Conservation Halton

Parks Master Planning

Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area

Stage Three Report

May I 2014





Archaeological Services Inc. TCI Management Consultants DILLON CONSULTING EDA Collaborative Inc.

Approval Statement

We are pleased to approve the *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area* as the official policy document for the management and development of this conservation area. The plan reflects Conservation Halton's intent to protect the natural environment of the Niagara Escarpment and the natural and cultural features of Crawford Lake Conservation Area and Crawford Tract II Resource Management Area and to maintain and develop high quality opportunities for outdoor education, recreation, discovery and enjoyment of the Niagara Escarpment by Ontario residents and visitors.

_____ _____

Ken Phillips
Chief Administrative Officer
Conservation Halton

Date

_____ _____

John Vice
Chair, Board of Directors
Conservation Halton

Date

I am pleased to deem this master plan in conformity with the general intent and purpose of the Niagara Escarpment Plan (2005) pursuant to S. 13-(1) of the *Niagara Escarpment Planning and Development Act*.

_____ _____

Deb Pella Keen,
Director
Niagara Escarpment Commission

Date

_____ _____

Ray Pichette
Director
Ontario Natural Heritage Lands and Protected Spaces Branch
Ministry of Natural Resources

Date

Preface

The Crawford Lake Conservation Area Master Plan is the principal guiding policy document for the planning, development and resource management of the Crawford Lake Conservation Area and Crawford Tract II Resource Management Area, which is owned and administered by Conservation Halton. This master plan has been undertaken recommended by the *Limestone Legacy* report prepared by Conservation Halton in 2007, which proposed a vision to create "a sustainable network of world class conservation parks for ecological health and to provide public greenspace for quality education and recreation." The vision, goals and objectives of that plan are attached to this report as Appendix III.

This plan was developed in a phased three stage planning process that was designed to address growing regional recreational demands while also ensuring the long-term protection and sustainability of this natural escarpment park. The planning process was structured to satisfy the legislative requirements of the *Niagara Escarpment Plan (2005)* and the *Conservation Authorities Act* and has included extensive consultation with the public, stakeholders and related agencies.

Final approval of this plan is under the jurisdiction of the Ministry of Natural Resources in accordance with the Niagara Escarpment Plan. Upon approval of this document by the Board of Conservation Halton, submission will be made to the Ministry of Natural Resources and Niagara Escarpment Commission for review, circulation and final approval by the Minister or designate of the Ministry of Natural Resources. This plan will be the prevailing policy document for the next ten years from the date of the Ministry of Natural Resources approval.

The Stage One Inventory and Analysis report was released in March 2010. The Stage Two document Concept Alternatives and Management Considerations was released in August 2010 for circulation and response from the public and related agencies.

The Stage Three *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Area* is the approved policy document for the management and development of the Crawford Lake Conservation Area. This document sets out park zoning and conservation area policies for resource management and operations as well as development policies to guide proposed conservation area management.

Executive Summary

Vision Statement

Conservation Halton's Crawford Lake Conservation Area aspires to be the premier Niagara Escarpment Nodal Park that functions as a significant, regional educational and tourist destination, presents interpretation of natural and cultural heritage, offers recreational opportunities, and protects and enhances the unique escarpment environment.

Significant Site Attributes of Crawford Lake Conservation Area

The Crawford Lake Conservation Area features spectacular natural and cultural heritage. As part of the UNESCO World Biosphere Reserve designated Niagara Escarpment, Crawford Lake Conservation Area features a rare meromictic lake, a 500 year-old Ontario Heritage-designated Iroquoian village site, innovative programming, high customer service delivery standards, and efficient operations management. Crawford Lake Conservation Area possesses an impressive array of natural and cultural heritage features including:

- The richest and most unique combination of natural and cultural features of any conservation area within the Conservation Halton conservation area system;
- A unique meromictic lake;
- In combination with the Crawford Tract II Resource Management Area, which is consist of 335 hectares of forests. Comprising 50 different habitat types, expansive valley wetlands and prominent escarpment cliff and rim features;
- An accurately dated First Nations archaeological site with three Iroquoian longhouses reconstructed on the exact footprint of the archaeological findings;
- A network of 18 kilometres of hiking and snow shoeing trails, featuring the Crawford Lake boardwalk, scenic canyon lookouts and trail connections to adjacent natural areas and the Bruce Trail;
- Designation as part of a World Biosphere Reserve by UNESCO part of the Niagara Escarpment UNESCO World Biosphere Reserve and identified as a Natural Environment Park under the Niagara Escarpment Parks and Open Space System;
- Identification as a Provincially Significant Area of Natural and Scientific Interest (ANSI) representing the Crawford Lake/Milton Outlier Valley Life Science ANSI and Lowville Re-entrant Valley Earth Science ANSI features;
- Identification as Provincially Significant Wetlands for the Nassagaweya Canyon Wetland and Crawford Lake and Calcium Pits Wetland Complex;
- Over 612 plant species (47 rare, 103 uncommon), 123 bird species (16 rare, 26 uncommon), 33 mammal species (5 rare, 2 uncommon), 13 reptiles (4 rare, 1 uncommon), and 9 amphibians (2 rare, 5 uncommon) can be found in the conservation area and the immediate surrounding area
- Protected habitat for 14 species at risk as well as 3 globally rare and 7 provincially rare habitat types, and 20 ancient Eastern White Cedars;
- Modest visitor centre and educational facility offering a variety of natural and cultural interpretive programs and exhibits with over 89,000 visitors in 2010;

- Major interpretive and educational facility offering a variety of natural and cultural programs and exhibits with over 40,000 students attending last year;
- Existing natural heritage features provides the equivalent of $2.2 million in ecosystem services annually.

Existing Policy Framework

The *Master Plan for Crawford Lake Conservation Area* builds on and supports existing Conservation Halton and provincial policy documents including the *Conservation Halton Strategic Plan (2009), Halton Escarpment Parks – A Limestone Legacy* plan (2007) and the *Niagara Escarpment Plan* (2005).

The *Limestone Legacy* document outlines a draft strategy to protect and enhance Halton Region's system of escarpment parks through a unique partnership between Halton Region and Conservation Halton

Within the provincial *Niagara Escarpment Plan (2005)*, Crawford Lake Conservation Area is recognized as a key component of the Niagara Escarpment Parks and Open Space System and has been identified as an Escarpment Nodal Park. As such, it is expected to provide visitor information services on Escarpment parks and open space activities, points of interest and attractions for the larger parks system and surrounding community.

Summary of Significant Issues and Challenges

Financial Constraints: Over the past 20 years, with changes in government and priorities, Conservation Halton's funding for park development and enhancement has almost disappeared. Therefore, Conservation Halton has been primarily using park revenues to offset operating expenses with limited funds for basic capital maintenance work, new facilities or tools to monitor environmental impact. Currently there is no real base-level capital-funding source. This limited funding has resulted in the deterioration of natural heritage features, facilities and amenities as well as the quality of the visitor experience. Limited funding threatens Conservation Halton's ability to continue to protect and maintain, let alone improve or enhance the conservation area

Crawford Lake Conservation Area, along with the other Conservation Halton conservation areas, suffers from the impacts of severely limited tax-supported funding. Funding models in many other Conservation Authorities in Southern Ontario include regional, municipal and/or provincial tax levy support. Additionally, development charges permit fees and other associated development fees are charged against Conservation Halton for conservation area capital development projects. Other park agencies in the region are normally exempt from these fees and charges.

Growth in Visitation: Over the last five years, Conservation Halton conservation areas have experienced 9.4 percent annual increase in visitation, while the regional population has grown at a rate of 4.5 percent over the same period. This growth trend is projected to continue, if not accelerate over the next ten years. This growth represents regional resident's positive attitude towards participation in healthy-lifestyle pursuits and interest in First Nation's culture, but also represents a threat to the sensitive natural ecology of the site unless properly managed and serviced with the appropriate facilities.

Natural Heritage Protection: Crawford Lake Conservation Area's unique and diverse natural heritage system, as documented under this master plan, is generally well protected and secure. However, some deterioration was identified at certain heavily used locations along the trails system,

highlighting the need for stronger monitoring and protection measures, especially in light of the population and visitation projections.

Facilities and Amenities: Central to Crawford Lake Conservation Area's vision will be a new state-of-the-art 'green and accessible' visitor interpretive centre to house cultural artefacts and interpretive displays, host programs and educate visitors about the park's unique features, including a reconstructed 15th century Iroquoian village, the meromictic lake, natural heritage trails and scenery, and sensitive escarpment ecosystems. To fulfill Crawford Lake Conservation Area's vision, a 1300 square metre interpretive and educational centre (new visitors center) is proposed. The proposed centre will meet the current and future demand for educational visits, provide space to house archeological artifacts found on-site, provide interpretive presentation space and displays, provide tourist attraction facilities, meet Ontario accessibility requirements and standards and model an environmentally sustainable building.

Cultural Heritage Protection: There are five registered archaeological sites within the Crawford Lake Conservation Area, with the two largest and most significant located at the Middle Iroquoian village site. The authentically reconstructed village on the exact footprint of the original longhouses represents an extremely rare interpretive and educational resource. Through the master plan's outreach and consultative process with First Nations of Ontario and others, it is evident that there is potential to explore partnership opportunities that further develop the interpretive and educational values associated with these cultural spaces.

Visitor Experience: While the natural and cultural features of the Crawford Lake Conservation Area are spectacular and unique, the present built amenities, facilities and infrastructure are inadequate to serve the projected growth in visitation. While visitors currently enjoy their experience at Crawford Lake Conservation Area, continued growth will put facilities beyond the capacity they were built for, which will detract from the quality of the visitor experience.

Education and Programming: The educational programming at the Crawford Lake Conservation Area is a strong and important component compared to the other escarpment conservation areas. Crawford Lake Conservation Area programs support school curricula and offer hands on First Nation cultural experience that is not offered anywhere else in the region. Current school group program attendance is close to maximum capacity for most of the school year and limited facility space restricts the expansion of programs and ability to meet current and projected increased demand.

Recommended Policies:

The master plan that has been developed to support the Crawford Lake Conservation Area as a significant regional destination for local visitors and tourists:

- Ensures protection and enhancement of the natural heritage and cultural spaces of the site;
- Promotes environmental values, excellence in education, healthy lifestyles and outdoor recreation;
- Prescribes a workable visitor impact management strategy that addresses the expected increased visitation and any accompanying potential impacts;
- Specifies development requirements and standards that meet the appropriate level of design excellence in high quality educational, interpretive and recreational facilities, programs and amenities; and;

- Outlines a realistic financial management strategy that defines funding and revenue generation requirements, potential partnerships, management and operational costs and that aims at ensuring long-term viability.

Highlights of the Development Proposal

The master plan identifies a range of new facilities to provide enhanced natural heritage protection, visitor experience, amenities, educational and interpretive opportunities and recreational conveniences. Financial and environmental sustainability are defining, and in some cases limiting factors in the proposed list of master plan recommendations. The main elements of the master plan are summarized as follows:

- A major new investment in a state-of-the-art interpretive and educational centre (new visitor centre) of approximately 1300 square metres that provides visitor orientation and information, interpretive exhibits and educational facilities. It is recommended that the costs be identified for budgeting purposes and the building program and space allocations be further refined as part of a detailed feasibility study with final approval through the Niagara Escarpment Development Permit process.
- A system of entrance, directional, interpretive and other signage that is consistently branded across all Conservation Halton conservation areas and standardized to meet accessibility, readability, risk management and marketing objectives.
- An enhanced, realigned sustainably-designed system of small-scale roads and parking areas that promotes safety and security for visitors and a positive sense of arrival, and which is tastefully designed to harmonize with the natural setting of the conservation area.
- Repurpose existing parking lot by Gathering place to become Special events area
- A new 250 car sustainable parking lot north west of village
- Upgrade overflow parking area with grass paver system
- Upgrade existing parking lot by gatehouse
- Upgrading Iroquoian village features to include constructing two fully functional longhouses, and one partial longhouse. Refurbish existing longhouse and reconstruct palisade. This will provide additional educational and interpretive facilities and to meet heritage designation standards and building code requirements.
- Renovate and upgrade existing gatehouse
- Reconstruct palisade
- Re-purposing the existing Visitor Centre and Gathering Place buildings to complement proposed new interpretive and educational centre.
- Site technology upgrades including telephone and video surveillance.
- Accessibility upgrades for all buildings and pathways to meet forthcoming *Accessibility for Ontarians for Disabilities Act* (AODA) built environment standards.
- Trail system improvements to ensure protection and enhancement of the natural heritage features.
- Upgrading the existing boardwalk and related interpretive lookouts around the lake to meet anticipated user needs.

- An upgraded standardized palette of day-use passive recreation amenities such as picnic shelter, comfort station, site furniture, etc.
- New maintenance building and works yard.
- Site services upgrades including potable water, electrical service and wastewater treatment that use sustainable technologies that demonstrate respect for the environmental values associated with the site.
- Consider acquisition of additional lands for future expansion of the administrative facilities, recreational programming sites and natural heritage features and requirements.

Overall Capital Development Costs

Overall capital development cost for the build out of the proposed master plan for the Crawford Lake Conservation Area amounts to approximately **$17.5 million** over a ten-year period. A generalized breakdown of this amount is summarized below.

Interpretive and Educational Centre including: **$ 10,000,000**

- Building
- Site development
- Exhibits
- Roadway/Parking Lot
- Contingencies

Site Works:

Signage	$ 132,000
Roads and parking	$ 1,600,700
Picnic and site furnishings	$ 170,000
Site upgrades, longhouses and infrastructures	$ 2,121,525
Trails	$ 572,000
Restoration of natural features	$ 1,035,000
Visitors Impact Management Plan ($15,000/yr.)	$ 150,000
Subtotal	***$ 5,780,125***
Soft costs, fees, contingency (30%)	$ 1,734,038
Total (excluding educational centre)	**$ 7,514,163**
Grand Total	**$17,515,163**

Site Works

Overview of Financial Parameters

The key financial and related parameters of the development plan for the Crawford Lake Conservation Area are as follows:

- The cost of the development plan for the Crawford Lake Conservation Area over the 10-year development timeframe is just over $17.5 million (measured in terms of 2010 dollars) and a stable base level capital funding source must be established to facilitate plan implementation.

- Attendance at the Crawford Lake Conservation Area is expected to grow significantly to just over 230,000 by the year 2020.
- While more visitors will generate increased revenues, the financial analysis in this report demonstrates that this by itself will not be sufficient to offset the higher costs of operation; however, despite increased operating costs, Crawford Lake Conservation Area can operate on a break even basis or even generate a small surplus, through a variety of strategies.
- To provide for the enhanced level of customer services and environmental protection called for in this master plan, and not incur an operating deficit a pricing study must be undertaken to determine how to increase net revenues or identify means to subsidize operating costs.

Putting it in Context: Conservation Halton's Contributions to Society and the Environment

Conservation Halton creates significant direct economic benefit in the community. The operations of Conservation Halton, plus the expenditures of visitors who come to the region to utilize the programs and services offered, create nearly $12 million of additional gross domestic product (GDP) in Halton Region alone. This is associated with 274 jobs in Halton Region, $8.4 million in wages and salaries and $5.7 million in additional taxes paid. If this were a single business or industry, it would be recognized as a significant component of the economic base of the Region. Beyond Halton Region itself, there are further economic benefits accruing across the Province of Ontario.

In addition to the economic impacts, Conservation Halton provides a valuable service to the community in terms of 'ecosystem services' – the impact of the forest and wetlands maintained by Conservation Halton in terms of filtering and cleaning water and air. Ecosystem valuation quantifies the cost of providing these services commercially as opposed to having conservation authority lands provide these benefits 'for free'. The estimated savings to society from these services provided by Conservation Halton's holdings are nearly $16 million annually.

Conservation Halton conservation areas provide a growing population with access to abundant, natural green space for leisure and recreation. More specifically, these spaces offer opportunities for recreation that promotes healthy living through physical activity and exercise. By keeping costs low, Conservation Halton conservation areas strive to offer accessibility to all residents while supporting culturally and socioeconomically diverse communities. In addition to serving local residents, as significant regional destinations, the conservation areas also serve to attract tourists to Halton Region.

The availability of Conservation Halton spaces, programs and services adds considerably to the perceived quality of life in Halton Region. This in turn can be extremely valuable in attracting the highly mobile 'creative class,' those individuals most likely to create businesses, invest in the community and bring new ideas and energies into the region. Thus, indirectly, Conservation Halton operations add to the attractiveness of the region overall as a place to live and work.

Financial Sustainability Strategy

The master planning process has made it abundantly clear that:

- While the prime focus of Conservation Halton's conservation areas has been and will continue to be protection and enhancement of the natural heritage resources, it is also

imperative that there be consideration for the social and economic components of the sustainability model;

- As growth in visitation inevitably increases, so too must the investment in infrastructure, amenities, related facilities and the visitor impact management program that is required to protect and enhance the natural heritage features and thereby achieve and maintain the necessary balance between protection and usage;
- Protection of natural heritage resources requires key investments in:
    - Enhancements to existing facilities, infrastructure and amenities;
    - New facilities: educational, recreational and interpretive;
    - Protection and enhancement initiatives: visitor impact management, restoration, etc.;

Annual base level of financial support should be sourced through Halton Region (the Province of Ontario and / or municipalities, etc.,) as the main recipient(s) of the benefits provided by this conservation area. This should result from (and possibly be correlated with) the quite significant population growth occurring in the region, which will by itself place a heavier demand upon the usage of Conservation Halton's areas and facilities. This will require a new and different business model to be developed for Conservation Halton, one that acknowledges the significant economic benefits conferred upon Halton Region by Conservation Halton, and recognizes the pressures placed upon Conservation Halton by population growth.

Consequences of not providing adequate on-going capital funding may include the need to implement one or more of the following actions:

- Raise admission fees at specific individual conservation areas;
- Raise membership fees;
- Charge differentially at peak times;
- Limit visitation;
- Limit access to certain conservation areas;
- Cut back on some of the programs and services currently offered;
- Cutback the proposed capital development program or extend it beyond the projected 10-year timeframe with subsequent increases in cost.

Conservation Halton creates valuable environmental, social and economic benefits, and provides significant value-added services to Halton Region. In order to enable Conservation Halton to continue to provide these benefits, ongoing investment in Conservation Halton's conservation area facilities and programs will be required.

Acknowledgements

The *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area* is the product of collective input from Conservation Halton staff, local residents and key stakeholders. These dedicated individuals addressed important concerns and issues surrounding the development of the master plan.

Those who made an effort to participate in the public meetings and design charrettes will have a greater sense of community ownership and pride, because they helped to shape the master plan concept and recommendations for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area. The ideas of local citizens combined with the management experience of Conservation Halton and the analytical and design expertise of the consultants has produced a master plan concept to guide the future development of this unique and beautiful natural area.

Consultants

EDA Collaborative Inc. completed this study between November 2008 and February 2011. This document summarizes the factors including environmental, social, economic and management policy considerations that were taken into account in order to create an appropriate *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area*.

Dillon Consulting Limited provided the environmental analysis and programming with particular attention to resource management policies.

TCI Consulting Inc. provided the economic evaluation, market analysis, and preliminary capital and operating budgets for the master plan.

Conservation Halton Master Plan Review Committee

Neil Switzer – Manager of Projects and Services

Angela Nonkes – Parks Planner/ Landscape Designer

Robert Edmondson – Director of Watershed Management Services (past)

Gene Matthews – Director, Conservation Lands

Marta Proctor – Director, Conservation Lands (past)

Lorrie O'Brien – Director, Conservation Lands (past)

Hassaan Basit – Director, Communications Services

Linda Scott – Manager of Crawford Lake and Mountsberg Conservation AreasDolf DeJong – Manager of Crawford Lake and Mountsberg Conservation Areas (past)

Julia Madden – Manager of Crawford Lake and Mountsberg Conservation Areas (past)

Craig Machan – Manger of Hilton Falls, Rattlesnake Point, Mount Nemo Conservation Areas

Ron Kindt – Manager of Hilton Falls, Rattlesnake Point, Mount Nemo Conservation Areas (past)

Brenda Axon – Manager, Watershed Planning Services

John Bush – Manager, Watershed Lands and Resource Services (past)

Kim Barrett – Senior Terrestrial Ecologist

Nigel Finney – Natural Heritage Ecologist, Conservation Projects

Jarold Holland-Hibbert – GIS Specialist

Technical Advisory Committee

Anne Marie Laurence – Niagara Escarpment Commission

Susan Cooper – Ontario Ministry of Natural Resources

Stephanie Jarvis – Town of Milton

Shelley Young – Region of Halton

Conservation Halton Field Staff

Nigel Finney

Brenda Van Ryswyk

Lesley McDonell

Andrea Dunn

Rachel Martens

Jennifer Roberts

Other Supportive Organizations, Agencies or Individuals

Conservation Halton Board of Directors

Conservation Halton Foundation

FEREN

Halton Environmental Network

Halton Multi-Cultural Council

Halton Region

Halton Region Health Department

Ontario Parks

Our Kids Network (Vanessa Box-Jones)

Province of Ontario South Peel Naturalists

Sustainable Trails Limited

Halton REGION

Funding for this project was provided by The Regional Municipality of Halton

Ontario

Assistance for this project was provided by The Ministry of Natural Resources

TABLE OF CONTENTS

List of Tables

Other tables from Section Five are in Appendix II: Financial Calculations

List Of Figures

Appendix I: Resource Management

Appendix II: Financial Calculations

Appendix III: A Limestone Legacy: Visions, Goals and Objectives

Appendix IV: Community Engagement for Stages Two and Three

Section One: Introduction

1.1 Background

Master planning for Crawford Lake Conservation Area was undertaken to provide Conservation Halton with a sustainable management and development plan for the site to operate as a Natural Environment Park under the Niagara Escarpment Parks and Open Space System (NEPOSS). Crawford Lake Conservation Area has also been designated a Nodal Park under NEPOSS. Nodal Parks have been identified to represent the various segments of the escarpment and are intended to provide visitor reception and information dissemination concerning Niagara Escarpment parks and open space activities, points of interest, and attractions in surrounding escarpment area and communities. (*NEP* Policy 3.1.2).

This master plan also addresses management of the Crawford Tract II Resource Management Area. This planning process is important to the protection and management of the 222-hectare conservation area and the 113-hectare resource management area, which are located in the Town of Milton, a part of the Halton Region, in Southwestern Ontario just to the west of the Greater Toronto Area.

This report constitutes the third and final stage of the master planning process – the master plan. Previous stages produced the *Inventory and Analysis: Stage One Report* (EDA Collaborative Inc. 2010a) and the *Concept Alternatives and Management Considerations: Stage Two Report* (EDA Collaborative Inc. 2010b). Further details of the planning process can be found in Section 1.7 below.

1.1.1 Existing Conservation Area

The Crawford Lake Conservation Area and Crawford Tract II Resource Management Area are located within the Niagara Escarpment Plan Area within the Town of Milton; the Crawford Lake Conservation Area borders on Rattlesnake Point Conservation Area. These lands straddle Guelph Line - the main site area is located on the east side and Crawford Tract II Resource Management Area is located on the west side of Guelph Line. The Bruce Trail connects Crawford Lake Tract II Resource Management Area across the Guelph Line to the main Crawford Lake Conservation Area and then crosses the Nassagaweya Canyon to Rattlesnake Point Conservation Area. The approximate location of this conservation area is shown on Figure 1-1.

Crawford Lake Conservation Area is endowed with perhaps the richest and most unique combination of both natural and cultural heritage features of any of the Conservation Halton conservation areas. These significant resources include the inherent qualities of its regionally environmentally sensitive area site, Provincially Significant Life Science ANSIs, Niagara Escarpment site as part of the UNESCO World Biosphere Reserve, a rare example of a meromictic lake, thoroughly documented pre-European settlement archaeological sites and an authentically reconstructed 15th century Iroquoian village. Together, these features provide visitors with an exceptionally wide range of interpretive and educational opportunities on one site.

The lands comprising Crawford Lake Conservation Area and Crawford Tract II Resource Management Area have been designated as Escarpment Natural Area and Escarpment Protection Area under the *Niagara Escarpment Plan* (2005). The Escarpment Natural Area consists of a steeply sided glacial valley and mature forest. The Escarpment Protection Areas are mainly former farmlands. Most of the Crawford Tract II Resource Management Area is not suitable for development due to significant natural heritage features, topography and wetlands. See Section Two of the *Stage One Report* (EDA 2010a)

for policy constraints on development of these lands. The Crawford Lake Conservation Area is accessed via Conservation Road where it intersects with Guelph Line. The entrance road passes the gatehouse, overflow-parking area, the Visitor Interpretive Centre, Iroquoian village, the Gathering Place and arrives in the parking lot for cars and bus drop off. The site attracts a large volume of school groups in Grades 3 and 6, as well as older grades, thereby requiring major bus parking areas.

There is an extensive trail system throughout the site. The most popular and intensively used route is the Crawford Lake Trail and boardwalk that surrounds the meromictic lake. The raised boardwalk is particularly important in restricting pedestrian access to the lake and protecting the sensitive features in that part of the site. A series of rest area lookouts, interpretive stations and educational signage provide information on the unique qualities of the lake and its importance relative to the discovery of the archaeological sites at the conservation area. In addition, there is a network of other trails that provide access to various parts of the site and connect with the Bruce Trail.

The major cultural heritage feature is the Iroquoian village. School visits to the village usually include a variety of seasonally-based activities. This may include an introduction to the native species teaching gardens and grinding stone, a guided hike, a visit inside the village to the various outdoor demonstration areas and at least one of the rebuilt longhouses where visitors can experience everyday life in the longhouse in the 15th century.

Key support facilities and amenities are available at the visitor centre and include a multi-media amphitheatre, gift shop, lunchroom, washrooms and administrative offices. In addition, another classroom facility with kitchen and washrooms is provided at the Gathering Place building.

