - *Picea mariana*), red maple (*Acer rubrum*) and white birch (*Betula papyrifera*) are the dominant species covering much of the study area. Balsam fir generally dominates in the understorey.

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Yellow birch (*Betula allegheniensis*), red oak (*Quercus borealis*), trembling aspen (*Populus tremuloides*), large-tooth aspen (*Populus grandidentata*), white spruce (*Picea glauca*), white pine (*Pinus strobus*) and tamarack (*Larix laricina*) occur in small numbers at a few locations. Tolerant species such as sugar maple (*Acer saccharum*), and American beech (*Fagus grandifolia*) occur at but one location, and eastern hemlock (*Tsuga canadensis*) is absent. Red spruce, another tolerant species, is uncommon in the study area. The absence of tolerant species would suggest that this area has been repeatedly disturbed in the past.

The species composition observed in the study area corresponds more closely to the red maple, white birch and red oak stands characteristic of burned areas in this District (Davis and Browne 1996). The abundance of black spruce and black spruce/red spruce hybrids in the study area would also suggest that the area was burned in the past since black spruce regenerates well following fire. Black spruce has serotinous cones which open after exposure to high heat, permitting it to rapidly re-colonize burned sites.

The following text describes the vegetation habitats illustrated in **Figure 10**. The method for developing these descriptions is included in **Appendix A**, along with tables of the specific descriptions undertaken.

3.5.1 Black Spruce/Balsam Fir/Red Maple Forest

This is the most abundant habitat type present in the study area (see **Figure 10**). It is found throughout the Western Common on well to imperfectly drained sites. Table 3 (Appendix A) presents the species composition data for this habitat type. The overstorey is composed mainly of black spruce, balsam fir and red maple. The understorey is generally sparse and is composed largely of advanced regeneration balsam fir, black spruce and red maple along with lambkill (*Kalmia angustifolia*) and witherod (*Viburnum cassinoides*). Balsam fir is the most abundant species in the understorey. The ground vegetation layer consists of a well developed moss and liverwort carpet dominated by Schreber's moss (*Pleurozium schreberi*), bazzania (*Bazzania trilobata*), sphagnum moss (*Sphagnum spp.*) and broom moss (*Dicranum spp.*).

In the absence of disturbance, the relative abundance of black spruce, a long-lived species, would be expected to increase in the canopy as the shorter-lived red maple and balsam fir senesce and die. Balsam fir would decrease in abundance in the overstorey but would increase in the understorey and intermediate levels of the canopy as seedlings of this shade tolerant species establish in gaps left by the death of overstorey trees. This pattern of succession would be expected in stands having a relatively high abundance of black spruce in the canopy. Over time, an uneven-aged stand composed of black spruce and balsam fir should develop.

In even-aged stands greater than 60 years of age where balsam fir is very abundant there is a relatively high probability that the balsam fir contingent of the canopy could die in a short period of time as a result of butt rot and/or insect infestations such as the balsam wooly aphid. Simultaneous death of the overstorey trees would release balsam fir seedlings in the understorey resulting in the re-establishment of another balsam fir dominated stand. Black spruce present in the overstorey may be subjected to higher than normal mortality as a result of wind throw once the dead balsam fir begin to fall down. This phenomenon of simultaneous mortality of mature balsam fir was observed at several locations in the study area. The under stories of these stands typically consisted of a mixture of balsam fir and black spruce along

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with some red maple and white birch similar in species composition and abundance to the overstorey prior to the mortality event. These mortality events would ensure that balsam fir remained a dominant species in the canopy.

Fire would tend to reduce the abundance of balsam fir since it would kill both mature trees and seedlings and increase the abundance of black spruce since it would stimulate the opening of the serotinus cones of this species resulting in the establishment of large numbers of black spruce seedlings.

3.5.2 Balsam Fir/ Red Maple/ Black Spruce Forest

This habitat type is generally found on well drained sites (see **Figure 10**). Table 4 (see **Appendix A**) presents species composition data for this habitat type. The same species present in the Black Spruce/ Balsam Fir/ Red Maple Forest are present in this forest type, however, the relative abundance of the constituent species is different with balsam fir and red maple more abundant and black spruce less abundant. This habitat is also characterized by the presence of small numbers of white birch in the canopy. The understorey is composed mainly of lambkill and advanced regeneration of balsam fir. Other shrub species which occur in this habitat type fairly regularly include false holly (*Nemopanthus mucronata*) and witherod. The ground vegetation consists mainly of a patchy carpet of Schreber's moss, broom moss and bazzania which is punctuated by scattered patches of bracken fern (*Pteridium aquilinum*).

In the absence of disturbance the importance of spruce in the canopy can be expected to gradually increase since it is tolerant of competition with other species and is long-lived. The importance of red maple and balsam fir in the canopy would decrease; however, balsam fir would continue to be abundant in the understorey. Gaps in the canopy created by the death of overstorey trees would be filled by balsam fir seedlings since this species is tolerant of competition and is the only tree species present in the understorey. Ultimately, over hundreds of years, secondary succession would result in a conversion of this habitat type to Black Spruce/ Balsam Fir/ Red Maple Forest.

3.5.3 Spruce/ Red Maple/ Balsam Fir Forest

This forest type is uncommon in the study area and is generally found around the margins of lakes. It is typically associated with well drained slopes (see **Figure 10**). The overstorey of this forest type is composed mainly of various spruces, red maple, and balsam fir. White birch is frequently found in these stands but is generally not abundant (see **Table 5, Appendix A**). Red spruce is the dominant species in most stands although black spruce/ red spruce hybrids also frequently dominate these stands. White spruce was the dominant species at one of the stands sampled. This stand had established on abandoned pasture. White spruce is a characteristic colonizer of abandoned agricultural land in most of Nova Scotia, so its presence at this site is to be expected.

