

COOTES TO ESCARPMENT

Conservation and Land Management Strategy



Phase 1—Background Report

December 2007



Our living countryside

**Royal Botanical Gardens
Conservation Halton
Hamilton Conservation Authority
City of Burlington
City of Hamilton
Halton Region
Hamilton Naturalists' Club
Bruce Trail Conservancy
Hamilton Harbour Remedial Action Plan**

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Table of Contents

Acknowledgements	i
Executive Summary	ii
1 Introduction	1
1.1 Study Purpose.....	1
1.2 Study Area.....	2
1.3 Planning Process	3
2 Legislation and Plans.....	3
2.1 Provincial Legislation, Plans and Policies.....	3
2.1.1 Growth Plan	5
2.1.2 Greenbelt Plan.....	6
2.1.3 Niagara Escarpment Plan	9
2.1.4 Parkway Belt West Plan.....	15
2.1.5 Provincial Policy Statement	15
2.2 Environmental Legislation and Plans	16
2.2.1 Royal Botanical Gardens Legislation and Mandate	16
2.2.2 Conservation Authority Legislation and Mandate	17
2.2.3 Species Protection Legislation	18
2.2.4 Environmental Assessment Act Projects	19
2.3 Regional and Local Plans and Policies.....	20
2.3.1 Municipal Official Plans	20
2.3.2 Hamilton Harbour Remedial Action Plan	22
3 Local Context	23
3.1 Land Ownership	23
3.2 Land Use & Future Urban Development	24
3.3 Regional Road Network	25
4 Cultural Environment	26
4.1 Ecological and Cultural History	26
4.2 Cultural and Historic Resources.....	29
4.2.1 Federal.....	29
4.2.2 Provincial	29
4.2.3 Municipal	29
5 Natural Environment	33
5.1 Setting and Climate	33
5.2 Physiography and Soils	33
5.3 Hydrology.....	34
5.4 Ecological System	35
5.4.1 Terrestrial Habitat	35
5.4.2 Special Features	40
5.4.3 Fisheries and Aquatic Habitat.....	40
5.4.4 Greenlands System.....	42
6 Social & Economic Environment	44
6.1 Population and Population Growth	44
6.2 Economic Activities	45
6.3 Recreation Uses and Trends	47
6.3.1 Bruce Trail	47
6.3.2 Inter-Municipal Recreational Trails.....	47
6.3.3 Recreational and Educational Facilities	48
6.3.4 Recreation Trends	51

Cootes to Escarpment Conservation and Land Management Strategy
Phase 1 Background Report

7	Environmental and Conservation Land Management Summary	52
7.1	Environmental Significance	52
7.2	Environmental Sustainability	53
7.3	Conservation Lands Threats and Opportunities	53
	References	57
	Figures.....	61

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Executive Summary

The Cootes to Escarpment Conservation and Land Management Strategy will provide direction on the long-term management and ecological health of key natural areas in a portion of the City of Hamilton and City of Burlington. It will also bring forth a vision and plan of action for providing permanent protection of significant natural lands in the area to create a system of linked natural areas and public recreation and education opportunities. The focus is on the natural lands owned by public and non-profit organizations in the Westdale, Dundas, and Waterdown areas of Hamilton; and, Aldershot in Burlington. This includes major land holdings around Cootes Paradise Marsh, Grindstone Creek and the Niagara Escarpment totaling about 1,550 hectares.

The study area is located within Ontario's Greenbelt. The Greenbelt Plan, enacted in 2005, gives permanent protection to natural heritage and water resource systems within its boundaries in order to sustain a healthy future for south-central Ontario. Cootes Paradise is an important ecological and hydrological feature in the Greenbelt which also includes the Niagara Escarpment, a World Biosphere Reserve. The management of lands in the study area will protect the health of these natural features and maintain the integrity of the Greenbelt from impacts of future development.

This Background Report is Phase 1 of a two phase process. The second phase will begin in January 2008 with an extensive public process to develop the Strategy. Background information has been collected through a literature review and covers the legislative framework; physical and natural environment; and, cultural and social environment including recreation facilities and nature education programs.

The Introduction presents an overview of the study purpose (section 1.1) and process (section 1.3), and study area (section 1.2). A description of the study areas is expanded in Section 3 with an overview of the public and non-profit land ownership and a general description of the land use and road network surrounding these lands. Detail on the characteristics of the study area are in section 4 where ecological and cultural history and current cultural resources are presented; section 5 which describes the physical and natural features; and, section 6.3 which covers recreation facilities and nature education programs. Finally, sections 2, 6.1, and 6.2 present the legislative framework that is applicable to development of a conservation and land management strategy, the projected population numbers and demographics, and municipal direction for economic development.

While the background information can be read in the order it is presented, it could also be read based on the interest areas identified above. The last section (7), begins to identify the environmental and cultural values of the natural lands and the major land management issues and opportunities facing the public and non-profit landowners. It is intended to stimulate the discussion necessary to define the future use and management of the natural lands entrusted to our care.

1 Introduction

The Niagara Escarpment from Dundas to Burlington connecting to the Cootes Paradise Marsh and the Grindstone Creek Estuary is one of the richest biological areas in Canada. This unique ecological corridor is a natural resource on the landscape which must be viewed in the context of the Hamilton and Burlington cities within which it is located. It is strategically located both with respect to its environmental significance, rich cultural history, and its location within a rapidly developing urban area.

The Cootes to Escarpment Conservation and Land Management Strategy is a collaborative effort of several public landowners and key stakeholders. This includes Royal Botanical Gardens, Conservation Halton (Halton Region Conservation Authority), Hamilton Conservation Authority (Hamilton Region Conservation Authority), City of Hamilton and City of Burlington as the main public conservation landowners. Working with a core group that also includes the Halton Region (Regional Municipality of Halton), Hamilton Naturalists' Club, Bruce Trail Conservancy, and Hamilton Harbour Remedial Action Plan, it is intended to develop, with the community, a "vision" for these lands and prepare an integrated Strategy for their future use and enhancement. The planning approach will take into account the values attached to these lands from the perspective of the natural, social and economic environments.

This Phase 1 Background Report provides information on the study area and an evaluation of the information in the context of park planning. It will be used in the development of the Strategy and form the basis for the Phase 2 final document.

1.1 Study Purpose

About 1,550 hectares of publicly owned natural lands are present within this ecological corridor. Some of the natural lands have existing facilities and master plans for their future management. However, many of the protected natural areas have no management plans in place and there is no overall coordinating management strategy for natural lands within the corridor. The Cootes to Escarpment corridor faces intense pressures from the surrounding urbanized portions of Hamilton and Burlington, and major transportation arteries such as Highways 403 and 6. The effects of urban growth include stressors such as increased infrastructure needs; demand for recreation and educational programs and facilities; and, unauthorized use and access and damage to sensitive habitats jeopardizing important environmental research and natural areas restoration and enhancement projects.

While large blocks of protected natural lands are present, there are also significant gaps which include both key natural features and habitats and essential ecological linkages that are vital to the long term viability of some existing protected natural lands and/or important connections for future public recreational opportunities. Conserving key missing links in the natural lands system would insure the future health of the ecosystem and facilitate public enjoyment of the land base.

Due to increasing urban pressure on this unique area a coordinated conservation and land management strategy for these lands is needed. This Strategy will provide protection and direction for the use of these significant natural lands and bring forth a vision and plan of action for providing permanent protection of additional significant natural lands in the area to create a system of linked natural areas and public recreational and education opportunities that will be ecologically viable in the long term.

The Phase 1 Report provides background information, based on a literature review, as the basis upon which the final Cootes to Escarpment Conservation and Land Management Strategy will be developed. Using a community based planning approach, a vision for the conservation lands will be developed. The Strategy will illuminate this vision by identifying future management strategies, identifying at a conceptual level recreational open space uses, and identifying additional lands necessary to ensure the long term health of the natural system within the study area. The development of the Strategy will consider such aspects as: access to the natural system; protection of special habitats; regional, provincial, or national ‘park’ status; land acquisition and land trusts; and public facilities.

1.2 Study Area

The study area (approximately 8,500 hectares), as illustrated on figure 1, straddles the boundary of the City of Hamilton and the City of Burlington, which is part of Halton Region. Its boundaries loosely follow Brant Street in Burlington on the east, Dundas Street (Highway 5) on the north, Sydenham Road, in Hamilton, on the west, and Hamilton Harbour on the south. The central natural features include a portion of the Niagara Escarpment in Hamilton and Burlington and lands and waters associated with Cootes Paradise Marsh and Grindstone Creek.

There are a number of key public land holdings of Conservation Halton, Royal Botanical Gardens, and Hamilton Conservation Authority that are part of natural systems that drain into Cootes Paradise Marsh and Grindstone Creek Estuary. The natural areas contain some of the botanically richest lands in Canada, as well as providing habitat for many important bird, reptile, amphibian, fish, and insect species. The area has a unique micro-climate due to the moderating effect of Lake Ontario and shelter provided by the south facing slope of the Niagara Escarpment. These conditions bring together the specialized habitats for southern Carolinian forest zone plant species at their northern limits and more northern species at their southern limits. Cootes Paradise Marsh and Grindstone Estuary connect this ecological unit to Lake Ontario through Hamilton Harbour.

The two main watersheds are Grindstone Creek, with a watershed area of 9,000 ha, and Spencer Creek, with a watershed area of 28,400 ha. The mouth of Spencer Creek is a 250 ha shallow marsh and open water area known as Cootes Paradise Marsh. Cootes Paradise Marsh used to outlet to the estuary of Grindstone Creek, until the current outlet directly into Hamilton Harbour was created in the 1850’s. The estuary is now separated from Cootes Paradise Marsh by fill connecting Burlington Heights, a glacial bay-mouth sandbar with the north shore of Hamilton Harbour (also referred to as Burlington Bay).

The Niagara Escarpment is a major geological and ecological feature extending 725 kilometres from Queenston in Niagara Region to Tobermory on the Bruce Peninsula. The Niagara Escarpment is recognized internationally by the Bureau of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and Biosphere Program as a World Biosphere Reserve. This limestone ridge is a glacial rebound feature formed by deposits on the bed of an Ordovician tropical sea. Several glacial advances, erosion and weathering have created the feature it is today.

Through the Dundas, Flamborough and Burlington section, the Niagara Escarpment is characterized by a variety of habitats such as a wide reentrant valley (Spencer Creek), cliff faces, and narrow ravines (Grindstone Creek). Several smaller watersheds drain directly to Cootes

Paradise Marsh or Hamilton Harbour from the Escarpment. These include Falcon, Indian, Hager and Rambo Creeks, which start just above the Escarpment. This section of the Niagara Escarpment is one of the few sections with a southern aspect. It is this south facing protected microclimate that creates the habitat for the wide diversity of unique species that will be detailed in later sections.

1.3 Planning Process

The Strategy will be guided by a Steering Committee made up of key public and non-government landowners in the study area. These include Royal Botanical Gardens, which is the lead agency, Conservation Halton, Hamilton Conservation Authority, City of Burlington, City of Hamilton, Halton Region, Hamilton Naturalists' Club, Bruce Trail Conservancy, and Hamilton Harbour Remedial Action Plan. This project is divided into two phases. Phase 1 will document the physical, social, and economic characteristics of the area. This will be presented to the public and potential stakeholders to provide the starting point for developing a management strategy.

Full involvement of the community will be an essential component to development of the Strategy. Phase 2 will include the formation of a Stakeholder Advisory Group. It is intended that the Stakeholder Advisory Group will include representatives from local citizens, non-government interest groups, and municipal, provincial and federal agencies. The Stakeholder Advisory Group will guide the development of the Strategy's components including identifying issues; establishing a vision; and developing concept plans and management recommendations. The Phase 2 Report will be presented to the public for review and input.

The Steering Committee will finalize the Strategy and secure its endorsement from their respective Boards or Councils as well as a general commitment towards its implementation. The final document will provide the vision and strategy to guide future natural areas protection and recreation and education development initiatives

2 Legislation and Plans

2.1 Provincial Legislation, Plans and Policies

Ontario's municipal planning system is policy driven and guides local municipal growth form and location. Stemming from concepts of sustainable ecological systems, recent Provincial plans and policies recognize that a healthy community depends on a healthy natural environment. The municipalities implement Provincial plans and have adopted Official Plans that are consistent with provincial policy. Developing a conservation and land management strategy for the Cootes to Escarpment Corridor should consider the direction provided by the Province and municipalities. A summary follows, with specific details on the various provincial and municipal policies under subsections 2.1.1-2.1.5 and 2.3.1.

There are four Provincial Plans applicable to this area: Growth Plan, Greenbelt Plan, Niagara Escarpment Plan (figure 2), and Parkway Belt West Plan. While they work together overall, the Growth Plan focuses on providing direction on the form and location of development in urban areas and transportation networks and the Greenbelt Plan supports rural communities and agriculture while giving permanent protection to natural heritage and water resource systems. The Greenbelt Plan has designated a natural heritage system that builds upon the Niagara Escarpment Plan natural system. Together the Greenbelt Plan and Niagara Escarpment Plan

define the environmental framework that is intended to protect, maintain and enhance natural heritage, as well as hydrologic and landform features and functions. The Growth Plan supports these two plans and builds upon them through policies that encourage development of an urban open space system. All three plans support conservation and promotion of cultural heritage resources, while the Niagara Escarpment Plan specifically includes policies on maintaining associated cultural heritage features with the most natural Escarpment Natural Area features, and includes policies for the protection of cultural features and areas within other designations.

All three plans encourage municipalities, conservation authorities, and non-government organizations to develop accessible parkland open space systems and trails that respect the natural sensitivity of areas and landscapes. The Niagara Escarpment Plan has defined a Parks and Open Space system based on existing publicly owned lands. This Plan provides the most direction on developing park management plans. Parks in the Niagara Escarpment Plan system are classified based on the predominant natural and physical characteristics and include Nature Reserve, Natural Environment, Recreation, Historical, and Escarpment Access. The uses that could occur in these parks range from minimal facilities that would be necessary for scientific research or natural history interpretation in Nature Reserves to active recreation requiring major infrastructure such as a campground in Recreation Parks. The Niagara Escarpment Plan outlines specific zones that would define uses that could be applied to a park based on the physical and natural characteristics of the site.

These three plans have been recently approved or updated by the Province. The Parkway Belt West Plan is a plan close to 30 years old. Large portions of the Plan area are also covered by the three previous plans which provide much greater direction and protection of natural features for the Natural Heritage System. Two areas of note are Pleasantview in Hamilton and North Aldershot in Burlington. Further discussion on these two areas will follow after the following brief synopsis of the Provincial Policy Statement and municipal Official Plans.

The Provincial Policy Statement, like the Provincial Plans has specific policies aimed at ensuring that the natural system, cultural heritage and archeological resources are managed such that essential ecological processes are protected, there would be minimal environmental impacts, and cultural resources are conserved. The Provincial Policy Statement and the Greenbelt Plan strongly promote natural and hydrologic systems as the best means of protecting natural features and functions due to the interrelationships between land, water, abiotic and biotic elements. Furthermore, the policies in these documents support maintenance, restoration or improvements of these systems, with the Growth Plan and Niagara Escarpment Plan supporting this direction. They both do not permit development or site alteration in provincially significant wetlands, coastal wetlands and the habitat of endangered or threatened species. Development or site alteration is not permitted in wetlands not of provincial interest, significant woodlands, significant valleylands, significant wildlife habitat, fish habitat, savannahs and tallgrass prairies, or areas of natural and scientific interest within the Greenbelt. The Provincial Policy Statement indicates that development may be permitted if the health and integrity of these features or ecological functions is not threatened.

The official plans of the City of Hamilton, Burlington, and Halton Region must conform with the Provincial Plans. Both cities have prepared recent official plan updates that implement a natural heritage system and are intended to conform and implement the Provincial Plans. Halton Region is updating their Official Plan. Halton Region's Official Plan has a natural heritage system as envisaged by the Province under the Provincial Policy Statement.

Pleasantview is generally considered to be the area between Hwy 6 and Borer's Falls Conservation Area, mostly along a plateau from the bottom of the Escarpment cliff face to just south of York Road in Hamilton. The area has been confirmed in the current Provincial and Hamilton policies as a rural area. Lands may be developed as large 10 ha residential lots as set out by the Ontario Municipal Board. As well the Greenbelt Natural System policies would also need to be considered. Anything that differs will require further studies and amendment to the City of Hamilton Official Plan and will need to conform with the Growth Plan, which does not contemplate this area for urban use, as well as other applicable policy. While this area is in the Parkway Belt West Plan, the Province is currently considering transferring Pleasantview to the Niagara Escarpment Plan Area. Once this occurs, policies on land use and environmental controls will need to be established by amending the Niagara Escarpment Plan.

North Aldershot covers the study area in Burlington north of Hwy 403. This area has been the subject of numerous studies and most recently the North-Aldershot Inter-Agency review. This study forms the basis for the policy direction in this area. There are three sectors, of which the Central Sector between Grindstone Creek and just to the east of Waterdown Road could be developed as water and sewer services are available. The City of Burlington and Halton Region official plans, Greenbelt Plan and Niagara Escarpment Plan all restrict development from the environmental areas associated with the creek systems and their valley, environmentally significant areas, and Niagara Escarpment natural features as well as the buffers to these areas. The lands that could be considered for development are covered by the Growth Plan, Parkway Belt West Plan, and municipal Official Plans. The general principle that would need to be met is the development would be low-density and visually compatible with the existing character, natural landscape and environment. Further studies would be required to establish additional development in the remainder of North Aldershot. This would include refinement to the boundaries of the environmental areas.

In summary, provincial and municipal planning policy support the establishment of a natural system that protects the features and ecological functions of these areas. There is also direction to conserve the cultural resources and consider the cultural landscape with the form and location of development. These two aspects when combined and considered for both urban and rural contexts should form part of a comprehensive open space park system that would be accessible to the public in manner that respects environmental and cultural sensitivities.

2.1.1 Growth Plan

The *Places to Grow Act, 2005* provides the legislative framework for the Growth Plan for the Greater Golden Horseshoe (referred to as Growth Plan). The Growth Plan provides the policy direction for: the location of development, the relationship of the growth areas to natural areas, and where walking and cycling will be practical elements of the urban transportation system. The Growth Plan identifies existing built-up areas and designated greenfield areas at a conceptual level. This will be refined with the local and regional municipalities. Portions of the study area are within the built-up areas and designated greenfield as well as Greenbelt (which is discussed below).