1.1.1.1 Infrastructure

A number of facilities and amenities exist on the Crawford Lake Conservation Area site including:

- The entrance road to the conservation area is at the intersection of Conservation Road and Guelph Line.
- The 39 square meter (420 square foot) concrete block gatehouse is located in the middle of the main access road with a ticket window on the entrance road side.
- The 632 square-metre, (6803 square foot) two-storey visitor centre is located on a hillside south of the entrance road and the Iroquoian village. The current visitor centre is inadequate for the interpretive demands placed upon it, and limits the staff's ability to provide an engaging experience for the visitors who now frequent the site, let alone the growth anticipated for the next five or ten years.
- The Iroquoian village is a re-creation of the 15th century village once located on this site. The village reconstruction began in 1984 and has come to include two fully built-out longhouses - the Turtle Clan Longhouse and the Wolf Clan Longhouse - a log palisade that defines and surrounds the village as well as various site features such as gardens, a games field and various program areas.
- The 163 square meters (1750 square foot) Gathering Place Building is located east of the Iroquoian village. The building provides multi-use classroom space / eating area with kitchen, washrooms and storage areas for public functions including programmed events and classroom facilities.
- A small outdoor amphitheatre, constructed of stone blocks, is located near the lake.
- 1.86 hectares of the site are mowed for picnicking, games and interpretive activities

- Car parking is at the main parking area east of the visitor centre/village area (capacity 150 vehicles); there is also a 25 car parking lot near the main entrance.
- All vault toilets on the site are open year-round to the public:

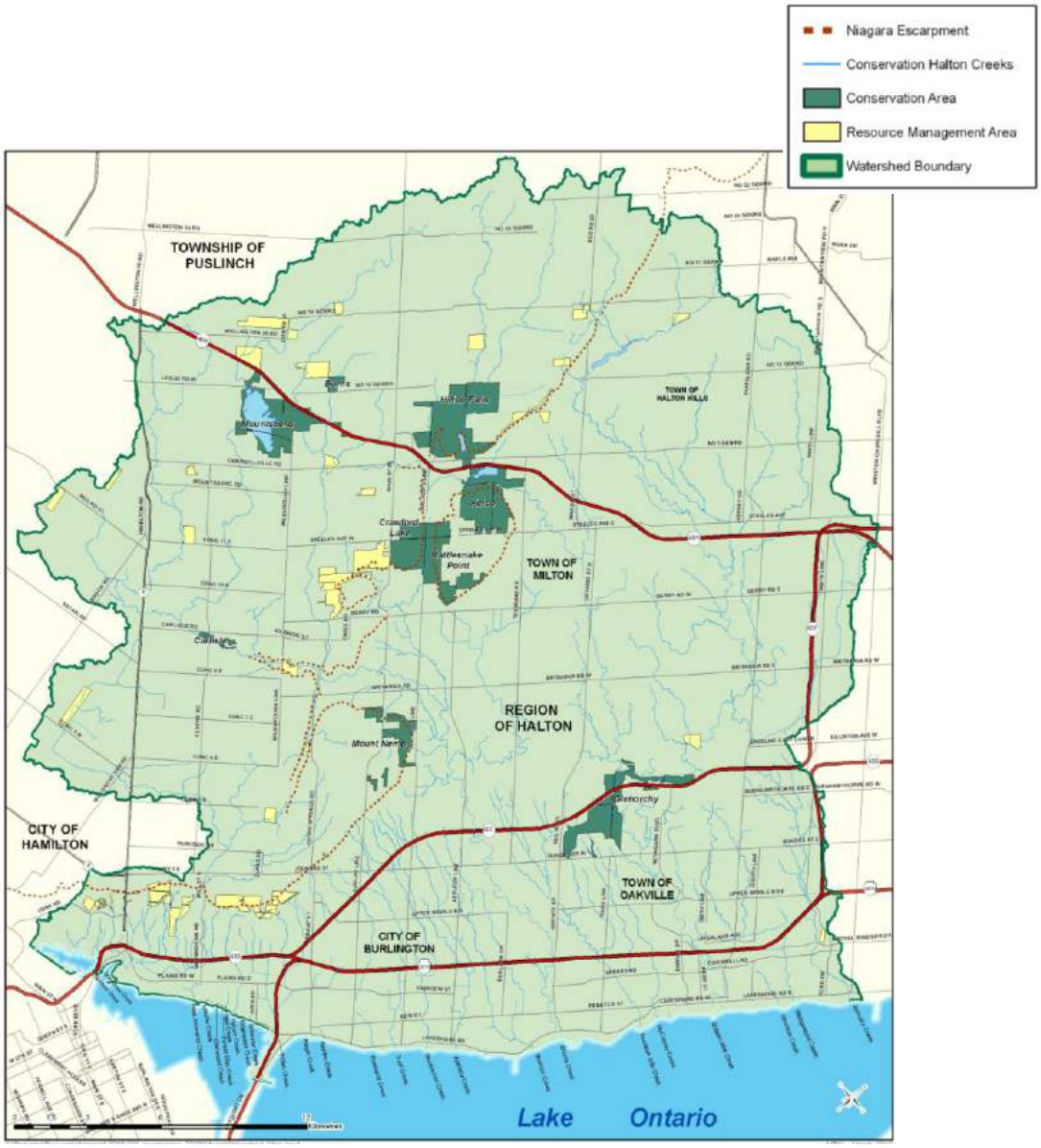


Figure 1-1: Location Map

1.1.1.2 Recreational Facilities

The Crawford Lake Conservation Area currently offers a variety of outdoor recreational activities including:

- Hiking, snowshoeing and cross-country skiing along a variety of trails – refer to the summary of trails in the next section of this report for details
- Wildlife viewing, nature study and photography that focuses on soaring bird watching through the Nassagaweya Canyon and related interpretation

- Heritage site viewing of the reconstructed 15th century Iroquoian village with longhouses, palisade, native species garden, grinding stone, artefacts and exhibits
- Geocaching is a recreational activity that Conservation Halton does allow within its conservation areas.
- The Bruce Trail Corridor traverses these lands. The Bruce Trail Conservancy is committed to maintaining a public footpath along the Niagara Escarpment in order to protect its natural ecosystems and to promote environmentally responsible public access to this UNESCO World Biosphere Reserve. The corridor includes Main and Side Bruce Trails as well as the optimum route.

1.1.1.3 Staffing

Crawford Lake Conservation Area is managed in conjunction with Mountsberg Conservation Area, with one full time Manager, one fulltime Operations Coordinator, one fulltime Education Coordinator and one fulltime Customer Service Coordinator between the two parks. Other staff includes full and part-time educational, operations, and customer service staff.

Crawford Tract II Resource Management Area is under the jurisdiction of the Watershed Lands and Resources Services department.

1.1.1.4 Visitation

Average annual visitation for the years 2005-2009 is 84,000 with a marked upward tendency. Approximately 40% of this figure is accounted for by school groups. As discussed in Section 5.2.1 below, visitation is expected to continue to increase in coming years.

1.2 Site Characteristics

The lands comprising the study area are mainly upland and lowland forest types with many significant wetlands. A glacial valley system flows through the central portion of Crawford Tract II Resource Management Area. It is also home to sink holes, crevice and talus caves, an ancient dry waterfall and talus springs. These lands are also recognized as very rich botanical sites, with rare old growth cedars and a prime example of talus slope forest and a substantial area of interior forest. Many regionally, provincially and nationally rare plant species are also present. Thus, the conservation area offers opportunities to interpret the natural environment including ecosystem succession, dealing with both the unique character and information derived from the escarpment itself and of the general patterns of animal and plant habitats of the Niagara Escarpment.

The open rural landscape character associated with the Niagara Escarpment Planning Area, as well as the greenbelt corridor, is evident at the Crawford Lake Conservation Area. Contributing factors include anthropogenic rural features such as open agricultural fields and hedgerows, and natural features such as forested slopes, stream valleys, and talus slopes. Seasonal changes impact dramatically on the visual character of the site. This wide diversity of natural heritage features renders the lands very aesthetically valuable.

Additionally, archaeological excavations have revealed that the site was inhabited by Iroquois several times before European settlement. The current reconstructed village is based on evidence of an unpalisaded settlement occupied during the 15th century A.D. For a detailed discussion of the archaeological significance of the finds at Crawford Lake Conservation Area, see the *Stage One Report* (EDA 2010a). This land was also owned and occupied by various settlers during the 19th and early 20th century. Evidence of this occupation consists of the foundations of the Crawford cottage and

barn, the Hunter cottage and barn, ruins of a sawmill, and of a few other buildings. When purchased Lot 1, Concession IV, the Howard property, contained a 75 year old barn and a 100 year old house; these were removed. The remaining evidence of settlement could form the basis of further interpretive programming.

1.3 Site Ecology and Policy Context

Designated natural features in the Crawford Lake Conservation Area and surrounding area include regionally and provincially significant landforms, vegetation communities and other natural heritage features including:

- Crawford Lake–Rattlesnake Point Escarpment Woods Environmentally Sensitive Area (ESA)
- Crawford Lake/Milton Outlier Valley Provincially Significant Life Science and Earth Science Area of Natural and Scientific Interest (ANSI)
- Lowville Re-entrant Valley Provincially Significant Earth Science ANSI
- Calcium Pits ESA
- Nassagaweya Canyon Provincially Significant Wetland (PSW)
- Crawford Lake and Calcium Pits Provincially Significant Wetland Complex

The master plan must conform to numerous planning acts and policies, including but not limited to the *Planning Act*, *Provincial Policy Statement*, *Niagara Escarpment Plan*, *Greenbelt Plan*, Places *to Grow Act*, *Conservation Authorities Act*, *The Regional Official Plan* for Halton Region and the *Town of Milton Official Plan*. The implications of these policy statements are laid out in the *Stage One Report* (EDA 2010a) and pertinent sections addressed elsewhere in this report.

Recently Halton Region has adopted an amendment to their official plan. Instead of land use designations called Greenlands A and B, they have initiated a Regional Natural Heritage System.

> *The goal of the Regional Natural Heritage System is to increase the certainty that the biological diversity and ecological function within Halton will be preserved and enhanced for future generations. ROPA 38 (Adopted by Regional Council December 16, 2009)*

All of the conservation area falls under this natural heritage system classification.

1.4 Land Use Context

1.4.1 Regional Context

The population base within southern Ontario is significant is growing rapidly. The estimated current (2010) population within a one half-hour drive radius is just over 2 million, while that within a one-hour radius is estimated to be nearly 7 million. At anticipated growth rates, the population within the one-hour radius will be approximately 8.5 million by the year 2021.

The provincial growth plan, the *Places to Grow Plan*, sets population and employment targets that Halton Region must plan to achieve. Specifically, it needs to plan for a *total* of 780,000 people and 390,000 jobs by 2031. Thus, Halton Region needs to plan for an *additional* 134,000 people and 54,000 jobs in the years 2021-2031. Clearly, Conservation Halton's facilities and programs can draw on and will have to accommodate a significant and growing local and regional market.

Although the area is experiencing phenomenal population growth and will continue to do so for the foreseeable future, most of the surrounding area has a rural character. Moreover, the local

municipalities as well as Halton Region are committed to "Smart Growth" principles of concentrating development and preserving open space.

1.4.2 Local Context

1.4.2.1 Land Use

The areas directly abutting Crawford Lake Conservation Area and the Crawford Tract II Resource Management Area lie entirely within the Niagara Escarpment Plan Area and, thus, all land uses must comply with the policies governing the assigned designations. The areas are comprised of Escarpment Natural Area and Escarpment Protection Area. A Boy Scout camp is located west of Twiss Road across from Crawford Tract II Conservation Area. Some scattered estate residential lots and many farmsteads exist along Conservation Road and Twiss Road.

1.5 Study Purpose

Master planning for the Crawford Lake Conservation Area and Crawford Tract II Resource Management Area was undertaken to ensure that Conservation Halton meets its obligations under the *Niagara Escarpment Plan* 2005) and aligns with its own *Strategic Plan* (2009). It is also in fulfillment of the mission of the *Limestone Legacy* report (2007). The purpose of this new master plan is to update and renew the 1983 *Master Plan*. This process is important to the protection and management of the 353-hectare site, which is part of a UNESCO World Biosphere Reserve.

The overall purpose of the master planning process was to protect and enhance the significant natural features and ecological functions of the conservation area while providing opportunities for the public to enjoy this spectacular area, appreciate its outstanding scenic beauty and participate in recreational opportunities. This master plan develops a vision and role for the conservation area in relation to other facilities within the Conservation Halton watershed. The *Master Plan for Crawford Lake Conservation Area* will serve as the principal guiding document for the future planning, design, development and resource management of the conservation area in accordance with all relevant acts and regulations. It is applicable for 10 years from the date of formal approval by the Ministry of Natural Resources with opportunities for amendment as described in Section 7.4 below.

1.6 Study Goals and Objectives

The primary goal of the *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area* is to create an optimum balance between environmental and historical protection, resource management and public use. This goal was accomplished through a phased and integrative planning and consultation process. Objectives of the final master plan included:

- Identify heritage features and conservation and restoration area components);
- Establish Niagara Escarpment Parks and Open Space Zones for the protection of all significant natural and cultural features;
- Conduct inventory and market analysis of surrounding natural and recreational facilities;
- Recommend enhanced basic facilities and amenities to bring the areas up to standards appropriate to a regionally significant resource;
- Establish details of the type and location of current and proposed uses.
- Develop appropriate park zoning, development guidelines and management policies;
- Recommend species at risk monitoring and habitat management program;

- Assess the feasibility of implementing a Visitor Impact Management (VIM) program and recommend a suitable VIM plan;
- Conduct financial assessment and develop budget estimates for capital and operating costs;
- Address physical and financial accessibility barriers to visitation; and
- Define carrying capacities for the conservation area and its associated uses;

1.7 Study Process

A master plan provides a long-range vision to guide development over a period of ten years. The master planning process for this study involved three stages.

Stage one of the study provided the context and foundation for the master plan that was being developed for the Crawford Lake Conservation Area. It summarized the site's existing environmental, historical, social and economic features and factors, and opportunities and constraints that influenced the development of the master plan. This required an extensive inventory and analysis process conducted in Stage One, the findings of which are documented in the *Inventory and Analysis: Stage One Report* (EDA 2010a).

The *Stage Two Report* consists of three development options including suggestions for programming, facilities and finances. The three conceptual options included Concept A - Upgraded status quo: provide proposed basic level of Conservation Halton conservation area services or meet expectations; Concept B - Basic level plus additional, "value added" services that exceed expectations and Concept C - Become a regional destination: a "must see/must do" experience. All concepts were built upon a major natural heritage system protection and enhancement program. These options were presented to interested members of the public and key stakeholders for review and discussion and, based on these findings; a preliminary preferred concept was identified.

The Ontario Ministry of Natural Resources states in the NEPOSS Planning Manuel, Section 3.1.5, "that park zoning is required as part of Master Plan development for all parks in NEPOSS." Park zoning as it is essential to the effective management of a park or open space. It can be used to assign land uses based on an area's significant for protection and potential for recreation within the context of a parks classification (NEP, 2005). These zones, and management guidelines for each, are presented in Section Three of this report and are detailed in Appendix I of this report.

During this third and final stage of the master planning process the preferred concept as determined in stage two has been further refined and a phased implementation plan developed for Crawford Lake Conservation Area. The final master plan includes a phased implementation and management plan for Crawford Lake Conservation Area. The completed plan will be submitted to the Board of Conservation Halton for approval and then to the Niagara Escarpment Commission and the Ontario Ministry of Natural Resources for endorsement/final approval.

1.7.1 Public Consultation

The master plan process started with visioning sessions with staff and board members in January 2009. In early February 2009, targeted interviews were held with interested organizations[1] to gain insight into what they would like to see in the Master Plan for each park. On November 28th, 2009 their was an initial open house to discuss proposed ideas for Crawford Lake. This open house was at

[1] Organizations – Represents; Groups, Interested parties and corporate bodies. Examples; Ontario Climbing Coalition, The Bruce Trail Conservancy, Tourism Burlington, and Dufferin Aggregates

Crawford Lake Conservation Centre and promoted free entrance to the park, 67 public citizens attend. More information regarding the visioning and workshop can be found in Stage One Report: Appendix II.

After Stage I: Inventory and Analysis was complete, the development of three proposed concepts for Crawford Lake were brought forward and discussed at an Open House on May 29th, 2010. At the open house, discussions about Rattlesnake Point, Mount Nemo and Hilton Falls Master Plans were had. The open house was advertised in the local papers, newsletters and on the Conservation Halton website, to which 15 public citizens attended the workshop which included 3 Metis Nation of Ontario members, and 3 were Conservation Halton staff. An extensive survey was distributed at the parks and online regarding Hilton Falls, Rattlesnake Point, Mount Nemo and Crawford Lake Conservation Areas, to which 170 people responded. Survey results and information on the May 29th, 2010 workshop including Metis Nation of Ontario discussions can be found in Appendix IV.

After the open house and survey, Conservation Halton determined that the preferred concept for Crawford Lake Conservation Area, derived from this review process, is based on Concept C. Concept C builds on the work proposed under Concept A (consisting of an upgrade of existing facilities to the enhanced base level proposed by these master plans) and Concept B, which further proposed to reroute the entrance road around the west side of the Iroquoian village, build a small educational centre, construct a new parking lot north of the village and add one new longhouse. Concept C proposed a larger educational centre, as well as reconstructing three more longhouses. It also proposed overnight accommodations. This master plan recommends that the need for this sort of facility be investigated as part of the interpretive and educational centre feasibility study. Concept C represents the best use of the considerable resources of this conservation area.

The Stage II document was posted on Conservation Halton's website and letters were distributed to neighbours within 120 meters of each park on September 1st, 2010. Newspaper ads were placed in local papers in September 2010 and a media blast posted advertising that there would be a Master Plan Stage II Open House. On October 7th, 2010 the preferred concept "C" was presented at two open houses held on the afternoon and evening of October 7, 2010. In the afternoon 28 people attended; in the evening 12 people attended. A variety of opinions and issues were presented by members of the public which were; impacts on the ecological features and decommissioning trails. These items were addressed in the Stage III Master Plan for example; proposing to reroute entrance road and identifying trails to be decommissioned. In general, Conservation Halton has received requests for more adult learning opportunities and improved multi-cultural, First Nations and handicapped accessibility to the facilities and interpretive programs. The Master Plan was further refined based on input from the Ministry of Natural Resources, the Halton Region, the Niagara Escarpment Commission, the Town of Milton and members of the public.

1.8 Significant Issues

The *Master Plan for Crawford Lake Conservation Area* has been developed in response to significant input from staff, current park visitors and a technical advisory committee. During this process, a number of significant issues have come to the fore, which it has been necessary for this master plan to address. These issues are summarized below.

1.8.1 Visitation and Community Issues

Conservation Halton expects to see visitation expand considerably at its conservation areas due to the expected population growth for Halton Region (anticipated to be 71% over the next 20 years) and

recreation trends (see section 5.1 below and Section 6.6 in the *Stage One Report* (EDA 2010a). In general, Conservation Halton has received requests for more adult learning opportunities and improved multi-cultural, First Nations and handicapped accessibility to the facilities and interpretive programs. At Crawford Lake Conservation Area public access to the longhouses is not possible when weekday school programs are occurring, and the existing visitor facility is not large enough to accommodate or service existing interpretive, public and staff needs.

At the open houses, concerns were expressed regarding community impacts that may result from development and increased visitation. Conservation Halton customarily locates activity areas away from adjacent neighbours and additionally provides buffers, such as hedgerows, to screen views and buffer sound. Moreover, Conservation Halton strives to work in harmony with its neighbours and considers their concerns at all times and will ensure that the Visitor Impact Management Program remediates any effects on neighbouring properties. During and following the master planning process invitations have been extended to neighbouring property owners, the general public and specific user groups to provide feedback to the proposed development options.

Concerns that the natural environment wasn't being given enough emphasis in these plans were raised; however, Conservation Halton's mandate includes providing appropriate levels of public access and recreational opportunities while being financially self-sustaining. Nevertheless, environmental protection has been of paramount importance throughout this master planning process. Many management policies are incorporated in this plan, most notably the Visitor Impact Management plan, and all development is confined to the Development Zone, with trails and other low-impact facilities being located in other zones.

Recent site inventory has revealed that public trails are located in Nature Reserve Zone The master plan calls for major upgrading of existing trails to minimize the potential for erosion and ponding. During this process, Conservation Halton will review the need to close or reroute trails away from sensitive areas. At present, one 512-metre trail is scheduled to be decommissioned, as it passes through sensitive habitat.

The input and suggestions from First Nations is particularly critical for the Crawford Lake Conservation Area. As such, special attention was paid to solicit their views. The Métis Nation of Ontario has shown interest in participating in developing programs, educational materials and special events.

1.8.2 Financial Constraints

Conservation Halton has been underfunded for more than a decade and has fallen behind in important infrastructure upkeep. Ongoing financial constraints are partially due to a lack of any supplemental regional / municipal or provincial tax levy support. Many other Conservation Authorities are supported by tax levies. Additional capital cost burdens include municipal development charge requirements when typically other public parks in Halton Region are exempt.

1.8.3 Liaison Constraints

Concerns were expressed from the Niagara Escarpment Commission and Ontario Ministry of Natural Resources with the proposed size of the interpretive and education centre (new visitors centre) – 2000 sq me (21,500sq ft). While development proposals for the NEC are considered on a case by case, the proposed interpretive and education centre exceeded the largest comparable facility within the Niagara Escarpment Parks which is Balls Falls visitors centre with a footprint of 1080 m³/12000sq ft. Therefore, Conservation Halton has reduced the proposed size of the building to 1300m² (14,000sq ft.) and will

work with the Niagara Escarpment Commission when developing the Interpretive and Education centre.

1.8.4 Environmental Protection

Conservation Halton has developed many resource management plans, such as their forest management plan. This master plan suggests that Conservation Halton continue to develop and implement detailed management plans in areas such as invasive species control and monitoring species at risk, such that the natural heritage features and system at Crawford Lake Conservation Area are protected and enhanced to the greatest extent possible, using the most up-to-date knowledge and practices. Conservation Halton should also develop a comprehensive Cultural Heritage resource management plan to better track, assess, and protect areas of cultural, historical and archaeological significance within Crawford Lake Conservation Area and its other properties. Section Three elaborates on the need for, and some requirements of, these plans.

1.8.5 Provincial Policy

The policies of the Niagara Escarpment Plan (2005) aim to balance protection, conservation and sustainable development. The objective of the Niagara Escarpment Plan(2005) of particular relevance to this Master Plan include: to protect unique ecological and historical areas, to maintain the Escarpment's open landscape character and to provide adequate opportunities for outdoor recreation as well as public access to the Escarpment.

Development at the Crawford Lake Conservation Area will be designed with the intention of:

- Preserve the natural scenery;
- Maintain the open landscape character;
- Maintain the cultural heritage landscapes;
- Maintain natural vegetation cover, slope, terrain and other natural features (e.g. escarpment brow and prominent slopes);
- Protect the view of the escarpment and the land in its vicinity;
- Protect the natural environment; and
- Minimize land use conflicts.

These zones, and management guidelines for each, are effective management of a park or open space. It can be used to assign land uses based on an area's significant for protection and potential for recreation within the context of a park's classification (NEP, 2005). As per Part 3.1.5 of the NEP, park zoning is required as part of Master Plan development for all parks within NEPOSS. The NEPOSS manual (MNR,2012) describes this park zoning system in more detail.

Other park management policies, such as trail development, Visitor Impact Management and cultural heritage protection, are also found in Section Three. These policies have been developed in accordance with governing policy documents such as the *Ontario Heritage Act*, the Niagara Escarpment Plan (2005) and the *Conservation Authorities Act*.

Section Two: Background Plan Considerations

2.1 Environmental Benefits of this Conservation Area

Crawford Lake Conservation Area supports a core area of the natural environment and is part of areas designated as Areas of Natural and Scientific Interest (ANSI) and Environmentally Sensitive Areas (ESA). Crawford Lake Conservation Area is within an area designated as a UNESCO World Biosphere Reserve; it also has areas that are designated as Provincially Significant Wetlands (PSWs) and Regional Natural Heritage System. The conservation area includes many natural features some of which include ancient Eastern White Cedar trees, forest interior, corridor linkage, provincially significant geologic formations, national and provincial species at risk, as well as nationally and provincially rare vegetation communities. The natural heritage features associated with the conservation area were provided in three main maps in the *Inventory and Analysis: Stage One Report* including Figure 3-5 Core Conservation Lands, Figure 3-7 Areas of Functional Ecological Importance and Figure 3-10 Significant Natural and Cultural Features (EDA 2010a). These maps combined, delineate the natural heritage system discussed in Section 3.2 of the *Stage One Report* (Ibid.). Figure 3-5 is being reproduced in this report as Figure 2-1.

2.2 Social Benefits of Natural Areas

2.2.1 Benefits of Healthy Lifestyles and Outdoor Recreation

Conservation Halton's contribution to the health and wellbeing of residents of Halton Region cannot be overemphasized. Investment in parks and recreation brings societal and economic benefits to a community; it ensures the health of citizens both by helping to create a cleaner environment and by providing outlets for physical activity and psychological restoration, thereby also reducing health care costs. The province and Halton Region are both investing considerable resources in public health initiatives such as Active 2010, Active Halton and Walk this Way.

Recently, the Province of Ontario proposed a Children's Activity Tax Credit to encourage parents to involve their children in pursuits that help them grow as knowledgeable, involved, healthy and productive individuals. Considerable attention has also been given to youth diversion programs that help kids at risk to find healthy and fulfilling alternatives to the lure of gangs, drugs and crime. More money spent on programming for at-risk youth reduces spending on incarceration.

In addition to the benefits of outdoor recreation activities, Conservation Halton's conservation area programming helps to instill knowledge of, and respect for, environmental protection and sustainability, which helps to ensure a healthy and productive open space for future generations.

2.2.2 Public Use and Appreciation of Parks and Open Space

Parks and public open space contribute to a vibrant and healthy community. According to a 2009 Parks and Recreation Ontario (PRO) report based on an extensive survey of people from across Ontario, citizens consider parks and public open space to be highly valuable not only to themselves but to the community as a whole.

The report concludes that:

> *Parks provide many values for users and to the community as a whole. Parks provide a sense of place in the community, allowing for escape, contemplation, discovery, access to nature, interpretive education and recreation. They also provide shelter, wildlife habitat, relief from urban form, reduce] the "heat island effect" and improve] air quality, and serve as buffers between residential and industrial areas. Parks enhance aesthetic quality, increase property values and improve the image and livability of communities. Recreation, through physical, social and artistic expression, provides opportunities for individuals to improve their health and wellness, socialize and interact with others, learn new skills, have fun and find balance in their lives. In particular, physical activity and stress reduction are two health issues that researchers identify as benefits of local parks and recreation to public health.*

Key findings of this report include:

- Recreation is important in achieving "work-life balance."
- Ontarians seek recreation opportunities in their communities and rely on municipal and non-profit recreation and parks services.
- Recreation needs to be accessible to everyone.
- All Ontarians benefit from parks and recreation: The use of parks and recreation services is spread almost equally across the age continuum.
- Most people are willing to pay for public recreation and parks.
- Ontarians understand the wider benefits of parks and recreation.
- Public space is vital to community health.
- Participating in recreation is a key determinant of health status and quality of life.
- Local parks and recreation services have a vital impact on community and social development.

Conservation Halton's move to create a regional system of high-quality, publicly-accessible natural areas to satisfy these public needs and desires. As a public agency, Conservation Halton has struggled to keep entrance fees low in order to be financially accessible to all people. The importance of this public service will only increase in the coming years.

2.2.3 Benefits of Contact with Nature

The concept of biophilia was first introduced by Harvard biologist Edward O Wilson in 1984. The word biophilia literally means "love of life." Wilson chose it to label what he defined as humans' innate and evolutionarily based affinity for nature. In the last few years, studies have begun to show it has significant and measurable effects on people's state of mind.

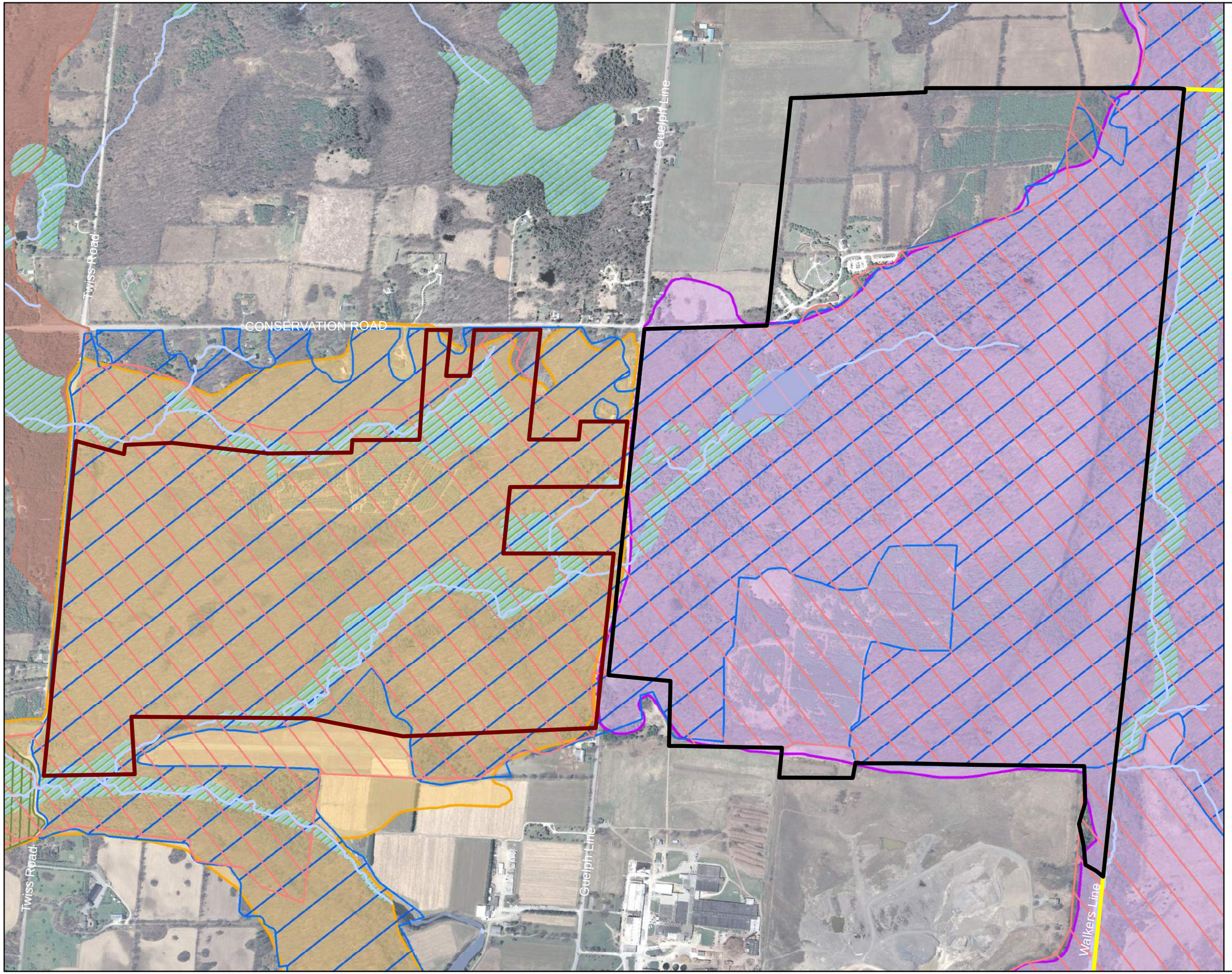
Many such studies have been conducted to explore the benefits accrued from exposure to natural elements. Overwhelming evidence has been accumulated, which has been summarized in a literature review written by environmental sociologist Dr. Cicely Maller and her associates at the School of Health and Social Development, Deakin University, Melbourne (1998). Summarized below are the benefits related to parks.