The understorey of these stands is composed largely of advanced regeneration of balsam fir, red spruce and black spruce. The ground vegetation layer consists of a patchy moss and liverwort carpet dominated by Schreber's moss, bazzania, and broom moss. Vascular plants such as goldthread (*Coptis trifolia*) and wild sarsaparilla (*Aralia nudicaulis*) are also relatively abundant.

Successional change in this forest type could lead to several outcomes depending on which species of spruce is present. Stands dominated by red spruce and black spruce can be expected to remain dominated by these species, with a gradual reduction in

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the abundance of red maple and overstorey balsam fir. Stands dominated by white spruce will have a different successional trajectory. White spruce is relatively short-lived and its seedlings are not tolerant of shade. As overstorey trees die they will be replaced by balsam fir seedlings present in the understorey resulting in the gradual conversion of this stand type to a fir dominated stand.

Stand 23 (see **Table 5**) located on the eastern shore of Nichols Lake is an excellent example of a mature Spruce/Red Maple/Balsam Fir Forest. Based on the large size of the dominant red spruce, this stand may be over 150 years old. Red spruce is the dominant tree of the overstorey along with some red maple and a few yellow birch. Balsam fir appears to have been eliminated from the overstorey but is present in large numbers in the understorey. This stand may be a remnant of old growth forest. It overlooks a very scenic cascade on the Prospect River. Given its apparent old age and the scenic setting in which it is located, it is recommended that this stand be preserved.

3.5.4 Red Maple/White Birch/Balsam Fir/Spruce Forest

This forest type occurs throughout the study area on well drained ridges and upper slopes of hills (see **Figure 10**). It is usually found on stony till deposits and is often associated with barrens areas. This is the most abundant deciduous forest type in the study area. Red maple, white birch and balsam fir are the dominant tree species (see **Table 6, Appendix A**). Spruce and yellow birch are also present in many of the stands. Yellow birch, red spruce and white spruce are generally present at sites having better growing conditions, while black spruce is usually present in the stands situated on poorer sites.

The understorey is composed of a mixture of advanced regeneration of balsam fir, black spruce and red spruce as well as ericaceous shrubs such as lambkill, Canada blueberry (*Vaccinium myrtilloides*) and late lowbush blueberry (*Vaccinium angustifolium*). Witherod is also an important shrub.

The species composition of the ground vegetation varies from stand to stand. Some of the most frequently encountered species include Knight's plume moss (*Ptilium crista-castrensis*), bazzania, broom moss, bunchberry (*Cornus canadensis*), New York fern (*Thelypteris noveboracensis*), hay-scented fern (*Dennstaedtia punctilobula*), wild sarsaparilla, gold thread, and bracken fern.

Over time the relative abundance of white birch, red maple and balsam fir would be expected to gradually decrease while the relative abundance of spruce and yellow birch would increase. Given the abundance of white birch and red maple, it would take a long time for spruce and yellow birch to come to dominate these stands.

3.5.5 Red Maple/White Birch/Trembling Aspen Forest

This is a relatively rare forest type in the study area which is found only at one location in the study area. It has established in moderately well drained sites which have been disturbed in the past by human habitation. The stand found in the study area was located adjacent to the Exhibition Park Grounds along the abandoned water supply pipeline (see **Figure 10**). It is similar in species composition to the Red Maple/White Birch/Balsam Fir/Spruce Forest type except that the abundance of balsam fir and spruce are reduced and trembling aspen is a common constituent of the canopy (see **Table 7, Appendix A**). The understorey is composed mainly of advanced regeneration of balsam fir and red spruce. The ground vegetation layer is composed of a variety of species of moss and vascular plants including Schreber's

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moss, bunchberry, wild sarsaparilla, bracken fern, goldthread, and starflower (*Trientalis borealis*).

Successional change in this forest type would be expected to occur relatively rapidly since most of the dominant species have relatively short life spans and white birch and trembling aspen quickly succumb to competition. Red Maple would be expected to persist the longest and gaps in the canopy would be filled by advanced regeneration of balsam fir and red spruce. Ultimately, an uneven aged stand composed of red spruce, balsam fir and red maple would develop in the absence of disturbance.

3.5.6 Black Spruce/Tamarack Forest

This habitat type is found in poorly drained depressions throughout the study area (see **Figure 10**). These depressions are typically peat filled suggesting that this stand type may represent the late stages of bog succession. Black spruce is the dominant species (see **Table 8, Appendix A**). Tamarack is found in most stands, and in half of the stands sampled it was almost as abundant as the black spruce. Red maple is also present in most stands; however, it is generally in low numbers. The understorey is well developed and composed of a mixture of shrubs and advanced regeneration of black spruce. Shrub species characteristic of the understorey include lambkill, false holly, and witherod. The ground vegetation layer consists of a continuous mat of sphagnum moss. Other species present include sedge (*Carex trisperma*), bunchberry, creeping snowberry (*Gaultheria hispidula*), and Schreber's moss.

Relatively little successional change would be expected over the next 50 years. Black spruce should remain as the dominant species. Tree growth is slow in these poorly drained areas, consequently, the rate of succession is also expected to be slow. As tree size increases, the canopy cover may increase resulting in a reduction in the abundance of shrubs and ground vegetation.

3.5.7 Barrens

Barrens are found scattered throughout the study area (see **Figure 10**). They are typically found in well drained areas, often on hill tops where bedrock is close to the surface or where the till is very stony. It is likely that the barrens originated as a result of repeated fires which destroyed much of the soil organic matter and promoted erosion. Other factors such as naturally thin soils and / or the formation of an impenetrable hard pan layer in the soil may have contributed to the development of these barrens. Tree overstorey of this habitat is very sparse and composed largely of black spruce and red maple (see **Table 9, Appendix A**). The shrub layer is well developed and is dominated by lambkill, late low-bush blueberry, witherod, huckleberry (*Gaylussacia baccata*), and rhodora (*Rhododendron canadense*). Ground vegetation layer is poorly developed and is characterized by bracken fern, wintergreen (*Gaultheria procumbens*), reindeer lichen (*Cladonia alpestris*), and Schreber's moss.