A key vision of the Greater Golden Horseshoe is:

“A healthy natural environment with clean air, land and water will characterize the GGH. The Greenbelt, including significant natural features, such as the Oak

Ridges Moraine and the Niagara Escarpment, has been enhanced and protected in perpetuity. These will form the key building blocks of the GGH's natural systems. The GGH's rivers and streams, forests and natural areas will be protected and accessible for residents to enjoy their beauty. Open spaces in our cities, towns and countryside will provide people with a sense of place.” (Ministry of Public Infrastructure and Renewal, 2006)

To achieve this, the Growth Plan has policies to protect valuable natural heritage features and areas, and cultural heritage sites. It recognizes that both the Greenbelt Plan and Niagara Escarpment Conservation Plan identify natural heritage systems and has policies to guide their protection. The Growth Plan supports and builds on these Plans. Under section 4.2.1, Natural Systems the following policies are directly applicable to developing this conservation and land management strategy:

“3. Planning authorities are encouraged to identify natural heritage features and areas that complement, link, or enhance natural systems.

4. Municipalities, conservation authorities, non-governmental organizations, and other interested parties are encouraged to develop a system of publicly accessible parkland, open space and trails, including shoreline areas, within the GGH that –

- a) clearly demarcates where public access is and is not permitted
- b) is based on a co-ordinated approach to trail planning and development
- c) is based on good land stewardship practices for public and private lands.”

(Ministry of Public Infrastructure and Renewal, 2006)

Furthermore the Growth Plan encourages the establishment of an urban open space system within the built-up area. The natural open space system and urban open space system would ideally work seamlessly together.

2.1.2 Greenbelt Plan

The Greenbelt Plan applies to all lands outside the built-up areas and designated greenfield areas of the Growth Plan. The Greenbelt Plan supports and includes the lands protected under the Niagara Escarpment Plan and Parkway Belt West Plan and builds upon the natural heritage system in these Plans by identifying a ‘natural heritage system’ within the Protected Countryside designated areas of the Plan. The Greenbelt is intended to provide permanent protection to natural systems and at the same time support economic and social activities associated with tourism and recreation. A key vision of the Greenbelt Plan is:

“The Greenbelt is a broad band of permanently protected land which:

- Gives permanent protection to the natural heritage and water resource systems that sustain ecological and human health and that form the environmental framework around which major urbanization in south-central Ontario will be organized; and
- Provides for a diverse range of economic and social activities associated with rural communities, agriculture, tourism, recreation and resource uses.” (Ministry of Municipal Affairs and Housing, 2005)

The applicable Environmental Protection goals to achieve this vision are:

- “Protection, maintenance and enhancement of natural heritage, hydrologic and landform features and functions, including protection of habitat for flora and fauna and particularly species at risk”;
- “Protection and restoration of natural and open space connections between the Oak Ridges Moraine, the Niagara Escarpment, Lake Ontario, Lake Simcoe and the major river valley lands, while also maintaining connections to the broader natural systems of southern Ontario beyond the Golden Horseshoe such as the Great Lakes Coast, the Carolinian Zone, the Lake Erie Basin, the Kawartha Highlands and the Algonquin to Adirondacks Corridor”;
- “Provision of long-term guidance for the management of natural heritage and water resources when contemplating such matters as development, infrastructure, open space planning and management, aggregate rehabilitation and private or public stewardship programs”. (Ministry of Municipal Affairs and Housing, 2005)

The applicable Culture, Recreation, and Tourism goals to achieve this vision are:

- “Support for the conservation and promotion of cultural heritage resources”; and
- “Provision of a wide range of publicly accessible built and natural settings for recreation including facilities, parklands, open space areas, trails and water-based/shoreline uses that support hiking, angling and other recreational activities”. (Ministry of Municipal Affairs and Housing, 2005)

The policies related to the Natural System (Section 3) focus on restricting development from the System which includes:

1. key natural heritage features (significant habitat of endangered species, threatened species, and special concern species, fish habitat, wetlands, ANSI’s, significant valleylands, significant wildlife habitat, savannahs and tallgrass prairie);
2. key hydrologic features (streams, seepage areas, springs; and wetlands); and
3. lands connecting the features in 1 and 2.

However Section 4.1.2.4 identifies certain parameters that if met would allow for small scale recreational uses.

A major component of the Greenbelt Plan is related to parkland, open space and trails. The plan recognizes that a publicly accessible system of parklands, open space and trails needs to be maintained and expanded to meet the demands of a growing and changing population for recreation, tourism, and natural heritage appreciation.

Specific Parkland, Open Space and Trail policies (Section 3.3.2) include:

“The Province should, in partnership with municipalities, conservation authorities, non-government organizations, and other interested parties:

1. Encourage the development of a system of publicly accessible parkland, open space and trails where people can pursue the types of recreational activities envisaged by this Plan, and to support the connectivity of the Natural Heritage System;
2. Encourage the development of a trail plan and a coordinated approach to trail planning and development in the Greenbelt to enhance key existing trail networks and to strategically direct more intensive activities away from sensitive landscapes; and
3. Promote good stewardship practices for public and private lands within the Greenbelt, including clear demarcation of where public access is permitted.” (Ministry of Municipal Affairs and Housing, 2005)

The Municipal Parkland, Open Space and Trail Strategies (Section 3.3.3) policies indicate that municipalities should:

- “1. Provide for a full range of publicly accessible, built and natural settings for recreation including facilities, parklands, open space areas, trails and water-based activities;
2. Develop and incorporate strategies (such as community-specific levels of provision) into official plans to guide the adequate provision of municipal recreation facilities, parklands, open space areas and trails;
3. Include the following considerations in municipal parkland and open space strategies:
 - a) Providing for open space areas for current and future populations and promoting stewardship of open space areas;
 - b) Providing facilities, parklands, open space areas and trails that particularly support an active, healthy community lifestyle;
 - c) Identifying key areas or sites for the future development of major facilities that avoid sensitive landscapes;
 - d) Identifying and targeting under-serviced areas for improved levels of protection; and
 - e) Protecting the recreation and tourism values of waterfront areas as a high priority; and
4. Include the following considerations in municipal trail strategies:
 - a) Preserving the continuous integrity of corridors (e.g. abandoned railway rights-of-way and utility corridors);
 - b) Planning trails on a cross-boundary basis to enhance interconnectivity where practical;
 - c) Incorporating the existing system of parklands and trails where practical;
 - d) Restricting trail uses that are inappropriate to the reasonable capacity of the site (notwithstanding the ability to continue existing trails/uses);
 - e) Providing for multi-use trail systems which establish a safe system for both motorized and non-motorized uses;
 - f) Supporting and ensuring compatibility with agriculture; and
 - g) Ensuring the protection of the sensitive key natural heritage features and key hydrologic features and functions of the landscape.” (Ministry of Municipal Affairs and Housing, 2005)

Furthermore, the Plan recognizes that ‘conservation authority lands are also important components in the development of parkland, open space and trail strategies. Ongoing management of these lands for publicly accessible recreation, in keeping with environmental management plans and strategies for such areas and the policies of this Plan, is important in providing access to this system.’ (Ministry of Municipal Affairs and Housing, 2005)

2.1.3 Niagara Escarpment Plan

The Niagara Escarpment Plan is Ontario’s first environmental land use plan approved by the Provincial Cabinet in 1985 under the provisions of the *Niagara Escarpment Planning and Development Act* (1973).

In 1990 the Niagara Escarpment Plan was recognized internationally as a World Biosphere Reserve, one of 13 in Canada. A “Biosphere Reserve” is an international designation of recognition from UNESCO (the United Nations Educational, Scientific, and Cultural Organization) for an area in the world which is deemed to demonstrate a “balanced relationship between humans and the biosphere.”

The objectives for the Niagara Escarpment Plan are outlined in the *Niagara Escarpment Planning and Development Act* under Section 8 and form the basis for the Niagara Escarpment Plan:

- “(a) to protect unique ecologic and historic areas;
- (b) to maintain and enhance the quality and character of natural streams and water supplies;
- (c) to provide adequate opportunities for outdoor recreation;
- (d) to maintain and enhance the open landscape character of the Niagara Escarpment in so far as possible, by such means as compatible farming or forestry and by preserving the natural scenery;
- (e) to ensure that all new development is compatible with the purpose of this Act as expressed in Section 2;
- (f) to provide for adequate public access to the Niagara Escarpment; and
- (g) to support municipalities within the Niagara Escarpment Planning Area in their exercise of the planning functions conferred upon them by the *Planning Act*.” (Province of Ontario, 2007b)

The purpose of the Niagara Escarpment Plan is:

“to provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment, and to ensure only such development occurs as is compatible with that natural environment.”

This Plan is administered by the Niagara Escarpment Commission. In areas where there is a conflict between the Niagara Escarpment Plan and the Greenbelt Plan, the more restrictive policy applies. Within the Niagara Escarpment Plan area, only the Greenbelt Plan Parkland, Open Space, and Trails policies apply.

Within the Study Area, four of the Niagara Escarpment Plan (referred to as NEP) designations apply. The Escarpment Natural Area contains lands that are in a relatively natural state and represent the most significant natural and scenic parts of the Escarpment. The Escarpment Natural Area includes the forested Escarpment face and forested lands extending 300 m back from the Escarpment brow, Provincially Significant Life Science Areas of Natural and Scientific

Interest (ANSI) and the most significant wetlands. These areas are afforded the highest level of protection under the NEP.

Permitted uses are restricted, however, passive recreational uses are encouraged such as ‘non-intensive recreation uses such as nature viewing and trail activities, except motorized vehicle trails or the use of motorized trail vehicles’ Also permitted is ‘forest, wildlife and fisheries management’.

The Escarpment Protection Area designation applies to the Escarpment face where land uses have altered the natural environment, Regionally Significant Areas of Natural and Scientific Interest, including regionally identified Environmentally Sensitive Areas, and lands that are part of the landscape required to provide a buffer to the more sensitive parts on the Escarpment environment. Escarpment Protection Areas can be more visually prominent than the Escarpment Natural Area. Only limited development may occur in the Escarpment Protection Area.

Within the Escarpment Protection Area, permitted uses in non-agricultural area include ‘recreation uses oriented towards the land which require minimal modification of the existing natural, topographic and landscape features and which do not require the building of major structures (e.g., picnic sites, day use sites, unserviced camp sites, trail uses). Golf courses are not permitted.’ ‘Forest, wildlife and fisheries management’ is also permitted.

Escarpment Rural Areas are necessary to maintain the open landscape character and/or to provide a buffer to the more ecologically and visually significant portions of the Escarpment landscape.

Within the Escarpment Rural Area the range of permitted uses permitted on non- agricultural land is more permissive. For example, recreational uses such as campgrounds, golf courses and associated golf course country clubs and trail uses may be permitted provided that any detrimental impact of these uses on the Escarpment scenic qualities and natural environment is kept to a minimum. Also permitted is ‘forest, wildlife and fisheries management’.

The Urban Area designation also occurs within the Study Area, and recognizes the Urban designation in the approved municipal official plans.

Within the Urban Area designation, which applies to Waterdown, permitted uses are ‘subject to conformity with Part 2, Development Criteria, and the Development Objectives of the NEP as incorporated into official plans and/or secondary plans and, where applicable, zoning by-laws’.

The land use designations and permitted uses are described more fully under Part 1 of the NEP. Part 2 of the NEP sets out specific Development Criteria that must be met by all development.

In addition to the permitted uses and Development Criteria, Part 3 of the NEP describes the Niagara Escarpment Parks and Open Space System. This section sets out the framework for the establishment and co-ordination of a parks system to be implemented by public and quasi-public bodies (e.g., the Bruce Trail Conservancy and the Royal Botanical Gardens). The park planning system and criteria that applies to the development of a Park or Open Space Master/Management Plan is described in this Part. The Bruce Trail corridor and related infrastructure is permitted in all land use designations. Once a Park or Open Space Master/Management Plan is approved by the Ministry of Natural Resources to not conflict with the NEP, the Park Master/Management Plan takes precedence over the land use designations in the NEP

Part 2 prescribes the Development Criteria that might apply to development. Certain development, as prescribed by regulation, does not require a development permit from the Niagara Escarpment Commission. The Development Criteria will be used as a guide in the parks planning process. Specific developments proposed as part of Phase 2 within the NEP will need to be reviewed against the Development Criteria to ensure overall conformity of the Strategy with the NEP. While all criteria will apply, Part 2.13 speaks specifically to recreational activities:

- “1. All recreational activities should be designed and located so as not to conflict with surrounding land uses (e.g., agriculture) and be compatible with the natural and cultural character of the area.
2. Where they may be permitted, golf courses shall be designed and maintained to minimize impact on the natural and physical Escarpment environment (i.e., minimum re-grading, maximum incorporation of natural vegetation, undisturbed and rough areas, minimum fertilizer and irrigation demands).
3. Subject to the applicable criteria of the Plan, a golf course in the Escarpment Rural Area may be permitted to have a small scale restaurant appropriately sized to serve only members and their guests provided that water and sanitary services are to the satisfaction of the relevant authorities and the Public Health Department only if the golf course is one that is open to the public (pay-as-you-play, by private membership or both) with a minimum of nine regulation holes comprising the course. Banquet and conference facilities shall not be permitted.
4. Intensive recreational activity is intended to occur primarily in the designated Escarpment Recreation Areas and on the public lands of the Niagara Escarpment Parks and Open Space System established for this purpose.
5. Recreational uses should not exceed the carrying capacity of a site or area.
6. Trails will be located and designed so as not to adversely affect adjoining private landowners.
7. Motorized vehicle trails are encouraged to use abandoned pits or quarries, abandoned railway lines or unused township roads where disruption of the natural environment would be minimal.
8. Trails will be located and designed to avoid wherever possible steep slopes, wetlands, erosion-prone soils, agricultural areas and ecologically sensitive areas such as deer-wintering yards and significant plant and animal habitats and Areas of Natural and Scientific Interest.
9. Where existing trails are in locations that cause environmental deterioration, relocations to a less critical location shall be encouraged.
10. Trail design, construction and management should ensure the safety of trail users.” (Province of Ontario, 2006)

Part 3 of the Niagara Escarpment Plan, sets out the policies for the Niagara Escarpment Parks and Open Space System. The System ‘is based on public lands acquired to protect distinctive features and significant areas along the Escarpment’. The objectives of the Parks and Open Space System are:

- “1. To protect unique ecological and historical areas;
2. To provide adequate opportunities for outdoor education and recreation;
3. To provide for adequate public access to the Niagara Escarpment;

4. To complete a public system of major parks and open space through additional land acquisition and park and open space planning;
5. To secure a route for the Bruce Trail;
6. To maintain and enhance the natural environment of the Niagara Escarpment;
7. To support tourism by providing opportunities on public land for discovery and enjoyment by Ontario's residents and visitors;
8. To provide a common understanding and appreciation of the Niagara Escarpment; and
9. To show leadership in supporting and promoting the principles of the Niagara Escarpment's UNESCO World Biosphere Reserve Designation through sustainable park planning, ecological management, community involvement, environmental monitoring, research and education." (Province of Ontario, 2005)

The System includes six park classifications and each park may be zoned for particular purposes. As well some parks are identified as Nodal Parks. Nodal Parks provide a focal area to the System and have extra functions as visitor reception, orientation, education, interpretation, and recreation.

Within the Study Area the following areas are part of the Parks and Open Space System:

Name	Park Class	Nodal Park
Royal Botanical Gardens	Natural Environment	Nodal Park
Borers Falls Conservation Area	Nature Reserve	
Clappison Woods	Natural Environment	
Grindstone Creek	Nature Reserve	
Waterdown Woods	Nature Reserve	
Burlington City Park	Recreation	
Kerncliff Park	Natural Environment	
Cedar Springs Trail	Escarpment Access	

The classification is based on the predominant characteristics of the property. The classifications are intended to guide the management and use of the park or open space area and will be confirmed when the management plan is prepared. The NEP encourages park managers to bring parks or open space areas into conformity with the Plan. The following excerpts from the NEP describes the basis upon which more detailed park planning for these areas would be undertaken.

“Nature Reserve

These are areas which represent the most significant and the distinctive natural areas and landforms found along the Niagara Escarpment. These areas serve to protect selected Areas of Natural and Scientific Interest. Management practices and uses in a nature reserve will ensure that the features and values for which the reserve was established remain protected in perpetuity.

Access to these areas will not be widely promoted and activities will be limited to those which can further scientific understanding and education (e.g., scientific research, natural history interpretation, and nature trails or the Bruce Trail). The minimum of facilities necessary to support these activities will be provided.

Natural Environment

These lands are characterized by the variety and combination of outstanding natural features, historical resources and outstanding landscape.

Natural Environment areas provide opportunities for the protection of important natural and cultural features. Activities may range from back-country hiking in the interior of these areas to car-camping and day use activities in the more developed or accessible areas.

Recreation

These are some of the best recreational environments along the Escarpment. They either occur naturally or are capable of being developed to provide a wide variety of outdoor recreation opportunities in attractive Escarpment surroundings. In Recreation areas, management and development of resources is appropriate in order to provide the recreational environment and facilities required to support a wide variety of activities. These may be day use only. Facilities for overnight camping may also be provided including campgrounds, temporary yurts and tents, lean-to's and unserviced camper's cabins.

Escarpment Access

These areas will complement the larger, and in some cases, more developed parks or open space areas, by providing opportunities for public access to the Niagara Escarpment at appropriate points along the Escarpment. These areas will normally be small and may provide modest facilities to support day use activities at view points, rest areas, trailheads, picnic sites, scenic areas, fishing areas, beaches, or other points of interest.

New Escarpment Accesses may be established by the Ministry of Natural Resources, conservation authorities, or on the initiative of local municipalities or organizations such as service clubs.

Not all Escarpment Accesses are identified in Appendix 1 or on Map 10 since new Accesses at strategic locations may be secured or acquired from time to time where a gap in the System has been identified (e.g. lack of public access)." (Province of Ontario, 2006)

While the park class generally identifies how the park or open space should be managed, the actual management plan will provide specific direction for each area. The NEP identifies a park zone system that would be applied to each park or open space that would recognize that each area is unique with respect to the natural features, the significance of these features, and the potential for development or existing development. The six zones in the NEP are:

1. Nature Reserve Zones: include significant natural features or areas which require careful management to ensure the long term protection of these natural values.
2. Natural Zones: include aesthetic landscapes in which a minimum of development is permitted to support low to moderate intensity recreational activities.