It has widely been found that views of, and contact with, nature have significant health benefits. It has been proven to:

Figure 2-1: Core Conservation Areas

CONSERVATION HALTON

Crawford Master Plan
Core Conservation Lands
Figure 2-1



Legend

- Regulated Watercourse
- Waterbody
- Crawford Lake Conservation Area
- Crawford Tract II Resource Management Area
- Rattlesnake Point Conservation Area
- Provincially Significant Wetlands (PSW)
- Calcium Pits Environmentally Sensitive Area (ESA)
- Crawford Lake-Rattlesnake Point Escarpment Woods Environmentally Sensitive Area (ESA)
- Guelph Junction Woods Environmentally Sensitive Area (ESA)
- Crawford Lake-Milton Outlier Valley Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI)
- Lowville Re-Entrant Valley Provincially Significant Life Science Area of Natural and Scientific Interest (ANSI)
- Kilbride Swamp Regionally Significant Earth Science Area of Natural and Scientific Interest (ANSI)

DRAFT

N W E S

1:10,000

0 200 400 600

Created By: SFG
Checked By: ME
Date Created: 02/10/10
Date Modified: 03/26/10
File Path: I:\GIS\103003 - Conservation Halton\Dillon\Crawford Lake\Mapping\Priority Conservation Lands.mxd

- Positively influence immunity and cardiovascular function;
- Reduce stress;
- Promote healing;
- Improve cognitive function and self-esteem;
- Alleviate anxiety and depression.

In addition, it has been found that involvement in nature-based activities in one's own community can foster a sense of belonging or a sense of place and enhance social ties and relationships, thereby boosting satisfaction with one's neighbourhood. Parks and nature are an affordable, non-elitist, highly accessible means of improving community health that may help people reach their full potential; however, parks are a public resource yet to be fully utilized for individual and community health and wellbeing.

Conservation Halton's conservation areas will undoubtedly confer many benefits to Halton Region and its citizens.

2.2.4 Local Values

As mentioned is Section One, Halton Region recently drafted *Amendment 38* for their *Regional Official Plan*, which introduced the notion of a Regional Natural Heritage System (117(6)). One of the uses permitted in that system is "non-intensive recreation uses such as nature viewing and pedestrian trail activities." Moreover, the Region supports the provision of a diverse range of accessible cultural and recreational facilities and services as set out in the *Regional Official Plan* Section 161; and as part of their economic development policy, they express the intention to:

> *Promote Halton as a tourist and recreational destination for both its own residents and outside visitors based on the following themes:*
>
> *a) scenic beauty,*
>
> *b) extensive trails,*
>
> *c) a strong and diversified agricultural industry,*
>
> *d) waterfront,*
>
> *e) major outdoor and indoor recreational facilities,*
>
> *f) Halton's Heritage Features, museums and other cultural attractions, and*
>
> *g) indigenous goods and products.*
>
> *Regional Official Plan (170 (16))*

As part of the development of these recreation and tourism opportunities, Halton Region provided funding for this master planning process. Conservation Halton's *Limestone Legacy* plan expressed the desire to create a superior system of regional parks, which would further Halton Region's cultural and recreational, economic development and stewardship goals. Local municipalities as well as Halton Region appreciate the natural beauty and recreation opportunities these lands afford them, as these natural areas enrich community life and guarantee unique experiences in a time of urban intensification.

2.3 Financial Benefits of Conservation Halton

2.3.1 Ways in Which Conservation Areas Create Value

The *Stage One Report* for Crawford Lake Conservation Area contained an overview of the economic benefits that Conservation Halton's activities confer on its local community and Halton Region (EDA 2010a). Several ways Conservation Halton benefits the regional economy materially are:

- **Purchases of goods and services from the local area:** Conservation Halton is a large purchaser of goods and services from the region (including labour in the form of its employees). See Section 2.3.2 for an estimate of the order of magnitude of these benefits.
- **Visitor attraction:** Conservation Halton conservation areas and facilities attract a large number of visitors from outside the community (as well as from outside the Greater Toronto Area) who spend money in the region, which in turn helps support local businesses.
- **Investment attraction:** Conservation Halton facilities and services increase the overall quality of life in Halton Region, and, thus, its attractiveness as a location for people to live and work, and as an area within which businesses can invest.
- **Contribution to a healthy community:** Somewhat more difficult to quantify, this aspect nonetheless has a very real value. By contributing greenspace to the community, and providing opportunities for individuals and families to have recreational and outdoor experiences, Conservation Halton helps the region overall to offer healthy-living choices and opportunities for residents and visitors alike.
- **Value of ecosystem services:** The wetlands and forest areas preserved by Conservation Halton add tangible value to the community because they in effect provide filtration and cleansing services for air and water. If commercial prices were paid for these cleansing services, the costs would run into the millions of dollars. Estimating the value of these services that otherwise might have to be provided commercially, provides another measure of value of Conservation Halton's services. See section 2.3.3 for an estimate of the order of magnitude of these benefits.
- **Watershed protection:** The floodplain management activities of Conservation Halton protect communities within the watershed from ongoing damage such as erosion and spring flooding, as well as potential destruction in the event of storms and severe weather events.
- **Increased land value:** The values of residential and estate properties located adjacent to or near conservation area properties can increase by virtue of this proximity.
- **Educational value:** Finally, the provision of educational programs and services to the local and regional community can have an economic impact. An educated populace will understand and respect the purpose, values and activities of conservation organizations, and may be more likely to support their activities in future through tax support, donations and attendance at various events and programs.

Thus, a considerable range in the nature and type of economic benefits generated in the Region and area result from the existence of Conservation Halton. Further details relating to this conservation area can be found in the *Stage One Report* for Crawford Lake Conservation Area (EDA 2010a).

2.3.2 Economic Impact of Conservation Halton Operations Overall

As mentioned, the *Stage One Report* for Crawford Lake Conservation Area contained an overview of the economic benefits of Conservation Halton's activities (Ibid.). Using the provincial economic impact model (TREIM), the expenditures both of Conservation Halton and of visitors from outside the region were modeled to determine the extent of these benefits. The *Stage One Report* contains all of the details in this regard. The chart below presents the summary of the impact of Conservation Halton's expenditures (based on Conservation Halton's 2010 budget). These estimates are of the economic impact of the entire authority's operations. At the level of analysis presented here, it is impossible to distill the results for any specific conservation area, because so many of the operations of Conservation Halton cannot be singled out and allocated to one conservation area as opposed to another.

Table 2-1: Total Impact of Conservation Halton Expenditures

Impact Variable	Impact in Halton Region	Impact in the Rest of Ontario	Total Ontario
GDP($)	$11,977,770	$10,666,436	$22,644,206
Employment (jobs – FTJE*)	274	195	469
Labour Income($)	$8,443,598	$7,581,634	$16,025,232
Federal Taxes ($)	$3,309,502	$2,637,956	$5,947,458
Provincial Taxes ($)	$2,350,365	$1,891,929	$4,242,294
Municipal Taxes ($)	$38,008	$105,356	$143,364
All Taxes ($)	$5,697,875	$4,635,241	$10,333,116

** full-time job equivalents*

The operations of Conservation Halton represent a positive return-on-investment for the community. The $20.670 million dollar budget of Conservation Halton generates $22.644 million in associated economic impact, measured in terms of additional GDP in the province overall. In other words, every dollar of operating budget spent by Conservation Halton is associated with $1.10 of GDP in the province. The operations of Conservation Halton are associated with 469 jobs province-wide, which are associated with labour income of approximately $16 million. Finally, the operations of Conservation Halton are associated with over $10 million of tax revenue accruing to the three levels of government.

In addition, the tables above show much of this economic impact occurs in and to Halton Region: nearly $12 million annually in terms of GDP. An even greater benefit to Halton Region is not accrued, perhaps, because the region is part of the highly interdependent Greater Toronto Area (GTA) economy, so necessarily there is some degree of leakage to areas outside the region itself. For example, 48% of the employees of Conservation Halton live in the region, implying that a majority – 52% - live outside the region.

In summary, the activities of Conservation Halton confer significant economic benefits to both the Halton Region and the province.

2.3.3 Value of Ecosystem Services

A recent report by the David Suzuki Foundation (2008) presented a procedure to measure the value of 'ecosystem services' provided by large tracts of open space, forest and wetland within Ontario's

Greenbelt. (As mentioned above, this is a measurement of value based upon what it would otherwise cost to provide filtering and cleansing services to the land base served by the conservation area.)

The value of ecosystem services provided by Conservation Halton's holdings is just under $16 million per year, given Conservation Halton owns approximately 11,000 acres and the value of ecosystem services is $1,444 per acre on average (Ibid.).

An estimate of the total value of ecosystem services provide by Crawford Lake Conservation Area and the Crawford Tract II Resource Management Area can be obtained by applying detailed information for the Suzuki report to specific types of land cover. The calculations are shown in Table 2-2.

Table 2-2: Crawford Lake Conservation Area – Value of Ecosystem Services

Land Cover Type	Value Per Hectare	No. of Hectares in Crawford Lake Conservation Area	Value of Corresponding Ecosystem Services
Wetland	$14,153	30	$424,590
Forest	$5,414	323	$1,813,690
Total Estimated Value of Ecosystem Services for Crawford Lake Conservation Area			$2,238,280

Value per hectare sourced from Suzuki Foundation 2008

To put this information into context assume that the value of ecosystem services is equivalent to an income stream. If the value referenced above (i.e. $2,238,280) represented the income from an investment, generating a 5% return on capital, the investment would have a capital value of approximately $44.88 million. In other words, an investment of $44.88 million, at a 5% annual return, will generate income of $2,238,280. This is one way of understanding the value of investment in the conservation area, which might be warranted.

Section Three: Master Plan Goals, Objectives and Management Policies

3.1 Conservation Area Policies

3.1.1 Park Classification

Crawford Lake Conservation Area is a "Natural Environment" park under the classification system developed by the NEC. They are identified as follows:

> *These lands are characterized by the variety and combination of outstanding natural features, historical resources and outstanding landscape.*
>
> *(NEP 2005).*

Rationale: The conservation area includes the presence of many natural features: forest interior, corridor linkage, significant geological formations, national and provincial species at risk, as well as globally and provincially rare vegetation communities. It also has very significant cultural heritage features.

Crawford Lake Conservation Area has also been identified as a Nodal Park under NEPOSS. Nodal Parks represent the various segments of the escarpment and are intended to provide visitor reception and information dissemination concerning parks and open space activities, points of interest and attractions in the surrounding escarpment areas and communities. (*NEP* Policy 3.1.2).

Niagara Escarpment Commission objectives for this park: to protect and enhance important natural and cultural features; to provide access to the Niagara Escarpment; to provide high quality service and amenities; and to provide appropriate levels of recreational and educational programming.

3.1.2 Vision Statement

Conservation Halton's Crawford Lake Conservation Area aspires to be a premier Niagara Escarpment Nodal Park that functions as a significant, regional educational and tourist destination, presents interpretation of natural and cultural heritage, offers recreational opportunities, and protects and enhances the unique escarpment environment.

3.1.3 Goals

Under this master plan, Crawford Lake Conservation Area shall provide an appropriate range of passive recreational facilities and resource management programs to best meet regional needs in a sustainable, environmentally appropriate and fiscally responsible manner.

Therefore, the goals of this master plan are:

- To protect and enhance the significant natural heritage features and ecological functions of the conservation area
- To provide recreational opportunities and opportunities for the public to enjoy this spectacular area, appreciate its scenic beauty and cultural resource.
- To implement program and development opportunities that capitalizes on the unique features of the area.
- To continue to build involvement of First Nations and Métis Nations in the ongoing planning and development and management of Crawford Lake Conservation Area.

For Crawford Lake Conservation Area, the unique features to be built upon include the Iroquoian village, the meromictic lake and the escarpment natural area. In addition, an overall upgraded level of service and amenities is proposed by this master plan. This enhanced base level will enable this conservation area to meet visitors' expectations for a first-rate regional park in terms of arrival and accessibility, services, facilities and amenities, and quality of programming and environmental services.

Under this master plan, the Crawford Lake Conservation Area shall provide an appropriate range of passive recreational facilities and resource management programs to best meet regional needs in a sustainable, environmentally appropriate and fiscally responsible manner. It will also be a regional destination for people wishing to learn about the history of the area and it will continue to serve an important role in the regional education system.

3.1.4 Objectives

1) To protect and enhance all significant environmental features.
2) To comply with the established park zoning and management policies, in accordance with the Niagara Escarpment Plan(2005) and the *Niagara Escarpment Parks and Open Space System Planning Manual* (MNR, 2012), which will then guide all future development and management operations.
3) To continue the development and implementation of a Visitor Impact Management program for recreational use so that visitors do not exceed the carrying capacity of the natural resource base.
4) To provide year-round group and individual recreational opportunities and facilities within the constraints of the site's natural features and carrying capacity in accordance with Region's 'Healthy Living / Healthy Communities" model and Conservation Halton corporate goals.
5) To minimize any adverse affects of the area's use or development on surrounding properties through appropriate management techniques.
6) To operate the park in a financially sustainable and self-sufficient manner with surplus revenues directed to other Conservation Halton programs.
7) To offer excellent interpretive and curriculum-based educational programming, with the active involvement of First Nations groups, Métis, the early settlers and the natural heritage features of the area.

3.2 Enhanced Base Level of Services

The proposed base level of conservation area facilities and services is meant to help Conservation Halton develop a standard of excellence within their conservation area system. This enhanced base level of service includes a range of measures that was developed in consultation with Conservation Halton staff, stakeholders and the public.

The proposed base level of service would be instituted at all Conservation Halton conservation areas and would include:

- Clear corporate branding
    - Consistent visual standards for all signage, facilities and buildings that establish each conservation area as part of the Conservation Halton portfolio.
- Arrival and accessibility

- Consistent directional and identification signage including directional and orientation;
- A fee collection system including a gated structure;
- Organized, sustainably-designed parking and visitor amenities in the arrival area;
- A public day use area;
- A minimum level of universal accessibility with specifically identified areas that meet Facility Accessibility Design Standards (FADS) and *Accessibility for Ontarians with Disabilities Act* (AODA) built environment standards;
- Controlled access to the natural heritage system.

- Services
  - Staff presence (augmented with volunteers) to collect fees, offer information, directions and some level of interpretation;
  - Visitor safety and security measures that include a modified entry control system.
- Facilities / amenities
  - Facilities that reinforce Conservation Halton's corporate identity program;
  - Clean, sanitary and accessible washrooms;
  - Consistently-designed interpretive signage;
  - A trail system that meets Conservation Halton standards and is constructed to protect the natural heritage system and provides amenities that may include benches, signage, mapping, identifier markers and trail etiquette rules;
  - Day-use facilities that may include benches, rest areas, picnic areas with potable water (if possible) and shelter;
  - Basic products for purchase (e.g. water, snacks, etc.).
- Quality assurance
  - A consistent and sustainable approach that demonstrates Conservation Halton's values and corporate mission;
  - High-quality management of the natural heritage system, species at risk and other features;
  - A Visitor Impact Management (VIM) program that includes positive reinforcement and education, monitoring of impacts and staff education and training;
  - High-quality sustainability standards in the design and construction of all buildings, features, facilities, site and landscape development such as Leadership through Energy and Environmental Design (LEED) and the American Society of Landscape Architects (ASLA) Sustainable Sites Initiative (SITES) – these are described in more detail in Section 2.3 of the *Stage Two Report* (EDA 2010b);
  - A consistently high level of maintenance and operations.
- Consistent interpretive themes
  - Conservation authority and watershed;
  - Niagara Escarpment;
  - Sustainable park use / Visitor Impact Management;
  - Cultural heritage.

3.3 Priority Protection Areas

The boundaries of the priority protection areas have been determined through a comprehensive process of inventory and analysis based on the practices of integrated landscape planning and natural heritage system strategies. See Stage 1 for a breakdown of the inventory and analysis. The Priority Protection Areas were developed by means of prioritizing and ranking all the features identified as natural heritage features together with the core conservation areas of ESAs and ANSIs'. The priority areas were than used as the basis for defining the boundaries of the park zoning system. Under the *Niagara Escarpment Plan* (2005) zoning is stipulated as essential to the orderly planning, development and effective management of protected natural areas.

See Table 3-1 in Appendix I for a summary of the criteria evaluated and the rationale for the priority protection number provided for each criterion. In many cases, multiple criteria overlap and the most restrictive criteria of those determined the priority level for the any particular area. The breakdown of the priority zones primary features are highlighted below.

3.3.1 Priority Level 1

Priority Level 1's purpose is to provide for the long-term protection of all natural features deemed to be particularly sensitive to passive recreation or related infrastructure. Elements that fall under this category are: Provincially Significant Wetlands; Sensitive deep forest interior (≥200 m); coldwater and potential coolwater thermal stream classifications (30 m buffer ;) rare vegetation communities (G1 – G3 & S1 – S3); species at risk; globally and provincially rare species; seeps; vernal pools; bat hibernacula; municipal well head protection area (100 m radius), ancient eastern white cedars; forest monitoring plot, forest bird monitoring stations better(0-30 m); and escarpment face slope (45-80%).

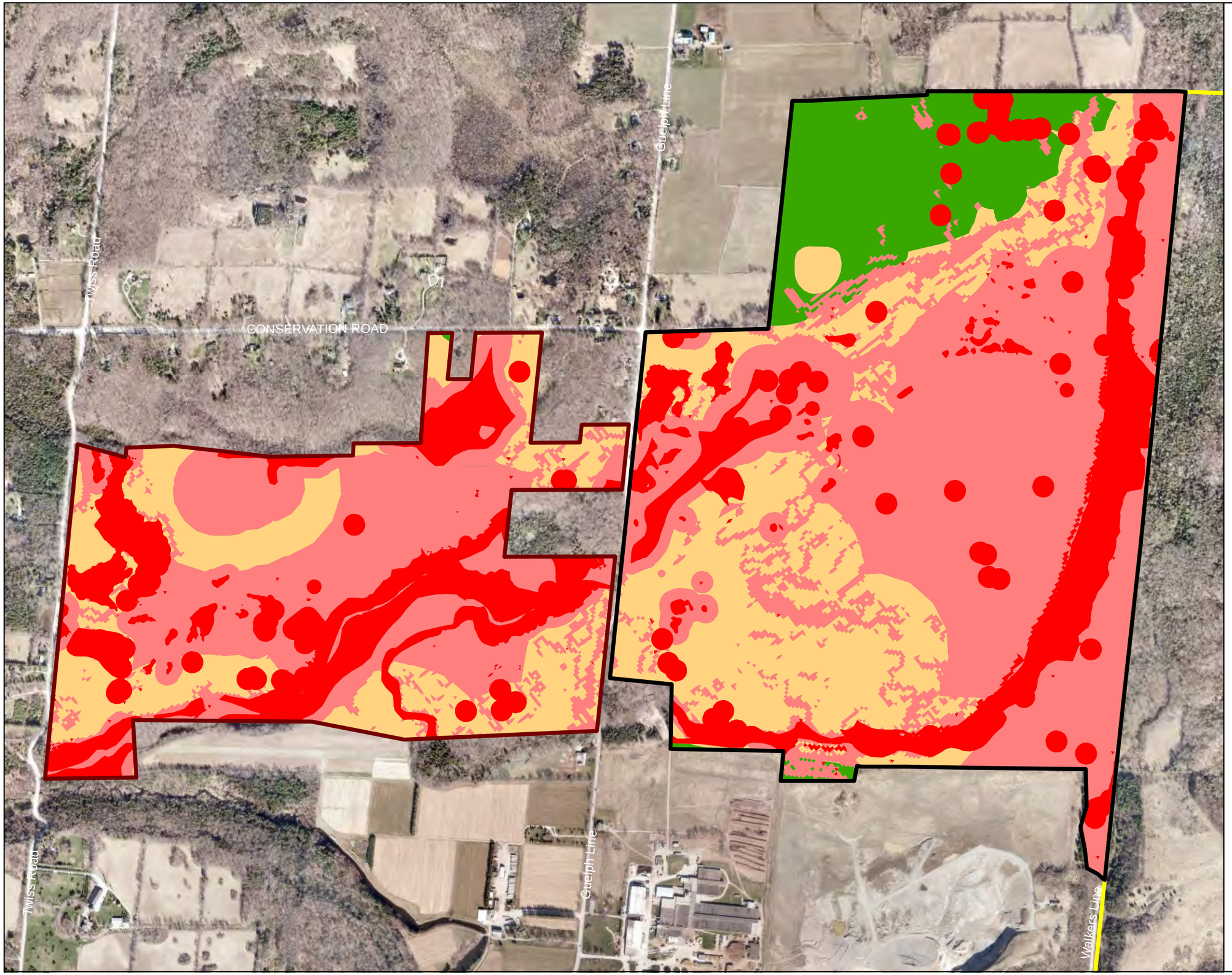
3.3.2 Priority Level 2

Priority 2's purpose is to protect natural areas with high-quality attributes that contribute essential habitat or add essential components to the natural heritage system. Elements which fall under this category are; Provincially Significant Wetlands (<30 m buffer), potential coolwater and warmwater thermal stream classification (30 m buffer), Halton region species at risk habitat; Non-Provincially Significant Wetlands (>2 hectares + 30 m buffer); Non-Provincially Significant Wetlands (<2 hectares + 15 m buffer); municipal well head protection area (100 m to 2 year time of travel); floodplain hazard; vernal pool (30 m critical function zone); stable top of bank hazard component (15 m buffer), meander belt hazard component; EMAN plot, forest bird and fish monitoring station buffer (31-100 m); and talus and other slopes (8-25% & 25-45%).

3.3.3 Priority Level 3

Priority Level 3 has a similar purpose to the above priority level but with a focus on protecting features that are typically more resilient to public access. Elements which fall under this category are; seeps (30 m buffer), floodplain (15 m buffer) veteran trees, environmentally sensitive areas(ESA); Area of Natural and Scientific Interest (Life Science); escarpment natural area; meander belt hazard component (15 m buffer) stable top of bank hazard component (15 m buffer); interior forest (≥100 - 200 m); municipal well head protection area (2 year to 5 year time of travel); watercourses' (15 m buffer;) and cultural heritage features.

3.-1 Priority Protection Areas Map



CONSERVATION HALTON

Crawford Master Plan
Priority Protection Areas
Figure 4-1

Legend

- Crawford Lake Conservation Area
- Crawford Tract II Resource Management Area
- Rattlesnake Point Conservation Area

Priority Levels

- 1
- 2
- 3
- 4
- 5

Note: Jefferson Salamander habitat, as per the Habitat Regulations, has not yet been mapped for this conservation area and therefore is not shown on the map.
Further additional species at risk may also be present.

DRAFT

1:10,000

0 200 400 600

Created By: SFG
Checked By: ME
Date Created: 02/10/10
Date Modified: 03/26/10
File Path: I:\GIS\103003 - Conservation Halton\Dillon\Crawford Lake\Mapping\Priority Protection Areas.mxd

3.3. 4 Priority Level 4

Priority Level 4's purpose is to recognize and protect areas that already provide a level of protection to some of the more sensitive natural features and their functions in the conservation area. Elements of the natural environment that fall under this category are; Areas of Natural and Scientific Interest (Earth Science); provincially significant wetland buffers (31-120 m); escarpment protection area; fringe forest (<100 m); plantations, regenerating habitat, and hedgerows; warmwater forage fish thermal stream classification and a 15 m buffer; municipal well head protection area (25 year time of travel); Non-Provincially Significant Wetlands (>2 hectares + 31-120 m buffer); Non-Provincially Significant Wetlands (<2 hectares +16-30 m buffer); and Lookouts.

3.3. 5 Priority Level 5

Priority Level 5 is to provide protection for all remaining natural features that supports the ecological function for a greater variety of species and connections between the larger landscape matrix. Elements within this level are: escarpment rural area; agricultural fields and cultural meadows; existing facilities; and utility easements.

3.4 Park Operations Policies

Conservation area activities are subject to the *Conservation Authorities Act* (R.R.O. 1990, Regulation 116) and Ontario Regulation 365/88. In addition to these, the following general policies shall be adopted:

Trail use and any other recreational or educational activity permitted in the conservation area will be allowed to take place as long as:

- The capacity of proposed facilities is not exceeded;
- No significant environmental degradation of the natural resource base occurs; and
- The Visitor Impact Management (VIM) program is implemented to monitor impacts and provide management with a means to curtail recreational overuse and provide corrective measures.

Event activity areas will generally be restricted to the Development Zone of the conservation area with the exception of specialized activities that may require utilization of the trail system. Permitted events will only include those that are deemed compatible with the general nature and capacity of the conservation area without negatively affecting conservation area resources or users. Permits or bookings shall be negotiated and approved by customer service staff under the supervision of the conservation area manager.

Bookings for educational programs will be organized, delivered and invoiced by customer service staff. The staging or hosting of special, historic or tourism events shall typically be organized and operated by Conservation Halton staff as an integral component of natural and cultural education services.

Additional special events will also be permitted by private groups or individuals at various locations subject to negotiation and issuance of a special-use permit by Conservation Halton. Additional special events permits shall be negotiated on a case-by-case basis

3.4.1 Accessibility Policy

As a public agency, Conservation Halton has an obligation to make its resources and services available to all members of the public. Therefore, Conservation Halton shall to the greatest extent possible, remove financial barriers to enjoyment of its conservation areas.

In addition, Conservation Halton will ensure that its infrastructure is consistent with *Accessibility for Ontarians with Disabilities Act* (AODA) built environment standards where possible.

3.4.2 Facility Sustainability Policy

As an agency entrusted with vast tracts of ecologically important lands, Conservation Halton shall provide, to the greatest extent possible, facilities and services that protect and enhance the natural heritage system. This entails building facilities to the highest standard and siting them in non-sensitive areas. Moreover, all development should conform, to the greatest extent possible, to guidelines offered in the Leadership in Energy and Environmental Design (LEED) Green Building Rating System and the Sustainable Sites Initiative (SITES) Guidelines and Performance Benchmarks (2009). Such guidelines include best practices for managing onsite rainwater, the use of native vegetation in landscaping, high energy and water efficiency in building design, the use of alternative, 'green' sources of energy and reuse or recycling of existing materials. All development shall be kept to a minimum, conform to good site-planning standards and shall not conflict with the general landscape character. For trail sustainability guidelines see *'Trail Development, Use and Management'* in Section 3.4.4.