Secondary succession in this habitat is dependent on the constraints present to the growth of tree species. Harsh climatic conditions or impoverished soil conditions may preclude the growth of trees on the site and ensure that the barrens habitat is the climax plant community. Woodlands may eventually develop on barrens which are associated with repeated fires if fire disturbance is precluded. This process is very slow and would not occur within 50 years.

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3.6 WETLAND HABITATS

Drainage in the study area forms in bedrock fractures. These drainage lines are severely deranged, with most low areas displaying small bogs, and other wetlands, and wet habitats. Wetland habitats are illustrated in **Figure 11**.

3.6.1 Bog

Bogs are defined as peatlands with the water table at or near the surface. The bog surface, which may be raised or level with the surrounding terrain, is virtually unaffected by nutrient rich groundwater from surrounding mineral soils and as such is characterized by low fertility and high acidity (National Wetlands Working Group 1987). The substrate is typically composed of weakly to moderately decomposed sphagnum moss and woody peat, at times underlain by sedge peat. Bogs may be treed or treeless and are generally covered with sphagnum moss (*Sphagnum spp.*) and ericaceous shrubs.

Bogs are the most common wetland type in the study area (see **Figure 11**). The low buffering capacity of the underlying soils and bedrock as well as the infertility of soils in the area have contributed to the establishment of bogs. Air photo analysis of the study area combined with ground level surveys revealed the presence of five discreet bog types which include Dry Treed Bog, Wet Treed Bog, Low Shrub Dominated Stream Bog, Graminoid Dominated Stream Bog, and Basin Bog. **Tables 10-14 (Appendix A)** provide habitat descriptions for each of these bog types.

Dry Treed Bog

This habitat is associated with older bogs having a dry hummocky surface. It is characterized by a well developed tree canopy composed of stunted black spruce (see **Table 10, Appendix A**). The shrub understorey is well developed and is composed of a variety of ericaceous shrubs including lambkill, leatherleaf (*Chamaedaphne calyculata*), Labrador tea (*Ledum groenlandicum*), and rhodora. Other common shrubs include witherod and false holly. The ground vegetation consists mainly of a carpet of sphagnum moss punctuated by patches of bunchberry and bake apple (*Rubus chamaemorus*).

Wet Treed Bog

This bog type is found in younger bogs which have less well developed hummocks and therefore tend to be wetter. The species composition of the tree and shrub layers are similar to the Dry Treed Bog except that rhodora is absent and black crowberry (*Empetrum nigrum*) and huckleberry are present (see **Table 11, Appendix A**). Black spruce are abundant in both bog types but tend to be smaller in the Wet Treed Bogs. Ground vegetation in both bog types is dominated by sphagnum moss; however, the associated vascular plant species are different. In the Wet Treed Bog the most abundant vascular plants are deer grass (*Scirpus cespitosus*), three-leaved- false-Solomon's-seal (*Smilacina trifolia*), cotton-grass (*Eriophorum virginicum*), and sedge (*Carex paupercula*).

Low Shrub Dominated Stream Bog

This bog type is associated with the margins of sluggish streams and is typically flooded during high water events. The tree layer is poorly developed and consists of scattered black spruce and tamarack (see **Table 12, Appendix A**). The shrub layer is moderately to very well developed. Dominant species include leatherleaf, sweet gale (*Myrica gale*), Labrador tea, rhodora and lambkill. The ground vegetation varies depending on how dense the shrub overstorey is and how dry the site is. Drier sites having a dense shrub overstorey typically have a sparse ground vegetation layer

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composed largely of scattered patches of sphagnum moss along with small quantities of sedge (*Carex stricta*) and reindeer lichen (*Cladonia rangiferina*). Moister sites with a more open shrub layer are characterized by the presence of a continuous mat of sphagnum moss, punctuated by small patches of deer grass, cotton-grass (*Eriophorum virginicum*), and bog goldenrod (*Solidago uliginosa*).

Graminoid Dominated Stream Bog

This bog type is also associated with sluggish streams but is generally found away from the edge of the stream. It is one of the most common bog types in the study area. It is characteristic of areas which have been flooded in the past by beaver or human activity. The species composition of this bog type is similar to the Low Shrub Dominated Stream Bog except that Labrador tea is absent and sedge (*Carex stricta*) is abundant (see **Table 13, Appendix A**).

Basin Bog

Basin Bog is found in poorly drained depressions throughout the study area. It is also found in the interior of large stream bogs where the influence of stream flow is negligible and conditions are relatively dry. The tree layer is generally sparse and composed of scattered black spruce and tamarack (see **Table 14, Appendix A**). Species composition of the shrub layer varies from site to site but is consistently strongly dominated by lambkill and bog lambkill (*Kalmia polifolia*). The ground vegetation is consistent between sites and consists of reindeer lichen (*Cladonia alpestris*), sphagnum moss, bake apple, deer grass, and bog goldenrod.

3.6.2 Fen

Fens are defined as peatlands with the water table at or just above the surface. The water in fens tends to be nutrient rich and derived from surrounding mineral soils. The substrate is composed of sedge or brown moss peat of variable thickness (National Wetlands Working Group 1987). The vegetation generally consists of sedges, grasses, reeds, and brown mosses with some shrubs and occasionally trees.

Fens are relatively rare in the study area and Stream Fen was the only fen type recorded in the study area (see **Figure 11**).

Stream Fen

This fen type was found along a tributary to Prospect River in an area subject to recent beaver flooding. This habitat was characterized by a relatively sparse shrub layer composed of bog rosemary (*Andromeda glaucophylla*), sweet gale, black spruce, rhodora, and tamarack (see **Table 15, Appendix A**). The ground vegetation layer is composed of a moderately dense sedge sward underlain by a continuous carpet of sphagnum moss. *Carex rostrata* and *Carex lasiocarpa* are the dominant sedge species. Other ground vegetation species include pitcher plant (*Sarracenia purpurea*) and large cranberry (*Vaccinium macrocarpon*). Given the abundance of sphagnum moss, it is likely that this fen represents an early stage in bog succession. Over time, the abundance of ericaceous shrubs will increase and the abundance of sedge will decrease.