3. Access Zones: serve as staging areas (e.g. trailheads, parking lots) where minimal facilities support the use of Nature Reserve Zones and relatively undeveloped Natural and Historical Zones.
4. Historical Zones: include significant archaeological or historical features or areas which require management that will ensure the long term protection of the significant values.
5. Development Zones: provide the main access to the park and open space, and facilities and services to support the recreational activities available (e.g. campgrounds, picnic areas, maintenance facilities).
6. Resource Management Zones: provide for intensive resource management (e.g., forest management, fisheries management, water management, wildlife management, multiple use management).” (Province of Ontario, 2006)

The NEP states that a Nature Reserve may only have Nature Reserve Zone, Access Zone, and/or Historical Zone. All other park classes may have any of these zones.

Under Part 3.1.6, the NEP provides direction on the preparation of master/management plans that are intended to ‘establish policy guidelines for the long term protection, development and management of the park or open space’. While this Strategy will cover more than one park as well as lands outside the Niagara Escarpment Plan area, this Strategy should not conflict with the NEP at least for the lands within the NEP area. The classification of a park or open space area can be changed as a result of a master/management planning process without an amendment to the NEP. Within Part 3, there are specific policies which guide recreation and commercial uses, the Bruce Trail, and land acquisition and disposal.

There are two areas on the Niagara Escarpment that have special provisions and/or are under consideration for inclusion in the NEP:

North Aldershot Policy Area

Under Part 2.2 of the NEP, there are Special Provisions for the North Aldershot Policy Area which indicate:

“16. Notwithstanding the policies of Part 2.2, development may occur in accordance with the land use policies set out in Amendment No. 197 to the City of Burlington Official Plan in the area identified as the North Aldershot Policy Area on Map 3 to the Niagara Escarpment Plan.” (Province of Ontario, 2006)

Pleasantview Survey

In Dundas, Part Lots 20-29, Concession 1-2, is a rural area known as the Pleasantview Survey. These lands are not within the Niagara Escarpment Planning Area. However, the Province is currently considering including this area within the Niagara Escarpment Planning Area with the support of the Niagara Escarpment Commission and the affected municipalities. Once the lands are included in the Niagara Escarpment Planning Area, an amendment to the Niagara Escarpment Plan would be required to include these lands in the Niagara Escarpment Plan.

2.1.4 Parkway Belt West Plan

The Parkway Belt West Plan (referred to as PBWP) was prepared and approved in 1978 under the *Parkway Belt Planning and Development Act*. The goals of the PBWP include providing ‘a system of open space and recreational facilities linked with each other’ (Ministry of Treasury, Economics & Intergovernmental Affairs, 1978). This Plan designates lands as Public Use Areas, with several sub-categories, and Complementary Use Areas. The direction provided by the PBWP is built upon and further defined by the Growth Plan and Greenbelt Plan. For the purposes of this Strategy, the Plan area can be considered in two parts: the natural lands now covered by the Greenbelt Plan and the remainder of the PBWP area.

a) Natural System Lands within the Greenbelt Plan

The lands designated Public Open Space in the PBWP, have been included in the Protected Countryside designation of the Greenbelt Plan as well as the Natural Heritage System of the Greenbelt Plan. The policies of the Greenbelt Plan with respect to Natural System and Parkland, Open Space and Trails apply to these areas of the PBWP. The Greenbelt Plan policies provide greater direction and protection to natural features in this regard than the PBWP.

Portions of the lands designated Complementary Use in the PBWP have also been included in the Natural Heritage System based on existing assessed natural features. While the Complementary Use policies continue to apply, the policies of the Greenbelt Plan with respect to Natural System and Parkland, Open Space and Trails also apply to these areas. The Greenbelt Plan policies provide greater direction and protection to natural features in this regard.

b) Other Lands within the Parkway Belt West Plan

There are areas of Pleasantview designated Complementary Use in the PBWP that are included in the Greenbelt Plan but are not part of the Natural Heritage System of that plan. There are also Complementary Use areas north of Hwy 403 in Burlington within the PBWP and not in the Greenbelt Plan. In these cases, the policies of the PBWP continue to apply and the Protected Countryside policies of the Greenbelt Plan do not. The intent of the PBWP policies is for the area to be used for low-density, low-intensity agricultural, institutional, and recreational uses. There are several policies that indicate development and re-development must be designed to be visually compatible with the natural landscape.

2.1.5 Provincial Policy Statement

The Provincial Policy Statement (Ministry of Municipal Affairs and Housing, 2005b) identifies the provincial policy foundation for regulating the development and use of land. The Province has identified specific policies aimed at ensuring that the natural system, cultural heritage, and archaeological resources are managed such that essential ecological processes are protected, there are minimal environmental impacts, and cultural resources are conserved. The Provincial Policy Statement seeks a balance between environmental, economic and social benefits and supports a coordinated approach between municipalities to managing natural heritage, cultural heritage, and archaeological resources.

With respect to Public Spaces, Parks and Open Space, specific policies include:

“1.5.1 Healthy, active communities should be promoted by:

- a) planning public streets, spaces and facilities to be safe, meet the needs of pedestrians, and facilitate pedestrian and non-motorized movement, including but not limited to, walking and cycling;
- b) providing for a full range and equitable distribution of publicly-accessible built and natural settings for recreation, including facilities, parklands, open space areas, trails and, where practical, water-based resources;
- c) providing opportunities for public access to shorelines; and
- d) considering the impacts of planning decisions on provincial parks, conservation reserves and conservation areas.” (Ministry of Municipal Affairs and Housing, 2005b)

The Provincial Policy Statement (referred to as PPS) has policies directed to natural heritage and water features and areas, but also expects identification and protection of the natural system as it is necessary for its long term function and diversity. In summary the PPS policies provide the following direction (policies 2.1 and 2.2):

1. a biologically diverse natural heritage system should be maintained, restored, or improved that recognizes and maintains the linkages between the terrestrial and aquatic features and areas with surface and ground water;
2. development and site alterations (to be referred to as development in this section) are not permitted in provincially significant wetlands, coastal wetlands, and the habitat of endangered and threatened species;
3. where there is a significant woodland, significant valleyland, significant wildlife habitat, or provincially significant area of natural and scientific interest (referred to as ANSI), development may only be possible in and adjacent to these areas if it will not threaten the health and integrity of these features or their ecological function;
4. development is not permitted in or adjacent to fish habitat unless it does not result in a harmful alteration, disruption, or destruction of fish habitat, unless authorized under the federal *Fisheries Act*; and
5. vulnerable or sensitive surface and ground water features will need to be protected, improved or restored.

Cultural heritage resources include buildings or structures associated with architectural, cultural, social, political, economic or military history that have been identified as important to the community. Policy requires that these resources be conserved such their heritage values, attributes and integrity are retained.

Archeological sites and artifacts found as a result of development need to be conserved by removal or documentation. Where the archeological resource is considered to be significant and must be preserved on site, the heritage integrity of the site will need to be maintained.

2.2 Environmental Legislation and Plans

2.2.1 Royal Botanical Gardens Legislation and Mandate

Royal Botanical Gardens (referred to as RBG) is governed by the provincial *Royal Botanical Gardens Act*. The original legislation was passed in 1941 and has been amended several times to its current form. The Act includes under the objects of the corporation:

- “a) to develop, assemble, document and maintain living collections of plants and animals;
- b) to maintain nature preserves;
- c) to protect specific environments and flora and fauna that are of special value as parental stock or may be in danger of extinction;
- d) to exhibit its collection to the public in cultivated and natural areas;
- e) to conduct botanical, horticultural and related biological research; ...
- g) to act as an information resource centre for plant sciences and the understanding of natural phenomena, and conduct education programs, including extension activities.” (Province of Ontario, 1989)

RBG has had a long history of acquiring and managing natural lands as part of its program. Hendrie Valley and some of Cootes Paradise Marsh formed part of the original landholding of Royal Botanical Gardens when it was incorporated in 1941. It has also developed an extensive education program for adults and children that includes curriculum based education classes as well as general interest courses that are aimed at developing an understanding of plants and environmental stewardship.

In 2005, through a review of the RBG mandate, these roles have been confirmed through its vision to be ‘a natural asset recognized for its excellence in preserving, conserving and presenting flora and fauna in its unique landscape’ (Royal Botanical Gardens, 2005). The key roles RBG should continue in are conservation and education as well as horticulture and science and research. In developing its key role in conservation as a modern botanic garden in the areas of biodiversity conservation, environmental education and sustainable development, long term actions include:

1. preparing a natural lands stewardship plan in partnership with key stakeholders; and
2. collaborate with partners to develop and implement interpretive programs for its natural lands. (Royal Botanical Gardens, 2005)

Related to the natural lands, RBG plays a key role in educating the public about the importance of plants and the scientific significance of the RBG natural lands, as well as promoting environmental sustainability. These will enrich visitor experience and link to issues that are important to the general public to tangible natural areas. A long term action to achieve this is to ensure that the physical development of RBG supports education such that it can play an important regional and provincial education role (Royal Botanical Gardens, 2005).

2.2.2 Conservation Authority Legislation and Mandate

There are two conservation authorities within the study area: Conservation Halton, which includes the North Shore and Grindstone Watersheds, and Hamilton Conservation Authority, which includes the Spencer Creek Watershed. Conservation Authorities are local, community-based environmental agencies that derive their powers from the *Conservation Authorities Act*. Section 20 states ‘the objects of an authority are to establish and undertake, in the area over which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals’. While each conservation authority has a program that is based on the characteristics of its watershed, the programs can broadly be categorized as protecting local ecosystems, managing water resources on a watershed basis, and educating people of all ages on the natural environment.

Conservation Halton's *Towards a Healthy Watershed*, 2005 identifies the strategic directions for the organization. Their vision is 'to sustain a healthy watershed with clean streams, vigorous forests, abundant green space and balanced growth that results in strong livable communities'. Strategic directions to achieve this vision include:

- “1.1 Develop, enhance and sustain a natural heritage system for the watershed
- 1.5 Ensure protection and environmentally effective management of lands under Conservation Halton stewardship
- 2.2. Develop outdoor recreational opportunities across Conservation Halton lands” (Conservation Halton, 2005)

There are specific actions identified that this project implements, including: 'identify threatened wildlife, plants, and habitats along with protection strategies; develop and implement master plan and management strategies for Conservation Halton lands; develop and implement an environmentally sustainable strategy for Conservation Halton lands including measures to protect threatened or endangered species of wildlife and plants, and the habitats that sustain them; develop partnership opportunities for effective land management; and, develop and implement a watershed trail strategy on Conservation Halton lands in relation to other trails'.

Hamilton Conservation Authority's *Leading Conservation Forward*, 2006 identifies the strategic directions for the organization. Their vision is 'Hamilton Conservation Authority will work to ensure healthy streams and healthy communities in which human needs are met in balance with the needs of the natural environment, now and in the future'. The main goals relevant to this Strategy are 'protect, restore, and enhance natural areas, ecological systems, and built heritage through land acquisition, stewardship and environmental planning' and 'provide high quality, diverse conservation areas to promote greater physical activity, health and well-being for all, and to act as tourist destinations'. Specific objectives that apply to this project include: 'prioritize potential land acquisitions based on considerations such as endangered habitat and species, connections, corridors, core areas and waterfalls; and review and update master plans for selected conservation areas' (Hamilton Region Conservation Authority, 2006).

Both conservation authorities have similar program directions with respect to land management and land acquisition. In addition to regulatory, planning and stewardship programs to achieve the goals and objectives of the Conservation Authorities, both own and manage natural lands.

2.2.3 Species Protection Legislation

Provincial and federal legislation exists specifically to protect species at risk. Species at risk are wild plants and animals that have been found to be at some risk of disappearing from the wild in Canada. Since 1996 when the federal, provincial and territorial governments signed the National Accord for the Protection of Species at Risk in Canada, governments have been working together to protect species at risk through various laws as it is recognized that the health and quality of life depends on biodiversity. Loss of species through human activities reduces this biodiversity.

The primary federal law is the *Species at Risk Act*. In Ontario, the *Endangered Species Act* has existed since 1971, and has been updated but does not come into effect until June 30, 2008. Both governments acknowledge that protecting species at risk requires the involvement of landowners to be good stewards of the land and to participate in preserving the species and their habitats through voluntary actions and stewardship activities.

The *Species at Risk Act* includes measures to protect both the species and the habitat. On non-federal owned lands the Act only applies to federally listed endangered, threatened or extirpated aquatic species and migratory bird species. The Act seeks to protect the species as well as their habitat.

The Ontario *Endangered Species Act*, 1990 currently protects listed endangered species and their habitat and applies to all lands in Ontario not owned by the federal government. The new Act, when it comes into effect, will protect listed endangered, threatened and extirpated species and their habitat. It also includes a requirement to develop plans such that species of special concern (a native species that is sensitive to human activities or natural events and formerly termed vulnerable) will recover.

A principle action of both the federal and provincial legislation is the development of recovery plans (recovery strategy under federal law) for endangered and threatened species and the development of management plans for species of special concern. These plans identify ways to manage and improve the status of the species and could include measures to increase the population, ways to protect critical species habitat, and monitoring. Many of the recovery strategies have been prepared; however have yet to be released for public review or adopted by the federal government (per. com. Natalie Iwanycki, Oct. 29/07).

While these are the primary pieces of legislation to protect endangered, threatened, extirpated, or species of special concern there are a number of other federal and provincial laws and policies that can be used to protect these species on private lands. These include federal *Fisheries Act*, *Migratory Birds Convention Act*, and *Canada Wildlife Act*. At the provincial level, these include *Fish and Wildlife Conservation Act*; and, through land use planning and the Provincial Policy Statement.

2.2.4 Environmental Assessment Act Projects

Under the Environmental Assessment Act, certain types of projects need to undergo an environmental assessment to identify and eliminate or reduce the effects on the environment. Three projects relevant to this Strategy are described briefly below (per. com. Lorissa Skrypnik, Sept. 12/07).

Waterdown Aldershot Transportation Master Plan: This project is being led by the City of Hamilton in partnership with the City of Burlington and Halton Region. The part within the study area relates to Waterdown South. The project is currently starting Phase 3, which will identify a recommended design for geometric improvements and widening of Waterdown Road and widening of Mountain Brow Road. This phase has just started.

Valley Inn Road Bridge: The City of Hamilton undertook a class environmental assessment to address structural deficiencies at the Valley Inn Road Bridge over Grindstone Creek. This was carried out in consultation with the West Harbour Trails Master Plan Steering Committee that recommended a trail link along Valley Inn/Spring Gardens Road as part of the waterfront trail system. Detailed design is now being undertaken for the preferred option which is to have the Valley Inn Bridge for pedestrian use only. The location for closing of Valley Inn Road and Spring Gardens Road will be carried out as part of detail design. The City of Hamilton intends to carry out works in 2008. There is no time-line for works on the City of Burlington side.

Strathcona Neighbourhood Waterfront Trail Pedestrian Connection: A portion of this environmental assessment project is located within this study area. The project is seeking a solution to provide pedestrian access from the Strathcona Neighbourhood in the City of Hamilton to the Waterfront Trail. This project is currently reviewing potential solutions with a preliminary preferred location being a crossing located at the end of Locke Street.

2.3 Regional and Local Plans and Policies

2.3.1 Municipal Official Plans

a) City of Hamilton

The City of Hamilton includes the communities of Waterdown, on the north side of the study area, Dundas on the west side of the study area, and Westdale on the south side of Cootes Paradise Marsh. These urban areas are covered by the Regional Official Plan of Hamilton Wentworth (January 2007 office consolidation) as well as the local official plans until such time as the Urban Area Official Plan for the City is prepared. The City has adopted a Rural Official Plan (September, 2006) that replaces the Regional Official Plan for the area it applies to. It covers most of the City in the study area, however it has not been approved by the Ministry of Municipal Affairs at this time. For the purposes of this Strategy, the Rural Official Plan policies were referred to as they represent the general direction that the City intends to proceed.

The Rural Official Plan has been prepared to implement and conform with the provincial planning documents. It identifies a Natural Heritage System. Lands within the Natural Heritage System are designated a specific land use and development would only be permitted if it met the specific policies of the land use designation as well as the policies of the Natural Heritage System. The Natural Heritage System includes the Greenbelt Natural Heritage System, the Greenbelt Protected Countryside, and other core areas across the Official Plan area. Development is not permitted within the Greenbelt key natural heritage features and key hydrological features; and, provincially significant wetlands, significant coastal wetlands and the habitat of threatened and endangered species for core areas outside the Greenbelt. The Plan recognizes the importance of linkages between the core areas to maintaining the ecological health and integrity of the System. The Greenbelt Natural Heritage System includes some linkages. Otherwise, linkages have not been identified at this time.

In addition to the features identified above, the Open Space designation includes Niagara Escarpment lands, city wide parks and small neighbourhood parks. The City's goal is to provide an integrated parks and recreation system by linking open space lands through the use of walkways, bicycle paths and trails.

The Pleasantview area is identified as Special Policy Area A within the Rural Official Plan. Future studies and adoption of Secondary Plan policies will be required prior to any development that differs from the Official Plan of the former Town of Dundas, as set out by the Ontario Municipal Board.

The Urban Area of Hamilton has a Greenlands System that includes Core Natural Areas, Ecological Linkages and Linkage Restoration. Within the study area, environmentally significant areas, ANSIs, habitat for rare species, and provincially significant wetlands form the core areas. Linkages are identified along Spencer Creek and Ancaster Creek. The Plan anticipates that these

areas ‘warrant protection from development’ (Regional Municipality of Hamilton-Wentworth, office consolidation 2007).

In Waterdown, the area roughly bounded by Kerns Road, Dundas Street, Mill Street, and Mountain Brow Road is the subject of the South Waterdown Subwatershed Study being prepared by the City of Hamilton in conjunction with Halton Region, City of Burlington, Niagara Escarpment Commission, and Conservation Halton. The subwatershed study will identify the environmentally significant area boundaries and buffers within this area and provide the environmental basis for the Secondary Plan being developed (per. com. Catherine Plosz, Aug. 29/07).

b) Halton Region and City of Burlington

The City of Burlington is a lower tier municipality within Halton Region. Both municipalities have Official Plans. The Halton Region Official Plan identifies an Urban System, a Rural System, and a Greenlands System. The City of Burlington Official Plan further articulates these areas and policies. The City of Burlington has adopted a new Official Plan (October 2006), however it has not yet been approved by Halton Region. For the purposes of this Strategy, the new Official Plan policies were referred to as they represent the general direction that the City intends to proceed. It is not anticipated that the intent of the environmental policies will change significantly (per. com. Robin van de Lande, Aug. 29/07).