3.4.3 Niagara Escarpment Parks and Open Space System Management Zones

The *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area* employs the zoning system of the Niagara Escarpment Parks and Open Space System (NEPOSS)[1]. This system consists of the following six standard park zones: Nature Reserve Zone, Natural Zone, Access Zone, Historical Zone, Development Zone and Resources Management Zone. The Special Protection Area has been used to better recognize and protect high quality or fragile resource areas within the Nature Reserve Zone.

Figure 3-2 illustrates the park management zones assigned to different portions of the conservation area. This section of the report sets out the management policies and permitted uses for each of these zones.

Park zones are intended to fulfill the following functions:

- Identify and provide recognition of the natural and cultural features and attributes of the conservation area;
- Delineate areas on the basis of their differing requirements for management; and ensure park users get the most out of the conservation area, within environmental protection constraints.
- Ensure park users get the most out of the conservation area, within environmental protection constraints.
- This conservation area has no land designated as an Access Zone.

The boundaries of the zones have been determined through a comprehensive process of inventory and analysis based on the practices of integrated landscape planning and natural heritage strategies. The Priority Protection Areas Map was developed by means of prioritizing and ranking all the features identified as natural heritage features together with the core conservation areas of ESAs and ANSIs'. The Priority Protection Map was used as a base for defining the boundaries of the park zoning system. (Figure 3-1). Under the Niagara Escarpment Plan, zoning is stipulated as essential to the orderly planning, development and effective management of the conservation area.

3.4.3.1. Nature Reserve Zone

Purpose:
The Nature Reserve Zones include significant natural features or areas that require careful management to ensure the long-term protection of their natural values (NEP, Section 3.1.5, 2005). The aim is to protect natural features that are sensitive to passive recreation or related infrastructure. The Nature Reserve Zone shall preserve and protect lands that serve important ecological functions with emphasis on their long-term protection and management. Some examples of features in this zone are; Escarpment features (brow, slope, toe, face,) ANSIs', interior forest and endangered or threatened habitats. This zone is comprised of approximately 155 hectares or 70% of the total area at Crawford Lake[2]. In Crawford Tract II Resource Management Zone 103 hectares are assigned to this Zone.[2]

Permitted Uses:
Generally this zone should preclude activities except those deemed appropriate for environmental stewardship purposes. Limited visitor usage may be considered where it has been established that there will be minimal negative impacts for the proposed uses. Activities will be restricted to passive and low intensity recreation including hiking, environmental scientific research, wildlife and forest management practices that contribute to the sustainability and/or enhancement of the natural system. Current uses within this area (i.e. hiking, snowshoeing) will be maintained so long as environmental impacts on the natural features are minimal to none. Development is generally restricted to trails, signage, temporary research facilities and conservation practices. Public access to these areas should be managed carefully through the Visitors Impact Management Program.

Special Protection Area:

The purpose of the Special Protection Area (as proposed by Conservation Halton Staff) is to provide a higher level of protection to unique or endangered natural features than normally provided within the policies of the Nature Reserve Zone. The Special Protection boundaries are located within the Nature Reserve Zone, and further identify core areas that warrant special management strategies. Areas assigned to this are mainly areas of steep slope, wetlands, sensitive vegetation communities, interior forest and areas where rare species and/or globally rare vegetation types are known to occur. This area encompasses approximately 129 hectares or 50% of the Nature Reserve Zone at Crawford Lake and Tract II.[2]

Permitted uses will be restricted to environmentally appropriate scientific research, interpretation and limited forest management services such as hazard tree removal and invasive species management. General public access will be restricted; however, current environmentally appropriate uses (i.e. hiking) within this area will be maintained if they are shown to cause no further encroachment or negative effects on the natural heritage feature. Certain activities and infrastructure may be decommissioned and/or rerouted on a case-by-case basis.

3.4.3.2 Natural Zone

Purpose:
To protect natural areas and high-quality attributes that contributes to essential habitat and essential components to the natural heritage system. This zone is to serve as a buffer between the Nature Reserve Zone and the Development Zones. The areas assigned to this designation at Crawford Lake are located adjacent to the Development Zone and is mainly meadow or brush. This zone is comprised of approximately 7 hectares or 3% of the total area at Crawford Lake.[2] For Crawford Tract II Resource Management Area the Natural Zone comprises 0.5 hectares of the area or 0.44%.[2]

Permitted Uses:
Natural zones include aesthetic landscapes in which a minimum of development is permitted to support low- to moderate-intensity recreational activities (NEP, 2005). Recreational uses should be restricted to defined areas and the public should be educated about the impacts of off-trail use. Some activities which will be permitted in this zone are; hiking, nature viewing, interpretive facilities, and day uses activities. Development should be restricted to the minimum necessary to support low to moderate recreational activities. The types of development permitted in this zone are trails, interpretive facilities, signage and restoration works.

3.4.3.3 Historical Zone

Purpose:
Historical Zones include significant archaeological or historical features or areas which require management that will ensure the long-term protection of the significant values (NEP, Section 3.1.5.) The area at Crawford Lake which is identified as the historical zone is the site of the Frist Nation village and three areas where structures were built by the early European settlers. 18 hectares or 8.5% of the area at Crawford Lake is designated as Historical zone, no area at Tract II are assigned to this zone.

Permitted Uses:
Low to moderate activities are permitted within the historical zone at Crawford Lake. Current activities such as trails, viewing platforms, and interpretive facilities will be permitted as long as there is no sign of degradation to the historical features. Development shall generally be restricted to trails, fencing, and interpretive, educational, research facilities. Maintaining the condition of historical feature and restoring or reconstruction heritage features will also be permitted within this area. Archeological works may be permitted under approval of the Ministry of Cultural, Sport and Tourism and consideration should be given to investigate the historic significance of the existing settlement –era ruins.

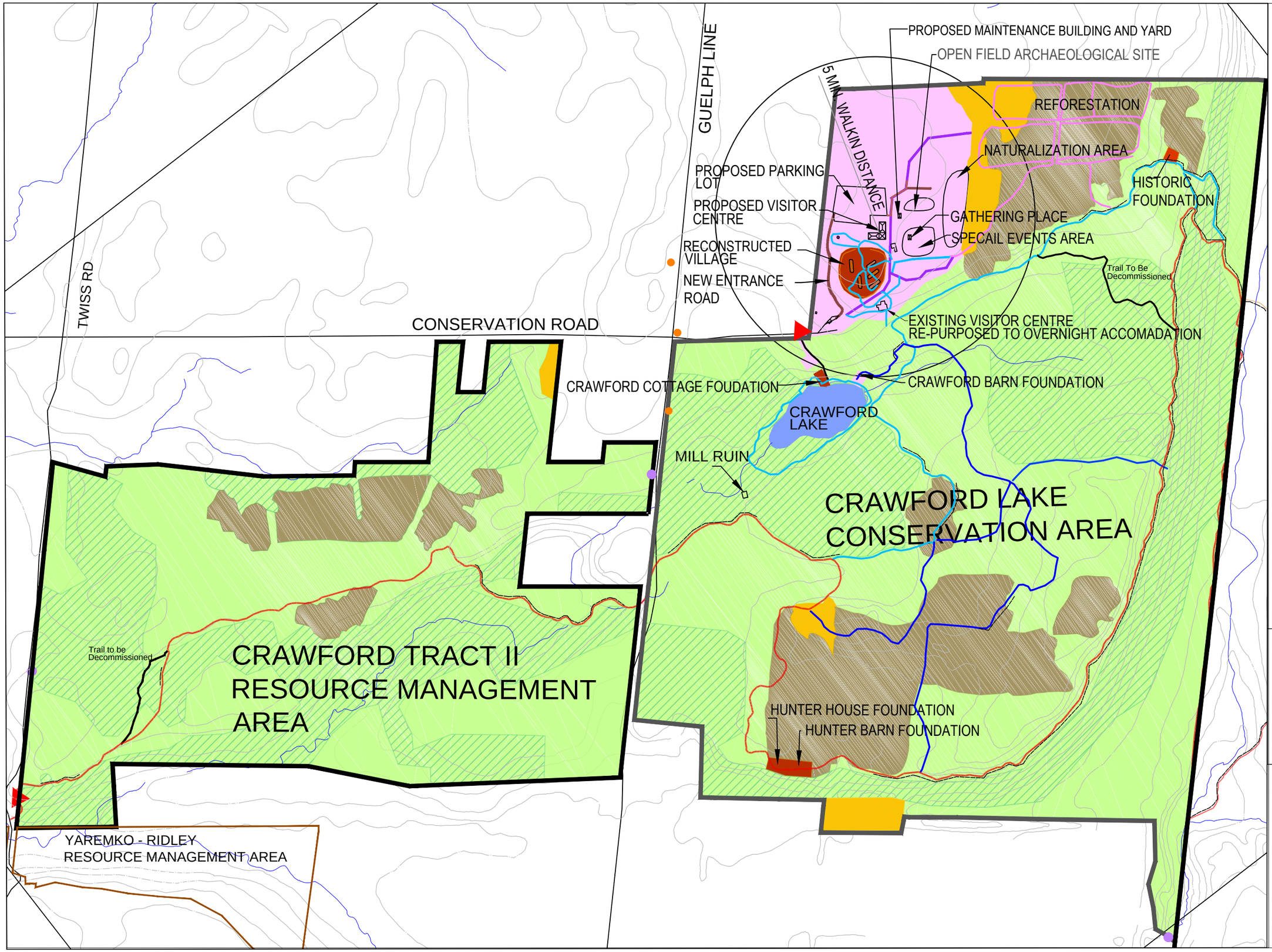
3.4.3.4 Resource Management Zone

Purpose:
Resource Management zones are defined as;

- Resource Management Zones certain public lands that are managed primarily to provide resource related benefits, such as; harvesting forests products, demonstration plots, and wildlife habitat.
- To re-establish previously disturbed sites, such as old agricultural fields to natural vegetation.
- Land which has traditionally been managed under long-term forms of tenure or agreements. (E.g. Forest Management Agreements or agricultural leases.)

At Crawford Lake the Resource Management Zones are previously disturbed sites undergoing natural regeneration (old agricultural fields) or sites having long term resource agreements, (managed forest

Figure 3-2: Master Plan with Park Zones



CONSERVATION HALTON

Crawford Lake Conservation Area
Figure 3-2
Master Plan with Park Zones

Legend

- Conservation Area Boundary
- Other Conservation Area
- Road
- Contour 5m intervals
- Watercourse

Conservation Halton Trail

- Single Track
- Medium Service
- High Capacity

Bruce Trail Conservancy

- Main Bruce Trail
- Side Bruce Trail
- Nature Reserve Zone
- Special Protection
- Natural Zone
- Historical Zone
- Resource Management Zone
- Development Zone
- Proposed Road
- Priority Trail Management
- Proposed Trail
- New Signage
- Existing Longhouse
- Proposed Longhouse
- Existing Structure
- Historical Structure
- Public Access
- Service Access

0 250 500 metres

SCALE 1:9,000

N W E S

Tax incentive program). This zone At Crawford Lake is comprised of approximately 39 hectares or 17.5% of the total area. The lands at Crawford Tract II have 9.5 hectares assigned to this zone or 8.5% of the area. Resource Management Zones should not be established in Nature Reserve Parks or in life science ANSIs' with the exceptions noted in Policy 3.1.5 of the NEP (2005).

Permitted Uses:
Intensive resource management activities such as; forestry, natural area restoration, agriculture and low to medium recreational activities, (trails, service roads and interpretive facilities,) will be allowed in this zone. Resource Management Zones permit the continuation or implementation of historical and traditional activities such as sustainable forestry and agriculture that may not be permitted in other parts of the system. Resource Management Zones shall be actively managed under a prescribed forestry management plan or restoration plan as prepared by Conservation Halton staff.

3.4.3.5 Development Zones

Purpose:
To provide protection for all remaining natural features that support the ecological function for a greater variety of species and connection within the larger landscape matrix. This zone provides the main access to the park, open space, facilities and services to support recreational activities (NEP, 2005.) This zone accommodates existing infrastructure which facilitates visitor use to the conservation area. At Crawford Lake, this designation has been assigned to the current day use area and includes the access route, picnic area, gathering place, open spaces, visitors centre, education centre and parking areas. This zone is comprised of approximately 18 hectares or 8.5% of the total area. No area in Crawford Tract II is assigned to this zone.

Permitted Uses:
The Development zone is usually orientated to the provision of recreational opportunities that are suited to the natural character of the park. This zone accommodates the facilities, infrastructure and staging areas necessary to support recreation and the conservation associated activities. The development zone consists of the public access to the park including the roads, gatehouse, kiosk and parking lots. The picnic area, pavilions, and education centre, are all supporting facilities to the park and are to be included in the Development zone. All development shall be kept to a minimum, conform to good site-planning standards and shall not conflict with the general landscape character. The development of the facilities must have minimal negative effect on natural, cultural and heritage features and must be undertaken in a way to minimize the environmental impact.

3.4.4 Trail Development, Uses and Management

Trail construction and management policies include:

- Trails will be located and designed to avoid, wherever possible, steep slopes, wetlands, erosion-prone soils and ecologically-sensitive areas such as species at risk habitat and rare vegetation communities.
- Trails will be located and designed so as not to adversely affect adjoining private landowners.
- Recreational uses should not exceed the carrying capacity of a site or area.
- Where an existing trail is in a location that causes environmental deterioration, relocation to a less critical location is encouraged.

- Trail design, construction and management should ensure the safety of trail users.
- Permitted trail uses will be indicated on trail signage in the conservation area.
- Trails will be located and designed in consultation with appropriate Watershed Management Division staff.
- Trails design shall be appropriate to location, zoning and uses (i.e., trail width and surface treatment).
- Where necessary, management plans should allow for temporary trail closure.
- Where needed, closure of trails shall be actively restored using native vegetation.

3.4.4.1 Trail Classification Objectives and Carrying Capacity

Conservation Halton has adopted a three-level trail-classification system that describes the type of visitor experience that is desired as well as some of the physical properties of each class of trail. This classification system will assist in determining trail development, use and management practices. Each of these trail categories has been assigned a social carrying capacity. Carrying capacity is a theoretical model for estimating the number of people who can travel on a trail at any one moment in time and experience a qualitative natural experience without feeling overcrowded. This is separate to the physical or biological carrying capacity of the trail which varies under weather and seasonal conditions and which will be managed under our Visitor Impact Management System as described in the following section. See Section 4.3.1 and Appendix I for further discussion of the conservation area's social carrying capacity.

Single-Track Trails Management Considerations: Use of these trails may be discouraged by not advertising any interpretive or viewing opportunities on them. They may also need to be closed in wet seasons given the natural surface treatment. On very busy days, access may be controlled by trail stewards posted at trailheads. There are 4532 metres of this grade of trail at the Crawford Lake Conservation Area. The assumed carrying capacity on this type of trail is 5 groups of 2 people per 1500 metres.

Medium Service Nature Trails Management Considerations: Small service vehicles (gator, golf cart or quad) can be used on these trails.

High Capacity/ Service Access Trail Management Considerations: Authorized service vehicles and emergency vehicular access route can be used along these trails.

Table 3-2: Trail Classification System

Trail Type	Width	Carrying Capacity per 1500m	Existing Length	Surface	Experience
Single-Track	No more than 1.2 m wide	5 groups of 2 people	4532 metres	soil, vegetation or bedrock	A sense of being immersed in a natural landscape

Medium Service Nature Trail	No more than 2m wide	10 groups of 2 people	5451 metres	natural, though modified, surface featuring indigenous materials such as wood chips	Some resource modifications are evident, but they harmonize with the natural environment. Few recreation facilities are provided, and those that exist are minimal and rustic.
High Capacity / Service Access Trail	No more than 3m wide	20 groups of 2 people	4851 metres	natural surface of packed limestone chips and may be designed for universal accessibility	These are intended to be high use trail corridors that access prime conservation area features and that provide emergency access as required. Resources are modified for essential visitor and conservation area operation needs, but they are changed in a way that harmonizes with the natural environment.

3.5 Visitor Impact Management

Conservation Halton will develop and implement a thorough Visitor Impact Management program. This will necessitate designating one additional staff person to coordinate Visitor Impact Management activities at Crawford Lake and Mountsberg Conservation Areas. This program may involve a public committee for oversight and a host of volunteers for implementation. This is an adaptive management process, meaning that monitoring and applying management actions will be followed with a reassessment of impacts and management actions.

3.6 Cultural Heritage Management

Four sites have been registered within the Crawford Lake Conservation Area (Figure 3-3). The **Crawford Lake site (AiGx-6)** is a major Middle Iroquoian village. The **Crawford Lake Metate (AiGx-215)** is a large boulder located outside the village that was used for grinding and processing activities (note that for the purposes of this study the Crawford Lake Metate is considered a subcomponent of the Crawford Lake site). **Crawford Lake 2 (AiGx-89)** is a Middle Iroquoian camp and the **Crawford Lake 3 site (AiGx-317)** is a camp or special purpose site of unknown date or cultural affiliation. The Crawford Lake site is discussed in more detail in Appendix 2 of the *Stage One Report* (EDA 2010a), but it should be noted that portions of the site remain unexcavated.

Three sites have been registered within the Crawford Tract II Resource Management Area (Figure 3-3). The **Plunge Pool site (AiGx-9)** was registered by William Finlayson in 1975. It is a small Middle Iroquoian site of unknown function. The **Plunge Pool 2 (AiGx-138)** and **Plunge Pool 3 (AiGx-139)** sites were also registered by Finlayson. No data are available concerning either site.

3.6.1 Archaeological Potential within the Conservation Area

The identification of zones of archaeological potential within the individual conservation authority properties is based on the predictive model developed for the *Master Plan of Archaeological Resources of the Regional Municipality of Halton* (Archaeological Services Inc. 1998). It is therefore necessary to review the process by which this model was created and by which it has been reviewed only recently (ASI 2008) to evaluate its effectiveness. The predictive model is based on the analysis of

the locations of known archaeological sites across the landscape, the past distribution of natural resources and changes to the environment through time, Aboriginal and Euro-Canadian land use patterns, settlement and subsistence practices, and other factors. A more detailed discussion of the modeling process is provided in Appendix II of the *Stage One Report* (EDA 2010a).

3.6.2 Planning Guidelines

Planning for the cultural heritage resources of Conservation Halton's properties—both known and potential—requires consideration of existing land-use management processes, as enshrined in provincial legislation and as they relate to cultural heritage resources; the types of pressures that current and/or proposed activities within the study area may be expected to exert on these resources; and development of a set of clear objectives that provide a coherent statement of intent with respect to the conservation and enhancement of these resources.

The specific provincial legislation governing planning decisions is complex, but provides for a number of opportunities for the integration of cultural heritage resource conservation. The two principle pieces of legislation are the *Planning Act* and the *Environmental Assessment Act* (see Section Two of the *Stage One Report* for discussion of the applicable clauses, EDA 2010a).

3.6.2.1 The Threats to Archaeological Resources

Archaeological resources are generally scarce, fragile and non-renewable. Two major elements of the environment pose threats to these resources:

- Natural forces may result in numerous deleterious effects to heritage resources, such as flooding and erosion of archaeological sites by watercourses, or disturbances and displacements caused by tree growth or burrowing rodent activities.
- Human activity may also result in adverse effects. Looting, for instance, while not only illegal, disrupts important archaeological sites. Imprudent planning is capable of destroying archaeological sites without appropriate mitigative measures.
- Initiatives or activities within a conservation area that should include consideration of archaeological concerns during the preliminary planning phases include road and trail construction, service installations, amenities developments, changing water levels, forestry activity, borrow pitting, drainage improvements, continued occupation (e.g., the use and maintenance of modern camp/picnic sites where these and archaeological sites coincide), and any other activity that involves disturbances of soil and bedrock.

3.6.3 Conservation Goals and Objectives

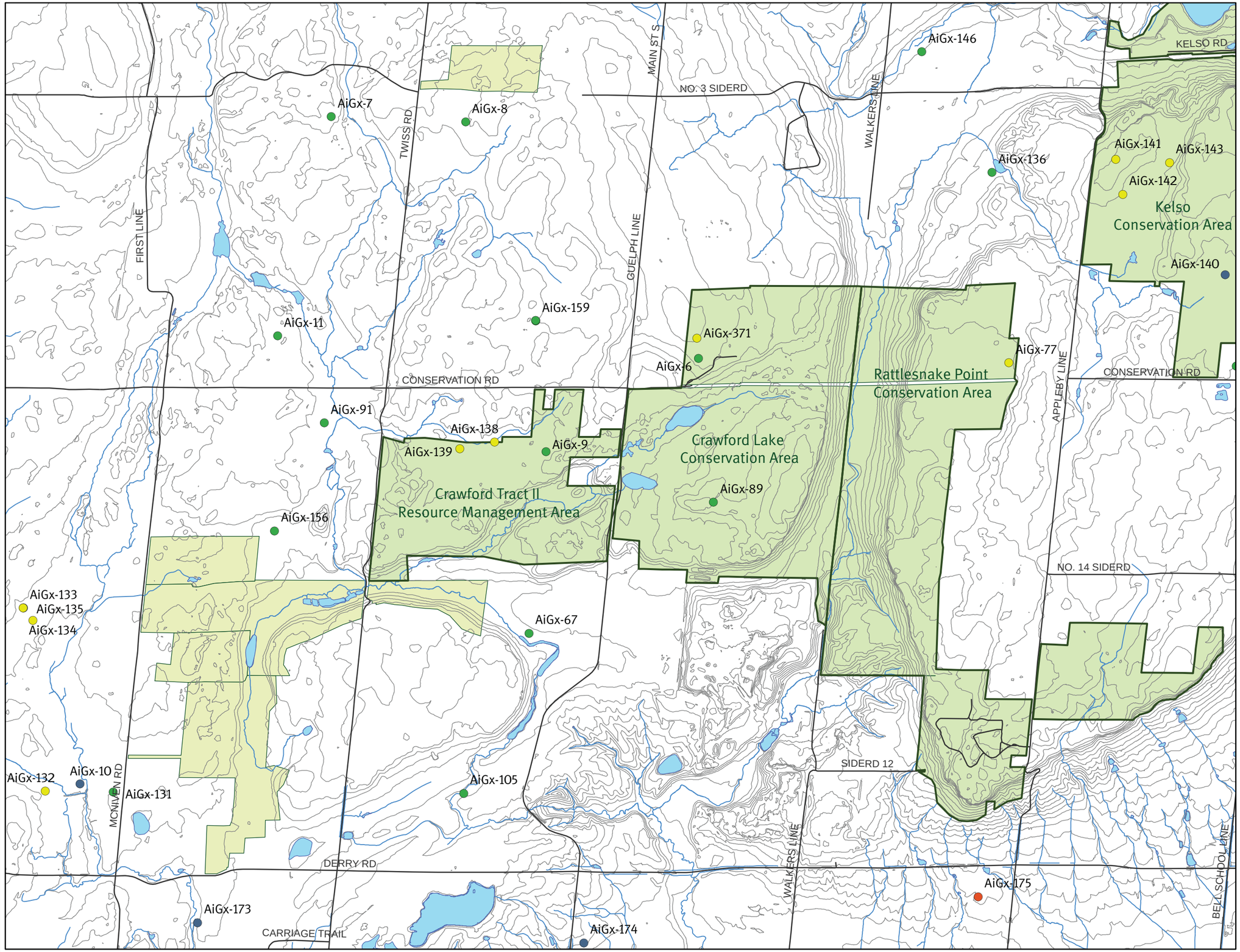
Conservation Halton avoids wherever possible the disruption or disturbance of known archaeological sites or areas of archaeological potential within any of its properties.

Table 3-3 outlines the general types of land uses that may be expected in the context of lands managed for recreational purposes that may have negative effects on cultural heritage resources, unless preceded by impact assessments completed to the standards identified in the Ontario Ministry of Tourism, Culture & Sport's 2009 final draft of the *Standards and Guidelines for Consultant Archaeologists.*

Figure 3-3: Archaeological Sites

CONSERVATION HALTON
Crawford Lake Conservation Area

Archaeological Sites
FIGURE 3-3



Legend

Archaeological Sites
- Archaic (7,000 - 1,000 BC)
- Late Woodland (AD 900 - 1600)
- Multi-component
- Undetermined

- Conservation Area
- Other Conservation Halton Lands
- Roads
- Contour Line (5m intervals)
- Waterways
- Waterbody

0 250 500 750 metres

SCALE: 1:23000

Table 3-3: Typical Land Use Activities that may Impact Archaeological Resources

General Activity	Specific Activities	Impacts
Road Construction	Cutting, filling, borrow pits, bridge and culvert construction, ditching, etc.	Loss or degradation of resource base in absence of prior assessment and mitigation
Tourism	Interpretive centre and ancillary facility (e.g., servicing, comfort stations, scenic lookouts, etc.) development/construction	Loss or degradation of resource base in absence of prior assessment and mitigation
Outdoor Recreation	Access point parking facility development, trail system development and maintenance, camp/picnic site development and maintenance	Loss or degradation of resource base in absence of prior assessment and mitigation

3.6.4 The Archaeological Assessment Process

The Archaeological Assessment process is typically divided into four stages of activity. A **Stage 1** assessment consists of background research concerning registered sites on the subject lands or within close proximity, as well as the environmental character of the subject lands and its land use history. A **Stage 2** assessment consists of field survey to document any sites that may be present within the subject lands. It should be noted that completion of an archaeological field assessment of a particular development impact area, no matter how rigorous, does not fully guarantee that all significant archaeological resources on that property will be identified prior to land disturbance. This is particularly the case in areas where processes such as filling, flooding or erosion have resulted in the burial of original ground surfaces, or with respect to isolated human burials that are typically small features that can escape detection. **Stage 3** investigations are designed to secure a detailed understanding of the nature and extent of a site and may involve complete or partial systematic surface collection and test excavation. **Stage 4** undertakings comprise extensive excavation; comparative analysis and interpretation of content and contextual information, or the development of planning and design measures to ensure that the site is protected from any adverse impacts through avoidance.

3.6.5 Identifying and Evaluating Impacts

If no adverse impacts to a resource will occur, then development may proceed as planned, however, a contingency plan should be designed for implementation throughout the process to ensure protection of a previously undetected resource (e.g., a deeply buried deposit) and for its rapid investigation.

Should a significant resource be discovered during the course of an assessment, Conservation Halton staff and the archaeological consultant shall assess the potential impact of the proposed undertaking upon it and arrive at rational decisions regarding its significance, the most appropriate means of its integration into the development plan, or the implementation of mitigative options.

Should the resource be threatened, the two available options are to immediately integrate the resource into the development plan, through redesign or provide for mitigative procedures. The decision-making process with respect to mitigative procedures may be subject, however, to a cost benefit analysis where the mitigative option involves input from all of the stakeholders, including, where relevant, affected First Nations.

There are a number of mitigative options including avoidance, modifications to construction techniques and various degrees of documentation and/or excavation. In all cases, thought should be given to the interpretive and educational potential of the site. It should also be noted that detailed information regarding a site is frequently required in order to make a more accurate assessment of significance and to determine the potential for adverse effects. This may involve different levels of on-site investigations.

All management decisions that are made during this process must be informed by an assessment of that site's significance as well. It is only after such an evaluation that the most appropriate mitigative strategy, both in terms of resource protection and in terms of successful integration within the overall development plan, can be identified. This evaluation depends, in turn, upon information recovered during the course of the archaeological resource assessment that led to its discovery.

3.6.6 Evaluating Site Significance

The process of evaluating site significance or "heritage value," to use the current terminology preferred by MCL, is based on a number of overlapping considerations that are applied on a case-by-case basis. These considerations fall into three basic categories: information value, value as a public resource, and community value.

- **Information value** refers to the likelihood that investigation of a site will contribute to an increased understanding of the past. Such an assessment must be carried out through consideration of several major criteria: the degree to which a site will contribute to our understanding of the past (its cultural, historical and scientific value); the relative rarity or commonness of similar sites locally or regionally; its productivity or richness in terms of the artefacts it contains; and the degree to which it has been disturbed by more recent land uses or natural processes.
- **Value as a public resource** refers to the degree that a site will contribute to an enhanced understanding and appreciation of Ontario's past on the part of the public.
- **Value to a community** refers to whether or not the site has intrinsic value to a particular community, First Nation or other group.