3.6.3 Anthropogenic Wetlands

These wetlands have developed in areas where the drainage of woodland habitats has been impeded as a result of road construction. These wetlands represent the earliest stages of wetland succession. There is little or no peat accumulation due to their young age. The species present are characteristic of a variety of wetland types making them very difficult to classify. The tree layer is very sparse and consists

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mainly of young wire birch (*Betula populifolia*), black spruce and tamarack growing on hummocks (see **Table 16, Appendix A**). The shrub layer is poorly developed and consists of speckled alder and saplings of black spruce and tamarack. The ground vegetation layer consists largely of sphagnum moss, hair-cap moss (*Polytrichum commune*), bulrush (*Scirpus cyperinus*), fowl manna grass (*Glyceria striata*), cinnamon fern (*Osmunda cinnamomea*), and sedge (*Carex canescens*).

Over time these wetlands will probably develop into either swamps or bogs depending on drainage. Within a 50 year period, ericaceous shrubs should establish and black spruce and tamarack should increase in abundance.

3.7 AQUATIC HABITATS

Water quality and fish species data within the study area lakes is dated and sparse. Big Indian Lake supports populations of brook trout, banded killifish, American eel, golden shiner and sticklebacks (Alexander et al 1986). Fishery surveys in Otter Lake produced golden shiners; but the recreational fishery indicates the presence of brook trout as well. Anecdotal information suggests that brook trout occupy the remaining lakes in the study area. Although not officially recorded, eels and small fish such as minnow species, stickleback, and killifish are probably common to all the lakes. The Nine Mile River is a popular place to fish for sea run brook trout. There are no rare or endangered species of fish recorded in this area.

The dam on Big Indian Lake blocks fish passage up the Prospect River. This dam is of high quality concrete and it is possible to make a fish ladder on the south side of the dam. It is not known if there are other impedances to fish passage elsewhere in the Prospect River system.

3.8 RARE PLANTS

A review of the Atlas of Rare Vascular Plants in Nova Scotia, Pronych and Wilson (1993) revealed that two rare species, mountain sandwort (*Arenaria groenlandicum*) and evening primrose (*Oenothera fruticosa*) have been found within the atlas squares within which the Western Common Study Area is situated. Mountain sandwort has been recorded from Geizer's Hill which is located within 2 km of the Western Common; however, there is no record of it being found within the Western Common. The atlas does not indicate where the evening primrose was found. During the field surveys the appropriate habitats for both of these species were searched; however, neither species was found. No other rare species were encountered during the surveys. No rare species were encountered during the detailed vegetation surveys conducted within the Western Common Study Area as part of the environmental assessment for the Otter Lake landfill site.

3.9 BIRDS

Seventy-six species of birds have been recorded in the Western Common Study Area (see **Table 17, Appendix A**). Most of these are relatively common species characteristic of forest habitats. There are, however, a number of species which have been listed as vulnerable species by NSDNR (1998a) or are sensitive to disturbance. Common Loon and Northern Goshawk have been yellow listed by NSDNR, indicating that they are species known to be, or believed to be, particularly sensitive to human activities or natural events.

Common Loons are threatened by lead, mercury and PCB contamination of food and water. Local breeding populations may be adversely affected by flooding of nests by propeller wash from motor boats, collisions with motor boats, and loss of nests as a

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result of flooding of hydroelectric flowages. Common Loon breeding habitat is threatened by cottage development, other shoreland development activities, water pollution and forest harvesting along the shores of lakes.

During the field surveys Common Loons were observed on Otter Lake and Little Indian Lake. No evidence of nesting was found; however, it is likely that Common Loon could nest on any of the lakes in the Western Common that have low islands suitable for nesting. The lack of shoreline development, presence of fish and very low levels of motor boat traffic on these lakes would make them suitable breeding habitat.

Threats to Northern Goshawk include small population size, limited geographic distribution, disturbance of nest sites, loss of suitable nesting habitat as a result of forest fragmentation and stand conversion which may cause changes in prey abundance.

One Northern Goshawk was observed in the Western Common in October near the eastern end of Big Indian Lake. Given the season in which the observation was made it is not possible to confirm if this species breeds in the study area. Northern Goshawks breed in mature hardwood or mixed wood forests which are relatively abundant in the Western Common, suggesting that this species may breed in the area.

Several other raptor species have been recorded in the Western Common including Osprey, Bald Eagle, Red-tailed Hawk, Broad-winged Hawk, Barred Owl, and Great Horned Owl. Most raptors species are particularly sensitive to anthropogenic disturbance since they occur in low numbers, require large territories and are easily disturbed. During the field studies for the Otter Lake landfill site an Osprey nest and a suspected Barred Owl nest were found in the area between Otter Lake and Nine Mile River. It is not known if these nests are still occupied. Suitable nesting habitat is available within the study area for all of these species. Osprey and Bald Eagle nests tend to be constructed in tall pines, usually on slopes overlooking fish bearing water courses. Red-tailed Hawks and Broad-winged Hawks typically construct their nests in mature hardwood forest or mixed wood forest. Barred Owls and Great Horned Owls breed in a variety of mature forest types. Barred owls generally nest in large hollow hardwoods while Great Horned Owls typically make use of the abandoned nests of crows, ravens and other raptors.