Halton Region has defined a Greenlands System that is composed of Greenlands A, Greenlands B, and Escarpment Natural Area. This system includes all the natural heritage features identified in the Provincial Policy Statement and it is expected that these areas would be further articulated in the local official plan. But, limited development could occur within portions of the Greenlands system. These primarily include existing uses, single detached dwellings, non-intensive recreation uses, and small scale public uses. Dwellings and small scale public uses are not permitted in Greenlands A, which includes provincially significant wetlands and the significant portions of the habitat of endangered and threatened species. It is the policy to direct development to Urban Areas.

The City of Burlington new Official Plan includes policies for natural features and open space. The City intends to identify a natural heritage system that connects natural heritage features and further amend the plan. Until the natural heritage system is developed, existing ecologically sensitive natural features have been designated Greenlands. The new Official Plan also designates community and city-wide parks as Major Parks and Open Space and creeks as Watercourse.

North Aldershot, which is the area of Burlington between Hwy 403 to the northern Burlington boundary, encompasses a large mostly undeveloped portion of the study area. The area was the subject of the North Aldershot Inter-Agency Review (1994) that forms the basis for the policy direction in this area. This Review divides the area into three sectors. The West Sector is between Hwy 6 and Grindstone Creek; the Central Sector is between Grindstone Creek and just to the east of Waterdown Road; and the East Sector covers the remaining area up to the existing Tyandaga Community. There are special policies applicable to this area in both the Halton Region and City of Burlington Official Plans. The Halton Region objective is ‘to provide limited amount of development in certain locations while preserving significant natural areas and maintaining the predominantly rural and open space character of the landscape’ (Region of Halton, 2006). The Central Sector has been designated as an area eligible for urban services,

while the remainder would be serviced by private systems. This limits the potential intensity of development due to the Growth Plan, Parkway Belt West Plan and Regional policy in the immediate future.

The Burlington Official Plan further articulates the Halton Region policy but has the same overall objective. The Central Sector has defined development areas and environmental areas. The environmental areas are associated with the creek systems and their valleys, environmentally significant areas, and Niagara Escarpment natural features as well as the buffers to these features. These have been designated Environmental Protection. Large parts of the East and West Sectors have been designated as Environmental Protection and Recreational/Open Space. The remainder has been designated as Infill Residential, along existing roads, and North Aldershot Special Study Area. Further studies would be required to define the form, location, and density of development as well as any refinements to Environmental Protection lands.

2.3.2 Hamilton Harbour Remedial Action Plan

In the 1980's Hamilton Harbour was identified by the International Joint Commission as an Area of Concern (pollution hot spot) under the Great Lakes Water Quality Agreement. The Remedial Action Plan for Hamilton Harbour was first released in 1992, with the Stage 2 update most recently prepared in 2002. The Remedial Action Plan (referred to as RAP) identifies a number of recommended measures to 'bring about sustainable natural ecosystems in Hamilton Harbour and its entire watershed, and to improve the potential for more extensive recreational uses' (Hamilton Harbour RAP, 2002). The recommendations are divided into a number of categories, with the most relevant to this project being under Fish and Wildlife and Public Access and Aesthetics.

Specific Fish and Wildlife recommendations that support this project or need to be considered in the preparation of the Strategy are:

FW-1 "Continue to implement the Fish and Wildlife Habitat Restoration Project and maintain the existing projects. Where possible and appropriate, provide public access to the projects and other green spaces."

FW-8 "That a management plan be developed for restored fish and wildlife habitats to protect them from overuse by the public interested in fishing, ecotourism, wildlife viewing, hiking and education." (Hamilton Harbour RAP, 2002).

As part of the Remedial Action Plan a large body of work has been undertaken to develop watershed plans and specific projects to restore the habitats of the Hamilton Harbour watershed.

Specific Public Access and Aesthetic recommended actions include:

PAA-1 "Municipalities and other authorities continue to acquire and develop lands for public use, to develop existing lands under their control and to identify new sites that provide more physical access to the shores of the Hamilton Harbour, its tributaries and significant related ecosystems..." (Hamilton Harbour RAP, 2002)

A long term objective to achieving this recommendation is to improve trail linkage.

PAA-2 “Promote appreciation throughout the entire watershed area of wetlands and other natural ecosystems through activities such as:

- Developing partnerships with community non-profit organizations to assist in the implementation of the objectives;
- Constructing boardwalks, trails and viewing platforms with appropriate signage.” (Hamilton Harbour RAP, 2002)

To achieve this recommendation the Bay Area Implementation Team¹, has in its 2006-2011 Work plan a mid-term objective to ‘explore the idea of a collaborative master planning exercise among all levels of government and relevant agencies/NGOs for natural lands from the Harbour/Cootes Paradise Marsh to the Dundas to Burlington portion of the Niagara Escarpment.’ (Hamilton Harbour RAP, 2006). The Cootes to Escarpment Conservation and Land Management Strategy implements this objective and identifies the study area focus. Implementation of the resultant study will work towards achieving the objectives of the Remedial Action Plan.

3 Local Context

3.1 Land Ownership

Lands in public and not-for-profit organizations ownership are illustrated on figure 3. Significant public ownership of natural lands occurs around Cootes Paradise Marsh, Borer’s Falls, Clappison Escarpment Woods, Grindstone Creek, and Waterdown Woods. The City of Burlington also owns New Park, Bayview Park, and Hidden Valley Park which include natural areas.

For ease of reference, properties of each land owner have been grouped together and named based on the main feature. New Park and Bayview Park are part of the Waterdown Woods Properties and Hidden Valley Park is part of Hendrie Valley Properties. These are listed in the following table with the approximate land area in hectares.

¹ Bay Area Implementation Team (BAIT) is a stakeholder group representing a cross-section of interests in the community formed to implement the recommendations of the RAP

Owner	Property Groups and Areas	South Shore Cootes Paradise (ha)	North Shore Cootes Paradise (ha)	Borer's Falls (ha)	Hendrie Valley (ha)	Clappison Woods (ha)	Grindstone Valley (ha)	Waterdown Woods (ha)
Royal Botanical Gardens		235	375	112	127			
Conservation Halton				34		77	58	160
Hamilton Conservation Authority		28		101				
Bruce Trail Conservancy							1	11
City of Hamilton		20	30				4	
City of Burlington/Halton Region					44			155
	Total Area	283	405	247	171	77	63	326
	1572 ha							

(note: areas are approximate)

The Bruce Trail Conservancy has a conservation easement over 26.5 ha of City of Burlington property under Waterdown Woods (Kerncliff Park) as well as lands it owns outright. As well, the area identified under the Grindstone Valley is a conservation easement. Lands owned by Ontario Heritage Trust are under a long term management agreement with Conservation Halton.

Large parcels of private lands are located between Borer's Falls and Cootes Paradise Marsh along the Niagara Escarpment, around Clappison Woods, Grindstone Creek north of Hwy 403, and around Waterdown Woods as shown on figure 3. As well, lands owned by the Province of Ontario as well as for hydro corridors are identified.

3.2 Land Use & Future Urban Development

Current Land Use

The land uses identified on figure 4 illustrate information based on land assessment classifications. It indicates generally how property is used by the owner. Lands are primarily urban residential or agricultural around the publicly owned lands. Residential uses are primarily within the settlement areas, with rural residential along most of the rural roads. Most of the agricultural land use is idle farmland. There are two major east-west hydro corridors crossing the study area and one major north-south corridor.

McMaster University abuts the south side of Cootes Paradise South Shore Properties. There is a waste transfer station and other industrial uses abutting or within the North Shore Cootes Paradise Properties. Active crop farming is occurring on land to the north of Borer's Falls Properties. To the west of Hwy 6, north of York Road (Dundas) there is a rural residential community abutting Borer's Falls Properties.

Between Clappison Woods Properties and Grindstone Valley Properties, there is a school/convent at the north end of Snake Road with a large portion of its lands in natural cover. Otherwise urban development is located to the north of these properties and idle agricultural lands to the south. There is a large cemetery at Snake Road and Old York Road.

South of Waterdown Woods Properties, on either side of King Road, industrial lands is used for a shale quarry. Large commercial office businesses are located on the north side North Service Road.

Hendrie Valley Properties abut Hwy 403 on the north side and residential land uses on the east side. Two large cemeteries front on Hamilton Harbour south of Hendrie Valley. On the opposite shoreline to the west, rail lines run along the shore of Hamilton Harbour, however on the table lands above is Dundurn Castle, a national historic site.

Future Urban Development

The main urban areas are south of Hwy 403 in Burlington; and Waterdown, Dundas, and Westdale in Hamilton. The North Aldershot area of Burlington extends from Hwy 6 to just west of Kerns Road, north of Hwy 403. While a number of properties are identified as agricultural, outside the Greenbelt Protected Countryside, this area has been designated for urban development. The central area between Grindstone Creek to just east of Waterdown Road will have water and sewer services, which means development can proceed once subdivision approval has been received. The areas that will remain natural are associated with the creek systems and will be part of final design decisions of the City of Burlington. The remainder of the North Aldershot area is also identified for development, however further studies are required to establish development area and servicing potential prior to specific development approvals. Based on approved applications, the population for North Aldershot is estimated to increase by 1715 more than double the current population of 1175 (based on 2006 census, per. com. Sheila Bengert, Oct. 30/07).

In Waterdown, the area north of Mountain Brow Road between Kerns Road on the east and Flanders Drive on the west is the South Waterdown Secondary Plan area. While this large area is identified as agricultural, these lands are slated for future development. The boundary between development and natural lands will be determined by the secondary planning process currently being carried out by the City of Hamilton. The estimated population on full build-out is about 8,900. This may change as the secondary planning process progresses. There are no major land areas identified for development in Dundas or Westdale. Both might be subject to intensification of development on in-fill sites within the urban areas. On the west side of Waterdown, east of Hwy 6, the lands north and south of Dundas St. are being developed for industrial and commercial uses.

3.3 Regional Road Network

The area is serviced by a well-developed road network. Three provincial highways cross the subject lands: Highway 5 (Dundas Street) crosses east-west above the Niagara Escarpment; Highway 403 crosses east-west below the Escarpment, and Hwy 6 starts at Hwy 403 taking traffic north. Major regional roads include Plains Road, Waterdown Road, and King Road in Burlington; and Sydenham Road, Main Street West, Cootes Drive, and York Road (Dundas) in Hamilton.

Hwy 6 is currently being upgraded to a full interchange at York Road. The existing exits to Northcliffe Avenue and Plains Road West will be closed. The existing community on the west side of Hwy 6 off Northcliffe Avenue has access to York Road via a new road off of Zellens Road (not shown on figures). Highway 6 will be widened to have 3 north-bound lanes and two south-bound lanes. Future work will include an interchange at Dundas Street and Highway 5. Waterdown Road is proposed to be widened and is currently at the design phase of a class environmental assessment as previously noted.

The Ministry of Transportation initiated an environmental assessment under both the Ontario *Environmental Assessment Act* and Canadian *Environmental Assessment Act* to address existing and future anticipated transportation capacity deficiencies within the Niagara to Greater Toronto Area corridor over the next 30 years. The Niagara to GTA Corridor Planning and Environmental Assessment Study was initiated in October 2005 and the terms of reference for this project approved by the Minister of the Environment in June 2006. The study area includes the regions of Niagara and Halton and the City of Hamilton and is divided into two phases. The project is currently in Phase 1 and focuses on evaluating transportation system alternatives and identifying a preferred transportation development strategy. Phase 2 will identify actual infrastructure, alternative locations and develop mitigation for impacts. Phase 1 is expected to be completed mid 2009 (Province of Ontario, 2007).

4 Cultural Environment

4.1 Ecological and Cultural History

This section is based on a compilation of information from the following resources: Conservation Halton 1997 and 2006, Disher & Smith 2001, Evans 2006, Laking 1966 and 1971, Lord 1996, McKeen 1998, Norris 1996, Scott 1970, Woodhouse 1951.

The study area has undergone significant physical changes over millions of years. The lands have changed shape, the climate has gone through periods of warming and cooling, and the plants and animals that lived under these conditions have changed with this. Human activity in this area is relatively recent. The following is a brief synopsis of some of the major landscape and human actions that have shaped the present day conditions.

Sometime 430 and 450 million years ago, the study area was under a tropical sea. Deposition formed a dolomitic limestone cap over the shale beneath the sea. After the sea retreated, unequal erosion of the rock layers formed the Niagara Escarpment. About 16,000-14,000 years BP (Before Present) the last major continental Wisconsinian glaciation was in retreat. During this period, the area was once again covered by water. This time the meltwater from the glacier formed Lake Iroquois, which due to an ice plug in the St. Lawrence River valley was larger than the current Lake Ontario, with water levels about 35 metres higher than today. This melting glacier also filled the reentrant Dundas Valley with more than 200 metres of glacial debris. Until the glacier retreated enough to allow water to flow out the St. Lawrence River, water lapped at the shoreline forming a beach. When the ice plug in the St. Lawrence valley was gone, Lake Iroquois dropped leaving behind the Burlington Heights sand and gravel bar. Fossil evidence indicates woolly mammoth, giant beaver, wapiti, and bison roamed the tundra like landscape.

Between 6,000 and 4,000BP, significant warmer and drier conditions resulted in the extension of Great Plains prairie introducing savannah and prairie plants, and oak-hickory forests. Fossils

indicate that northern pike, bullfrog, timber snake, rattlesnake, muskrat, and barred owl inhabited the area. Behind the Burlington Heights sandbar, a nutrient rich shallow fresh water marsh thrived with wild rice and wild celery; and, herring and trout using the waters. Archeological evidence shows that from about 3,500BP to about 2,800BP Archaic Period aboriginals hunted and fished the shores of the marsh. However, there is then no further evidence of human presence until about 1,100BP. Princess Point, then an island, was used as a campsite by late Woodland period aboriginal peoples and has lent its name to the characteristics typifying similar sites as the Princess Point Complex. Based on human remains found on the shores of Cootes Paradise Marsh, this area appears to have been used until 350BP by the Neutrals, an Iroquoian speaking people. Archeological evidence suggests the area may have been used seasonally for fishing and hunting.

Not until the American Revolution, when the British began buying the land from Niagara Falls to Toronto from the Mississauga Nation, did the pace and scale of change to the natural systems accelerate. Following his arrival in Upper Canada, John Graves Simcoe saw to the construction of Governor's Road and Dundas Street, opening up the area from York (now Toronto) to Oxford (now London), and surveying of the land to be granted to Loyalists and other supporters of the British. Between 1787 and 1802 many of the tracts of land in Westdale, Dundas, Waterdown, and Aldershot were granted to the first European landowners. From surveyors' notes of that time, oak, pine, chestnut, maple and beech were identified on the uplands with cedar and hemlock in the lowlands. With the influx of settlers, the forests were cleared to establish farms and provide lumber for England.

Industrialization & Open Space Preservation

Simcoe returned to England before his plan to create the garrison Town of Cootes Paradise, named for the adjacent marsh, was started. Thomas Coote was in the British army from 1776-1787. The use of his name was first noted in 1793 although there is no record that he actually visited the area. The story says the marsh was named for him since he spent a great deal of time shooting ducks in the marsh (Jack Lord, 1996). In 1800, the first mill was constructed in Dundas by Richard Hatt. He continued to buy up over 400 ha of land along Morden's Creek (now Spencer Creek) over the next 7 years, building a sawmill, distillery, ashery, cooperage, tannery, blacksmith shop, and woolen mill. The creek was dammed and altered to supply the power.

Similarly, a saw mill was constructed at Borer's Falls. Although it is not known when it first started operating, it was working in 1867 and continued to operate until the 1940's. There was no permanent mill pond created. Rather the mill ran from late fall to early spring when the farmers were off the land. Planks were put in the creek on the north side of the bridge. A flume diverted water to the west side of the creek to run a wheel at the base of the Escarpment (McKean, 1998).

In Waterdown, land was granted to Alexander Brown from Lake Ontario to 4th Concession along Grindstone Creek. The first mill was constructed by the Griffin brothers on a parcel bought from Brown in 1821. By 1841 there were 4 dams, 4 sawmills, a gristmill, a tannery, and a woolen mill. At the peak of the industrial period, there were 14 mills in Smokey Hollow.

With the establishment of farms, the rich soils and protected micro-climate were found to be conducive to market gardening and orchards. From the mid 1800's the Aldershot area became a prime peach and apple growing area, with produce shipped to larger centers and as far away as England.

By the 1900's most of the forests were cut down. Many wetlands had been filled or drained for agriculture. The flow in the creeks had become less consistent and floods washed out dams. Black bear, marten, fisher, wolverine, timber wolf, lynx, elk, cougar, and the passenger pigeon were extirpated (no longer present) or became extinct. The fishery was no longer as rich and water quality had declined. Waterfowl was reduced in abundance.

Two features that survive from this period of early settlement are the Desjardin Canal and LaSalle Park. In 1826 Peter Desjardin obtained a charter to build a canal from Spencer Creek through Cootes Paradise Marsh to provide a shipping route to Lake Ontario. It took until 1837 to complete and served to move agricultural and wood products out and supplies into Dundas. In the mid 1850's, the Great Western Railway built the railway along Burlington Heights. To reduce the number of water crossings, the railway closed the original outlet for Spencer Creek and Cootes Paradise Marsh (creating what is now known as Long Pond) and cut a new outlet through Burlington Heights. With the coming of the railway, use of the canal declined and it became a recreational boating route up to the early 1950's when the turning basin was filled in.

In 1820, Brown's Wharf was constructed in Hamilton Harbour at the end of Waterdown Road (now LaSalle Park Road). Brown's Wharf was a busy shipping point for lumber and produce from Waterdown, Aldershot and the surrounding areas. With the demise of forest production and an increased reliance on rail transport, the use of Brown's Wharf declined. By 1915, Brown's Wharf and the land above were purchased by the Hamilton Board of Park Management to create Wabasso Park to provide residents a place to escape the city. During its heyday in the 1920's and 30's, ferries ran from Toronto and Hamilton carrying passengers looking for a beautiful place to swim, attend dances and concerts, picnic or play in the amusement park. In 1923, Wabasso Park was renamed LaSalle Park. The pavilion was built in 1917 and a bathhouse, which later burned down, in 1922. The pavilion still stands although reconstructed after a fire in 1995.