Table 3-4: Heritage Values, Crawford Lake Conservation Area

Site Name	Site Period and Type	Status	Heritage Value
Crawford Lake (AiGx-6)	Middle Iroquoian village	Portions remain unexcavated	High: Mitigations required prior to any further development
Crawford Lake 2 (AiGx-89)	Middle Iroquoian Camp	Portions remain unexcavated	High: Mitigations required prior to any development
Crawford Lake 3 (AiGx-317)	Unknown	Intact and unexcavated	Cannot be determined on basis of available data: Stage 3 assessment required prior to any development

Table 3-5: Heritage Values, Crawford Tract II Resource Management Area

Site Name	Site Period and Type	Status	Heritage Value
Plunge Pool (AiGx-9)	Middle Iroquoian Site of Unknown Function	Unexcavated	High: Mitigations required prior to any further development
Plunge Pool 2 (AiGx-138)	Unknown Pre-contact	Unknown	Cannot be determined on basis of available data: Stage 2-3 assessment required prior to any development
Plunge Pool 3 (AiGx-139)	Unknown Pre-contact	Unknown	Cannot be determined on basis of available data: Stage 2-3 assessment required prior to any development

Prior to any development of the proposed parking lot north of the proposed new interpretive and educational centre, it will be necessary to complete a full Stage 3 assessment, conducted according to the Ministry of Tourism, Culture Sports. *2010 Standards and Guidelines for Consultant Archaeologists*, which came into effect January 1, 2011.

The Stage 3 assessment would require re-plowing the site area, allowing it to weather through several rainfalls and then conducting a controlled surface collection of the artifacts that are found on the surface. These would be tied to the artifact locations recorded by the previous archaeologist, to the degree possible, based on the information provided in his reports. The archaeological consultant would then establish its own recording grid and excavate a series of one-metre test units at five-metre intervals throughout the site area, as well as others in selected locales. Given the reported size of the site, somewhere between 20 and 30 one metre units are required.

This fieldwork would likely require a crew of four to be on site for 7-8 days. Industry standard charge out rate for a crew is $1,550/day, so the fieldwork is likely to be in the order of $11,000-$12,500, not including expenses (e.g., mileage). Administration, analysis and report preparation costs would be an additional $5,000-$7,000.

Should the results of the Stage 3 assessment indicate that the site is of high cultural heritage value, Stage 4 mitigation would be required. There are two basic options for Stage 4: preservation and avoidance, which may not be feasible in the current situation; or complete salvage excavation involving the continued excavation of one-metre units until all significant artifact deposits have been removed. There is a requirement to discuss the Stage 4 options with the relevant First Nation stakeholders as part of the decision-making process in choosing one option over the other.

The Niagara Escarpment Commission also suggests that: “Where new development involves a heritage feature it should express the feature in some way. This may include one or more of the following:

1) Preservation and display of fragments of the former buildings' features and landscaping;
2) Marking the traces of former locations, shapes and circulation lines;
3) Displaying graphic verbal descriptions of the former use; or
4) Reflection of the former architecture and use in the new development.” (NEP, Section 2.12)

This policy would be applicable to some of the pioneer-era heritage artifacts, such as the Crawford Cottage Foundation. In is intended that some interpretive programming will be developed around the pioneer use of this land.

3.7 Natural Resource Management

The purpose of the Natural Resource Management Section is to identify key recommendations that require specific attention during the management of the conservation area. This section and its recommendations should guide the protection of the natural heritage system for the long-term, using an adaptive management approach that may involve both active and passive management. In some cases, resource management recommendations will require the collection of additional information or the development of guidance material prior to their full implementation.

3.7.1 Land and Water Management

The landform and landscape character of Crawford Lake Conservation Area together with the natural hydrological regime shall be protected to the highest level while still providing compatible opportunities for recreation. Conservation area operations or development shall comply with the following:

- Any works proposed in areas regulated by Conservation Halton under Ontario Regulation 162/06 will be reviewed by appropriate Watershed Management Division staff. An internal review process will be followed that will result in the issuance of a clearance letter from the Watershed Management Division once it has been demonstrated that the proposed works meet all Conservation Halton regulatory requirements. No works will take place until such time as the clearance letter is received to ensure all works follow the appropriate protocols;
- Any works proposed within fish habitat will be reviewed by appropriate Watershed Management Division staff in accordance with Conservation Halton's Level II Agreement with the Department of Fisheries and Oceans;
- Any grading will be restricted to approved components of the master plan;
- No soil or fill material shall be imported onto this site unless in conjunction with an approved component of the master plan and accompanied with certificate of fill quality from a certified laboratory;
- Surface and groundwater shall be protected from any pollution or contaminants; and
- Waste consisting of natural materials will be reused or composted within the park where feasible and appropriate. Otherwise, all solid waste will be removed from the park for recycling or disposal.
- Source Water Protection: Conservation authorities are responsible for conducting technical studies that will be used to develop source water protection plans for their watershed. Source Water Protection Committees have been formed to undertake the technical studies for Source Water Protection Areas, including potential development constraints upon wellhead protection areas, which in most of the cases cover the boundaries of more than one conservation authority area. The Halton-Hamilton Source Water Protection Committee has completed a Source Protection Area Assessment Report, which is to be used to prepare the Drinking Water Source Protection Plan. This Source Protection Plan will be applied to specific wellhead protection areas that include portions of the Crawford

Lake Conservation Area (see Figure 3-10 Significant Natural and Cultural Features in *Stage One Report* (EDA 2010a).

3.7.2 Vegetation Management

The proper protection and management of vegetation communities is essential to the health and well-being of Crawford Lake Conservation Area and the larger Conservation Halton watershed natural heritage system. Efforts shall be taken conserve and, where possible, restore viable populations of indigenous plant species, with a focus on protecting species at risk and their habitats within the conservation area;

3.7.2.1 Forest Management and Sustainability Policy

Management of Conservation Halton forest resources requires a cohesive strategy that prioritizes forest health, regeneration and conservation of the ecology of forest communities over timber production. A cornerstone to achieving this is the establishment of a new forest management plan to implement sustainable forest management practices that are adaptive and rely on the most current forest information and silvicultural techniques. The forest ecosystem should be viewed as green infrastructure in all management decisions. Forest sustainability should incorporate the following principles:

- Large, healthy, diverse and productive forests and their associated ecological processes and biological diversity should be protected and restored;
- Long-term health and vigour of forests should be provided for by using forest practices that, within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air and social and economic values, including recreational and heritage values;
- Assess and prioritize forest unit protection needs, identify an appropriate management regime for areas with different sensitivities (e.g. provincially rare vegetation communities) and management requirements (e.g. passive management, active management, etc.);
- Incorporate global warming information into management plans including documenting the role Conservation Halton forests play as sinks for greenhouse gasses;
- Assess and manage invasive species, forest pests and disease;
- Promote species at risk recovery and conservation;
- Assess appropriate forest fire management;
- The White-tailed Deer (*Odocoileus virginianus*) carrying capacity of conservation areas should be evaluated to determine the optimal size of deer population that may be sustained. This evaluation should assess browse impact on forest habitats and possible influence on the regeneration of young trees. This study should include all forest habitats in the study area, especially areas considered sensitive; and
- Improve and monitor habitat and biodiversity within managed forest landscapes in a manner that is consistent with the long-term protection of the conservation area's forest community.
- Every forest operations prescription shall include descriptions of the following:
- Current structure and condition of the forest in the area to which the prescription applies;

- Forest renewal and maintenance activities to promote forest health, regeneration and biodiversity;
- The expected results and future structure and condition of the forest; and
- Standards or guidelines used in developing the prescription.

All prescription activities must comply with good forestry practices as described in Halton Region Tree Conservation By-Law (Regional Municipality of Halton 2005), the Ontario Ministry of Natural Resources' *A Silvicultural Guide to Managing Southern Ontario Forests* (MNR 2000) and the *Niagara Escarpment Plan* (2005). The forest management plan should demonstrate leadership in forest management by applying international standards for sustainable forestry practices as embodied by one of the three independent forest certification systems in Canada (e.g. Canadian Standards Association's Sustainable Forest Management Standard, the Forest Stewardship Council Standard and the Sustainable Forestry Initiative). This management system should also complement the restoration plans for the conservation area and, where appropriate, refine the management of forest restoration areas in a manner that allows the development of mature forest communities found in the adjacent natural areas.

3.7.2.2 Forest Succession and Plantations

Several plantation areas occur in Crawford Lake Conservation Area, which have a variety of attributes and proposed management criteria. The management of these, as well as natural forest areas, should be guided by an updated forest management plan.

3.7.2.3 Dead and Hazardous Trees

Existing Conservation Halton protocols for the management of dead and hazardous trees will be implemented in Crawford Lake Conservation Area. Safety will be the largest factor in decisions for hazardous tree removal; however, the importance of dead tree material and downed woody debris to provide wildlife habitat must be considered. Dead tree falls and tip-ups may also be left in place to serve as important sites for mosses and fungi, germination areas for species requiring rotting wood as a rooting medium, and moist shelters for mammals and herptiles.

In addition, Crawford Lake Conservation Area has several records of Butternut trees that are considered *Endangered* under the provincial *Endangered Species Act*. If for safety reasons the removal of this species becomes necessary, the removal must conform to applicable laws, associated health assessments and permitting requirements (Ontario Regulation 242/08). Even dead Butternuts require the Ontario Ministry of Natural Resource's prior approval of a Butternut Health Assessment conducted by a certified evaluator prior to removal. Conservation Halton has several such evaluators on staff.

3.7.2.4 Plant and Seed Collection

Where existing vegetation may be lost due to development of trails, access roads, educational centre, etc., plants may be transplanted for naturalization and restoration purposes within the conservation area. Seed may be collected for use in propagation and planting within the conservation area for restoration and naturalization purposes. Harvesting efforts should be spread throughout the conservation area and not concentrated on any one area. The amount of seed collected will be based on the species, as determined in consultation with Conservation Halton forestry and ecology staff.

Generally, propagation areas will be discouraged due to the natural state of the conservation area and the fact that other areas may be more appropriate for this use.

3.7.2.5 Invasive Species

Invasive species removal should be an integral part of maintaining high quality ecological assemblages within the Crawford Lake Conservation Area. The complete eradication of invasive species is not always realistic and, therefore, prioritization of effort is necessary. Introduced species should be evaluated for invasive tendencies based on appropriate federal, provincial or municipal guidance material. For example, invasive plants and their invasive tendencies are summarized in Priority Invasive Plants in Southern Ontario (Appendix 3 in Havinga *et al.* 2000). Monitoring and research should be directed to prioritize the threat posed by invasive species and the feasibility of effective control. Based on this threat analysis, a species-specific management protocol should be established for those species that pose the greatest threat and/or have a high success rate in relation to effort expended. Biological control appears to have limited application because there are few pests or diseases found in North America that have any significant impact on controlling invasive species.

Plant Species

Priority invasive plant species identified within Crawford Lake Conservation Area include Garlic Mustard (*Alliaria petiolata)* along trails and in forested areas as well as Periwinkle (*Vinca minor*) along trails. Additional invasive plant species occur but have not been mapped. A full list of exotic plant species can be found in Table 3-6, Appendix I of the *Stage One Report* (EDA 2010a).

Forest Pest Species

It is clear that threats, due to forest pest establishment, exist in the surrounding area. The potential for forest pests to occur in the conservation area is being monitored as part of the forest health monitoring program as well as through other partnerships. Forest pest species of concern, which should be monitored as part of the overall management of Crawford Lake Conservation Area include:

- Gypsy Moth (Lymantria dispar);
- Asian Long-horned Beetle (*Anoplophora glabripennis*);
- Emerald Ash Borer (*Agrilus planipennis*);
- Two-lined Chestnut Borer (*Arrilus bilineatus*);
- Fall Cankerworm (*Alsophila pometaria*); and
- European Wood Wasp (*Sirex noctilia*)

3.7.2.6 Forest Diseases

Forest diseases that should be recognized and monitored in the conservation area include Butternut Canker, the decline indices of Oak, Ash, Maple, Red Pine and Beech bark disease.

3.7.2.7 Herbicides, Pesticides and Suppressants

Biological controls will be employed wherever possible. Manual and mechanical methods of invasive species control are the preferred management option, where possible.

Chemical herbicides, pesticides and suppressants will not be used for any vegetative management purposes except for the eradication of non-native species, establishment of native plantings where other methods with less residual impacts are not feasible, or for the control of noxious plants in publicly accessible areas. Areas left devoid of vegetation after invasive species removal should be planted with hardy native species in an effort to prevent re-establishment and to improve the floristic quality of the site.

3.7.2.8 Vegetation – Cutting, Injury, Destruction and Removal

Under Ontario Regulation 365/88 it is a prohibited activity for the public to cut, remove, injure or destroy a plant, tree, shrub, flower or other growing thing in a conservation area of Conservation Halton.

3.7.2.9 Ancient Eastern White Cedars

Twenty ancient cedars were identified and mapped in Crawford Lake Conservation Area, ranging in age from over 160 years to almost 600 years (Kelly and Larson 2008). Thirty-one of these ancient cedars were documented along the south and west facing cliffs. An adaptive management plan, which protects ancient Eastern White Cedars, monitors health and possibly contributes to research initiatives, should be developed. Educational programming (e.g. signage), which highlights the impressive age and life cycle of ancient cedars should be explored further. The ability to access each individual should be documented, those that have the potential to be accessed should be more closely monitored and where necessary, methods developed that reduce accessibility within the immediate vicinity.

3.7.3 Fisheries Management

Aquatic and fisheries resources associated with the conservation area are highly significant and should be protected. The appropriate separation of facilities from riparian areas is important for the protection of this resource. Retaining high quality riparian areas will maintain water temperatures and food supply; and filter nutrients, contaminants and sediments entering the water. The establishment or repair of any infrastructure within or adjacent the watercourses/lake shall be in accordance with the federal *Fisheries Act* with said works timed to occur within an approved in stream construction window. Riparian and littoral zones adjacent to lookouts should be monitored regularly for disturbance. Water quality monitoring, in strategic locations, should also be completed at appropriate intervals to assess possible changes in the lake environment.

Fisheries management practices at Crawford Lake Conservation Area will predominantly deal with habitat protection. Under Section 35 of the *Fisheries Act,* no harmful alteration, disruption or destruction of fish habitat (HADD) is permitted unless authorized by the Department of Fisheries and Oceans Canada (DFO). Any in-water works should first be screened by Conservation Halton staff to determine if the proposed works has a likelihood of causing a HADD. In addition, timing of these works should be confirmed with the Ontario Ministry of Natural Resources (MNR).

3.7.4 Wildlife Management

Wildlife management practices at Crawford Lake Conservation Area will predominantly deal with habitat protection and to a lesser extent habitat improvements/restoration. Under Ontario Regulation 365/88 it is a prohibited activity for the public to kill, trap, pursue or disturb a wild bird, reptile or animal in a Conservation Halton conservation area. See *Stage One* and Stage *Two Reports* for more detail, (EDA 2010a, b).

3.7.5 Species at Risk Monitoring Strategy

Twelve species at risk were documented as occurring within the Crawford Lake Conservation Area. They include Butternut, Golden-winged Warbler, Hooded Warbler, Louisiana Waterthrush, Eastern Milksnake, Eastern Ribbonsnake, Jefferson Salamander, Western Chorus Frog, Snapping Turtle, Monarch, West Virginia White, and Woodland Vole.

The habitats of *Threatened* and *Endangered* species receive varying degrees of protection under the *Endangered Species Act* as well as the *Species at Risk Act*. Where possible, recovery actions will be implemented in the conservation area in a manner that is consistent with recovery strategies or management plans that have been developed for the particular species. The appropriate management and monitoring of these species/vegetation communities should be encouraged through the development of specific management plans. In some cases, it may be beneficial to consider their management as an assemblage. Specific monitoring needs for these species are discussed below.

Recovery projects, as they arise, are not included in the 10-year monitoring budget. Provincially rare species are identified below and should be examined in more detail to establish appropriate protection/management protocols.

As part of management considerations, Conservation Halton should continue to educate visitors on species at risk and how people can contribute to their protection.

3.7.5.1 Butternut

Butternut is shade-intolerant and conservation area managers can promote natural regeneration by planting Butternut seed, sourced from local retainable trees, or small trees as part of the proposed forest restoration. Controlling competition can also increase survivorship of established seedlings. Monitoring of this species should be directed at identifying additional Butternut trees in the conservation area and monitoring the health, regeneration and survivorship of the species following the guidelines set forth by the Forest Gene Conservation Association in the *Butternut Health Assessment in Ontario* manual.

It is estimated that five days of work every third year will be required to carry out this monitoring task. The costs are calculated based on $440 per person day; therefore, over the 10-year period this item will cost $6,600.

3.7.5.2 Golden-winged Warbler

Forest bird monitoring, which tracks the number of breeding pairs in areas known to be of higher quality is recommended for monitoring this species over time. Although the Forest Bird Monitoring Program (FBMP) will help monitor this species, specific effort may be required in other areas that have established territories year after year. Where possible, and in an unobtrusive manner (e.g. observation from a distance) the success of nests (e.g. fledge young) should be monitored.

It is estimated that one day of work per year will be required to carry out this monitoring task (the costs are calculated based on $440 per person day; therefore, over the 10-year period this items will cost $4,400.)

3.7.5.3 Hooded Warbler

Forest bird monitoring, which tracks the number of breeding pairs in areas known to be of higher quality is recommended for monitoring this species over time. Although the FBMP will help monitor this

species, specific effort is required in other areas that have established territories year after year. Where possible, and in an unobtrusive manner (e.g. observation from a distance) the success of nests (e.g. fledge young) should be monitored.

It is estimated that one day of work per year will be required to carry out this monitoring task. The costs are calculated based on $440 per person day; therefore, over the 10-year period this item will cost $4,400.

3.7.5.4 Eastern Musk Turtle

As this species is considered to be locally extirpated, no specific monitoring for this species is recommended.

3.7.5.5 Eastern Milksnake

Monitoring for this species during warm days during April to June and October to November should be considered. The emphasis of monitoring should be to locate either hibernacula or egg laying sites. Random or wandering transect methods could be used for surveys. Surveys can be completed on an as available basis. Consideration should be given to constructing hibernacula in key areas, as part of the restoration efforts. It is estimated that three days of work per year will be required to carry out this monitoring task (the costs are calculated based on $440 per person day; therefore, over the 10-year period this items will cost $13,200.)

3.7.5.6 Eastern Ribbonsnake

The management plan for the Eastern Ribbonsnake falls under the Thames River Ecosystem Recovery Plan. The aim of the recovery is to enhance or restore water quality and aquatic habitat by reducing siltation, nutrient loadings and toxic contamination as well as reducing impacts of altered water flow. Monitoring for this species during warm days during April to June and October to November should be considered. The emphasis of monitoring should be to locate either hibernacula or egg laying sites. Random or wandering transect methods could be used for surveys. Surveys can be completed on an as available basis. Consideration should be given to constructing hibernacula in key areas, as part of the restoration efforts.

Monitoring for this species will be in conjunction with that for Eastern Milksnake above; therefore, no further costs will be accrued.

3.7.5.7 Snapping Turtle

A management plan is being prepared for the Snapping Turtle's recovery by the Ontario Ministry of Natural Resources. In the interim, Conservation Halton has recommended a 10-metre buffer around all waterbodies that provide Snapping Turtle habitat.

Nesting areas, where observed should be documented and protected. No specific monitoring for this species is recommended.

3.7.5.8 Jefferson Salamander

The habitat of this species is protected by the *Endangered Species Act* through Ontario Regulation 436/09. The Ontario Ministry of Natural Resources (MNR) has developed a GIS protocol to assist in delineating Jefferson Salamander habitat for the purposes of the regulation. The habitat of this species

will be protected based on the results of the MNR modeling. Key habitat areas of this species should continue to be monitored and the potential for others should be assessed. It would also be valuable to understand the upland movements of the local population, to identify areas of higher utilization.

It is estimated that ten days of work per year will be required to carry out this monitoring task (the costs are calculated based on $440 per person day; therefore, over the 10-year period this items will cost $44,000.)

3.7.5.9 Western Chorus Frog

It is likely that this species is very secure in Crawford Lake Conservation Area and will remain so provided appropriate measures are taken to protect core habitat areas. Areas where this species has been documented should continue to be monitored. Species occurrence and general abundance can be monitored using the Marsh Monitoring protocols and site-specific surveys.

It is estimated that two days of work per year will be required to carry out this monitoring task (the costs are calculated based on $440 per person day; therefore, over the 10-year period this items will cost $8,800.)

3.7.5.10 Monarch

No specific monitoring for this species is recommended.

3.7.5.11 West Virginia White

Areas of Toothwort (*Dentaria diphylla; Dentaria X maxima*) known to occur in Crawford Lake Conservation Area should be monitored during the spring season to assess the occurrence and general abundance of this species from year to year. Food plants should be protected from recreational activities.

It is estimated that one day of work per year will be required to carry out this monitoring task (the costs are calculated based on $440 per person day; therefore, over the 10-year period this items will cost $4,400.)

3.7.5.12 Woodland Vole

A small mammal inventory should be considered. This inventory would allow some investigation of possible population levels in the conservation area as well as serve to inventory other more commonly occurring mammals. Both aboveground (e.g. Sherman/Longworth live traps) and belowground (e.g. pitfalls, or livetraps placed in runways) traps must be used in order to get an accurate representation of Woodland Vole numbers or even presence. A partnership with the Ontario Ministry of Natural Resource and/or a university may be the most appropriate way of undertaking a detailed assessment of the Woodland Vole population.

It is estimated that 20 days of work per year will be required to carry out this monitoring task (the costs are calculated based on $440 per person day; therefore, over the 10-year period this items will cost $88,000.)

3.7.6 Globally and Provincially Rare Species

Globally and provincially rare species (G1-G3, S1-S3) observed in or immediately adjacent to Crawford Lake Conservation Area are identified in Table 3-6. These species should be investigated further to establish appropriate protection and management protocols.

Specifically noted for management planning would be Green Violet (*Hybanthus concolor*) which grows in vegetative colonies. Within the Conservation Halton watershed, the largest population of this species occurs within Crawford Tract II Resource Management Areas, totaling approximately 5.3 hectares. The area covered by this species at this property amounts to 49% of the known populations in the watershed. In consideration of this, specific management guidelines and practices should protect this species from harm. Decommissioning a segment of trail within Crawford Tract II Resource Management Area shown in the Master Plan Detail map (Figure 3-2) will assist in recovering habitat for this species.

3.7.7 Globally and Provincially Rare Vegetation Communities

Three Ecological Land Classification communities in the conservation area are considered *Very Rare* (G2) *to Uncommon* (G3) globally, as well as provincially rare (S2 to S3S4) are identified below in Table 3-7. An additional four vegetation communities documented in the conservation area are considered provincially *Vulnerable* (SRank - S3/S3S4) and three are or are likely to be ranked as *Imperiled (S2/ S2?/ S2S3)*. A summary of these communities is provided below in Table 3-8.

Table 3-6: Globally and Provincially Rare Species

Common Name	Scientific Name	Halton Region Status	GRANK	SRANK	Source
Plants					
Green Violet	*Hybanthus concolor*	Uncommon	G5	S2	NHIC 2004, CH 2009
Long-styled Canadian Sanicle	*Sanicula canadensis var. grandis*	Rare	G5T3T5	S2	CH 2009
Rugulose Grape Fern	*Botrychium rugulosum*	Rare	G3	S2	NHIC 2004
Amphibians					
Jefferson Salamander Unisexual Complex	*Ambystoma jeffersonianum-laterale*	Uncommon	HYB	S2	CH 2009, NHIC Herp Data 2004, CH 2009
Lepidopetera					
Delaware Skipper	*Atrytone logan*	*Not Ranked*	G5	S3S4	Halton NAI
Giant Swallowtail	*Papilio cresphontes*	Rare	G5	S3	BVR personal odelep database
Hickory Hairstreak	*Satyrium caryaevorum*	*Not Ranked*	G4	S3	Halton NAI
Odonata					
Amber-winged Spreadwing	*Lestes eurinus*	Rare	G4	S3	NHIC 2004
Azure Bluet	*Enallagma aspersum*	Rare	G5	S3	NHIC 2004
Green-striped Darner	*Aeshna verticalis*	Rare	G5	S2	Halton NAI

**Additional species at risk may be located within the conservation area. Please contact Conservation Halton ecology staff for comprehensive information.*

Table 3-7: Globally and Provincially Rare Vegetation Communities

ELC Unit	Name	GRank	SRank	Number / Area
CLT1-1	White Cedar Treed Carbonate Cliff Type	G2Q	S3	3 polygons 0.07 hectares
FOD5	Sugar Maple on Bedrock Forest	G3G4	SNR	5 polygons 9.01 hectares
TAT1-4	Fresh - Moist Sugar Maple Carbonate Treed Talus Type	G3G5	S3	11 polygons 14.4 hectares

Table 3-8: Provincially Rare Vegetation Communities

ELC Unit	Name	GRank	SRank	Number / Area
TAO1-2	Fresh - Moist Carbonate Open Talus Type	G?	S2	1 polygons 0.2 hectares
TAT1-5	Fresh - Moist Basswood - White Ash Carbonate Treed Talus Type	GNR	SNR *likely S2?*	1 polygons 2.8 hectares
FOD7-4	Fresh - Moist Black Walnut Lowland Deciduous Forest Type	G4?	S2S3	1 polygon 0.7 hectares
TAS1-2	Mountain Maple Carbonate Shrub Talus Type	G?	S3	5 polygons 1.71 hectares
TAT1-2	Dry - Fresh White Cedar Carbonate Treed Talus Type	G?	S3	6 polygons 7.9 hectares
CLO1-2	Bulblet Fern - Herb Robert Carbonate Open Cliff Type	G5	S3	4 polygons 0.04 hectares
SWC3-2	White Cedar - Conifer Organic Coniferous Swamp Type	G4G5	S3S4	1 polygon 3.3 hectares

These vegetation communities should be protected and maintained. If necessary, a vegetation management plan should be prepared to investigate appropriate protocols for each community.

3.7.8 Research

Appropriate research activities will be encouraged and will conform to the conditions stipulated in any Permit to Conduct Research issued by the Watershed Management Division, Ecology Department. Prior written permission will be required and reports upon completion of the study will be shared with Conservation Halton.

Section Four: Elements of the Master Plan

4.1 Introduction

In a regionally significant system of publicly-accessible natural areas, every area should meet a high standard of amenities and services. For Conservation Halton's conservation areas, this will become the proposed base level of service described in Section 3.2. While each of the conservation areas should add something unique to the overall system, many of the conservation areas will provide similar services and amenities such as hiking trails in order to meet the anticipated large increase in demand for passive recreational activities. In the framework proposed, the master plans build on the particular strength of each conservation area. Crawford Lake Conservation Area's focus will be on the Iroquoian village and the meromictic lake.

The concept plans presented in the *Stage Two Report* offered distinctly different approaches for Crawford Lake Conservation Area, ranging from offering an upgraded base level of services to becoming a regional destination (EDA 2010b). All of the concept plans were based on an "environment first" approach where the natural heritage features are protected and / or restored to the maximum extent possible. The differences are in the degree of intervention and investment necessary to accommodate educational, interpretive and programmatic elements.

The first option, Concept A, placed an emphasis on conserving and protecting the natural environment while offering some opportunities for recreation and education; the second, Concept B, defined a balanced approach between environmental preservation and public enjoyment; the third, Concept C, sought to promote the site to regional destination status while still protecting the environment to the maximum extent possible and offering a strong educational and recreational component for the community.

Through the consultation process with the community, Conservation Halton staff and the technical advisory committee, Concept C was selected as the preferred approach to development of the area.