The Western Common occupies portions of two breeding bird atlas squares (Erskine 1992). A total of 96 species were recorded in these squares (see **Table 18, Appendix A**). All but 29 of these species have previously been recorded in the Western Common. These additional species are marked with an asterisk in the table. Suitable breeding habitat is available in the Western Common for 14 of the additional species including Common Merganser, Sharp-shinned Hawk, Northern Harrier, Common Snipe, Black-backed Woodpecker, Alder Flycatcher, Eastern Wood Peewee, Olive-sided Flycatcher, Barn Swallow, Tennessee Warbler, Northern Waterthrush, Wilson's Warbler, Rusty Blackbird, and Fox Sparrow. One of these species, the Fox Sparrow, is considered to be a rare breeder in Nova Scotia. Treed bogs present in the study area could provide suitable breeding habitat for this species. The two raptor species, Northern Harrier and Sharp-shinned Hawk, are relatively sensitive to anthropogenic disturbance. Northern Harriers nest in open grassy wetlands and might be expected to breed in fen and low shrub dominated swamp habitat in the study area. Sharp-shinned Hawks nest in mature conifers often at the edge of a woods road or clearing.

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One other rare breeder, Northern Mockingbird was recorded in the atlas squares. In Nova Scotia, this species typically breeds in gardens and is unlikely to breed in the mature forest habitats characteristic of the Western Common.

3.10 MAMMALS

Observations and evidence of mammals were recorded during field work. Mammal evidence includes tracks, fur, carcasses or skeletal remains, and faeces. The list is not a complete inventory of potential mammal species in the study area since no small mammal surveys have been conducted in the area. Species recorded in the Western Common include: snowshoe hare (*Lepus americanus*), eastern chipmunk (*Tamias striatus*), american red squirrel (*Tamiasciurus hudsonicus*), northern flying squirrel (*Glaucomys sabrinus*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethica*), porcupine (*Erithizon dorsatum*), red-backed vole (*Clethrionomys gapperi*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), American black bear (*Ursus americanus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), river otter (*Lutra canadensis*), mink (*Mustela vison*), short-tailed weasel (*Mustela erminea*), and shrew (*Sorex sp.*).

Other species not recorded during field observations but noted in the area by field naturalists include star-nosed mole (*Condylura cristata*), short-tailed shrew (*Blarina brevicauda*), red fox (*Vulpes vulpes*), deer mouse (*Peromyscus maniculatus*), and bats (likely little brown bats, *Myotis lucifugus*). Moose (*Alces alces*) have been occasionally reported in the area. None of the species noted are considered to be rare in Nova Scotia (Scott 1994), or Canada (COSEWIC 1998). However, two species, moose and little brown bat are considered to be vulnerable in Nova Scotia (NSDNR 1998c).

The mainland moose population has been red listed indicating that it is known, or believed to be, in imminent danger of extirpation. Moose on mainland Nova Scotia are threatened mainly by interspecific competition with white-tailed deer and a high rate of infection by brainworm (*Parelaphostrogylus tenuis*), which is generally fatal. White-tailed deer are a vector for the brainworm such that the presence of high densities of deer increase the frequency of infection in moose. Increased road access caused by forest harvesting activities has increased the rate of illegal hunting of moose placing further stress on this population. Only the Cape Breton moose population is considered stable.

The little brown bat has been yellow listed by NSDNR indicating that this species is particularly sensitive to anthropogenic activities. Little brown bats are abundant in Nova Scotia and their population is considered to be stable (NSDNR 1998c). This species is sensitive to anthropogenic activity due to the fact that large numbers of little brown bats hibernate communally in caves and abandoned mine shafts. Consequently, during the winter months large proportions of the population are susceptible to disturbance or destruction of these hibernacula. The geology of the Western Commons Study Area is not conducive to the formation of solution caves and there are no known abandoned mines located within it. As such it does not provide critical little brown bat winter habitat.

Another mammal species of interest in the Western Commons Study Area is the black bear. Evidence of black bear feeding activity was found at several sites, particularly in barrens adjacent to Blueberry Lake. Barrens provide a variety of foods for black bears including blueberries, huckleberries and ants. Wetlands in the area provide grasses and sedges which are important food items for black bears in the

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early spring. Wetlands are also used by black bears during the summer months to provide relief from high temperatures. It is not known if black bears reside in the study area year round or wander into the area during late summer and fall to feed. Black bears generally avoid areas of human habitation. The large continuous habitat found in the Western Common permits this species to forage in close proximity to an urban center.

3.11 REPTILES AND AMPHIBIANS

Nova Scotia's terrestrial and fresh water herpetofauna consist of thirteen amphibian and nine reptile species. Field surveys and interviews with Mike Macdonald, a naturalist familiar with the Western Common revealed the presence of eight amphibian species and four reptile species in the habitats of the study area.

Frog and toad species observed in the study area include green frog (*Rana clamitans*), pickerel frog (*R. palustris*), wood frog (*R. sylvatica*), spring peeper (*Pseudacris crucifer*), and American toad (*Bufo americanus*). Yellow-spotted salamanders (*Ambystoma maculatum*) and eastern redback salamanders (*Plethodon cinereus*) are common throughout the study area. Red-spotted newts (*Notopthalmus viridescens*) occur sparsely in some of the lakes and ponds (e.g., Big Indian Lake).

Field surveys detected suitable breeding habitat for four-toed salamanders (*Hemidactylium scitatum*) at several sites although this species was not detected during the field surveys and has not been found in the area by Mr. Macdonald. Four-toed salamanders have been recorded from the general area (Gilhen, 1984) suggesting that there is a fairly high probability that they may be present in the study area.

Maritime garter snakes (*Thamnophis sirtalis*) are common throughout the area particularly in the vicinity of waterbodies and wetlands. Northern redbelly snakes (*Storeria occipitomaculata*) were encountered along paths, generally under rocks, fallen bark or logs. Eastern smooth green snakes (*Opheodrys vernalis*) and northern ringneck snakes (*Diadophis punctatus*) are also present in the Western Common.

The number of amphibian and reptile species present in the Western Common agrees well with distribution records compiled by Gilhen (1984). Gilhen's records indicate the presence of ten amphibian and five reptile from the general vicinity of the Western Common compared to eight amphibians and four reptiles recorded during field surveys and interviews. Species recorded in the general area by Gilhen but not found in the study area include four-toed salamander, bullfrog (*Rana catesbeiana*) and eastern painted turtles (*Chrysemys picta*).