It was the Hamilton Board of Parks Management and the vision of Thomas McQuestion for a grand western entrance to Hamilton that protected the many natural lands we have today. The Hamilton Bird Protection Society (now the Hamilton Naturalists' Club) thought Cootes Paradise Marsh would be an ideal bird sanctuary and presented this idea to the City in 1920. They saw it as a means to control the seasonal carnage of water fowl in the marsh. But the idea didn't go anywhere until a 1925 proposal to turn Cootes Paradise Marsh into a private duck farm to breed and raise ducks spurred the Hamilton Board of Parks Management and the Hamilton Bird Protection Society to convince the Province to declare the area as a Crown Game Preserve in 1927. In 1927, the Hamilton Board of Parks Management acquired about 48 ha of water lots in Cootes Paradise Marsh and about 105 ha of land, including Westdale Ravines. Between 1927 and 1931 the eastern shore of Cootes Paradise Marsh and Hendrie Park were acquired, such that by the 1940's 485 ha (approx.) of natural lands was owned by the Parks Board. After many years of work by the Parks Board, the *Act to Establish the Royal Botanic Gardens* was passed in 1941 creating RBG. It was these lands that formed the initial nucleus of natural lands of RBG. In 1942 the Department of Highways conveyed the north shore of Cootes Paradise Marsh and Rock Chapel to RBG having previously planned to use it for a highway bypass. Over the succeeding years, other parcels of natural lands continued to be acquired along the Niagara Escarpment by RBG, Conservation Halton, Hamilton Conservation Authority, City of Burlington and City of Hamilton. These natural lands are complemented by urban parks and open spaces, such as Hidden Valley Park, Woodland Cemetery and Burlington Golf and Country Club.

Burlington Golf and Country Club, on the shores of Hamilton Harbour, opened in 1924. In addition to the private golf club and public LaSalle Park, historically the residents of Aldershot

swam at a number of beaches, such as Brighton Beach, along the north shore of Hamilton Harbour. In the winter Carroll's Bay was used for ice skating and this use continues today. The area has also been a haven for bird watchers for over 150 years and is still regarded as one of the best birding areas in Ontario.

4.2 Cultural and Historic Resources

4.2.1 Federal

The federal government, through Parks Canada, has a program to recognize nationally significant places, persons, and events in Canadian history. Burlington Heights was designated in 1929 as a place recognized as a battle site during the War of 1812. In 1813, it was a strong point of reserve and depot arms for the defense of the Niagara Peninsula and for support of the Navy on Lake Ontario. Dundurn Castle was recognized as it incorporates an old farmhouse, classical and Italianate motifs, and French windows in what is considered a fine example of the Picturesque movement in Canadian architecture. Built between 1832 and 1835, it was the villa of Sir Allan Napier Macnab, former Premier of the Province of Canada from 1854-1856. MacNab is recognized as an influential politician, business man, land speculator, and soldier. He was lawyer appointed as Upper Canada's first Queen's Counsel. The Royal Botanical Gardens was designated in 1993 as an important teaching and research garden and conservation area.

4.2.2 Provincial

The Ontario Heritage Trust has a similar recognition program for the Province. Dundurn Castle is also recognized by the Province as is McMaster University, the Desjardins Canal and James Crook's paper mill on Spencer Creek as the first paper mill in Upper Canada. Sir John Harvey is recognized for leading a contingent of 700 men from Burlington Heights in a surprise attack against an invading force of 3000 American troops camped at Stoney Creek. The successful rout is generally considered to be a turning point in the War of 1812. Thomas Baker McQueston is recognized for his work with the Hamilton Board of Parks Management, as Minister of Highways and Chairman of the Niagara Parks Commission and his devotion to the creation of parks and numerous beautification projects.

4.2.3 Municipal

The conservation and protection of cultural heritage resources at the municipal level, in Ontario, is primarily provided by the *Ontario Heritage Act* as well as the legislation noted under section 2. These legislative provisions and associated policies and regulations require and enable municipalities to identify, protect and manage cultural heritage resources, including archaeology, built heritage and cultural heritage landscapes.

Properties may be formally designated under the *Ontario Heritage Act*, either individually or as a group, known as a Heritage Conservation District. Archaeological sites may also be designated under the *Ontario Heritage Act* and/or registered with the Ministry of Culture. In addition to those properties designated under the *Ontario Heritage Act*, there are individual properties and cultural heritage landscapes that may be identified (referred to as listed) by the municipality as having historical value, or have been documented in other studies.

City of Hamilton

Within the City of Hamilton the following is an overview of the protected heritage resources within the study area (information compiled by Meghan House, Nov. 1/07)

1. Dundas

Within Dundas, Cross-Melville Heritage Conservation District was designated under the by the former Town of Dundas in 1988 and is comprised of the properties located on the west and east side of Sydenham Street between Victoria and Melville Streets; the north and south sides of both Victoria Street and Melville Street between Sydenham and Cross Streets; and the west and east sides of Cross Street between Alma Street East and Park Street West.

This primarily residential area includes well-preserved mid- to late-nineteenth century homes, ranging from modest vernacular cottages to grand estate homes. Architectural styles range from Italianate and Queen Anne in the earlier periods to ranch and split level styles in the post-war era. The district also includes three churches, including St. Paul's United Church, Knox Presbyterian Church, and St. Augustine's Catholic Church.

Properties designated individually under the *Ontario Heritage Act* include:

- Worker's Cottage (built 1853) - 7 Cross Street
- Chapman's Book/Victoria Hall (ca. 1840s) - 11 Cross Street
- Platt Nash Family Home (ca. 1840s) - 22 Cross Street
- Former Mayor Thomas Wilson House (built 1859) - 39 Elgin Street
- Laing Apartments (built 1882) - 13-17 King Street West
- Dundas Town Hall (built 1849) - 60 Main Street
- Walter Chisholm/Laing Home (built 1959) - 15 Park Street East
- Original Hatt Property (built 1833) - 30 York Street
- Grove Cemetery Cottage (built 1875) - 129 York Road

2. Waterdown and Surrounding Area

The Mill Street Heritage Conservation District was designated under the *Ontario Heritage Act* in 1996 by the former Town of Flamborough. The District is located in the traditional village centre of Waterdown and includes the north and south sides of Mill Street between Elgin Street and Sealy Park; the west and east sides of John Street East between Mill and Main Streets; Griffin Street; and Union Street. The area protected by the heritage designation comprises 130 properties, including a portion of the traditional commercial area, a large residential area, several churches and a cemetery. Most of its buildings date back to the late-nineteenth and early-twentieth century and represent a variety of architectural styles, with the predominant character of these buildings being modest vernacular construction with some Gothic Revival and Italianate embellishment. Setbacks, lot sizes, and other landscape features vary, illustrating the area's evolution over a long period of time.

Properties designated individually under the *Ontario Heritage Act* or subject to an easement held by the Ontario Heritage Trust (referred to as OHT), include:

- Former East Flamborough Township Hall (built 1857) – 25 Mill Street North
- Pearson Home (Avonsyde Dairy) (built 1857) – 493 Dundas Street East
- Waterdown Memorial Hall (built 1922) – 317 Dundas Street East

- Former Waterdown Post Office (OHT easement only, built 1857) – 31 Main Street South

3. Original City of Hamilton

The study area includes two distinct areas of the former City of Hamilton, including the Burlington Heights area and the Westdale area.

a) Burlington Heights Area

The northwest entrance to the city of Hamilton, an area known as Burlington Heights, includes some of the City's most significant heritage resources. Burlington Heights is an area situated at the westerly end of Burlington Bay which, likely due to its elevated topography and access to a large water body, has a long history of both pre-historic aboriginal and early Euro-Canadian settlement and occupation. Historical features of this area include: York Boulevard, the original road from Hamilton to York (Toronto); historical associations with the War of 1812 and remnants of defensive ramparts and earthworks; the Hamilton Cemetery, the oldest municipal cemetery in Hamilton; the entrance to the Desjardins Canal; and, the Dundurn Castle National Historic Site of Canada, former estate home of Sir Allan MacNab.

Properties designated individually under the *Ontario Heritage Act* include:

- Castle Dean - 233-235 Locke Street North
- St. George's Anglican Church/Sunday School - 137 Strathcona Avenue North
- Gardener's Cottage - 25 Tecumseh Street
- Dundurn Castle and Park - 600-610 York Boulevard
- Hamilton Cemetery Gatehouse - 777 York Boulevard
- Thomas B. McQuesten High Level Bridge - York Boulevard over the former Desjardins Canal

b) Westdale area

The area known as Westdale is located to the west of Highway 403 and east of the former Town of Dundas. This area comprises a number of cultural heritage landscapes, including: the original Westdale neighbourhood which was one of Canada's first planned communities, with initial development in the 1920s; the historic portion of McMaster University, built in the 1930s; an area of Veteran's housing; and, another early suburban area known as the Burke Survey. The McMaster University Historic Core is subject to an Intention to Designate under the *Ontario Heritage Act*, therefore the property is under the protection of the Act, but is not officially designated.

4. Prehistoric Context and Archaeological Potential

As noted previously, there is a long chronology of continuous aboriginal and early Euro-Canadian occupation in the study area. Prehistoric aboriginal cultures in this area include Paleo-Indian, Archaic and Woodland, dating back from approximately twelve-thousand years before present to historic aboriginal and Euro-Canadian occupations. The Head-of-the-Lake area has been a popular location for settlement for the same reasons across all cultures, including: proximity to water, temperate climate, areas of elevated topography, plentiful subsistence resources, and rich soils.

Late-eighteenth and early-nineteenth century settlement is evident along transportation corridors, focused on what are now York Boulevard and King Street West in Hamilton, King Street East in Dundas, and Dundas Street East (Highway 5) in Waterdown, as well as farmsteads, churches,

cemeteries and schools generally located along the original concession and side roads throughout the entire area. There is also a border of initial historic occupation and activity along the original shoreline of Burlington Bay and the Hamilton Harbour area.

There are at least fifty registered archaeological sites within the study area, other “known” archaeological sites and numerous areas of archaeological potential. These registered and known archaeological sites range from aboriginal campsites and villages to historic trading posts and wharves, estates, military encampments and pioneer cabins.

The sequence of early historic settlement and urbanization in the area has had significant effects on the archaeological potential of the area. Areas of early urbanization have undoubtedly resulted in the loss of archaeological resources. However, lands developed prior to the 1950s generally have little disturbance outside of rights-of-way and building footprints, resulting in areas of archaeological potential outside of these disturbances, typically in back-yards. There are also substantial areas of greenspace and agricultural lands where lower degrees of disturbance have occurred and where buried archaeological resources may be undisturbed or been capped by fill. As a result, there is potential for both prehistoric and historic archaeology throughout this area.

The Ministry of Culture uses eleven criteria for determining the archaeological potential of a property. City of Hamilton Heritage Planning staff also uses these criteria to determine whether or not a property has archaeological potential and the necessity for an archaeological assessment prior to development or site alteration. The criteria may be summarized as follows:

- proximity to a registered or known archaeological site;
- proximity to primary, secondary or historical/ancient water sources;
- an area of elevated topography;
- an area of well-drained sandy soil;
- proximity to unusual landforms, such as the Niagara Escarpment, former shorelines, eskers, drumlins and moraines;
- an area used for past subsistence and/or extractive resources;
- an area of early non-aboriginal settlement;
- proximity to or associated with an early transportation route, such as a trail, road, canal, portage route or railway;
- a property designated under the *Ontario Heritage Act*;
- documentary sources, local knowledge or oral history associate the area with historic events, activities or occupations; and,
- an area that has not been subject to recent, extensive and intensive land disturbances that may have disturbed, removed or damaged archaeological resources.

City of Burlington

The City of Burlington has recorded information on close to 40 buildings north of Hwy 403 in the study area and many south of the highway. It has only designated buildings at the Royal Botanical Gardens and LaSalle Park under the *Ontario Heritage Act*. The same archeological criteria provided by the Ministry of Culture are applied by Burlington.

5 Natural Environment

5.1 Setting and Climate

The study area is located at the western end of Lake Ontario on the north shore of Hamilton Harbour and encircles Cootes Paradise Marsh. These two natural areas are connected to Lake Ontario through breaches of bay-mouth bars. The brow of the Niagara Escarpment is about 4 km from Hamilton Harbour and narrows down to about 1.5 km from Cootes Paradise Marsh. This area has one of the few south facing slopes on the Niagara Escarpment and ranges from about 70-100 metres high with some cliff faces 30 metres high. The land above the Niagara Escarpment is about 150 metres above Hamilton Harbour.

The two major watercourses are Borer's Creek and Grindstone Creek which have headwaters above the Niagara Escarpment. Cootes Paradise Marsh is at the mouth of Spencer Creek, which is the main system flowing into the marsh. The remaining watercourses include Westdale, Indian, and Falcon creeks; and, Hickory and Long Valley brooks. Except for Westdale Creek, these all start near the Niagara Escarpment brow. All of these creeks empty into either Cootes Paradise Marsh or Hamilton Harbour through mainly urbanized environments. The headwaters of Hickory and Long Valley brooks are in the least developed parts of the cities of Hamilton and Burlington.

This part of the Niagara Escarpment is within the Niagara Fruit Belt Climatic Region. The frost-free period is one of the longest in Ontario, with warm winters. In Burlington average temperatures range from 22C in July to -4.8C in January with a yearly average of 8.9C. Annual average precipitation is 879mm with about 108mm falling as snow (Environment Canada, website). Average snow depth in February is 7cm.

As one moves away from the Harbour, average temperatures drop due to the loss of the moderating effect Lake Ontario and, more importantly, topography. The lands below the Escarpment are considerably warmer and have longer frost free periods than lands above the Escarpment. In this area, Copetown above the Escarpment has a yearly average temperature about 1.5 degrees cooler than Burlington and a lower number of growing degree days. The south facing slopes of the Niagara Escarpment also have a warmer microclimate than the north facing slopes. Soil temperature is higher and soil moisture is lower on south facing slopes (Riley, Jalava, Varga, 1996).

5.2 Physiography and Soils

The study area has three main physiological features that have shaped the water features and vegetation patterns in the study area: Waterdown Moraine above the Escarpment, the Escarpment, and Iroquois Plain below. These are represented on figure 5. The slopes across the landscape are reflective of the characteristics derived from these features and are represented on figure 7

The underlying bedrock is the red shale Queenston formation. At the Escarpment, there are thin layers of sandstone, dolostone and shale underneath the limestone cap rock. The Amabel Formation forms the cap rock in the eastern part of the study area and transitions to the Lockport Formation in the western part of the study area (Conservation Halton, 2006). The Lockport cap rock is clearly evident in the Clappison Escarpment Woods area. The sediments deposited through successive glaciation created moraines above the Escarpment and plains below. The

slopes associated with the ravines, cliff faces, and plains are a direct result of the erosion of these features.

The Escarpment plateau is characterized by the Waterdown Moraine. Ridges of stony till run parallel with the Escarpment brow. Between the till ridges are sandy plains. Near the brow of the Niagara Escarpment, the bedrock is close to the surface and east of Hwy 6 is highly fractured exhibiting karst type characteristics. The Niagara Escarpment through this area is part of the Niagara Peninsula section ((Riley, Jalava, Varga, 1996). Extending between Niagara Falls and Burlington, the section of the Niagara Escarpment through Hamilton and Burlington has the highest concentration of incised gorges and waterfalls. Borer's Falls is one example that was carved by glacial meltwater and to a much lesser extent post glacial stream flow. This section also has the most extensive talus slopes and lower slopes extending about 2.5 km from the Escarpment face. The steep ravine valleys of Grindstone Creek, Indian Creek and Falcon Creek have been cut by the water flowing through these talus slopes (Riley, Jalava, Varga, 1996). Grindstone Creek also has a series of waterfalls that are representative of different waterfall types: ribbon, cascade, plunge and classical. The two waterfalls on Borer's Creek are classified as ribbon and cascade (Hamilton Conservation Authority, no date).

Below the Escarpment is the flat Lake Iroquois Plain. This flat sand plain underlies Aldershot through to Westdale. The steep bluffs along the shoreline, Burlington Heights sandbar, and Aldershot Bar are features created by Lake Iroquois and visible due to the receded waters of this glacial lake. Burlington Heights and Aldershot bars are remnant off-shore bars built by Lake Iroquois. (Note: the white areas on figure 5 have data missing and are illustrated as white. However the Spencer Creek Watershed Plan indicates that these areas continue as sand bar deposits identified on the map as Beaches Shorecliffs). The Aldershot Bar forced Grindstone Creek to turn towards its outlet with Hamilton Harbour thus forming the south shore of Grindstone Creek.

The soils have formed from these glacial and glaciofluvial deposits and through the weathering actions of wind and water (figure 6). In the east the clay loams are poorly drained as well as the clay silts. The sandy loam, such as over the Aldershot bar, and Iroquois plain are well drained. The loam soils along the Escarpment public properties are generally well drained. Imperfectly drained soils tend to be associated with the Waterdown Moraine. The streambeds are characterized by gravel and boulder beds along with muck where there are wider floodplains (Halton Region Conservation Authority, 1998, Conservation Halton, 2006, Hamilton Conservation Authority 2000).

5.3 Hydrology

The watercourses within the study area primarily start on the Escarpment or immediately above the Escarpment (figure 8). Groundwater seeps from the Escarpment face and below the Escarpment in areas of sandy soils such as in Hendrie Valley. Grindstone Creek and Borer's Creek have substantially larger watershed areas above the Escarpment. Most of the streams are intermittent as groundwater contribution is not sufficient to maintain baseflow throughout the year. Grindstone Creek, Borer's Creek, Spencer Creek, Ancaster Creek, Westdale Creek and Chedoke Creek have permanent flow through their length in the study area.

Grindstone Creek flow is maintained by groundwater throughout the year (per. com. Brenda Axon, Aug. 2/07) and for Westdale Creek by water infiltrating the sandy soils in Westdale (per. com Tÿs Theÿsmeÿer, Aug. 28/07). Thus both creeks are coldwater systems for their sections

through the study area. Ancaster Creek is cool water in its lower reaches where it connects with Spencer Creek. Permanent flow in this section of the creek is maintained by groundwater seeps in the Dundas Valley. Chedoke Creek is a highly altered system that carries storm flows from Hamilton. It is a warm water system that is permanent through the study area. The lower section of Spencer Creek is a low gradient, sand bottom stream, and as previously noted the largest watershed flowing into Hamilton Harbour. The creek is cold water, cooled by a combination of substantial groundwater from the Escarpment and its tributaries Ancaster Creek and Spring Creek. Hamilton Harbour and Cootes Paradise Marsh control water levels into the stream systems where they connect and, depending on the stream, some distance upstream. Thus the lower end of most creeks have some permanent water.