Concept C, as presented in the *Stage Two Report* (EDA 2010b), provides this enhanced level of amenities, interpretive and recreational day use facilities, including the following:

- Provide enhanced basic amenities and services to a much higher standard than at present;
- Develop Crawford Lake Conservation Area as a significant Nodal Park within the NEPOSS
- Interpretive storylines: 15th century Iroquoian village (see Section 4.3 for more detail on this interpretive element), meromictic lake, European settlement, escarpment, and sustainable use of recreational trails,
- Expand parking as required and strictly control trail routes (with fencing, boardwalks, etc.) which may require some re-routings to avoid sensitive areas.
- Re-route entrance road to the north around the west side of the Iroquoian village
- Construct new 250 car sustainable parking lot north of village
- Construct 100 car overflow parking area

- Develop a major Visitor Interpretive and Education Centre: "The place for integrated education focusing on natural heritage and First Nations cultural heritage on the escarpment within the GTA." Envisioning accommodating 16 school classes per day
- Provide new ways for visitor groups to experience the educational values of the site with provision of appropriate overnight accommodation if deemed to be desirable and feasible.
- Investigate additional land acquisition possibilities.

Figure 4-1 offers a close-up view of the development area.

4.2 Interpretive and Educational Centre (New Visitors Centre)

4.2.1 Existing Situation

Arrival at Crawford Lake is via the main entrance road, two parking/drop off locations exist, at the Lower Parking Lot and the Upper Parking Lot (main parking area.) There are three natural destinations at Crawford Lake; The Village, which is the natural focal point and educational facility; The Gathering Place, which provides classroom facilities, washrooms and a lunch room; and the Visitor Centre, which has a small audio visual theatre, a lunch room, classroom space and a gift shop. The access road between the Lower and Upper lots is less than desirable as it divides the main facilities at the property. The Iroquoian Village is located on the west side of the access road and the Visitors Centre is located on the East side of the access road. The Gathering place is located close to the upper parking lot, past the village. The process of arrival and orientation is less than desirable with the three areas being disconnected by the roadway. Repositioning the road way and parking lot would allow the three destination areas to be linked better by pedestrian access paths and trails and would enable easier flow around the property by visitors.

Much of the actual teaching and programming is currently done in the village and in the two existing longhouses. A short walk along a boardwalk nature trail takes visitors to Crawford Lake itself and allows interpretation of the meromictic lake and the discovery of the settlement site. Due to the high growth in numbers of school groups attending the educational programs, there has been a reduction in time spent in the longhouses and along the trails. The existing facilities are extremely heavily used at peak times by school groups allowing little availability of facilities and interpretation for other visitors at these times. Group usage at other times including evenings, weekends and holidays is not as heavy but could be expanded through alternative program development, marketing and perhaps over-night accommodation for school groups and others.

The existing visitor centre and ancillary facilities at Crawford Lake Conservation Area do not support the current requirements for excellence in education and programming envisioned by the *Strategic Plan* and *Limestone Legacy* plan.

4.2.2 Comparable Facilities

To gain a perspective on how other similar organizations approached the development of visitor centre/ educational facilities, several comparable facilities were reviewed. This review focused on the types of programs offered and the facilities that house and support these programs as well as costs depending on when the facility was built.

4.2.2.1 Ganaraska Forest Centre

This Ganaraska Forest Centre was recently built on the Oak Ridges Moraine by the Ganaraska Region Conservation Authority (GRCA). Visitors to the new centre include school groups, non-school groups, private functions and other GRCA learning events. The centre currently accommodates approximately 12,370 visitors on an annual basis of these slightly over 7,000 are schoolchildren (5,500 on a day trip basis and approximately 1,500 on an overnight residential basis). The centre has the potential to accommodate up to 19,370 visitors without a significant staff increase.

The Forest Centre is scaled to accommodate these visitors with an overall area of approximately 1,560 square meters (16,792 sq. ft.). The major features of the building include entrance, information corridor and entrance washrooms, great hall multi-use gathering space, teaching area with resource rooms, seminar and formal learning / board room, offices and staff lunch room, dormitories, commercial kitchen and service, maintenance and utility areas.

Cost of the facility was approximately $4.275 million not including exhibits. Detail breakdowns of the visitation statistics, building area program and costs are in Appendix V.

4.2.2.2 Black Creek Pioneer Village

The Black Creek Pioneer Village Visitor Centre is one of the largest centres of its type in the GTA. Completed over 20 years ago, the centre attracted approximately 50,000 schoolchildren in 2009 – with roughly 500 schoolchildren per day.

The centre is approximately 5000 square metres (55,000 sq. ft.) and includes a large amphitheatre, two large multi-purpose rooms, washrooms, gift shop, visitor reception and orientation hall, restaurant, administrative offices and storage.

4.2.2.3 Fort York Visitor Centre

A major expansion of the existing visitor centre at Fort York is planned. Attendance in 2006 was 82,000 visitors including 15,600 students and is expected to grow to approximately 130,000 visitors by year 10 of the plan. The expanded visitor centre is to open in year 5.

The visitor centre is subdivided into four zones:

- Zone A: Public / Non-Collection - lobby, classrooms, museum store, multi-use and visitor amenities
- Zone B: Public / Collection – collections, galleries that meet collection standards for security and environmental controls
- Zone C: Non-Public / Collection – collection storage areas, shipping and receiving, crate storage, conservation laboratories and handling areas
- Zone D: Non-Public / Non-Collection – staff offices and work areas

The existing interior exhibit and related space at Fort York is approximately 2,300 square metres (24,757 sq. ft.). The planned visitor centre will be 2000 square metres (21,500 square feet) in addition to the existing facilities. Assuming this is a net usable area figure, the actual building area is grossed up by 40% (1.4 X) to account for walls, stairs, service areas, entrance and exit space, mechanical and electrical space, etc.

4.2.2.4 Bruce Peninsula National Park Visitors Centre

The recently completed Bruce Peninsula National Park Visitors Centre is located adjacent to the Niagara Escarpment. The Centre features a 20 m tall observation tower, high definition theatre, exhibit gallery including a full size lighthouse, flowerpot and cliff as well as black bear, rattlesnake and ship wreck exhibits, gift shop and demonstration areas. During the 2008-2009 year, the centre attracted 198,000 visitors.

The overall size of the visitors centre is approximately 1,300 square metres (14,000 square feet), which is a reduced area from the originally project 17,500 sq. ft. The space is generally broken down as follows:

- Lobby 232 sq. m. / 2,500 sq. ft.
- Exhibit Gallery 418 sq. m. / 4,500 sq. ft.
- Theatre 107 seats
- Gift shop 28 sq. m. / 300 sq. ft.
- Storage / Workshop 47 sq. m. / 500 sq. ft.

This facility does not attract large numbers of school groups and, therefore, does not provide classroom space. Building costs were approximately $7.82 million in 2006 composed of roughly $4.0 million for the building and the balance for soft costs and exhibits.

4.2.2.5 Balls Falls Centre for Conservation

The Balls Falls Centre for Conservation was recently built at Balls Falls Conservation Area on the Niagara Escarpment. This is the example is similar to Crawford Lake as it is located within the Niagara Escarpment Parks and Open Spaces and had to follow the same guidelines in the Niagara Escarpment Plan. This visitor's centre provides a place where people can discover and learn about the area's rich historical past, the natural heritage of the escarpment, conservation and culture through a series of interactive exhibits and displays. Designed and built to have a limited impact on natural resources, this award winning LEED Gold certified facility features permanent and temporary galleries. The centre is open daily and offers a variety of programs and special events throughout the year. Most of the curriculum-linked programming is conducted outdoors.

The facility is approximately 1,115 square metres (12,000 sq. ft.) in size with approximately 55% of the space (613 square metres/6,600 square feet.) devoted to visitor services, 30% (335 square metres/3,600 square feet.) to exhibit space, and 15% (167.25 square metres/1,800 square feet.) to administrative and operational uses. Two exhibit galleries can be used for school tours / programs accommodating approximately 35 people in the larger gallery and approximately 15 people in the smaller gallery. The one large meeting space can be divided with a moveable wall to form two rooms. The large space can accommodate approximately 150 people at tables and 200 in chairs. School groups are substantially fewer than what is expected at Crawford Lake Conservation Area.

Costs of the centre were not available.

4.2.3 Best Practices

Having reviewed these facilities, it is clear that each is unique and responds to its special needs and program requirements. From that perspective it is difficult to draw exact parallels or applications, however, it is possible to learn from each and draw conclusions that would be applicable to the proposed interpretive and educational centre for Crawford Lake Conservation Area. The factors include:

- Ensure the facility is unique to this site and speaks to the special natural and human history at Crawford Lake Conservation Area – there should be no place like it;
- Ensure the facility is large enough to accommodate future anticipated growth in visitation;
- Ensure the facility is flexible enough to accommodate a variety of programs, group sizes and changes in venue type quickly;
- Ensure that the exhibits convey the interpretive themes clearly, address both natural and cultural heritage messages and are exciting and interactive;
- Ensure that the indoor and outdoor educational programs are closely linked and mutually supportive;
- Provide a rational zoning of the facility to allow for public and non-public space as well as collection and non-collection spaces, thereby providing gallery quality security and environmental controls for only those areas where required;
- Seek LEED certification and utilize building design strategies (such as green roof, solar panels, rainwater harvesting, low flow toilets, etc.) that can be used as part of the core environmental interpretive messaging;
- Ensure the designs for the building and the site landscape are cohesive and mutually supportive;
- Provide appropriate public support services and amenities for all group types and sizes;
- Ensure that there is sufficient revenue generating space in the building including rental spaces, support facilities such as a kitchen and gift shop;
- Ensure that the facility itself and related site programs create minimal impacts on the site relative to sensitive natural heritage areas, cultural heritage and archaeological zones and the visual character of the site and landscape.

It is recommended that Conservation Halton carry out a detailed feasibility study for the proposed interpretive and educational centre to ensure all factors are considered including:

- Rationalization and possible re-purposing of existing buildings,
- Detailed space-planning,
- Estimate of anticipated costs,
- Exact location and architectural style of the facility,
- Value engineering,
- Interpretive themes,
- Phasing and
- Potential for fund raising.

4.2.4 Preliminary Building Space Program and Costs

Based on the above evaluation of the existing conditions and visitor experience as well the review of comparable facilities, it is recommended that a new interpretive and educational centre be constructed at Crawford Lake Conservation Area. The proposed interpretive and educational centre would be located within the Development Zone of the Park, immediately to the north of the hedgerow north of the

Iroquoian village. The entrance road would be re-routed to the west of the village, moving up the hillside to the new parking area north of the hedgerow. This would eliminate the conflict between arriving traffic and pedestrian circulation. The design of the road and parking areas would sensitively integrate with the site grades, allow infiltration of water to ground water, provide natural surface drainage, and add native species shade trees and landscape development to the parking lot, road and arrival areas. Outdoor educational programs would continue to be held within the Village as well as near the lake. Upgrades to the trails, boardwalks and related pedestrian areas will be required to provide an appropriate base structure that will guide visitors to these areas to ensure minimal impacts on the site features. An active Visitor Impact Management program is also proposed to monitor and address the anticipated increased visitation to the Crawford Lake Conservation Area.

Repurposing of the existing 632 square metre visitor centre and the 117 square metre Gathering Place have been discussed during this planning process and will be part of the mandate of the feasibility study mentioned above. Possible uses for the gathering place are; becoming a rentals space for meetings or public events, or to like-minded groups (e.g. the Bruce Trail Club). The possible use for the Visitors Center is; Overnight Accommodation for students on extended field trips, this will provide a higher quality experience for educational programs and better use of our facilities. This would allow for longer programing hours, gain a deeper appreciation for the natural history, environment and is a better utilization of space at Crawford Lake. Currently the NEC does not allow overnight accommodations in Noble Parks, however during the Niagara Escarpment Plan (2005) review in 2015, Conservation Halton requests that there is a review of Noble Parks and the facilities permitted within these parks, to permit overnight accommodations for educational purposes, similar to that of recreational parks.

Based on the assumed educational programs and projected visitation a preliminary building program for the new interpretive and educational centre is proposed as follows:

Program Function	Area(m²)
Arrival / Admissions / Orientation	30
Cloakroom	20
Presentation theatre(s) w/ AV	200
Classrooms	200
Multi-use / Assembly space / lunch room	200
Interpretive Display space	200
Gift shop	50
Washrooms	80
Kitchen / Food preparation area	20
Storage	25
Staff offices, meeting room, washrooms	60
Subtotal – Net building space	**1085**
Allow gross up @ 20% (minimum)	217
Total Gross Space Requirement	**1302**

Based on this building program a preliminary estimate of anticipated cost is outlined below:

Total Gross Space Requirement	1300
Cost per square meter	$3,500
Net Building Cost	$4,550,000
+ Site Development / Landscape (7%)	$320,000
+ Exhibits (200 sq. m. @ $1,600 / sq. m.)	$320,000
+ Kitchen (20 sq. m. @ $4500 / sq. m.)	$90,000
+ Furniture and Equipment (3% of $7mil)	$140,000
+ A/V Budget (7% of $7mil)	$320,000

SUBTOTAL	**$5,740,000**
Soft costs + Fees (20%)	$1,148,000
Access Road+ Parking Lot (10,000sq m @ $300/sq. m)	$3,000,000
TOTAL Development Cost	**$9,888,000**

4.2.5 Potential Infrastructure Layouts

One possible layout of the facilities to be built at Crawford Lake Conservation Area is with the interpretive and educational centre (new visitor centre) serving as the hub, directing people to the area of interest to them at the moment, whether to the native village, the special events area or off to the hiking trails and restoration demonstrations. Figure 4-2 below illustrates the relationships between types of attractions and related amenities as they would be placed if the interpretive and educational centre were constructed north of the village as is anticipated.

A preliminary flow diagram is reproduced here as Figure 4-2.

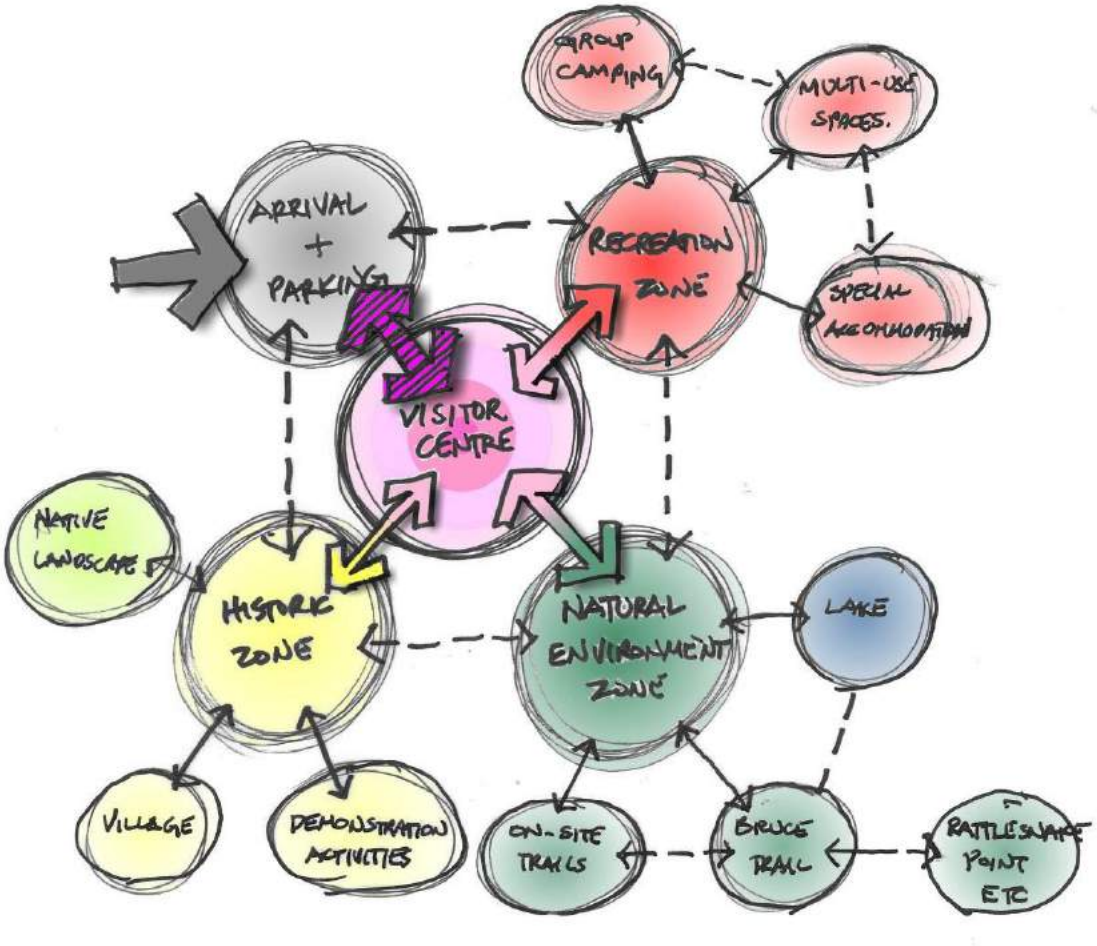
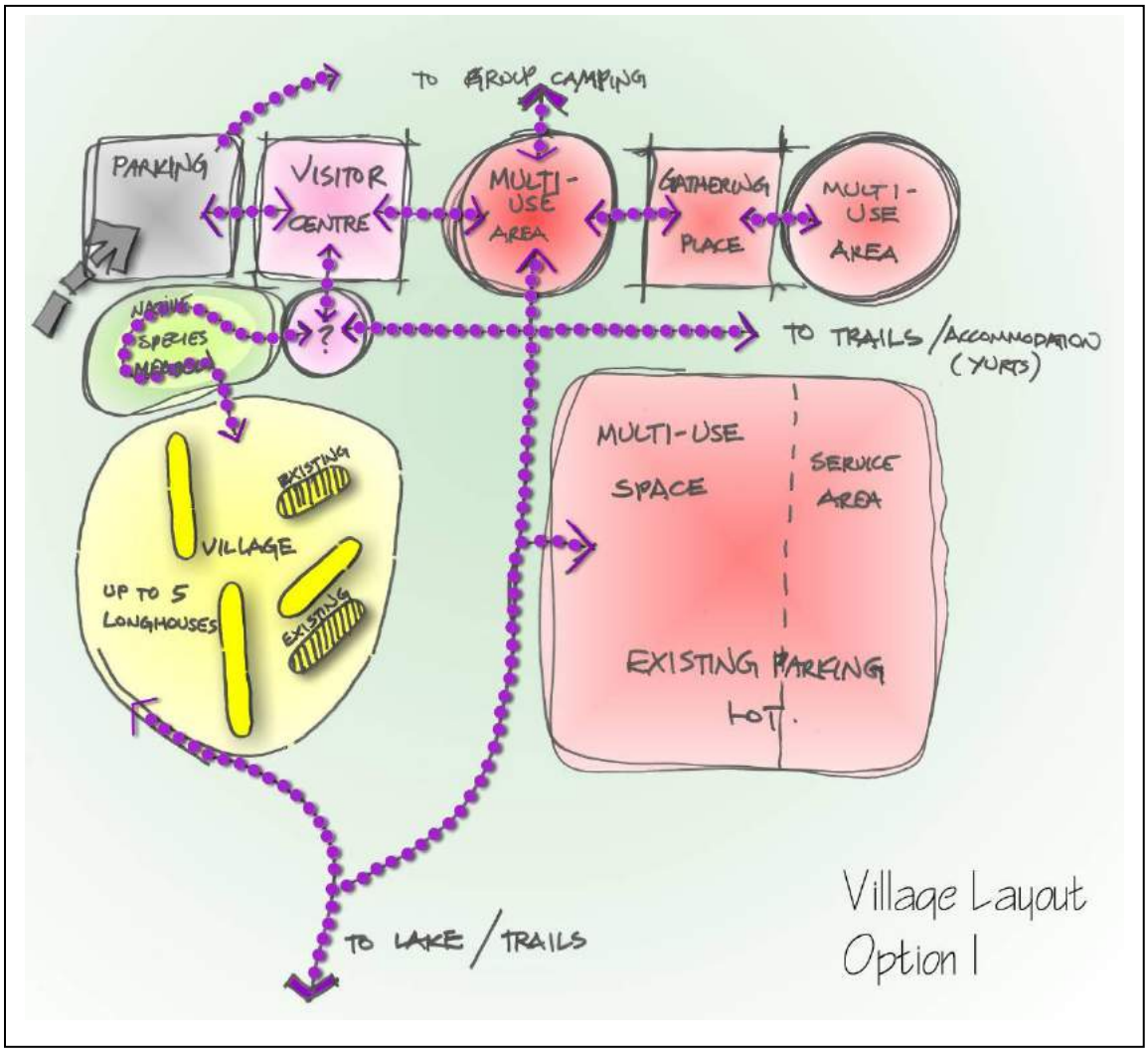


Figure 4-1: Visitor Flow Diagram

A potential redevelopment option for the historic village itself is illustrated below. All five longhouses that have been mapped as occurring simultaneously in the site could potentially be rebuilt. Under this scenario, classes would be able to spend half-an-hour in the reconstructed "experience spaces" given



the expected increase in schoolchildren's visits (from 8 to 16 groups per day).

Figure 4-2: Village Layout

4.3 Preliminary Discussion of Interpretive Program

This section describes the underlying rationale and interpretive approach for the thematic program at the Crawford Lake Conservation Area. The themes are based on the assumption that the conservation area continues to offer visitors a range of programs dealing with the natural environment of the escarpment. However since similar activities are offered at the other escarpment conservation areas, the programs described below have been proposed to highlight the features that make Crawford Lake Conservation Area unique: the meromictic lake for which it is named and the reconstructed First Nations archaeological site. In addition, Crawford Lake Conservation Area is designated a Nodal Park

within the NEPOSS – therefore, it has a significant role as a point of interpretation and information relative to the Niagara Escarpment. The themes will allow Conservation Halton to address key goals in Conservation Halton's *Strategic Plan* such as building awareness of Conservation Halton conservation areas as regional destinations and be in keeping with the "portfolio" approach being proposed to organize the development of Conservation Halton's various properties.

4.3.1 Benefits of a Focused Approach to Interpretation

A focused approach to interpretation should be designed, which would identify a few (3-5) strong related story lines or themes and orient all of the exhibits and content around those themes, is in our view a superior approach to interpretation than a more general approach that would feature a large number of largely unrelated displays. Reasons for this are:

- A more memorable visitor experience: The human mind can only hold so many ideas relating to a given idea at once. A few strong and interrelated themes are much more likely to be remembered and have a longer term impact upon visitors than a collection of what may be perceived as unrelated and unconnected story lines.
- Greater potential for branding: A few strong and interconnected themes, especially if they tell a unique story within the marketplace of potential cultural experiences in the area (say the GTA), has a much stronger potential for branding and recognition than the 'smorgasbord' approach. This, in turn, can benefit Conservation Halton overall by providing it with some strong and distinct elements in its portfolio of products and experiences that it can offer to the market.
- Greater potential for sponsorship: A strong and positive identity associated with distinct themes is, as well, more likely to attract corporate sponsorship (from corporations and foundations whose mandates are aligned with the story lines being interpreted). A more 'general' offering is less likely to attract sponsorship, unless the overall visitor numbers are so compellingly high that is becomes attractive for that reason alone.

4.3.2 Summary of the Proposed Theme Direction

The theme of an informal learning environment (museum, park, science centre) is a distillation of the key learning and experiential outcomes for visitors to that site. Thus, the theme will be founded in the goals (and mandate) of the institution in question; without clearly articulated goals, a powerful theme is not possible.

What are the goals for the reinvention of Crawford Lake Conservation Area?

4.3.2.1 Content goals

- To take a culturally-based approach to the site and its stories, complementing the approaches followed in other Conservation Halton Conservation Areas, which are more focused on the environment
- To strengthen the focus on the story of the Iroquoian people who once lived here, as revealed by archaeology
- To "celebrate" the more recent history of settlement and land use in the area in the 19th and 20th centuries
- To explain the unique character and importance of Crawford Lake itself

- And as a Nodal Park with the NEPOSS, to communicate the special geological and biological character of the Niagara Escarpment

4.3.2.2 Institutional goals

- To appeal to as wide a potential audience as possible, recognizing that many area residents are new Canadians
- To be innovative and outstanding in its programming and exhibits
- To create a facility that will attract major financial support from donors and funders
- To make links with a variety of local and regional groups who can act as partners and supporters

Fundamentally, the theme statement has to deal with the content goals, rather than the institutional goals. The theme expresses what the visitor is to learn or feel not how the institution intends to make this outcome happen. The implementation of the theme statement is a further step that would be dealt with once the statement is confirmed.

When the content goals are diverse and relatively unfocused, the solution is to make choices about priorities among them. What goal is most important, and what goals are of lesser importance in the bigger picture? If such choices cannot be made (i.e. if everything is equally important), the outcome for the visitor will be unfocused, potentially confusing and less than effective at conveying any of the multiple messages. The relative importance of the content goals is shown by the order in which they are listed above (with the most important first).

4.3.3 Interpretive Themes

The interpretive themes offered at Crawford Lake Conservation Area will be directed towards all conservation area visitors. The primary objectives of interpreting will focus on the biological, physical and cultural features that are found within the conservation area and its surrounding regional context.

Escarpment Heritage Journeys has been proposed as an interpretive theme for Crawford Lake Conservation Area. This theme may be further developed and refined given the evolution of interpretation theory and objectives. Additional programming may be created outside of this theme.

4.3.3.1 Escarpment Heritage Journeys

For thousands of years, the Niagara Escarpment has been occupied by people seeking to benefit from its resources geological, biological and cultural. First Nations people lived and visited here long before the arrival of Europeans, and have continued to do so ever since. Settlers arrived in the 1800s, making a living on the Escarpment in ways that have left imprints in the landscape, visible even today. And now people from the cities and towns that border its length come here to enjoy a natural environment. A visitor to Crawford Lake Conservation Area will explore these Escarpment Heritage Journeys and learn how different groups of people have adapted to and used this amazing landscape feature, and how ideas about the meaning and importance of the escarpment have changed over time.

4.3.3.2 Philosophy

The Crawford Lake Conservation Area includes a unique blend of both cultural and natural resources. For many visitors, the cultural stories of First Nations life 600 years ago, focused on the reconstructed homes of the people who lived here, are both accessible and involving. The natural stories of the

special character of the lake, and the geology and biology of the escarpment require the visitor to move out from the central village, expend more energy in walking the trails and put together their experience from a series of individual cues and small pieces of information about the landscape. For some visitors this is an exciting and engaging process; for others it lacks the structure that they seek in an informal learning experience. As a result, the current visitor experience at Crawford Lake Conservation Area tends to be either primarily about experiencing the Iroquoian village, or primarily about exploring and enjoying the landscape, depending on the visitor's interests, time budget and energy level.

However, both staff and visitors have expressed an interest in an approach that combines cultural and natural experiences into a single interpretive package; this interpretive option is intended to meet this goal in an innovative and memorable way. The archaeology of the Crawford Lake Conservation Area site strongly supports such an approach, providing extensive information enabling the story of the Iroquoian village to be effectively linked with that of the lake and escarpment. Because the landscape at Crawford Lake Conservation Area remains relatively similar to the way it was when the village was inhabited (compared to other areas of southern Ontario which have undergone major physical changes), this location has the potential to connect the First Nations and natural history stories of the Meromictic Lake, Niagara Escarpment and biological heritage.

In addition, because the sediments at the bottom of Crawford Lake preserve particulate matter such as pollen, they provide a record of hundreds of years of human activity in this landscape. Iroquoian farmers, European pioneers and even current conservation area users have all left their trace on the environment, one that has been recorded in the lake. In addition, there is direct archaeological evidence on the property (such as the pioneer ruins on the Nassagaweya Canyon Trail and the Crawford cottage site) that illustrates the use of the land by later arrivals; these could help visitors to explore comparative stories about other approaches to living on this particular landscape.

Thus, the Crawford Lake Conservation Area would continue to focus on the people who archaeology reveals lived there 600 years ago as well as right up to the present time, but broaden the interpretive lens to deal far more with their interaction with the landscape of lake, tableland and escarpment.

This approach would retain and build on the extensive knowledge base already developed about the Iroquoian village and its people, rather than requiring the Crawford Lake Conservation Area staff to develop new expertise in much less familiar areas, such as the larger history of First Nations in Ontario, or the processes of archaeology. Strong collaboration both with First Nations groups and with academic institutions with relevant programs would be essential to creating a network of consultants for site operations and programming.