With the exception of the four-toed salamanders, which were not encountered during the survey, none of the herpetile species present are considered rare in Nova Scotia (Scott 1994). Four-toed salamanders typically breed in sphagnum hummocks along the margins of sluggish streams. These sluggish streams provide habitat for the larvae of this species. After the breeding season, this species disperses to woodland habitats surrounding the breeding habitat. This species is very cryptic and is thought to be more widespread and abundant than existing records would suggest (Gilhen pers. comm.). The Western Common contains a number of small streams flowing through boggy areas which would provide suitable habitat for this species.

3.12 UNIQUE OR SENSITIVE FEATURES OF THE WESTERN COMMON STUDY AREA

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The most unique feature of the Western Common is the fact that it is a large area of relatively undisturbed forest habitat located in close proximity to a large urban centre. As the former water supply for Halifax, no forest harvesting has occurred since the area was designated as a water supply. As a result of this protection most of the study area is now occupied by mature forest. Most of this forest is second growth and characterized by low species diversity; however, the presence of a large area of almost continuous mature forest is of value particularly in the context of its location in an urban area which is highly fragmented by roads and human habitation.

There are several stands that warrant protection. These areas are illustrated in Figure 12, Special Habitats. They include: a probable old growth forest located along the Prospect River (this site also has aesthetic value with the river cascading through it); a remnant "typical" forest stand of this region which includes the hardwoods (e.g., sugar maple, beech, oak) and is approximately 150 years old, near Otter Lake; a stand which includes several old farmstead oaks, near Dick Lake; and several other minor stands which offer vegetation diversity.

This large tract of relatively UN-fragmented mature forest provides habitat for a number of wildlife species which require large areas of habitat or avoid contact with humans. Species which have been recorded in the Western Commons Study Area and require these conditions include black bear, moose, Bald Eagle, Northern Goshawk, Red-tailed Hawk, Broad-winged Hawk, Great Horned Owl and Barred Owl. The existing knowledge base is not sufficient to determine how critical the Western Common is to these species. For instance, it is not known which of the raptors recorded in the study area use it as a breeding area. Similarly, it is not known if black bear den in the area year round or just forage there during the late summer and autumn. Nevertheless, any development in the Western Commons Study Area should take the habitat requirements of these species into account.

Another unique feature of the Western Common is the juxtaposition of this area and Long Lake Provincial Park to the east and a large undeveloped crown land parcel to the west. The close proximity of these three areas provides a very large almost continuous area of relatively undisturbed habitat useful to species requiring large ranges. Thus its large size is perhaps its most important feature; in landscape ecology terms, large patches of mature forest are becoming rarer and rarer on the earth and as well as in Nova Scotia.

3.13 LAND USE

Early land uses in the study area included farming and forestry. The Greenhead Road and old St. Margarets Bay Road cross the Western Common connecting the drumlins which are old farmsteads. During field work a number of these farmsteads were discovered. The largest remains are on the same large drumlin as the Resource Management Centre (the south end). Foundations of both house and barn can be seen, and part of a field remains open. A second farm on a drumlin to east of Dick Lake can be identified by the large field oaks which remain in the forest, and the cellar hole. The remains of an old saw mill can be found on the drumlin to the north of Dick Lake.

The Halifax Watershed lands were acquired in the 1950s to protect the Halifax water supply. These lands remained closed to public use until the 1980s. At this time the province acquired the Long Lake provincial park reserve with the intention of developing a regional day-use park. These lands remain in provincial hands, with the exception of the parcel across Highway 333 from Ragged Lake which was sold to

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the Exhibition Park. Since the 1980's portions of the Western Common lands have been used by the City of Halifax for the Bayers Lake and Ragged Lake business parks.

Most recently, the Otter Lake Resource Management Centre has been located in this area. A fixed 1 km setback zone has been set around this facility where development is to be prohibited. A second zone at 2 km from the facility has also been established until the facility proves itself. A compost facility has also recently been located on these lands off of Highway #333 near Goodwood.

3.14 DEVELOPMENT IMPLICATIONS

The following are implications derived from the site description:

1. There is no commercial value in the mineral resources on the site.
2. Surficial aggregate sources are rare and small. The granite itself has limited value as bedrock aggregate.
3. Granite is not a source of acid rock drainage, a common problem with slate exposures in much of HRM.
4. The typically thin till and soil cover have little ability to buffer acid rain or other surface pollutants. Care must to be taken during development to control pollutants.
5. The bedrock and till have a high natural uranium content, but it is unlikely to ever be of interest as a mineral resource. Uranium is a radioactive element; the uranium decay cycle includes the colourless, odourless gas radon. Outdoors, even relatively high radon concentrations present minimal health risk. Radon is an indoor problem; buildings can collect and concentrate radon gas carried by soil gas and groundwater to levels that present a health risk. The more radon in the air breathed and or the longer the exposure to radon, the higher the risk of lung cancer. Remediation of buildings, building sites, and groundwater systems is effective and relatively inexpensive but requires engineering and geological site-scale surveys and radon measurement for this purpose both before and after development.
6. The granite bedrock means that any groundwater is high in dissolved minerals and metals and not appropriate for large scale water supply.
7. The generally thin till layer means that areas of relatively thick till should be optimized for development.
8. Drumlins are unique features and very valuable in HRM. A number of land uses are, for the most part, restricted to these areas (Wolfville and Hantsport soils), including large recreation fields, cemeteries, and farming. Other uses, such as on-site services, buried central services, development etc. are more cost effective on drumlins than elsewhere.
9. As elsewhere in HRM, the climate is generally cool and wet. Winter, solar gain is important. Locations to achieve increased solar gain and winter wind protection are important.
10. Habitats in the study area are generally typical of those in the region. that have been cut over repeatedly. These habitats could benefit greatly from overt management (e.g., fire, replanting missing species, etc.) to increase vegetation diversity, promote regeneration, and enhance the area for wildlife.
11. Some old farm fields persist in various stages of regeneration; these areas make interesting cultural interpretation.
12. No occurrences of rare flora or fauna have been found. Sensitive species require large, uninterrupted patches, suggesting a pattern of a large wilderness area as opposed to several small ones.