Information on water quality indicates that the three main watersheds in the study area have total phosphorous and bacteria levels above Ministry of Environment water quality objectives. As well, suspended solids (sediment) are high. Elevated phosphorous levels can lead to degradation of the aquatic environment through increased plant growth and ultimately oxygen depletion. High bacteria levels can pose a health hazard for recreational use and municipalities often close beaches when bacteria levels are above safe levels (Halton Region Conservation Authority, 1998, Conservation Halton, 2006, Hamilton Conservation Authority 2000). The water quality and quantity of Grindstone Creek is influenced by the waste water treatment plant in Waterdown and similarly water quality into Cootes Paradise Marsh by the plant in Dundas.

The public lands around Cootes Paradise Marsh and Borer's Creek have watercourses associated with Westdale Creek on the south shore; and a number of small creeks, including Long Valley Brook and Hickory Brook, as well as Borer's Creek itself on the north side. The public lands around Clappsions Woods and Grindstone Creek are part of the Grindstone Creek watershed. Falcon Creek is the main system associated with the Waterdown Woods area public land, while Kerncliff Park area is at the headwaters of Hagar and Rambo Creeks.

5.4 Ecological System

5.4.1 Terrestrial Habitat

In this section, the existing land cover on and surrounding the publicly owned lands will be described and a description of the natural terrestrial features provided. The ecological system that has developed is in response to the complex physical characteristics and relationships between water, earth, temperature and slope. Work to define this relationship is being carried out for Source Water Protection by the two conservation authorities. The range of physical conditions in this relatively small area is fairly high, leading to a higher than normal range of plant species and associated natural communities.

The publicly owned lands are characterized by a variety of natural cover including tallgrass prairie; meadow marsh, thicket swamp, and deciduous treed swamp; cultural thicket and meadow; and treed talus, deciduous forest, and tallgrass woodland. Some of the publicly owned lands are currently in agricultural cultivation or maintained for active recreation or botanical exhibition. There is a high degree of diversity in vegetation communities across the individual properties.

Adjacent to the South Shore Cootes Paradise, there is limited natural land. It is primarily surrounded by McMaster University, residential properties, and Churchill Park. Westdale Ravine extends south of the South Shore Cootes Paradise. Adjacent to the North Shore Cootes Paradise and the Borer's Falls Properties, the landscape is more rural. However, the rural lands are

primarily agricultural (fallow and active fields) or developed for rural residential, with more urban residential areas closer to Dundas. There is a forested valley of Hickory Brook that connects the North Shore Cootes Paradise with the Cartwright Nature Sanctuary as well as another forest valley to the east of Hickory Brook that connects to Long Pond.

Forested lands are contiguous to the east and west of Clappison Woods Properties. The north side is adjacent to urban development and to the south are culturally maintained lands, meadow or thicket. The Grindstone Properties are primarily surrounded by cultural woodlot, meadow or thicket. The Waterdown Woods Properties have contiguous woodlands as well as cultural meadow extending on the east, south and west sides. A forested valley connects Waterdown Woods Properties with a large woodlot known as Sassafras Woods to the south. On the north side of Waterdown Woods Properties, forest, wetland, cultural meadow, and thicket habitat abut the east half. Although separated by a road, this same area is adjacent to Kerncliff Park which is to the east. The remaining area north of Waterdown Woods Properties is in agricultural use but will develop for urban uses.

There are a number of natural areas that have been studied or afforded particular provincial or local designations and they often overlap. The following table identifies the assessed features in the study area. Environmentally Significant Areas (referred to as ESA) are identified by the local municipality based on a natural areas assessment and recommendations in that assessment. Hamilton Naturalists' Club, in collaboration with a number of partners, documented natural areas in the City of Hamilton and produced Nature Counts Project Hamilton Natural Areas Inventory (Hamilton Naturalists' Club, 2003). Conservation Halton, also in collaboration with many partners, likewise prepared Halton Natural Areas Inventory Volume 1 (Conservation Halton, 2006) for Halton Region. Many of these areas have also been documented in Ecological Survey of the Niagara Escarpment Biosphere Reserve (Riley, Jalava and Varga, 1996). These reports have been used in the descriptions of the natural areas below. Wetlands can be assessed using the Wetland Evaluation System for Southern Ontario. Wetlands that have been assessed using this system could then be identified as a provincially significant wetland (referred to as PSW) by the Province. The Areas of Natural and Scientific Interest (referred to as ANSI) is a designation assigned to areas that are the best representation of that plant community for Life Science or geologic feature for Earth Science by the Province.

Feature Name	Ownership	ESA Designation	Wetland Status	ANSI
Cootes Paradise	Mostly public- RBG, McMaster Hamilton CA, Hamilton City	Hamilton		Provincial Life Science
Cootes Paradise-Wetland within Cootes Paradise	Public- RBG, Hamilton City		PSW	
Borers Falls-Rock Chapel	Mostly public- RBG, Hamilton CA	Hamilton		Regional Life & Earth Science
Clappison Escarpment Woods	Public/Private- Halton CA, Hydro	Hamilton and Halton		Regional Life Science
King City Quarry – within Clappison Escarpment Woods	Public/Private			Provincial Earth Science
Bridgeview Valley	Private	Halton		

Cootes to Escarpment Conservation and Land Management Strategy
Phase 1 Background Report

Feature Name	Ownership	ESA Designation	Wetland Status	ANSI
Grindstone Creek Escarpment Valley	Public/Private-Halton CA	Hamilton and Halton		Provincial Life & Earth Science
RBG-Hendrie Valley-Lams Hollow Wetland –within Grindstone Creek Valley	Public- RBG		PSW	
Hendrie Valley—within Grindstone Creek Valley	Public/Private – Halton CA			Regional Life Science
Waterdown Escarpment Woods	Public/Private-Halton CA, Burlington, Bruce Trail Conservancy	Hamilton and Halton		Provincial Life Science
Old Nelson Quarry- within Waterdown Escarpment Woods	Public-Halton CA			Provincial Earth Science
Sassafras Woods	Private	Halton		Provincial Life Science
Nelson Escarpment Woods	Public/Private	Halton		
Waterdown Moraines- within Nelson Escarpment Woods	Public/Private			Regional Earth Science
Dundas Valley	Public/Private	Hamilton		Provincial Life & Earth Science

Cootes Paradise (about 1100 ha): The area has been identified by City of Hamilton as an environmentally significant area. It is a provincially significant wetland, containing open water, marsh and swamp, surrounded by rolling hills and ravines supporting woodland and successional communities. This area has a high diversity of plant communities, vascular plants, and wildlife species and supports a number of Carolinian and prairie-savanna plant species. It is an important staging area for waterfowl. There are a number of rare species and threatened plant, bird and turtle species and has the second highest total number of rare plant species along the Niagara Escarpment. The Few-flowered Club-rush (endangered) is located within this area and may be the only location within Canada (per. com. Natalie Iwanycki, July 24/07),

Borer’s Falls-Rock Chapel (about 330 ha): The area has been identified by Hamilton as an environmentally significant area. The area on the Niagara Escarpment has a diverse range of habitats and has one of the largest areas of upland woods and forested escarpment slopes. Prairie vegetation community and rare Ontario old growth cliff edge white cedar are located within this ESA. Endangered Red Mulberry and American Columbo, a species of special concern [status being considered by the Federal Government as endangered under the Species at Risk Act on recommendation by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)], grow here. Interior forest bird species have been documented and there are bird species of special concern that have been sighted.

Clappison Escarpment Woods (about 200 ha): This area has been identified by Hamilton and Halton Region as an environmentally significant area. King City Quarry is a provincial earth science ANSI. The south-facing Niagara Escarpment slopes support upland forests. The forested talus slopes provide habitat for a number of rare and uncommon species plant and bird species.

American Chestnut (threatened) and Red Mulberry (endangered) grow in this ESA. Interior forest bird species have been documented.

Bridgeview Valley (about 71 ha): This area has been identified by Halton Region as an environmentally significant area. This ESA is characterized by steep sided forested creek ravine with Carolinian plant species. The area provides habitat for a number of rare or species of special concern reptiles.

Grindstone Creek Escarpment Valley (about 490 ha): This area has been identified by Hamilton City and Halton Region as an environmentally significant area. The section north of Hwy 403 is also a provincial Life Science and Earth Science ANSI. At the downstream end, there is provincially significant wetland. The valley is mostly wooded, and supports Carolinian species. Groundwater discharge along the escarpment face and valley walls contribute significantly to the baseflow of Grindstone Creek. The habitat supports endangered or threatened plant, bird, turtle, and snake species as well as providing habitat for interior forest bird species.

Waterdown Escarpment Woods (about 400 ha): This area has been identified by Hamilton City and Halton Region as an environmentally significant area. Old Nelson Quarry, located in Kerncliff Park, is a provincial Earth Science ANSI. It has one of the largest areas of basswood talus forest slopes and the White Cedar-Red Oak community along the escarpment rim is a provincially rare community. A large number of interior forest bird species inhabit this ESA. Endangered plant species are within this ESA.

Sassafras Woods (about 144 ha): This area has been identified by Halton Region as an environmentally significant area. Along with Waterdown Escarpment Woods it is a provincial Life Science ANSI. This is one of the few remaining woodlots south of the Escarpment and recognized for its shale slope upland forest. The south facing slope provides suitable habitat for Carolinian species.

A small portion of Nelson Escarpment Woods is located west of Cedar Springs Road in Burlington. It is part of a larger ESA extending easterly along the Niagara Escarpment. The part within the study area is characterized by deciduous forest. As well, a small part of the Dundas Valley is located west of Main Street West in Hamilton. Main Street separates Cootes Paradise from the Dundas Valley. The Dundas Valley is a large ESA extending along the reentrant valley of Spencer Creek.

Outside the Environmentally Significant Areas species at risk and rare species have been found within Conservation Halton jurisdiction (per. com. Kim Barrett, Oct. 15, 2007). While, this may be an under-representation of species as this information was collated from records with the Natural Heritage Information Centre, it includes:

Endangered

Vascular Plants Hoary Mountain Mint, American Chestnut, Red Mulberry

Threatened

Reptiles/Amphibians Eastern Spiny Softshell Turtle, Blanding's Turtle, Stinkpot

Species of Special Concern

Vascular Plants American Columbo (currently recommended for Endangered Status)

Reptiles/Amphibians	Northern Map Turtle, Milksnake
<u>Rare to Very Rare</u> Vascular Plants	Shiny Wedge-grass, Downy False Foxglove, Fringed Puccoon, Arrowhead Spiketail, Purple Love Grass, Burning Bush, Hawthorn (<i>Crataegus dissona</i>), Hawthorn (<i>C. brainerdii</i>)
Birds	Black-crowned Night Heron, Tufted Titmouse
Butterflies	Mottled Duskywing

The natural area inventories note that Loggerhead Shrike has been extirpated from Borer's Falls-Rock Chapel ESA, as have Black Tern from Cootes Paradise ESA and Stiff Goldenrod from Grindstone Creek Valley. Loggerhead Shrike is an endangered species and Black Tern is a vulnerable species. Timber Rattlesnake (endangered) has been extirpated from the study area (per. com. Kim Barrett, Oct 24, 2007, Lisa Riederer, Oct 25, 2007). A recovery strategy is being developed for this species. From the Birds of Hamilton and Surrounding Areas (Curry, 2006) Northern Bobwhite (endangered), Prairie Warbler, Cerulean Warbler (special concern), and Henslow's Sparrow (endangered) were once present in or near the study area and are now extirpated. From the Atlas of the Mammals of Hamilton (Vlasman, 2005) Marten, Fisher, Grey Wolf, Lynx, and Elk are identified as being extirpated from the area. Extirpated species may recolonize their historical range from adjacent areas if the habitat for species is available. At the same time rare species that are still present may become extirpated due to adverse natural or human induced changes to their habitat.

While the number of species at risk is an indication of the environmental value of these areas, the total number of species in the study area is indicative of the biological diversity and another measure of environmental value. For the RBG natural lands alone, a total of about 1,100 plants have been recorded. When compared to other protected areas in Canada, the plant species richness is far higher than comparable protected areas of similar size (Point Pelee National Park, Georgian Bay Islands National Park) as well as many larger protected areas (Gatineau Park, National Capital Commission). The proximity to Lake Ontario and the habitat provided by Cootes Paradise Marsh and other marshes attract a wide variety of waterfowl. Other migratory species that do not fly over large expanses of water are funneled through the area and southward through the gap between Lake Ontario and Lake Erie. This combined with diverse habitats for breeding birds account for the exceptional diversity of species sighted in the area – some 386 as recorded in Birds of Hamilton and Surrounding Areas (Curry, 2006) of which about 34 are year-round residents.

The Royal Botanical Gardens and Conservation Halton carry out specific restoration or monitoring programs on their lands. As part of the Recovery Strategy for Red Mulberry, trees are monitored and invasive white mulberry has been removed from the North Shore Cootes Paradise and Rock Chapel as it hybridizes with this endangered species. Savannah and prairie habitat restoration occurs at Bulls Point on the North Shore Cootes Paradise, near York Road and Old Guelph Road, and Princess Point and Sassafras Point on the South Shore Cootes Paradise. Conservation Halton has a monitoring site above the Niagara Escarpment within Waterdown Escarpment Woods. Following the Ecological Monitoring Assessment Network (EMAN) program to assess forest biodiversity, data is being collected to assess long-term impacts of suburban development on natural lands. In addition, Conservation Halton and RBG staff

participate on the recovery teams for development of recovery strategies. RBG is carrying out research and monitoring as part of the recovery strategies for Butternut, American Columbo, and Few-flowered Club-rush. It is also conducting monitoring work for threatened Least Bittern, Blanding's Turtle, Spiny Softshell Turtle, and Musk Turtle.

5.4.2 Special Features

Individually these areas provide habitat for a very high number of plant and animal species. An important consideration in natural areas management and conservation is the linkage between natural areas such as the linkage between Cootes Paradise and Borer's Falls-Rock Chapel. This area through Dundas and Lake Ontario is the only ecological corridor between the lake and the Niagara Escarpment that is not cut off by a 400 series highway. Along the Escarpment the environmentally significant areas are or could potentially be linked to each other and to natural lands outside the study area along the Niagara Escarpment. This includes Borer's Falls-Rock Chapel, Clappison Escarpment Woods, Grindstone Creek Escarpment Valley, and Waterdown Escarpment Woods. A north-south linkage from Clappison Escarpment Woods could be made between Bridgeview Valley and Grindstone Creek Escarpment Valley which could potentially connect to Cootes Paradise, however major road barriers exist.

Historically, the area south of the Escarpment supported prairie and savannah habitat on the sandy soils of the Iroquois Plain. Prairie, savannah and oak woodland communities in Ontario are considered extremely rare (Conservation Halton, 2006). Remnant prairie and savannah habitat exist outside the environmentally significant areas of Cootes Paradise, Grindstone Creek Escarpment Valley and Borer's Falls-Rock Chapel such as at York Road and Old Guelph Road, at LaSalle Park, and in the Grove Park Road area.

In southern Ontario, the presence of forest habitat is limited and many forest lands continue to face pressure from urban development and from fragmentation by utility corridors and roads. Large forest patches tend to have a greater diversity of habitat niches and support a greater diversity of wildlife species. Interior forest provides habitat for a number of sensitive neotropical migrant and resident bird species. Forest-interior conditions can generally be considered when there are forest conditions 100 metres or more from the edge. Forest-interior species that are most sensitive to habitat edge are more likely to inhabit forest with interior area more than 200 metres from the edge. Forests will likely provide greater function when the patch is more round or square as opposed to narrow and linear (Environment Canada, 2004). There are large areas of interior forest habitat more than 200 metres from the forest edge in the Borer's Falls area and the North Shore Cootes Paradise (figure 10). There is potentially 200 metre interior forest habitat in Sassafras Woods and Clappison Escarpment Woods. Grindstone Creek Escarpment Valley has 100 metre interior forest habitat and small areas of interior forest habitat exist in Berry Tract/Cartwright Nature Sanctuary and Waterdown Woods. These areas as briefly noted above support a number of interior forest bird species and a high diversity of plant and wildlife species. As well, the forests in this area include many Carolinian plant species at the northern edge of their range.

5.4.3 Fisheries and Aquatic Habitat

Fish habitat is primarily associated with Spencer Creek, Ancaster Creek, Westdale Creek, Chedoke Creek, Borer's Creek, Grindstone Creek and tributaries, Grindstone marshes, and Cootes Paradise Marsh. The remaining streams flowing off the Escarpment are considered to be intermittent warm water streams, with some forage species in their lower reaches south of Hwy

403. Of these, only Falcon Creek which flows through to the Sassafras Woods environmentally significant area may have potential fish habitat, however a barrier downstream at Hwy 403 prevents fish movement. This section includes a description of fish habitat, significant species, and applicable fish management actions in the area.

Westdale Creek is a permanent cold water creek, in a forested ravine. The creek has had recent restoration work that has allowed forage fish to now use the entire length of the creek. The lower reach and mouth of Chedoke Creek is on the south side of the study area adjacent to Westdale. It is a channelized, warm water stream that is permanent through this section. It supports a variety of warm water forage fish and sport fish such as Largemouth Bass. On occasion, Northern Pike come in from Cootes Paradise Marsh. Ancaster Creek is managed as a cold water system. In the section between Main Street and its confluence with Spencer Creek a number of forage fish, including species preferring cool clear conditions, use Ancaster Creek (per. com. Lisa Jennings, Oct. 4/07).

Spencer Creek contains a mix of locally rare river resident species such as Rosyface Shiner and Fantail Darter, along with numerous lake-run forage fish and sport fish. It is the primary spawning location for White Bass for Hamilton Harbour. It also serves as a summer refuge for cooler water species, such as Northern Pike, White Sucker, and Yellow Perch, within the Cootes Paradise system (per. com. Tys Theysmejer, Oct. 4/07).

Borer's Creek is intermittent above the falls but is permanent for the balance of the system although stream flow during the summer is very low. It is used by warm and cold water sport fish and forage species. Above the falls, the creek primarily flows through industrial and agricultural lands. Below the falls, the watercourse flows through forested lands or has riparian cover along most of its length. Through this section, species preferring cool or cold water conditions are present (Hamilton Region Conservation Authority, 2000, 2002).