The role of Crawford Lake Conservation Area as a Nodal Park along the Niagara Escarpment is another clear opportunity for interpretation at the site. This presents the opportunity to introduce the other escarpment parks within the Conservation Halton portfolio as well as other parks in this and other segments of the escarpment such as Ball's Falls Conservation Area (in the Niagara Peninsula section of the escarpment), another nodal park operated by the Niagara Region Conservation Authority. Ball's Falls Conservation Area has a major visitor interpretive centre focusing on the escarpment and local heritage features. With the added historic elements of the Meromictic Lake, the reconstructed Iroquoian village and the early settlement features, Crawford Lake Conservation Area clearly has significantly more interpretive and educational potential, much of which ties into the Ontario school curriculum and provides immersive experiences for students.

4.3.3.3 Interpretation

A visit to Crawford Lake Conservation Area would involve two elements: an encounter with (and immersion in) the reconstructed village, and an exploration of the landscape around the village to understand how the people who inhabited the village lived in and on this natural environment. The key idea to be communicated would be that while the village is the most obvious and concentrated expression of how the Iroquoian people lived 600 years ago, in fact they spent much of their time out in the landscape, engaged in activities that linked them directly to the natural environment.

Thus visitors would come to understand the way the village and landscape are interconnected through the lives of the Iroquoian people … through activities such as agriculture, hunting and fishing, gathering materials to make buildings, and through spiritual connections.

In other words, for the people who once lived in these longhouses, the place where they lived was not just the village and its immediate vicinity, but a much larger region encompassing many square kilometres. Not only did they draw resources from more distant areas, but also once in every generation, the whole village would move to a new location within the region. Over time, the community would have built up a rich and detailed knowledge of, and relationship with the landscape, including a web of cultural meanings interwoven with the evident biological and geological features.

Interpretive offerings would enable visitors to explore this landscape (including plants and animals) "through the eyes" of the Iroquoian inhabitants. For instance, they could look at the physical structures in the village in terms of the resources that would be required to build them, find where these were located on the larger park grounds and learn how these resources were protected or depleted over time. In order to convey more effectively the amount of food required by a village of this size, a much larger area could be cultivated in the staple food plants (corn, beans and squash).

Interpretation could use this visual expression of the scale of agriculture, as a starting point for understanding the amount of work needed to produce it. Naturally, considerable resources would be needed to maintain an agricultural zone, suggesting school groups might be used to assist in the ongoing weeding (just as their similarly-aged predecessors did 600 years ago). Thus, a school tour might follow the daily path of a First Nations child: from longhouse to other parts of the village, out into the agricultural area to tend corn, beans and squash, and then back to the village via the lake, picking up water on the way.

Trails and tour routes would be expanded and developed to link key resources that the people might have used, changing seasonally as particular plants and animals come and go in the environment. Self-guided interpretive trails for casual visitors would not only link key locations together, but also communicate how First Nations people found their way across the landscape, often without the benefit of defined pathways. At appropriate locations within the conservation area, visitors could find accurate representations of the traces left by Iroquoian people, particularly a representation of a village a few years after it was abandoned.

The interpretive and educational centre would be primarily devoted to orienting the visitors to the landscape beyond the immediate vicinity of the village, and to communicating the parts of this story that are not physically accessible to most visitors, including the larger regional context, and the way in which activity patterns changed with the seasons. Comparisons between First Nations approaches to landscape and those of Euro-Canadians could be introduced here, with an interpretive approach that emphasizes visitor engagement and discussion of the ideas. For instance, what resources attracted the Iroquoian agriculturalists to this area, and how do these compare to the landscape features that

brought pioneers to the area? Based on this evidence, how did each group view their relationship with the land? A pioneer-focused educational program could link to the Grade Three curriculum element on pioneer land use, and so broaden the scope of Crawford Lake Conservation Area's popular Grade Three life in the Longhouse program.

Additional interpretive displays in the new interpretive and educational centre might bring the story up to the present, to discuss how the land came to be owned and operated by Conservation Halton and the impact the authority has had on the landscape. Such an approach naturally leads to discussion of the idea of stewardship, and offers a chance for park visitors to explore issues related to protecting the park environment. One of the themes of the Conservation Halton Strategic Plan 2009-2013 is the delivery of strong community stewardship program—a display on land management might offer the opportunity to create a community of understanding for the goals and objectives of Conservation Halton among local visitors.

4.4 Other Physical Components

As part of the corporate branding work being undertaken by Conservation Halton, park furnishings and architectural features, including picnic shelters, should be custom designed such that all Conservation Halton conservation areas exhibit a 'signature design.' Design guidelines should specify the colour scheme and logos to be used for all features and the use of natural stone and timber. All park facilities and furnishings should be designed to be in harmony with the natural environment, but should also be vandal resistant.

4.4.1 Facilities and Amenities

The proposed range of facilities is intended to provide appropriate accessibility, development, programming and educational opportunities in the Crawford Lake Conservation Area, consistent with the site constraints and opportunities. In addition to an interpretive / educational centre to allow expansion of their popular school group program, the master plan proposes a special events area with a picnic shelter, more native gardens interpretive signage throughout the site and various site furnishings. The following development may be exempted from requiring a Niagara Escarpment Commission Development Permit, provided that the Niagara Escarpment Commission is satisfied that the developments are in accordance with Section 5.41 of Ontario Regulation 828/90.

The facilities and features of the master plan include the following approximate specifications:

4.4.1.1 Accessibility Upgrades – buildings and pathways

Rest rooms, parking lots and ramps should be carefully designed to ensure access. At least 900mm of level, cleared space should be provided to the side of benches for wheelchairs. Provide plenty of space at scenic overlooks for persons to watch and listen. Safety rails must be carefully located to ensure that the sight line of persons in wheelchairs is not blocked.

4.4.1.2 Signage

<u>Signage Program Hierarchy</u>

Trail signage is an important element that enhances the trail experience and provides guidance to the user. Signs provide four major functions - information, direction, interpretation and regulations; these are described below.

Informational

Informational signage provides detailed information about the use and identity of the trail and adjacent features. This is usually conveyed using maps as components of the signboard. This type of signage also indicates trail conditions, such as steep slopes and trail amenities such as safety features, washrooms and look out areas.

Directional

Directional signage should be used to indicate the trail route, including changes in direction and / or straight portions of the trail, at determined intervals. This type of signage can also be used off trail, in open space indicating the route to nearby trail access points, at trail intersections or any point where a decision must be made by the user. At these points, information as to trail length, average duration and destinations or points of interest are important to note to allow users to make decisions as to the route to follow.

Interpretive

Interpretive signage provides information regarding natural, geological, cultural and historical features along the trails. These signs should be site specific and located at major interpretive nodes or at particularly exceptional viewpoints, with a surfaced viewing area between trail edge and sign. The information included on these signs should be concise, easy to understand for all age groups, and should ultimately improve user awareness and promote enjoyment of the trail and immediate area. Interpretive signs should be spaced out to enable the trail user to absorb the ideas and information provided. The educational / interpretive signage program at this conservation area is an important component of the VIM plan. Visitors will be educated about the importance and fragility of natural features; this type of education has proven effective in improving compliance with trail use guidelines.

The master plan has proposed an initial 20 interpretive signs (other than those located at trailheads); however, should it be decided in the future that more interpretive nodes or benches will be beneficial, the addition of such amenities is not proscribed by this plan. At the same time, it should be noted that Conservation Halton intends to increase the amount of digital interpretive material made available to its visitors. This would include downloadable audio tours available in several languages.

Regulatory

Regulatory signage provides trail users with the rules and regulations regarding trail use. This includes one-way and do not enter signs, among others.

<u>Elements</u>

All signage should be designed to suit the character of the natural surroundings and must relate to approved park activities, interpretive and recreational programs or special events within the park. Third party signs of commercial billboard or signs for businesses are not permitted. NEPOSS and the World Biosphere Reserve logos and information will be represented on trailhead signage and other places deemed appropriate

- Entrance signage – main entrance sign and Conservation Halton Conservation Area directional and cross-marketing signage.
- Interpretive signage
    - Interpretive programs at Conservation Halton's conservation areas are meant to educate visitors about the unique natural heritage and cultural features in the

respective areas and the importance of preserving them, including guidelines for low impact recreational activities.

- Minimum of twenty interpretive signs: escarpment, Meromictic Lake, forest, settlement history, trail etiquette, impact management and describing the natural heritage of the conservation area.
- Replace interpretive signage for Iroquoian village, native species teaching trail and the moccasin walk based on study to determine best public needs
- Language outreach upgrade.

4.4.1.3 Roads and Parking

Future road and parking upgrades will only be done after investigations for archaeological potential. Road and parking lot upgrades include testing the base to be sure it is able to hold up under traffic. Where it is found to be weak, it can be excavated and rebuilt with appropriate layers of compacted gravel. In all areas, grading will be carried out to ensure a smooth surface with appropriate slopes for drainage. Bioswales are vegetated ditches that surround the parking lot and roadway such that any pollutants will be filtered out near the source before rainwater or snowmelt disperses in the natural environment.

- Automated gated structure with payment system
- Access Road
  - The process of arrival and orientation is less than desirable with the main park features being disconnected by the roadway. Repositioning the road way and parking lot would allow the park feature to unified. The entrance road will be re-rerouted to the west of the village, moving up the hillside to the new parking area north of the hedgerow. The design of the road and parking areas would sensitively integrate with the site grades, allow infiltration of water to ground water, provide natural surface drainage, and add native species shade trees and landscape development to the parking lot, road and arrival areas.
  - Improve Road - 3100sq meters with stone chip surface
  - New Road granular -2000sq meters
  - bioswales - 1500 linear metres
- Construct new sustainable 250 car parking lot north of village
  - Stone chip surface – 7600 square metres
  - Bioswales – 600 linear metres
  - Space for six buses – 360 sq. meters
  - Shade tree planting – minimum 60 trees

    Large native species trees (80 mm caliper) will be planted near the main parking lots to shade parked vehicles on hot, sunny days.
- Upgrade existing parking area near gatehouse
  - 2500 square metres
- Overflow parking areas

- stabilized surface - 3000 square metres
- bioswales - 200 linear metres
- shade tree planting - minimum 20 trees
    - Smaller trees will be used in overflow parking areas and protected with fencing until they reach a size that is unlikely to be damaged by drivers.
- This area will also be used as unserviced special permit camping. Camping will only be permitted upon approval from Conservation Halton and for specific purposes e.g. Metis POW Wow, Scott jamboree. This will not be a regular camping area.

- The existing roadway will be rehabilitated into a trail to allow better pedestrian flow throughout the site and the parking lot east of the current visitors centre will be rehabilitated to turf, to be used for special events.
- Rehabilitate existing upper parking lots by Gathering Place into naturalized grass open space, and allow for natural regeneration of the peripheral area. This area will become a special events space and large functions.

4.4.1.4 Picnic Facilities

- One 115 square meter open air picnic shelter, located near the existing Gathering Place in the special events area. The shelter will be available to rent
- 20 picnic tables
- Site furnishings such as bike racks, garbage receptacles and benches

All site furnishings should be purchased at the same time in styles compatible with each other and with the natural scenery. See Figure 4-4 for examples of potential site furnishings.

4.4.1.5 Other Infrastructure Development

- Provide additional educational facilities and opportunities to experience key site features
- Repurpose existing building
- The Gathering Place will be turned into a rental facilities for meetings, events or clubs
- The Visitors Center could be repurposed as an overnight accommodation for school groups. This will allow for extended field trails, and providing a higher quality experience for educational programs and better use of the facilities. At Crawford Lake, this would allow for longer programing house, gain a deeper appreciation for the natural history, environment and is better utilization of space at Crawford Lake. During the design and construction of the new interpretive and educational centre we will determine if the repurposing to an overnight accommodation is a feasible project and if the need for this type of building exists. Currently the NEC does not allow overnight accommodations in Noble Parks, however during the Niagara Escarpment Plan (2005) review in 2015, Conservation Halton requests that there is a review of Noble Parks and the facilities permitted within these parks, which may permit overnight accommodations for educational purposes.
- Construct additional site features such as a native garden and healing garden
- Site services upgrades: water, sewage disposal, electrical

Figure 4-3: Master Plan Detail

CONSERVATION HALTON

Crawford Lake Conservation Area

Figure 4-3

Master Plan Detail

Recent Reforestation

Proposed Car & Bus Parking

Proposed Visitors Centre

Native Gardens

Grinding Stone

Palisade

Reconstructed Village

New Entrance Road

Vault Toilet

Existing Gatehouse

Mature Reforestation

Overflow Parking & Camping

Naturalization Area

Maintenance Building and Yard

Open Field Archaeological Site

Proposed Special Events Area with Picnic Shelter

Re-purposed Gathering Place

To be Decommissioned Trail

Rehabilitated Parking Lot

Existing Visitors Centre Re-purposed as Overnight Accommodation

Existing Amphitheatre

Crawford Cottage Foundation

Crawford Barn Foundation

Legend

- Conservation Area Boundary
- Other Conservation Area
- Road
- Contour 5m intervals
- Watercourse

Conservation Halton Trails

- Single Track
- Medium Service
- High Capacity
- Proposed Road
- Proposed Trail
- New Signage
- Existing Longhouse
- Proposed Longhouse
- Existing Structure
- Proposed Structure
- Historical Structure
- Public Access
- Service Access

W N S E

0 50 100 metres

SCALE 1:3,000

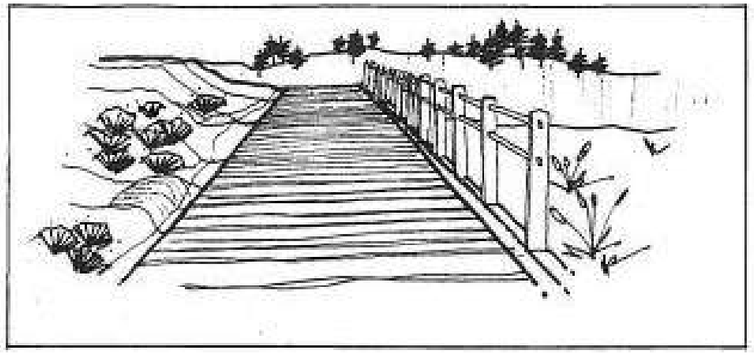
Figure 4-4: Amenities

CONSERVATION HALTON

Parks Master Planning

Amenities

FIGURE 4-4



Board walk Conceptual Sketch

Interpretive Node

Bench

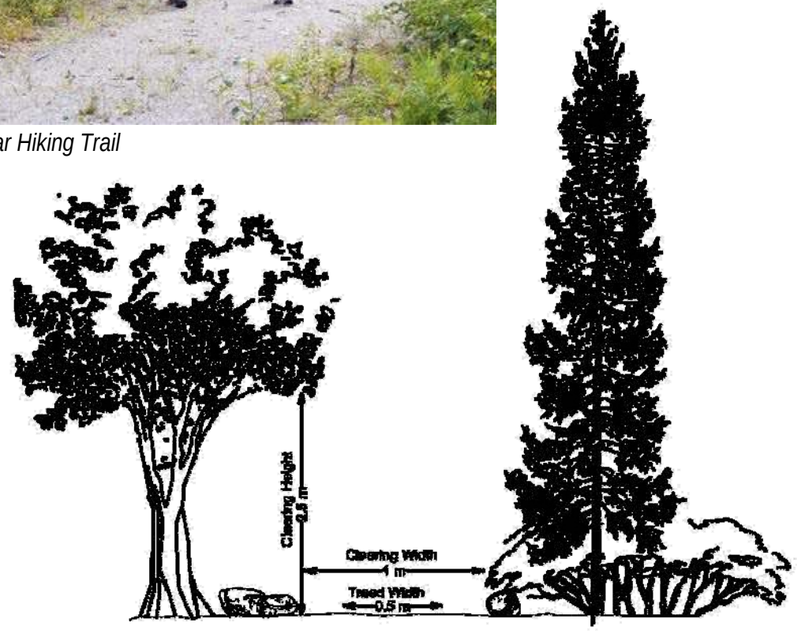
Boardwalks through Sensitive Areas

Surface for Overflow Parking

Granular Hiking Trail

Bridge

Picnic Shelter



Trail Construction

- Re-furbish two existing longhouses to provide maximum experience space
- Construct two fully functional longhouses, and one partial longhouse.
- Renovate and upgrade existing gatehouse
- Reconstruct palisade
- Add maintenance building (150sq. meters) and associated fenced maintenance yard (500 sq. meters.)
- Site Technology Upgrades; surveillance and telephones
- Develop Special Events Area: This is designating the area around the Gathering Place and rehabilitating the existing parking lots into a special events area. This space will be used for First Nation gatherings, brownie/girl guides jamborees. The proposed picnic shelter will also be located in this area.
- Upgraded toilets: 3 new standard units
- Repurpose existing day – use archeological overflow parking area

4.4.2 Trail System

As the population base in the region ages, participation in pleasure walking in natural environmental settings (hiking) is expected to be one of the fastest growing segments of outdoor recreation over the next 20 years. Therefore, Conservation Halton can expect their trail systems to be in high demand. **Proper trail construction is one of the most important factors in accommodating visitors without environmental degradation.**

Therefore, a key component of this master plan is to upgrade the trail systems so that damage to adjacent features will be minimized. Drainage issues will be addressed and trails delineated with logs or other natural materials. Select areas will be provided with elevated boardwalks. Such measures have been proven to keep the majority of visitors from straying off the designated trail. Seasonal or temporary trail closures will also be implemented as needed for added protection during sensitive periods of a species' life cycle, for regeneration of vegetation or to prevent erosion.

The preferred use at Crawford Lake is hiking therefore all trails will be built and managed for hiking activities. (Skiing and Snowshoeing are activities permitted in winter but the trails are not maintained for such activities) Single-track trails (narrow, substrate trails) are generally in less accessible areas and used mainly by dedicated hikers such as Bruce Trail members; these people are well versed in the 'Leave No Trace' approach to experiencing nature. The majority of visitor traffic would be encouraged to travel along major (medium or high capacity) trails rather than the single-track trails through strategic use of interpretive programming, mapping, and establishing and advertising places of interest. Additionally, as part of the trail upgrading proposed under the master plans, Conservation Halton will be assessing the risk to natural resources posed by trails being in nature reserve zone. Trail delineation, including the use of boardwalks, as well as rerouting some trails will be possible management responses. The action to be taken on the Bruce Trails in these areas will be discussed with representatives of the Bruce Trail Conservancy.

Currently, all Conservation Halton trail maps (pamphlets and signage) have trail regulations or trail etiquette guidelines printed on them. In addition, new interpretive signage will stress the value of the natural heritage features of the areas and encourage people to pursue recreational activities in low-

impact ways. Increased trail use does not necessarily lead to increased degradation, insofar as the social stigma of being seen disobeying trail use guidelines will discourage people from misbehaving. Volunteer stewards may be marshaled to patrol the trails on very busy days.

Where trails cross intermittent swales, streams or wetland areas, boardwalks, bridges or culverts are proposed. Boardwalks, bridges, and other water control measures will be constructed in such a way as to minimize impact on the natural features. Boardwalks should have a minimum width of 1.5 metres and be constructed of non-pressure treated timber materials. The exact location and length of bridges and boardwalks will be determined during the implementation phase based onsite conditions.

Trail Accessibility Upgrades

Hiking trails often can be made accessible to persons with physical disabilities. The types and needs of disabled persons should be recognized before designing such a trail. Conservation Halton staff will work closely with potential future users and local groups representing persons with disabilities when designing or upgrading trails.

For wheelchairs, crushed stone that has been rolled and compacted may be used. Visually handicapped persons can use natural trail treads with guide ropes or definite edges such as logs or other natural materials. Although accessible trails usually are located on level terrain with grades rarely exceeding 5 percent, acceptable grades will vary depending on the abilities and expectations of trail users. Regular rest stops should be provided on steep slopes.

Loop trails with cut-offs are desirable. Although trail lengths of less than 1.2 kilometres are often provided, a variety of trail lengths is needed to accommodate different abilities and expectations. Identify routes with a variety of different sights, sounds, odours and objects. Trails should follow a logical sequence to prevent the user's loss of direction.

4.4.2.2 Proposed Development

Infrastructure development actions for the trail system proposed by this master plan include:

- Decommission unauthorized trails (i.e., block entrances)
- Upgrade existing trail system to avoid wet areas and braiding - 1000 linear metres*
- Upgrade existing trail signage, blazing and mapping - 10 medium size signs and 40 directional signs
- Boardwalks replacement/enhancements - 600 square metres*
- Fencing or trail delineation or boardwalks along sensitive trail areas - 1000 linear metres (x2 sides)*
- Rehabilitate decommissioned road, into a high capacity trail. The trail will be 435 linear meters long and will be AODA complaint and serve as an emergency fire route.
- Decommission 512 metres of trail in the Crawford Lake Conservation Area and 280 metres of trail in the Crawford Tract II Resource Management Area
- Interpretive programming and equipment – GPS, personal media players, compasses, binoculars

** The figures provided throughout the master plan descriptions are rough estimates. Actual lengths/numbers will need to be determined through detailed site analysis at the implementation phase.*

4.4.2.3 Trailheads

Trailheads will include a trail information sign at the entrance that should inform users about the length and difficulty of the trail and the locations of rest stops, cut-offs and potential hazards. To accommodate certain physical disabilities, the sign should be mounted within easy reach of the trail at a height of 750-1000 mm and use raised or routed letters.

Further policies on trails are presented in Section 3.4.4. Figure 4-2: Amenities shows examples of appropriate trail construction.

4.5 Visitor Impact Management

Visitor Impact Management (VIM) program is a multiple step monitoring process developed for site managers to protect and enhance the natural resources and infrastructure components of a property. These processes usually involve substantial public participation, which may empower local residents, reduce conflicts between interest groups, expose multiple perspectives related to natural resources management and improve the quality of decisions. Public participation also increases visitor compliance with management strategies.

One element of the VIM plan will be to track visitation rates and monitor for impacts on the resources. Theoretical social carrying capacity levels have been determined for the various recreational activities allowed in the Crawford Lake Conservation Area; these will need to be revised if they prove to be unsustainable in practice.

It should be noted, however, that the term social carrying capacity no longer refers to an absolute number or formula-based decision. Rather, it refers to the desired visitor experience and resource conditions that are to be sustained (limits of acceptable change). Therefore, by managing to stay within desired resource and social conditions, the area is being managed within the "carrying capacity." Emphasis is on protection and enhancement of the natural environment and the visitor experience as opposed to accommodation of unlimited numbers of visitors. This is not a finite or absolute science – there are social values and judgments that enter into the equation; management actions also influence the ability of the facilities to accommodate visitors. Furthermore, adopting a carrying capacity is not a one-off exercise, but requires a continuing commitment to monitoring and decision-making.

4.5.1 Provisional Carrying Capacity Levels

Until enough data has been gathered to reassess these numbers, the following provisional carrying capacity levels will be assumed for Crawford Lake Conservation Area. At this time, theoretical carrying capacity for environmental considerations and conditions cannot be determined without further data collection and implementation of the VIM program. See Appendix I for a more detailed discussion of the calculations summarized here. These carrying capacity levels have been calculated assuming the following conditions have or are being met:

- Trails have been rationalized – avoid sensitive areas;
- Visitor Impact Management program is in place (includes temporary trail closure when necessitated by adverse weather conditions);
- Trails have all been upgraded during the first three years of the plan period– correctly constructed to avoid ponding, creation of social trails, etc.
- Impacts will be monitored and if unacceptable, remedial measures are taken.

Given the proposed facilities, the conservation area can accommodate 560 schoolchildren on supervised tours per day based on social constraints.

If tourists visiting the Iroquoian village do not engage in any hiking beyond the boardwalk around the lake, the facility could theoretically accommodate 3,440 people per day spread out between the village, the interpretive centre and the boardwalk. However, visitation will be capped at 2000 per day.

The special events area is expected to host about four weekend events per year with 500 people attending during the day and a have the overflow parking available for overnight event camping.

With the addition of some picnic tables and a picnic shelter, it is expected that the area can accommodate 250 picnickers on a peak day.

Given a comfortable density of hikers, which varies by trail classification, it was determined that the area can accommodate 505 hikers on a peak day. Crawford Tract II Resource Management Area can accommodate a further 38 people on its trails (see Appendix I for details of assumption and calculations used to derive this figure). These numbers were determined by Conservation Halton staff and the consulting team, and through extensive background research. It must be emphasized that at this point the defined levels are theoretical and must be validated by on-site monitoring. Moreover, carrying capacity numbers are based on the carrying capacity under ideal conditions and these numbers will periodically fluctuate downwards as required under the VIM program and weather conditions to ensure that the natural resource base remains ecologically sustainable. Subsequently, carrying capacity cannot simply be extrapolated into sustainable attendance numbers without the application of a modifying or "utilization" factor, which considers weather, market demand and so on.

This approach to social carrying capacity is based on identifying daily capacity of facilities rather than annual numbers. Visitor Impact Management programs are required to ensure that impacts to the site are minimal.

4.5.2 Visitor Impact Management Model

The visitor impact management program created for Crawford Lake Conservation Area is modeled on the *Kelso Conservation Area Master Plan* Visitor Impact Management plan. The nine steps described in the Kelso process model are a suitable starting point for all Conservation Halton holdings and should be expanded to include monitoring, reporting and implementation steps that actively involve volunteers, conservation area visitors and Conservation Halton staff (shown in Table 4-1). By revisiting the nine-step VIM model and introducing volunteerism through project initiatives in the monitoring and implementation steps the lack of money and staff that restricted the adoption of the VIM process are lessened.

4.5.2 Implementation

In the Stage Two report, it was demonstrated how students and volunteerism have played an important and often key role in many parks in addressing specific issues related to the sustainable development and management of natural resources and visitor experience (EDA 2010b). By revisiting the nine-step VIM model and introducing volunteerism through project initiatives in the monitoring and implementation steps, the lack of money and staff that restrict the implementation of the VIM process are lessened. Visitor Impact Management programs are not without costs, however. It is estimated that one additional employee and associated transportation costs will be required to administer the program at Crawford Lake and Mountsberg Conservation Areas (these two areas are jointly managed) (see Section 5.3.4 for costs involved).

The management plan must have an information technology (IT) component that informs the management team. Software models are available to provide more rapid analysis and evaluation, often in hours rather than days. Conservation Halton has recently upgraded to a new Point of Purchase (POP) software system providing information in real time and can now inform staff of capacity thresholds in all properties simultaneously. This will allow staff to direct visitors to properties that are receiving less traffic. Even social network sites and communication tools should be used to provide information and connect with volunteers.

Table 4-1: Visitor Impact Management Model

VIM Step	VIM Action	Description of VIM Action	Examples
1	Baseline Review	Stage One - Inventory and Analysis, which details the existing conditions of Crawford Lake Conservation Area. To be continuously reviewed as indicated by Step 9 - Continuous Improvement Committee.	Species at risk, rare species, veteran trees, invasive species, hydrology, vegetation communities.
2	Goals and Objectives	List of area objectives. Statement of Conservation Halton mandate.	Preservation, restoration, limited recreation.
3	Impact Indicators	List of specific physical indicators of impact and measures to be used during step 5 Monitoring.	Unauthorized access, trail closure success, restoration success, off-trail use, erosion of trails, visitor garbage, sensitive species success / survival rate, rare vegetation success / survival rate, invasive species.
4	Limits of Acceptable Change	Establish limits of acceptable change in addition to visitor threshold number / individual amenity capacity number.	Restoration efforts: Effect on existing communities, inspection / maintenance visits, visitor occurrence, trail use, refuse.
5	Monitor	Field conditions monitored by volunteers and Conservation Halton staff, supervised and led by Conservation Halton staff.	Monthly inspection or annual review.
6	Analysis	Analysis of field reports and surveys.	Inspection survey analysis.
7	Mitigation	Determine impact mitigation strategies using Conservation Halton matrix.	Trail closures, signage, surface trails, boardwalks.
8	Implementation	Implementation done by CH staff, assisted by volunteers.	Limited access for medium projects i.e. trail repair.
9	Continuous Improvement	Continuous review of goals and objectives by Working Committee. Recommendations to Step 1 to update process	Conservation Halton staff and community representation.