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13. The 1 km setback zone around the Resource Management Facility will probably be required indefinitely suggesting that no short term development may be planned there. The 2 km zone is temporary, until the new centre proves itself, and development may be planned in this one for the near term.

14. The Greenhead Road and St. Margarets Bay Road trails must persist in any successful plan.

15. Archaeological sites are of interest as cultural resources that may also represent development opportunities or limitations. An archaeological study was not undertaken and should be before development occurs because there is evidence of 19th and 20th century settlement and indication that the area may include pre-European sites. There are three registered archaeological sites in the area, two Late Ceramic Period native sites near the mouth of the Nine Mile River, and a Late Archaic to Early Woodland Turkey-Tail site in the area of Otter Lake. The presence of these sites suggests that the Nine Mile River represents a moderate to high potential for native settlement. These sites have potential for preservation and interpretation.

Appendix E: Chebucto Peninsula Concept Plan

Appendix F: Trail Profiles

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**Western Common
Recommended Trail Construction Costs
July 20, 2009**

Trail construction costs will be determined by topography and drainage conditions along the selected route. The following recommended costs are based on average unit rates from recent experience with trail construction and provided for budget and planning purposes only.

Shared-Use Trail (Motorized Vehicles, max. design speed 50 km/h)

- avg. width 12 feet
- trail surface compacted Type 1 gravel
- route selected to avoid gradients steeper than 15%
- allowance made for design / construction to “off-road vehicle” standards including
- engineering of plan and profile, cut and fill, stabilization of side slopes, subsurface drainage
- no allowance for water / wetland crossings
- recommended unit rate: \$130.00 / lineal foot

Shared-Use Trail (No Motorized Vehicles, max. design speed 20 km/h)

- avg. width 10 feet
- trail surface crusher dust on compacted Type 1 gravel base
- route selected to avoid gradients steeper than 10%
- no allowance for water / wetland crossings
- recommended unit rate: \$40.00 / lineal foot

Barrier-Free Trail

- avg. width 6 feet
- trail surface crusher dust on compacted Type 1 gravel base
- route selected to avoid gradients steeper than 5% (i.e. no ramps, curbs or rails required)
- no allowance for water / wetland crossings
- recommended unit rate: \$25.00 / lineal foot

Back-Country Hiking Trail

- avg. width 24 inches
- trail constructed with natural / site materials
- minimal site disturbance
- allowance included for access to remote locations
- recommended unit rate: \$10.00 / lineal foot

Bridges

- wood deck, steel span with abutments
- recommended unit rate: \$170.00 / square foot

Wetland Crossings

- boardwalk on piles
- recommended unit rate: \$100.00 / square foot

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Appendix G: Tables 4.1 and 4.2 from the Point Pleasant Park Plan, October 2008.

Excerpt of Chapter 4 from the *Point Pleasant Park Comprehensive Plan*. Ekistics Planning & Design/NIP paysage, October 2008.

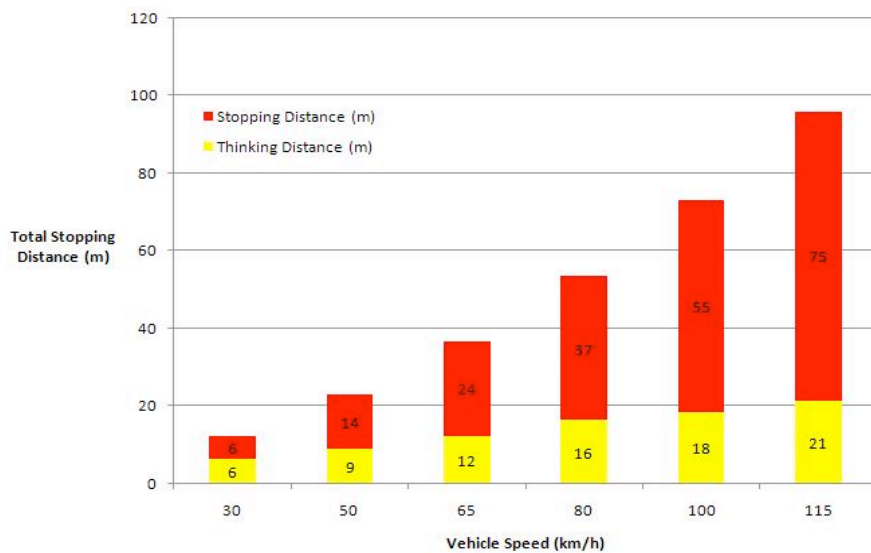
Appendix H: Active Transportation Routing Safety

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Cycling infrastructure in Canada varies between and within cities, but commuter cycling generally follows a strong pattern of being on road, beside both moving and parked motor vehicles. The construction of dedicated AT shoulder lanes as part of a comprehensive trails system within Kings has inherent risks involving bringing active transportation users and vehicles into close proximity.

One study found that in Canada, between 2000 and 2004, 44 per cent of cyclist fatalities occurred in rural areas on roads with posted speed limits of 80 km/h or higher.⁴⁹ The reason for this is simple - for both stopping distances and the severity of crashes, speed matters.