Grindstone Creek main branch and some of the tributaries support warm and cold water sport fish. Grindstone Creek has a self sustaining population of trout and salmon and the mouth of Grindstone Creek provides significant spawning and nursery habitat for a variety of species including Northern Pike. Downstream of the falls on the main branch, salmonid species migrate up to the base of the falls. Restoration efforts have been undertaken at the mouth of the Grindstone Creek, including a voluntary restriction on motorized boat traffic in Carroll's Bay. The tributaries flowing through RBG lands into Hendrie Valley are potentially coldwater habitat as groundwater flow contributions in this section change the creek from its warm character upstream (Halton Region Conservation Authority, 1998).

Cootes Paradise and Grindstone marshes have a variety of open water and marsh habitats. It is a principal fish nursery for this part of Lake Ontario. It has coastal and rivermouth marsh environments and is fed by a number of spring-fed brooks and streams. However, water levels are primarily controlled by Lake Ontario with average annual water levels fluctuating 0.7 metres. Since 1997, the Cootes Paradise Fishway has been operating at the outlet from Cootes Paradise Marsh through Burlington Bar to exclude Carp from the marsh. The burgeoning Carp population had resulted in loss of most of the marsh vegetation to the detriment of the fish and wildlife populations. With the installation of the Fishway, extensive restoration efforts have been undertaken to restore the habitat of Cootes Paradise Marsh (Hamilton Naturalists' Club, 2003).

Of the fish species recorded for Cootes Paradise Marsh and Grindstone Creek systems Grass Pickerel, Northern Brook Lamprey, Silver Lamprey, Longear Sunfish, and Greater Redhorse are

provincially rare or very rare, with Northern Brook Lamprey and Bridle Shiner being provincial species of special concern. Other species of special concern include Bigmouth Buffalo, Chestnut Lamprey, and American Brook Lamprey. Provincial and federal threatened species include Lake Chubsucker and Spotted Gar. Redside Dace is a federally threatened species. Blue Walleye, Lake Sturgeon, and Bridle Shiner are considered extirpated. The habitat for these species is available or potentially available with further restoration work (per. com Tÿs Theÿsmeÿer, Sept. 25/07).

As well, three clam species of note are present: Eastern Floater and Paper Pondshell (both very rare in Ontario) and Lilliput (extremely rare in Ontario).

In Ontario, the Province has created fisheries management zones. The study area is covered by the Southern Ontario zone 16 for the creek systems and Cootes Paradise Marsh and Hamilton Harbour are in Great Lakes zone 20. It is unclear whether Cootes Paradise Marsh and the mouth of Grindstone Creek are within zone 16 due to map scale and implementation practices (per. com. Tÿs Theÿsmeÿer, Sept. 24/07). Fishing restrictions are established for sport fish species within each zone.

The following have the same timing restrictions in both Zones, although exact dates may vary slightly:

Walleye and Sauger	closed spring
Largemouth and Smallmouth Bass	closed winter and spring
Northern Pike	closed spring
Muskellunge	closed winter and spring

The following have no fishing restrictions in Zone 20 (Cootes Paradise Marsh and Hamilton Harbour) but are closed spring and summer on the creeks: Brown Trout, Rainbow Trout and Pacific Salmon.

Fishing for Lake Sturgeon is closed all year in Zone 20 and only open May and June on the creeks.

There is a Ministry of Natural Resources seasonal fish sanctuary from the beginning of October to the end of April on Grindstone Creek upstream of the Plains Road Bridge to the Escarpment for pike, trout and salmon. The Royal Botanical Gardens has voluntary fish sanctuaries from mid March to the end of June for Cootes Paradise Marsh and upstream of Valley Inn Road on Grindstone Creek. During these times fishing is not permitted (voluntary under the RBG restrictions).

5.4.4 Greenlands System

The greenlands system of Halton Region, City of Hamilton and the Province of Ontario are based on the terrestrial and water features identified above. These areas are identified on figure 9. Where there is an ANSI, it is for the most part included within the municipal ESA. The MNR Natural Heritage System on the figure includes both the Greenbelt Natural Heritage System and the Niagara Escarpment Natural Area and Protection Area designations and represents the Provincial interest in natural systems. Halton Region and City of Hamilton ESA boundaries are outlined in green and for the most part are within the MNR Natural Heritage System. Portions of Grindstone Creek Escarpment Valley near the middle on the east side, has not been included

within the Natural Heritage System. The Province also captures the ANSIs and provincially significant wetlands in its system. There is a large area west of King Road, which has not been evaluated, included in the Provincial Natural Heritage System. As well, a linkage on the west side of Sassafras Woods and Waterdown Woods is included based on a tributary of the Grindstone Creek. Main areas not included in the Provincial system are south of Hwy 403 along Hendrie Valley and along Burlington Bluffs which is part of the Cootes Paradise ESA in Hamilton. The west end of Cootes Paradise ESA is also not captured within the Provincial system. However all of these areas are within the City of Hamilton Natural Heritage System.

The Hamilton Halton Stewardship Program undertook a project to establish habitat targets for some of the parameters defined by Environment Canada's How Much Habitat is Enough? (2004) The purpose of establishing targets was to provide direction for further restoration work and a means to measure these achievements in the Hamilton Harbour watersheds. The targets were developed on a watershed basis of which the study area is a component of the respective watersheds. The habitat targets applicable to this project are identified in the following table.

Habitat Targets for Hamilton Harbour Subwatersheds (Hamilton Halton Stewardship Program (2006))

	North Shore Watershed	Grindstone Watershed	Spencer Creek Watershed
Existing Wetlands (ha)	33.4	1259.6	30514
Existing Wetlands (%)	1.0	12.7	10.7
Proposed Wetlands (%)	2.0 (historical)	15.0	6% (urban watersheds) 10% (overall)
<hr/>			
Existing Forest Cover (ha)	501.6	2479.5	5782.5
Existing Forest Cover (%)	15.0	25.0	20.3
Proposed Forest Cover (%)	18.0	30.0	30.0
<hr/>			
Existing 100 m Interior Core (ha)	73.6	555.4	1553.4
Existing 100 m Interior Core (%)	2.2	5.6	5.5
Proposed 100 m Interior Core (%)	2.2	10.0	10.0
<hr/>			
Existing 200 m Interior Core (ha)	0.0	158.7	548.5
Existing 200 m Interior Core (%)	0.0	1.6	1.9
Proposed 200 m Interior Core (%)	0.0	5.0	5.0

The targets were developed based on historic and existing conditions and community input. An important outcome of the study is that the current conditions do not meet Environment Canada guidelines for the habitat targets, thus it is imperative that the existing habitat be protected.

6 Social & Economic Environment

6.1 Population and Population Growth

The study area is within the Greater Golden Horseshoe, which is a major growth and employment centre in Ontario and Canada. Growth in this area is being planned for based on the Growth Plan policies noted previously. The population projection till 2031 is noted in the following table for this area as well as surrounding municipalities.

Population Projection

	2007	2011	2021	2031
Halton Region and Hamilton	914,000	1,060,000	1,240,000	1,440,000
Peel Region	1,291,000	1,320,000	1,490,000	1,640,000
Wellington County/City of Guelph	210,000	223,000	269,000	321,000
Waterloo Region	497,000	526,000	623,000	729,000
Brant County	137,000	141,000	157,000	173,000
Niagara Region	435,000	442,000	474,000	511,000

Source: 2007 population projection: Minister of Finance, 2007
2011, 2021, 2031 population projection Growth Plan: Ministry of Public Infrastructure and Renewal, 2006

For the City of Hamilton and Halton Region, population is projected to grow by 146,000 (13%) from 2007 to 2011. By 2031 the increase will be 526,000 (37%) from 2007. The surrounding municipalities are projected to increase to 3,374,000 (24%) to 2031. During this time frame demographics will also change. The following table identifies these projected changes. The Minister of Finance data has been modified to account for higher growth projections under the Growth Plan.

Demographic Projection – Halton Region and City of Hamilton

	2007	2011	2021	2031
0-14	176,100	176,600	196,500	224,500
15-24	133,900	142,700	145,000	158,300
25-49	370,000	387,400	429,200	478,900
50-65	176,800	205,400	261,000	274,900
65+	57,100	147,700	207,900	302,500
Total	914,800	1,059,800	1,239,700	1,439,100

Source: Minister of Finance, 2007

The percentage change from 2007 is identified in the following table.

Population Percentage

	2007%	2011% (%change from 2007)	2021% (%change from 2007)	2031 (%change from 2007)
0-14	19	17 (-2)	16 (-3)	16 (-3)
15-24	15	13 (-2)	12 (-3)	11 (-4)
25-49	41	37 (-4)	35 (-4)	33 (-8)
50-65	19	19 (0)	21 (+2)	19 (0)
65+	6	14 (+8)	17 (+11)	21 (+15)
Total	100	100	100	100

Population within the Hamilton/Halton area is expected to change dramatically in the over 65 age category, more than doubling in that cohort, although the total population will still be less than in the two younger cohorts. Over the same time, there will be decreases in what is traditionally considered to be the active age groups.

The ethnic origin of people residing in Ontario generally has become more diverse. As well, immigrants have tended to settle in the large urban centres. Current census information is not available to illustrate this.

6.2 Economic Activities

Census information indicates that the economy of City of Hamilton and Halton Region is not dominated by one industry, but overall led by the service producing sector at about 70% (Halton Region, 2006, City of Hamilton, 2005). The following lists the top four industry sectors (Statistics Canada, 2002).

Hamilton (census metropolitan area)
 Manufacturing and Construction 25%
 Health and Education 17%
 Wholesale and Retail Trade 17%
 Business Services 16%

<u>Halton Region</u> (regional municipality)		<u>Burlington</u> (city)
Business Services	21%	19%
Manufacturing and Construction	20%	20%
Wholesale and Retail Trade	18%	19%
Other Services	16%	16%

Source: Statistics Canada, 2002

Both City of Hamilton and Halton Region have prepared economic development strategies to guide municipal programs that will support and encourage local economic growth. They both recognize that they need to provide a cost competitive environment and develop a skilled labour supply. Their strategies are aimed at building on the industry strengths within each community and leverage quality of life factors to support the people and families they are seeking.

City of Hamilton has focused on developing eight industry clusters to build upon the inherent strength of existing clusters (City of Hamilton, 2005). A cluster-based development strategy requires quality physical and social infrastructure that contribute to a good quality of life. An important component of this is the natural environment and availability of outdoor and recreational opportunities. The City recognizes the value of the water resources at its doorstep and the natural lands including the Niagara Escarpment.

The industry clusters include traditional areas like advanced manufacturing and agriculture as well as 'emerging' and 'non-traditional' areas. An emerging cluster the City is targeting is the film industry including film production for motion pictures and television. As natural lands are currently being used by the film industry, targeting this market will likely see continued use of natural areas and may increase the demand for access and use.

A non-traditional industry cluster that might directly affect natural lands is tourism. Both the City of Hamilton and Halton Region specifically target tourism including leveraging natural assets to enhance and develop outdoor experiences. Both recognize that while there are a large number of visitors to southern Ontario (16 million), the tourist region including Hamilton and Halton capture less than 25% of those visitors (statistics, City of Hamilton, 2005).

Halton Region's economic development strategy is more focused on developing entrepreneurship and innovation, including small-business start-ups rather than specific sectors. The strategy is more broad-based and includes actions to build skills as well as having the necessary physical infrastructure, such as serviced land and transportation facilities. The two sectors it does target are tourism, as mentioned, and agriculture.

To focus tourism development, City of Hamilton and Halton Region have or are preparing a tourism plan using a provincial initiative to help regions across Ontario develop a plan based on distinctive characteristics of the area. Both municipalities consider outdoor tourism as initiatives, and specifically reference the Niagara Escarpment. Tourism Hamilton states that the most popular outdoor activity for Ontario tourists is walking or hiking (9.3%) (Tourism Hamilton, no date). Halton Region has identified the Bruce Trail as an asset that could be more fully exploited (Regional Municipality of Halton, 2007).

Tourism Ontario found that pleasure visitors (visitors traveling for pleasure rather than business or visiting friends or relatives) to Ontario were four times more likely to travel in the summer. Of the 21.1 million overnight visitors in 2004, less than 5% visited this region. Half the visitors in Ontario were likely to participate in outdoor and/or sports activities, while 6% would visit botanical gardens. Of those with specific outdoor interests, visitors were more six times more likely to travel in the summer and 72% would participate in sports/outdoor activities (Ministry of Tourism, 2004a and 2004b). The types of activities were not detailed in these reports. A more general survey that looked at the travel activities of Canadians indicate that overnight travelers would participate in:

- cycling 11%
- mountain biking 4%
- jogging or exercising outdoors 11%
- hiking 23%
- visit national, provincial, state nature park 29%
- wildflower/flora viewing 10%
- bird watching 10%

- botanical gardens 14%

Source: Ministry of Tourism, 2007

6.3 Recreation Uses and Trends

6.3.1 Bruce Trail

The Bruce Trail Conservancy began work in the early 1960s to develop a public footpath along the entire length of the Niagara Escarpment, to raise awareness for the need for protection of the Escarpment. By letters patent in March 1963, the Bruce Trail Association was incorporated (now The Bruce Trail Conservancy) and in 1967 the Bruce Trail officially opened. The Mission of the Bruce Trail Conservancy is to secure a conservation corridor along the Niagara Escarpment, to protect its natural ecosystems, and make it publicly accessible via the Bruce Trail. Today the Optimum Route of the Bruce Trail is 843 km; less than 50% is secured in public ownership (e.g. Conservation Areas; Federal, Provincial and Municipal parks; BTC-owned land; Ontario Heritage Trust), 25% is on roads, and the balance is on private land by handshake agreements (Bruce Trail Association, 2007).

The Bruce Trail Conservancy coordinates the activities of nine regional Bruce Trail clubs who are responsible for the organization, landowner approval, construction and maintenance for their section of Trail, and also act as stewards of the lands that the BTC owns. In the study area the Iroquoia Bruce Trail Club is responsible for maintenance and planning. There are 125 km of main trail and 40 km of side trails in the Iroquoia section (Iroquoia Bruce Trail Club, website). The Bruce Trail Conservancy headquarters is located in Raspberry House on Royal Botanical Gardens lands. The main trail follows the Escarpment, with a number of side trails including one to Raspberry House. As part of Hwy 6 upgrades, an underpass has been incorporated into road design in the vicinity of Old Guelph Road below the cliff face. The underpass will open in summer 2008.

6.3.2 Inter-Municipal Recreational Trails

There are several inter-municipal trails in the study area. Along Lake Ontario is the Lake Ontario Waterfront trail. This trail connects Brockville to Niagara Falls and through Burlington the trail is 23km long and in Hamilton it is about 8 km long but follows two routes around Hamilton Harbour. It follows North Shore Road and Plains Road/York Road connecting LaSalle Park and Royal Botanical Gardens, with the off-road section going through Hendrie Valley. The off-road section will follow along Valley Inn Road once road closures and bridge improvements are finished. The Lake Ontario Waterfront Trail potentially can be used for walking, bicycling, and rollerblading depending on the surface. The Lake Ontario Waterfront Trail connects outside the study area with the Trans Canada Trail via the Hamilton-Brantford Rail Trail and Escarpment Rail Trail leading to Brantford and Caledonia respectively. Spencer Creek Trail is a short trail connecting McMaster with Dundas along Spencer Creek and Cootes Drive and also connects with the Hamilton-Brantford Rail Trail. The Bruce Trail connects with both the Lake Ontario Waterfront Trail and Hamilton-Brantford Rail Trail.

6.3.3 Recreational and Educational Facilities

Recreation

The main natural areas in the study area are listed in the following table and illustrated on figure 10. Royal Botanical Gardens land can be used for hiking and snowshoeing. The Bruce Trail and Cartwright Nature Sanctuary can be used for hiking, snowshoeing, and cross-country skiing. In addition to these uses, other public land owners may also permit mountain biking and horse back riding on their properties depending on the trail.

Property Name	Owner	Facilities
South Shore Cootes Paradise	Royal Botanical Gardens	120 ha upland, trails, on-road parking. Churchill Park is leased to the Hamilton for a nominal amount and has playing fields, lawn bowling
North Shore Cootes Paradise	Royal Botanical Gardens	260 ha upland, trails, parking on York Road 10 cars, Arboretum 94 cars, on-road parking
Rock Chapel	Royal Botanical Gardens	77 ha, 3.5 km trails, parking 18 cars
Borer's Falls Conservation Area	Hamilton Conservation Authority	101 ha, trails, parking 13 cars
Berry Tract	Royal Botanical Gardens	35 ha, trails
Cartwright Nature Sanctuary	Conservation Halton	19 ha, Bruce Duncan Memorial Trail
Clappison Woods	Conservation Halton	76 ha, Bruce Trail
Smokey Hollow	Hamilton, Bruce Trail Conservancy (conservation easement)	5 ha, Bruce Trail, parking 10 cars
Grindstone	Conservation Halton	57 ha, Bruce Trail
Waterdown Woods	Conservation Halton, Bruce Trail Conservancy	129 ha, Bruce Trail, parking 32 cars
Bayview Park	Burlington	58 ha, ball diamond, off-leash dog area, parking
Cedar Springs Trail	Conservation Halton	1 ha, Bruce Trail
Kerncliff Park and New Park (referred to as Burlington City Park in NEP)	Conservation Halton, Burlington	105 ha, trails with connection to Bruce Trail, parking 32 cars
LaSalle Park	Hamilton	23 ha, trails, marina, wading pool, sports fields, pavilion, parking
Hidden Valley Park	Burlington	44 ha., (9 ha active balldiamond, playground), trails, parking
Hendrie Valley	Royal Botanical Gardens	69 ha, 5km trails, part of Lake Ontario Waterfront Trail, parking 95 cars, ornamental gardens

(note: property areas and parking spaces are approximate)

Surveys of visitation for the natural lands within the study have not been undertaken. However based on attendance and membership at Royal Botanical Gardens, it is assumed that most frequent users of the natural lands will be from the Hamilton and Burlington area.

Cootes to Escarpment Conservation and Land Management Strategy
Phase 1 Background Report

Public properties providing natural environment recreational experience within 25 km are listed in the table below. Distances are measured ‘as the crow flies’ from Waterdown Road and Dundas Street.

Property Name	Proximity (approx. km)	Facilities	Visitation (avg/yr)
Bronte Provincial Park	14	684 ha, 144 campsites, 1.6 acre pool, 8 km easy trails	350,000
Mount Nemo Conservation Area	9	169 ha, 5km trails connecting to Bruce Trail, limited rock climbing routes	15,700
Rattlesnake Point	14	264 ha, group campsites, 10 km trails connecting to Bruce Trail, 40 rock climbing routes	42,500
Crawford Lake Conservation Area	15	468 ha, 15 th century reconstructed Iroquoian Village, 19 km trails connecting to Bruce Trail	76,700
Kelso Conservation Area	20	397 ha, 19 group campsites, 16 km trails connecting to Bruce Trail, mountain biking, swimming, skiing and snowboarding, Halton Region Museum	122,200 (+Glen Eden 156,600)
Hilton Falls Conservation Area	19	645 ha, reservoir, 10 m waterfall, 33km trails connecting to Bruce Trail, mountain biking	40,200
Mountsberg Conservation Area	17	472 ha, 1 group campsite, wildlife viewing, raptor centre, 16 km trails, mountain biking	54,500
Spencer Falls/Webster Conservation Area	10	hiking connecting to Bruce Trail, 41m and 2 m waterfalls, ice climbing	37,200
Dundas Valley Conservation Area	13	40 km trails, equestrian and mountain bike trails	45,000
Confederation Park	14	83 ha, 100 campsites, waterslide, go-karts, mini golf, pool	500,000 (+Wild Waterworks 124,500)
Fifty Point Conservation Area	25	76 ha, 47 campsites, 310 boat slip marina	90,000
Valens Conservation Area	29	300 ha, 220 campsites, 10 group campsites, 10km trails, reservoir, swimming, ice fishing	93,000
Westfield Conservation Area	21	heritage village, short trails	23800
Christie Lake Conservation Area	12	336 ha, 10km trails, reservoir, swimming, fishing	65,000

(note: areas and lengths approximate)

Within Hamilton cultural areas of note are Dundurn Castle and while outside the study area, Parks Canada has developed the Discovery Centre at Pier 8 as part of redevelopment of the

Hamilton shoreline into a public space. It is connected by the Lake Ontario Waterfront Trail to the Royal Botanical Gardens.

Within Hamilton 96 waterfalls have been inventoried for their physical characteristics and tourism potential, with an additional 4 located just outside the municipality in Burlington (per. com. Elizabeth Berestecki, Nov. 29/07). Within the study area there are two waterfalls on Borer's Creek and five waterfalls on Grindstone Creek on public lands (Hamilton Conservation Authority, no date). City of Hamilton is working on promoting the waterfalls within its jurisdiction as tourist attractions. Physical improvements at about 36 waterfalls have been or will be done to improve the visitor experience (per. com. Sandy Bell, Aug. 2/07). Currently site access enhancements are proposed for Great Falls and Grindstone Cascade at Smoke Hollow. The timing for works is under review, but will be no earlier than 2009.

Public lands are used by organized hobby groups. In the study area, Bayview Park on the west side of King Road is used by a model plane flying club and a rifle and revolver club. Unorganized users include birdwatchers, fishing (Cootes Paradise Marsh outlet and Grindstone Creek outlet), dog-walkers (Rock Chapel), mountain bikers (Clappison Woods area, Waterdown Woods area, Cootes Paradise), and runners (South Shore Cootes Paradise). Bayview Park is a 'leash-free' park, where dogs are not required to be on a leash. Favourite local 'birding hotspots' within the study area include Cootes Paradise Marsh and particularly West Pond, LaSalle Park, Valley Inn Road and the Grindstone Creek Estuary, Hendrie Valley, Woodland Cemetery, and the Niagara Escarpment corridor that includes Borer's Falls Conservation Area, Rock Chapel, Berry Tract and Cartwright Nature Sanctuary. Mountain biking is an informal use often occurring on public property or trails that does not permit bikes or private property.

Three golf courses are located in the study area. Tyandaga Municipal Golf Course abuts Kerncliff Park. Burlington Golf & Country Club as noted previously is on the shoreline of Hamilton Harbour, and Rock Chapel Golf Centre is on the north side of Hwy 5 on Borer's Creek. Owners of private lands can also offer outdoor experiences. Dymont's Farm at the edge of the Niagara Escarpment west of Sydenham Road offers farm-related school tours and has facilities for group picnics and parties.

Education

School based curriculum programs for grades K-12 are provided by Bronte Creek Provincial Park, Hamilton Conservation Authority, Conservation Halton and Royal Botanical Gardens. Bronte Creek program serves about 7,800 students from March to June with a specialization in Victorian rural life 100 years ago. Hamilton Conservation Authority runs their program primarily out of Dundas Valley Conservation Area, but also uses Mt. Albion Conservation Area, Christie Conservation Area, and Spencer Gorge. About 6,000 students have used the program in the past years, however this year programs of the Hamilton Wentworth Public School Board are being provided by the HCA, so the number of students is expected to be 12,000 and the program is at capacity. Halton Conservation runs programs from Mountsberg and Crawford Lake conservation areas. About 55,000 students attend their programs. Conservation Halton programs are not at capacity and is limited by winter weather concerns of the schools and bussing. The Royal Botanical Gardens runs a program primarily from the North Shore property. About 20,000 participate in the programs. The spring and fall programs are at capacity.

The Conservation Authorities and Royal Botanical Gardens provide summer day camps and professional development day activities for children as well as general public education programs to increase knowledge and awareness of the natural environment.

Private education based programs are run from the Dave Brown's Centre, behind G.R. Allen School in Westdale. Using the South Shore Cootes Paradise area, a limited program (15 days in the spring and fall) is provided for grades K-3 from inner city schools depending on funding. Other private suppliers of education based programs use natural lands in the Hamilton area (Beth Stormont, per. com. Sept. 20/07).

6.3.4 Recreation Trends

The American Outdoor Industry Foundation 2006 survey found that mountain biking, fishing, hiking, camping, and trail running are the most popular outdoor activities. The overall number of participants and how often they went out to mountain bike has dropped significantly over the last several years. Mountain bikers are in the 16-34 age bracket. Camping away from the car has remained relatively constant over the years but is considerably less popular than car camping. As well hiking has remained relatively constant in popularity and is spread across age groups. On the other hand, trail running has increased in popularity but is an activity of the young. Bird-watching is one of the few activities that is predominantly a pastime of those over 45. Rock climbing has remained relatively consistent, but is also an activity of the young.

It is noted that the American trends in outdoor recreation are not necessarily reflective of Ontario pursuits. Leisure research in Canada focuses on health and leisure. The Canadian Fitness and Lifestyle Research Institute (2006, 2007) found that more than 50% of Ontario residents were inactive in 2005, but since 1995 people have become more active. As well older adults are less likely to be active. Close to 69% of adults and 65% of youth report walking as their main leisure activity. Walking has remained popular over time, and might occur on trails or sidewalks, in rural or urban areas. In Canada, rounding out the top five adult activities are gardening, home exercise, swimming, and bicycling. Of the activities cited, only jogging or running (16%), fishing (9%), ice skating (6%), and skiing or snowboarding (4%) were activities that might take place in the natural environment. The top five activities youth participated in were jogging or running, bicycling, swimming, home exercise, and basketball. Bicycling has marginally decreased in popularity among adults and is not a favoured activity for older adults. Among youth, bicycling has remained stable.

An increase in population will place greater demand on the open space system for recreational use. With an aging population, the Baby Boom generation is expected to continue to be active, but will shift to less strenuous physical activities. While an older population may have more leisure time, they may choose to pursue education or a second career over recreation. It is also expected that there will be less demand for organized sports. Preferred activities will tend to be informal and individualized where participation can be done at a convenient time and place especially if 'work' demands continue to reduce discretionary time. At the same time, growing awareness of the health benefits of physical activity could lead to an increase in the percentage of Ontario residents who are physically active. Growing leisure activities include walking and cycling for young and old, outdoor activities and environmental learning, and physical activity as rehabilitation. There is a growing interest in learning about the natural environment. Implications include the development of greenways, bikeways and pathway systems, and the development of more experiential programs and learning about the natural environment.

Changing technology has led to new sports such as geo-caching or the ability to use navigation to go places people wouldn't have gone before (BC Recreation and Parks Association, 2006).

7 Environmental and Conservation Land Management Summary

This section provides a summary opinion and presents some threats and opportunities to the natural lands that the conservation and land management strategy will need to address. It is intended to stimulate discussion that will be necessary to defining the future of this area.

7.1 Environmental Significance

The natural features and habitats in the study area are among the biologically richest in Southern Ontario. Although the area has been heavily modified by urban, rural and industrial development over the past 200 years it retains environmentally significant wetlands, remnant prairies, forests and cliff face habitats.

A total of about 1,550 ha of natural areas are found within the study area, with the nature sanctuary properties of Royal Botanical Gardens alone (approx. 850 ha) being one of the largest natural park areas within any major urban area. These natural areas are increasingly being recognized by outside agencies for their significance. The Cootes Paradise Marsh is listed as a provincially significant wetland and a life science Area of Natural and Scientific Interest by the Province. The richness of the area for wildlife is also recognized by several agencies. Bird Life Canada lists the Dundas Valley and Cootes Paradise March as an Important Bird Area (IBA) of national significance (by Bird Life International), and the wetlands and other natural areas of the region are renowned as bird watching habitat, especially for the diversity of migratory species and occasional visitors to the area. The western end of Lake Ontario and the Hamilton Harbour bird nesting areas are also classified as IBAs of global significance.

The area has also been nominated as an Important Area for Reptiles and Amphibians (under criteria of the Canadian Amphibian and Reptile Conservation Network) and is being considered as an Important Plant Area (criteria under development by the Canadian Botanical Conservation Network). An indication of the importance of the habitat is that over 30 listed species at risk, plants, birds, reptiles and amphibians are known to be in the area. It includes the largest remaining population of Canada's most endangered tree, the Red Mulberry, as well as Canada's only population of the Few-flowered Club-rush, an endangered forest plant species.

The natural areas associated with the Niagara Escarpment contain a rich assemblage of habitats and species, and support a number of significant plant and animal species. Rock Chapel, Clappison Escarpment Woods, Grindstone Valley, Waterdown Escarpment Woods and Sassafras Woods have all been recognized as life science Areas of Natural and Scientific Interest by the Province. These areas, with their south-facing exposures, provide the necessary conditions to support a number of southern or Carolinian species, many of which are rare nationally and provincially, and are at the northern limit of their North American range.

The study area is of particular importance for the connectivity of its natural areas. Even large parks and protected areas often lose species diversity or fragile habitats because of the effects of fragmentation. By cutting off some natural areas from others, the movement of individual plant and animal species is also restricted or ended. Once cut off in virtual islands, all species are at increased risk of population-level problems such as inbreeding and ultimately local extinction.

Fragmentation takes many forms, and some types of land use patterns are greater risks to wildlife than are others. Natural areas where wildlife are able to remain in communication with other natural areas through both natural and permeable built environments form important corridors that support the survival of local populations. It is this corridor aspect of the region that is particularly important. The broad area running from the table lands at the top of the Niagara Escarpment (at properties such as Rock Chapel, Borer's Falls and the Berry Tract) to the Cootes Paradise Marsh, and related ravines and streams, form the only remaining ecological corridor between a wetland attached to Lake Ontario and the Niagara Escarpment itself.

Despite the pressure from fragmentation and other forms of human activities, the natural areas have demonstrated remarkable resilience over time. Lands that were clear cut or otherwise altered over the past 200 years by such uses as quarrying, farming, roads, and power transmission corridors now display lush secondary growth.

The Cootes to Niagara Escarpment corridor is an oasis in the midst of an urban population of 675,000 people. That so much of the natural environmental value of the study area has persisted into the opening years of the current millennium is due to a combination of good planning and serendipity. The growing economy and human population in the region will continue to place pressures on all natural areas, large and small, within this urban area.

7.2 Environmental Sustainability

Sustainability is about bringing our social, economic and natural environments into balance. The cities of Hamilton and Burlington as well as Halton Region have expressed a strong desire to become sustainable communities. The Provincial Greenbelt and Growth Plans have afforded certain protections to the lands in the study area that have not yet received development approvals. These protections will last for ten years and are then open to review.

The Greater Golden Horseshoe (referred to as GGH) is undergoing tremendous growth over the coming decades. Imagine a metropolitan population of 7 to 10 million people that is roughly the size of Chicago metropolitan area.

The Cootes to Niagara Escarpment corridor is not immune from GGH growth pressures. Recently, the Pleasantview area was the subject of a major Ontario Municipal Board hearing. Waterdown has secured Provincial Cabinet approval to double its population to 40,000 persons. North Aldershot is experiencing some growth pressure as well.

There is a pressing need to consider the importance of these lands at the landscape level. From a sustainability standpoint, protecting the ecosystem within the study area for future generations is integral to the greater community. As well, protection for the express purpose of retaining and restoring this area's natural heritage, while allowing for complementary public access type uses, and to strengthen their intimate relationship with the Great Lakes watershed is imperative. Fragmented natural lands throughout the study area need to be reconnected and strengthened to facilitate regeneration and restore damaged ecosystems.

7.3 Conservation Lands Threats and Opportunities

The physical characteristics of the lands owned by the public and non-profit organizations, as well as surrounding lands, influence the vulnerability of the natural environment to change. The variability in soils, slope steepness, height and orientation provide many opportunities for

different habitats including the rare cliff forests and prairie. There are few areas in the Hamilton area with interior forest conditions that can provide habitat for species sensitive to urban activities (termed area sensitive species). In contrast, the study area has larger tracts of forest lands that begin to provide these conditions and are connected to water sources through the creeks (some in ravines and some through fields), and Cootes Paradise Marsh and RBG-Hendrie Valley-Lambs Hollow Wetland. There is also potential to expand interior forest habitat through reforestation or natural succession in some parts of the study area.

The site conditions affect not only how the lands, plants, and animals interact but how resilient they are to internal and external changes and how the lands need to be managed by public and non-profit landowners. There can be impacts from activities occurring on the lands as well as from external activities. Use by people and pets brings in non-native and sometimes highly invasive species such as garlic mustard. Some soils seem to be more resilient to the establishment of different invasive species. Dogs running loose can spread non-native species and trample sensitive species or disturb mammals, birds, and amphibians. They can also create an unpleasant experience for other people and are at risk of injuring themselves. The number of people on trails and whether these people are walking, running or mountain biking, can cause excessive soil erosion, trail widening, or damage plants. Sometimes people make their own trails or a 'party' place, which could be in sensitive habitat, over steep erodable slopes, or involve tree cutting. The ability for some species to maintain populations can be greatly affected by human disturbance especially when young are being raised. Other destructive behaviours include intentional girdling and resultant killing of trees, the extension of private backyards into public lands, dumping of garbage and yard waste, and littering.

Urban development alters the surface and subsurface flow of water; and, introduces noise, predation, lighting, and chemicals from the people and pets that live and work in the urban areas. These can cause species to disappear, resulting in weaker natural systems unable to resist climate changes or naturally occurring environmental events, or result in sedimentation in the creeks and marshes. Slight changes in hydrology can result in significant in-stream erosion and resultant deposition of fine silts and clays into Cootes Paradise Marsh where major efforts to restore the habitat are being implemented. Recent surveys show that sediment deposition is continuing in the marsh and is a major concern to achieving restoration objectives of the Hamilton Harbour Remedial Action Plan. Land management can also be influenced by adjacent landowner concerns such as trees falling on their property, deer eating their plants, or views lost as plants grow.

The Hamilton-Halton Watershed Stewardship Program has identified possible targets based on current watershed conditions and Environment Canada guidelines. However, there is a growing body of research that suggests that the proposed minimum targets will not be sufficient to maintain habitat health. For example, amphibian species richness and community composition can be affected by incompatible land uses 3000 to 4000 metres from the wetland edge; and, at the scale of the study area and urbanized location, forest cover should be increased to at least 35% to maintain forest bird diversity. Furthermore several tracts of forest at least 200 ha are necessary to support native interior bird species. Given this, a conservative approach would have development at least 300 metres from all edges of large natural area remnants, while 200 metres may be considered a minimum where wildlife will not be disturbed. This would include roads and trails.

It has been estimated that by 2011, the population will increase by 146,000 in Hamilton and Halton Region. Using recreation and tourism statistics, an additional 70,000 people could potentially want access to the natural areas. In the immediate area of South Waterdown and North Aldershot the population will potentially increase by about 10,600. Using the same ratio,

there could be an additional 5,300 people wishing to use these areas for recreation from the immediate neighbourhood.

While the development and locations for recreation and education activities have to be carefully considered, this area does offer wonderful opportunities for education on unique biota (living things), geology, and cultural history. The natural areas have been used historically by aboriginal and early European settlers and this long history of use could be incorporated into management plans. There is an opportunity to explain and build upon the relationships between the fine architecture, bridges, roads, and canals we have now with the natural areas. In large part, it was the vision for a grand entrance to Hamilton in the early 1900's that gave us the natural areas we have today.

The development of a conservation and land management strategy will need to balance the need for species protection, research, and outdoor education with competing uses and demands for recreation and tourism. It is apparent from Provincial plans 30 years ago to the current Provincial Growth Plan and Greenbelt Plan that healthy natural systems and conservation of cultural resources are important to protecting the health and sustainability of the Hamilton and Halton Region communities, which includes sustaining the character of the countryside. Significant resources have been committed to restoring Hamilton Harbour and it is recognized that the watersheds supporting the Harbour need to be healthy for restoration efforts to succeed. The Greenbelt Plan and Niagara Escarpment Plan both have natural heritage systems that seek to protect the watercourses, seepage areas, wetlands, significant forest and valleylands, and other natural areas that are necessary to maintaining local and international biodiversity of plants and animals. Defining the area necessary to protect these systems and implementing appropriate land management measures will ensure the long term health of the natural areas and go a long way towards achieving a vision of the Greenbelt Plan 'permanent protection to the natural heritage and water resource systems that sustain ecological and human health and that form the environmental framework around which major urbanization in south-central Ontario will be organized.' (Ministry of Municipal Affairs and Housing, 2005).

It is critically important that efforts be made now to protect and regenerate vital natural lands and consider their intimate relationship with the Great Lakes watershed. Efforts towards ensuring long-term sustainability of these lands today will help ensure clean, green and accessible natural areas in this part of the Greater Golden Horseshoe in perpetuity.

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Figures

- Figure 1 Study Area
- Figure 2 Provincial Plans
- Figure 3 Land Ownership
- Figure 4 Land Use
- Figure 5 Physiography
- Figure 6 Soils
- Figure 7 Slope
- Figure 8 Hydrology
- Figure 9 Greenlands
- Figure 10 Interior Forest
- Figure 11 Recreation & Trails