Minimum Stopping Distance vs. Speed



The above graph illustrates that as speed increases, thinking distance—the time required to process the situation and begin braking—increases at a steady rate while stopping distances increase dramatically. For example, at 80 km/h, a driver who spots a pedestrian in the road 50 metres ahead will simply not have enough time to analyse the situation and stop in time. That same driver, driving at 50 km/h, will have stopped long before the pedestrian is at risk.⁵⁰

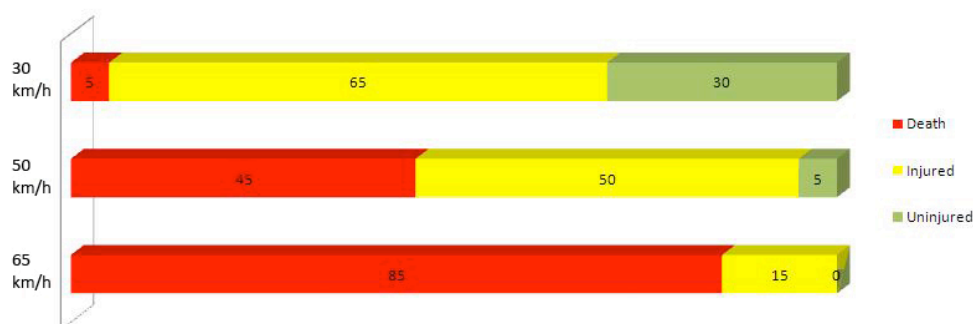
A doubling in vehicle speed results in a stopping distance four times as long and in four times as much kinetic energy absorbed during an impact. Driver response times further increase overall stopping distances. As a result, a small increase in roadway traffic speeds results in a disproportionately large increase in pedestrian fatalities.

Pedestrian Injuries at Impact Speeds (adapted from Transport Canada data)

⁴⁹ Increasing your odds of avoiding bike injuries, accessed July 26, 2009 at <http://www.cbc.ca/health/story/2009/07/22/f-bicycle-safety-avoiding-accidents-injury.html>

⁵⁰ Vehicle stopping distance and time, accessed on July 29, 2009 at <http://www.csgnetwork.com/stopdistinfo.html>

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Pedestrian crash severity is also much lower at low motor vehicle speeds. If a pedestrian is struck by a motor vehicle traveling at 65 km/h there is an 85 percent likelihood that the pedestrian will be killed. This percentage drops to 45 percent at 50 km/h and 5 percent at 30 km/h. Thus, slowing motor vehicle speeds not only reduces the chance of a crash due to the shorter stopping distance required, but also reduces the chance of a pedestrian fatality or serious injury.

Another factor to be considered is the tendency for vehicles to drift into opposing lanes in order to avoid AT traffic, even when more than enough room has been engineered into the design of the road to accommodate all traffic. One study found that cars and especially larger vehicles can move as much as 4 feet into the opposite lane, leaving enough space for an entire car to pass between them and the cyclist being avoided. A clearly delineated, marked bike lane was found to lessen this effect by as much as 40%.⁵¹

For urban roads with many junctions, accident analysis suggests that segregated cycling facilities are likely to produce a 12-fold increase in the number of collisions. These conclusions are supported by the experience of countries that have implemented segregated cycling facilities.⁵² At a 1990 European conference on cycling, the term Russian roulette was used to describe the use of roadside cycle paths. Increased speeds, reduced sight lines from hills and turns, the presence of farm machinery and transport trucks impinging on the lanes are all factors that must be taken into account in the design phase for any potential projects that will place the AT user in harm's way.

In contrast to the common North American design, European cities often offer a more dedicated cycling infrastructure alongside roads, but separated from motorized traffic (e.g., with medians, curbs, or other barriers).⁵³ There are also design issues with this methodology, as separated trails dramatically increase the risk of collision at intersections.

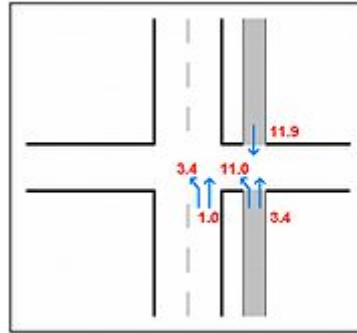
⁵¹ Evaluation of On-Street Bicycle Facilities Added to Existing Roadways, Hallett, Ian, Luskin, David and Machemehl, Randy. Center for Transportation Research, Texas Department of Transportation. 2006

⁵² [Risk factors for bicycle-motor vehicle collisions at intersections](#), Wachtel, A. and Lewiston, D., Journal of the Institute of Transportation Engineers, pp 30-35, September, 1994.

⁵³ "Russian roulette" on sidepaths - sidepaths are the target of criticism, accessed on July 29, 2009 from <http://www.bikexpert.com/bikepol/facil/sidepath/adfc173.htm>

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Separated AT Path-Roadway Intersection Risk Increases



At points where a roadway crosses a trail system, the conditioned behavior of drivers is to look both ways on the intersecting road, overlooking the trail system. Cyclists too, can be accustomed to having a free rein within their own lane, and can be unprepared for making stops at intersections, especially over terrain that allows for increased speeds. Simple design techniques can be incorporated into the trail system, such as the placement of steel or concrete bollards at road junction points to ensure that AT traffic is stopped and chicanes can be worked into the design of the pathways in order to minimize “tunnel vision”. Even placing clear signage at intersections, so that both vehicular and AT traffic is aware of the risk, can greatly reduce the risk.

While long stretches of rural highways, such as Highway 333 connecting Tantallon, Peggy’s Cove and the Western Common, are one of the more risk-prone places to put shoulder lanes for AT traffic, and in-town AT paths (where intersections are many) are not easily placed off the road, there should be a discernable point at which these two styles of AT enhancement can be employed in a logical manner.

Juxtaposing the aforementioned fatality vs. speed figures with those demonstrating the ability of drivers to respond to hazards at varying speeds, there is a point around 50km/h at which it becomes too risky to place AT users into traffic. As the speed limit in Nova Scotia is limited at 50 km/h within most communities (which is also where the risk of intersection collisions is the highest), one strategy that could be employed would be to place bikes on the streets within communities in their own lanes. For all other roadways where an AT connection is desired, a separate AT trail should be used, taking care to minimise intersections with roads.