Finally, the management plan will create a Continuous Improvement Working Committee of Conservation Halton staff (operations, information technology, public relations and science) and consideration should be given to a rotation of select leadership from active environmental advocacy and naturalist groups, the Bruce Trail Conservancy, assistance organizations such as Halton Multi-

Cultural Council and local outdoor, hiking or recreation clubs. The committee would be tasked with setting specific goals and objectives that are aligned with the Conservation Halton mandate and other planning objectives including this master plan.

A VIM matrix, Table 4-2 outlines the indicators to be monitored for each activity permitted in the Crawford Lake Conservation Area as well as identifies potential management actions to ensure sustainability of the activity. A budget of $60,000 each year will be provided to cover the products and implementation of these actions recommended through the VIM monitoring program. The budget will be divided between four parks; Mount Nemo, Hilton Falls, Rattlesnake Point and Crawford Lake in accordance to need.

4.6 Environmental Management and Restoration Plan

4.6.1 Rationale

Crawford Lake Conservation Area is in a relatively high quality natural state. The forest area is fairly contiguous as is evident by Figure 3-7 of the Inventory and Analysis: *Stage One Report* (EDA 2010a). Larger scale habitat restoration would have limited ability to improve forest size, interior space or overall habitat quality. Wetland and riparian areas appear to be in fairly good condition and contained within large areas of natural vegetation. Grassland area in the conservation area is low but appropriate given the natural state of surrounding landscape. As a result, limited habitat restoration is proposed. The limited habitat restoration that is recommended should be directed towards improving habitat in key areas for targeted species, advancing the natural succession of plantation forests and curtailing the spread of invasive species.

4.6.2 Estimate of Management and Restoration Costs

A cost structure for undertaking restoration of proposed restoration areas is provided below. For invasive species and forest succession and plantation restoration, specific recommendations have been made in other sections of this report regarding the need for additional planning in order to appropriately target resources and assign costs (e.g. invasive species, forest management plan, etc.). Therefore, cost provided below are preliminary estimates. The total cost for the measures described below is estimated to be $1,054,800. An additional $15,400 over 10 years for the Species at Risk Monitoring Program set out in Section 3.7.5 is not included in this 10-year monitoring budget.

4.6.2.1 Plantation Patch Planting

A few plantation areas occur in Crawford Lake Conservation Area with a variety of attributes and proposed management criteria. The total area of plantation in the conservation area is approximately 46 hectares. The management of these, as well as natural forest areas, should be guided by an updated Forest Management Plan. This would contribute to the health of the overall forested area and help promote increased biodiversity in the plantation areas while maintaining the health of natural forest that experiences higher visitor traffic.

As resources are available, and prior to the preparation of a new Forest Management Plan, it would be beneficial to plant mid-tolerant to shade tolerant native tree species and appropriate ground layer plants within plantation areas to speed the transition to a mixed forest canopy that is capable of supporting greater diversity.

The restoration plan will consist of cutting a few canopy trees for each planting area to allow light penetration; preparation, including ripping of soil structure, application of mycorrhiza and fertilizers.

Plantings will consist of mid-tolerant to shade tolerant hardwood species with appropriate herbaceous plants typical of the more diverse forest environments surrounding the plantation. The Plantation Patch Planting is estimated at $1,035,000. This assumes approximately 5% of coverage of plantation areas.

4.6.3 Trailhead Closures

There are areas where unauthorized access to the conservation area is occurring; the adjacent landscape in the immediate area needs to be rehabilitated to discourage entry. It will also be necessary, if a new trail system is to be implemented, to close existing unsanctioned trails in the conservation area. Trail closures are to be completed during the first ten years of the plan; the cost for this work is included under the trails costing.

Trail closures form an important mitigation measure for protecting the natural and cultural features of the conservation area, which should reduce unauthorized access and access to pre-existing trails prior to the implementation of the master plan.

The restoration plan will consist of a limited amount of equipment use to source and install large fallen logs, boulders and gated structures. The trail closures will allow restoration of interior portions of the trail to progress naturally. Detailed design at the implementation stage will determine the specific design details. Trailhead closures, gate installations, fencing and vegetation planting will be executed by qualified Conservation Halton operations staff.

4.6.4 Invasive Species Management

Costs for undertaking invasive species removal should be based on the threat analysis and specific management needs identified. To provide the master plan with a preliminary cost, the following has been assumed: threat analysis, invasive species removals every year for the first five years, invasive species removal every second year for the next five years. Total estimated cost for invasive species management over 10 years is $19,800.

4.6.4 Rationale for Restoration Costs

Cost per hectare pricing has been derived from the environmental consultant's unit price schedule (Table 4-3 in Appendix I). These costs are based on historical supply and installation pricing for the estimated quantities of materials known at this preliminary stage. Each cost per hectare is a combination of three main factors including:

- General earthworks (e.g. clearing and grubbing, blade and grade or excavation);
- Re-vegetation (and bioengineering supply costs); and
- Management (e.g. invasive species, plant replacement, etc.)

Exact quantities of cut, fill and materials handling are not available at this stage. Assumptions of the area to be covered are based on standard contractor outsourcing costs related to recent smaller scale projects. These assumptions provide a budget framework on which the detailed design can be based and refined during the implementation stage. Substantial savings through the application of different restoration techniques may be achieved (i.e. volunteers, lower densities, smaller stock, etc.).

Table 4-3 in Appendix I reflects the cost per hectare for a contractor's supply and install pricing using certified nursery grown plant materials. These materials would be specified at a size that provides an established root system and gives the plant its best chance for long-term survival. The costs would be significantly lower if bare root, field-sourced, or dormant harvest cuttings (live stakes) were specified. These types of cost saving measures are often used in situations where the restoration site is remote,

qualified personnel familiar with these restoration planting techniques particular to these plant materials are available and where project schedules allow for dormant harvest and bare-root material to be used.

General earthworks and re-vegetation costs represent the cost of establishing the restoration treatment onsite. The way that this cost is implemented over time can be scheduled based on funding and staff availability. Recent project cost examples for comparison are provided in Table 4-4 in Appendix I.

The preliminary estimate provided reflects real costs associated with contractor installation and are for budgetary purposes only. This estimate represents an idealized budget for the purposes of providing a suitable restoration plan which maximizes the potential of each dominant habitat type of the conservation area. The installation costs noted here should be considered the upper end of pricing that would normally be submitted during the competitive bid process. Costs can be reduced through refinement of restoration methodology at the implementation stage, selecting additional areas for natural regeneration as the primary restoration technique or through Conservation Halton internal programming. Should Conservation Halton complete restoration using internal resources, one could expect that costs could be reduced by up to two thirds. This reduction in cost is estimated based on possible volunteer effort and historical labour and equipment costs known to Conservation Halton.

All contracted restoration projects should be performed by qualified restoration personnel. One-year warranty is assumed for contracted planting. Typical design or contract administration fees are not included in the estimated costs. Monitoring of restoration efforts are recommended with site inspections at a variety of milestone dates to determine success and potential need for adjustments.

4.7 Potential Land Acquisition

Conservation Halton has a land securement program which identifies land across its watershed which would be of interest to the Authority should they become available. Lands identified within the Niagara Escarpment Plan (2005) are included as priorities, as are lands adjacent to Authority existing land holdings. Acquisition would also focus on lands that serve as natural corridors or provide linkage between core areas notably along the Niagara Escarpment, Limestone Creek tributary and connection to adjacent conservation areas. Partnership purchase with the Bruce Trail Conservancy and the Trail Optimum Route are properties that would contribute to the objectives of NEPOSS by securing a permanent route for the Bruce Trail on public lands and are included as priorities. Partnership with other partners also raises priority level for securement. Conservation Halton works closely with the Region of Halton (and others) in the Regions Greenland Securement policy and identifies priority lands in this program as well. When possible in a willing seller – willing buyer scenario, Conservation Halton will seek funding in partnerships to secure additional lands based on these priorities. However, Conservation Halton does not have identified budgets for acquisition, nor does the Province provide support for this at this time. Currently, in the absence of funding, Conservation Halton is not actively pursuing property purchase, but can and does work with owners in securing lands such as through the Ecological Gifts Program where opportunity to do so presents itself. Land Acquisition was included within the Master Plan to help provide strategic context in line with the Securement program for future land acquisition should funding or the opportunity to acquire new priority property becomes available.

Section Five: Financial Implications

This section presents the financial analysis of the *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area*.

All dollar figures quoted are in terms of 2010 dollars. There are two fundamental economic assumptions on which this master plan is based:

- **Modest economic growth provincially and nationally:** The first assumption underlying this overall analysis is that there will be slow to moderate economic growth over the 10-year development plan of the site. The recent financial uncertainty - since 2008 - will likely have stabilized, but expectations for overall economic growth are modest when compared to the 1990 – 2008 period. Therefore, companies and institutions will be very conscious of receiving value for money in any transaction. For this development plan, expectations are that partnerships will need to clearly demonstrate a 'win/win' aspect with clear benefits articulated.
- **Significant local population growth:** A second key assumption, fully documented in the *Stage One Report* for Crawford Lake Conservation Area (EDA 2010a), is that there will be quite high population growth in Halton Region relative to that anticipated for the province overall[3]. By itself, this would mean significant additional attendance at the conservation area. As well, though, Conservation Halton intends to adopt a more aggressive and pro-active marketing stance, and this too will lead to increased attendance numbers.

The attendance and revenue figures projected in this report take both these assumptions into account.

5.1 Capital Costs of Site Development

5.1.1 Allocation of Costs Over the Development Period

The capital cost of the overall development plan for the *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area* over a 10-year period (measured in 2010 dollars) is just over $17 million[4]. Assumptions relating to the pace of this development in terms of the specific projects and developments that are anticipated over this period are shown in Table 5-1 in Appendix II.

Conservation Halton will endeavour to complete the proposed works at the Crawford Lake Conservation Area in a phased and orderly manner as funds permit. Certain variances may occur due to funding availability or changed circumstances. It is recommended that all the upgrades necessary to bring Crawford Lake Conservation Area up to the enhanced base level of services and amenities (see Section 3.2 above for further details) called for by this master plan be done in the first three years of the 10-year development program. In the mid-term phase of the project, the larger infrastructure items should be constructed or installed. The final phase will incorporate items that are not a high priority. Table 5-2 in Appendix II shows the specific amount of capital expenditure expected in each year.

It should be noted that in the *Stage One Report* for Crawford Lake Conservation Area, some $288,600 in deferred capital maintenance had been indicated (major projects noted that had been deferred related to gatehouse expansion, comfort stations, and road and parking lot resurfacing)[5]. All of these deferred projects have been captured in the site development plan presented here.

---

[3] Note that over the 2001 – 2006 Census period, Halton Region grew at a rate almost 3 times that of the province overall (17.1% compared to 6.6%). This higher growth rate is projected to continue over the planning period.

[4] For context, note that this is significantly less that the capitalized value of ecosystem services as referenced in Chapter 5.

[5] The Stage One Report had identified $426,600 in capital maintenance items that were required, $138,000 of which had already been spent, leaving $288,600 of deferred capital maintenance.

5.1.2 Labour Component of Development Costs

This capital cost budget implies a significant labour component. The development cost outlined here assumes that all activity is contracted out. Assuming that half the development costs are for labour and that the average construction worker income plus benefits is approximately $50,000 per year, a development cost of $17.3 million for Crawford Lake Conservation Area would imply approximately 173 person-years of labour being involved in the construction and development activities.

5.2 Attendance and Revenue Forecast

5.2.1 Attendance Forecast

Currently, the average annual attendance at Crawford Lake Conservation Area is estimated to be 84,000 (over the 2005 to 2009 period).

The attendance projections developed for this conservation area are based on recognition of four contributing factors. These are:

- Population growth;
- Marketing;
- Shorter vacations, closer to home; and
- Major development.

Each of these factors is further discussed below:

5.2.1.1 Population Growth

The population growth projections (as obtained from local planning departments) assume significant annual growth in most of the municipalities comprising the immediate market area that Conservation Halton serves, and from which most visitors come. Growth in these source markets will naturally result in an increase in attendance. Specific growth projections from these immediate source markets are shown in Table 5-1.

Table 5-1: Anticipated Population Growth Rates in Key Source Markets

Municipality	Anticipated Annual Population Growth Rate (to 2021)[6]
Burlington	4.53%
Oakville	2.28%
Milton	6.19%
Halton Hills	1.48%
Mississauga	3.89%
Hamilton	0.71%
Other GTA	1.17%

[6] Obtained from municipal official plans.

For this conservation area, a weighted population growth rate of 4.72% was calculated (based on the estimated proportion of total attendance from each individual municipal source market – see the *Stage One Report*, EDA 2010a).

5.2.1.2 Marketing

Conservation Halton intends to adopt a more aggressive and proactive approach to promoting its facilities to local, regional and potential tourism markets, through increased signage (e.g. Tourism-Oriented Directional Signage), social media marketing, more packaging, etc. This more proactive approach can be expected to result in greater levels of attendance than population growth alone would deliver. A conservative increment of 2%, over what would otherwise be the attendance, has been assumed to account for this factor.

5.2.1.3 Closer to Home and Shorter Vacations (so-called 'Staycations')

A major recent impact on tourism has been the recession of 2008 and stagnant to slow economic growth since then (which is foreseen to continue over the coming decade). This has caused Canadians to tend to spend leisure and vacation time on shorter trips that are closer to home, and that are thus less costly. This has been exacerbated by tightened United States border restrictions that make it more difficult for Americans to come to Canada and more difficult and problematic for Canadians to visit the United States. The result, somewhat paradoxically, has been an increase in the propensity of Greater Toronto Area residents to visit GTA-based attractions[7]. A conservative increment of 1% over what would otherwise be the attendance (i.e. from population growth alone) has been assumed to account for this factor.

5.2.1.4 Major Developments at Each Conservation Area

Within the development plans for certain conservation areas, there are major facilities being proposed that can be expected to have some influence upon overall attendance. For Crawford Lake Conservation Area, the $10 million interpretive and educational centre (new visitors centre), constructed in Years 4 and 5 and opening in Year 6, will have a major impact. (Additional utilization is expected from school groups as well as the public.) It is anticipated that this will increase utilization by 50% over what attendance levels otherwise would have been in Year 6 and onwards.

This forecast is based on an estimate of what the utilization of facilities and services at this conservation area **could be**; the market will deliver the level of attendance estimated here. The revenue and cost estimates presented in this section are based on this estimate of attendance. However, should Conservation Halton decide that allowing this level of use might damage the environmental integrity of the conservation area; it could limit attendance through a variety of strategies (higher pricing, closing the park at certain periods, limiting attendance on peak days, etc.)

Table 5-4 in Appendix II shows the attendance growth projection for Crawford Lake Conservation Area.

[7] For example, the total number of visitors to Conservation Halton facilities increased from approximately 568,000 in 2007 (all conservation areas plus Glen Eden) to 748,000 in 2009. This represents an annual growth factor of about 9.6% per year over this period. The 'population growth factor' described above would account for only about half of this growth rate. The remainder would be a combination of increased marketing (of which there had been some) and the 'staycation' factor as described here. Clearly, this factor can be significant.

5.2.2 Revenue Projection

At present, the revenue per visitor realized at Crawford Lake Conservation Area is:

Table 5-2: Crawford Lake Conservation Area Budgeted Revenue Projection

Total Budgeted Revenues, 2010	$369,500
Average Annual Visitation (based on 2005 – 2009)	84,000
Average Revenue per Visitor	$4.40

Note that this shows average **direct** revenue from visitors to Crawford Lake Conservation Area. Revenues that accrue to Conservation Halton as a result of annual membership passes (and that are thus not directly attributable to Crawford Lake Conservation Area) are not included here (although of course the visitors coming to the conservation area using these passes are reflected in the utilization figures shown above). This is, therefore, a low (conservative) estimate of the total revenue generation potential of the park.

Most of this revenue (76%) comes from the entry fees and the gift shop, with only a small proportion coming from facilities rental and other events.

Going forward, the proposed revenue strategy for Crawford Lake Conservation Area will be follows:

- To increase per person gate fees to $5 on average (reflecting the higher demand for the facility, as well as the higher value provided to users)
- When the new interpretive and educational centre comes on-stream in Year 6, increase the admission fees by $1 per visitor on average, to $6[8].

Table 5-6 (in Appendix II) shows the attendance and revenue generation estimates for the Crawford Lake Conservation Area under these assumptions.

5.3 Operating Costs of Site Development

The operating and maintenance costs associated with the operation of the site are estimated as follows:

- The current operating budget for the conservation area is assumed to continue;
- Salary costs for added staff for maintenance, security, visitor impact management, and interpretation;
- Additional maintenance costs associated with the new capital development;
- The incremental costs of an enhanced standard of care for trails and forest management;
- An estimate of species management and monitoring costs for the park over its 10-year planning period; and
- An increased marketing budget.

Each of these costs is discussed separately.

[8] This level of revenue generation per visitor is quite realistic: Black Creek Pioneer Village in the Toronto Region Conservation Authority generated revenue of over $20 per visitor in 2009.

5.3.1 Continuation of Operating Budget of Conservation Area

Table 5-7 (contained in Appendix II) presents the current 2010 operating budget for Crawford Lake Conservation Area (showing expenditures and revenues). As shown, current expenditures are approximately $337,000, most of which is wages, salaries and benefits. It is assumed that over the 10-year period these costs will continue (calculated in terms of 2010 dollars).

5.3.2 Additional Staff

Utilization of the facilities will increase because of overall population growth in the Halton Region, and in the neighbouring jurisdictions. This would be true even if no additional facilities or services were developed at the site. Additional services and facilities will require additional staff be brought on board over time. These additional staff will be employed directly at the conservation area, in primarily maintenance, visitor management and interpretive activities.

It is estimated that the current staff utilization at Crawford Lake Conservation Area is 3.07 staff (measured in terms of full-time job equivalents - FTJE). It is possible to estimate the additional staff complement under the new attendance forecast scenario as follows:

Table 5-3: Crawford Lake Conservation Area Staffing Projections for Development Scenario

Current Estimated Staff Complement (FTJE)	3.07
Percentage Growth in Visitors to 2021[9]	171%
Growth in number of FTJEs to 2021	5.25
Total number of FTJEs at Crawford Lake Conservation Area , 2021	8.32

The current average salary and benefits per position at Conservation Halton is $76,000[10] Multiplying this by the estimated growth in the number of FTJEs to respond to increased demand (i.e. the 5.25 positions referred to above) yields an estimate of the total additional wages and salaries required. (Again, bear in mind that all of the projections and estimates developed here are done in terms of 2010 dollars.)

Table 5-9 (in Appendix II) shows the staffing projections associated with the development plan for the site.

5.3.3 Additional Capital Maintenance Costs Associated with Development Scenario

An additional expenditure category for the conservation area will be the maintenance costs associated with the new development on the site. On average, annual maintenance and replacement costs associated with the physical infrastructure developed are estimated to be approximately 2 to 5% of the original capital development costs. This percentage would cover a wide range of specific cost elements as well as global corporate service support costs such as security, minor construction and maintenance, general ecosystem monitoring, ecosystem maintenance, etc. Because these will all be relatively new facilities, maintenance costs as the lower end of this range are reasonable. Accordingly,

[9] i.e. from the 2005 – 2009 average of 84,000 visitors annually to the anticipated level of 227,000 visitors in Year 10.

[10] Communication from Marnie Piggot, Conservation Halton, February 8, 2011. The average salary shown here is high because currently all employees have been with Conservation Halton for more than 15 years and are in supervisory or management positions. There are no full-time general labour positions at this time, which could have been used as a basis for this calculation.

2% of the cumulative development budget has been assumed as the additional maintenance and replacement cost[11].

Table 5-10 (in Appendix II) shows the calculation for the maintenance costs associated with the new development in Crawford Lake Conservation Area. As shown, this is expected to rise to just over $346,000 by the end of the development period.

5.3.4 Enhanced Standard of Care for Trails and Forests

In addition to the expected maintenance costs, an enhanced standard of care, relative to current levels of treatment, shall be implemented. Costs associated with this enhanced standard include monitoring and maintenance of the forest area for hazard tree removal and the cost for enhanced maintenance on trails. Hazard tree removal is estimated to cost approximately $39 per hectare and enhanced trail management is estimated at $1,000 per linear km[12]. As the area of the conservation area is set (323 hectares), this budget item (measured in terms of 2010 dollars) will be fixed. However, because new trails are coming on-stream over the development of the plan, this element will increase over time. Table 5-11 in Appendix II outlines these anticipated operating costs.

5.3.5 Estimate of Species Management and Monitoring Costs

Table 5-12 in Appendix II shows the costs associated with species management and monitoring (as outlined in Sections 3.7.5 and 4.4). Over the ten-year period of this master plan, nearly $20,000 will be spent on control of invasive species, and just over $15,000 on monitoring activities.

5.3.6 Marketing Budget

The current estimated marketing budget for Crawford Lake Conservation Area is $31,250[13], (excluding the provincial directional signs to the site – see below). However, in future, Conservation Halton wishes to move to a more active marketing stance where out-of-pocket marketing costs are funded as a percentage of overall direct revenues generated at the conservation area. (This is based upon the approach currently in place at Glen Eden, where the marketing budget is set at 2.5% of total direct revenues.) However, taking this approach to Crawford Lake Conservation Area now would imply a diminution in the total marketing budget. Accordingly, in the forecast of costs, we have assumed a flat marketing cost of $31,000 (rounding) until the increase in direct revenues from all sources is sufficient to bring this marketing budget above this threshold (which actually does not occur until Years 9 and 10 of the development period). Added to these costs is the annual fee for participation in the provincial signage program (TODS – see below).

5.3.6.1 Provincial Signage Program (TODS)

Another key element of the marketing budget is the cost of participation in the Tourism-Oriented Directional Signage (TODS) program, which permits qualified tourism operators to place their business signs along Provincial roadways. Offered jointly by the Ministries of Tourism and Transportation, the

[11] Actually, the maintenance cost is estimated as 2% of the cumulative new development costs to the *previous* year (no maintenance costs are assumed for new development in its initial year). So, for example, in Year 7, maintenance costs would be assumed for new development only up until Year 6 – development in year 7 is not assumed to need any maintenance until Year 8.

[12] Based on figures provided by a provincial park employee.

[13] Based upon communications with Hassaan Basit, Director, Communications Services, Conservation Halton.

TODS program provides way-finding and directional information to travelers throughout the Province of Ontario. Signs on the freeway display the business name and icon or logo. There is an annual fee per sign to participate in the signage program.

Specific assumptions relating to the deployment of TODS signs for Crawford Lake Conservation Area are four freeway major attraction signs @ $4,500 each (two off Highway 401 and two off the Queen Elizabeth Way).

Accordingly, $18,000 has been added to the marketing budget in each year for these costs.

5.3.7 Total Operating Costs

Table 5-13 in Appendix II outlines the total operating costs for the 10-year development timeframe of Crawford Lake Conservation Area, summing each of the foregoing six components over the period. At the outset of the development period, operating costs are estimated to be over $600,000 annually; by year ten, they are estimated to have nearly doubled to $1.18 million annually.

5.4 Net Operating Position

Table 5-14 in Appendix II shows the net financial position of Crawford Lake Conservation Area at the end of the 10-year development period, under the various assumptions outlined here. Note that at present, Crawford Lake Conservation Area is a 'profit centre' for Conservation Halton; the development plan presented here shows that its potential as a revenue generator can be enhanced significantly beyond this, although with a prolonged deficit over the first half of the development period.

One management approach would be to target a certain level of revenue generation per visitor each year in order to overcome the anticipated shortfall in these middle years. Table 5-15 in Appendix II shows that a very nominal surcharge of approximately $1 to $2 per visitor (on average) would be required in order to eliminate the shortfall in the years showing the highest deficit. This could be undertaken through an increase in the admission fee, or the annual membership fee (which permits access to all conservation areas), or possibly through more aggressive pricing for specific services and programs. The price-sensitivity of the offering at the conservation area would need to be examined; however, pricing could be one way to adjust attendance levels if it were thought that attendance levels were exceeding the capacity of the conservation area.

It should be noted that, at the highest level of surcharge that might apply, the cost of the experience at Crawford Lake Conservation Area is less than that of a movie.

Another related consideration would be whether or not pricing levels (in particular, admission fees) consistent with fees charged at other conservation areas was a desirable policy position. If so, then an average surcharge target for a group of parks would need to be considered. These management considerations will need to be addressed and adjusted periodically over the development period.

5.4.1 Rationale for Additional Investment in Conservation Halton

Conservation Halton creates significant direct economic benefit in the community. The operations of Conservation Halton, plus the expenditures of visitors who come to the region to utilize the programs and services offered, create nearly $12 million of additional gross domestic product (GDP) in Halton Region alone. This is associated with 274 jobs in the Region, $8.4 million in wages and salaries and $5.7 million in additional taxes paid. If this were a single business or industry, it would be recognized as a significant component of the economic base of the Region. Beyond Halton Region itself, there are further economic benefits accruing across the Province of Ontario.

In addition to the economic impacts, Conservation Halton provides a valuable service to the community in terms of 'ecosystem services' – the impact of the forest and wetlands maintained by Conservation Halton in terms of filtering and cleaning water and air. Ecosystem valuation quantifies the cost of providing these services commercially, as opposed to having conservation authority lands provide these benefits 'for free.' The estimated savings to society from these services provided by Conservation Halton's holdings are nearly $16 million annually.

Conservation Halton conservation areas provide a growing population with access to abundant, natural green space for leisure and recreation. More specifically, these spaces offer opportunities for recreation that promotes healthy living through physical activity and exercise. By keeping costs low, Conservation Halton conservation areas strive to offer accessibility to all residents while supporting culturally and socioeconomically diverse communities. In addition to serving local residents, as significant regional destinations, the conservation areas also attract tourists to Halton Region.

The availability of Conservation Halton spaces, programs and services adds considerably to the perceived quality of life in Halton Region. This in turn can be extremely valuable in attracting the highly mobile 'creative class,' those individuals most likely to create businesses, invest in the community and bring new ideas and energies into the region. Thus, indirectly, Conservation Halton operations add to the attractiveness of the region overall as a place to live and work.

5.4.2 Financial Sustainability Strategy

The master planning process has made it abundantly clear that:

- While the prime focus of Conservation Halton's conservation areas has been, and will continue to be, protection and enhancement of the natural heritage resources, it is also imperative to consider the social and economic components of the sustainability model;
- As growth in visitation inevitably increases, so too must the investment in infrastructure, amenities, related facilities and the visitor impact management that is required to protect and enhance the natural heritage features and, thereby, achieve and maintain the necessary balance between protection and usage;
- Protection of natural heritage resources requires key investments in:
    - Enhancements to existing facilities, infrastructure and amenities;
    - New facilities: educational, recreational and interpretive;
    - Protection and enhancement initiatives: visitor impact management, restoration, etc.

An annual base level of financial support should be sourced through Halton Region (the Province of Ontario and / or Municipalities, etc.,) as the main recipient(s) of the benefits provided by this conservation areas. This should result from (and possibly be correlated with) the significant population growth occurring in the region, which will by itself place a heavier demand on Conservation Halton's areas and facilities. A new and different business model needs to be developed for Conservation Halton; one that acknowledges the significant economic benefits conferred upon Halton Region by Conservation Halton and recognizes the pressures placed upon Conservation Halton by population growth.

Consequences of not providing adequate on-going capital funding may include the need to implement one or more of the following actions:

- Raise admission fees at specific conservation areas;
- Raise membership fees;
- Charge differentially at peak times;
- Limit visitation;
- Limit access to certain conservation areas;
- Cut back on some of the programs and services currently offered;
- Cutback the proposed capital development program or extend it beyond the projected 10-year timeframe with subsequent increases in cost.

Conservation Halton creates valuable environmental, social and economic benefits, and provides significant value-added services to Halton Region. To enable Conservation Halton to continue to provide these benefits, ongoing investment in Conservation Halton's conservation area facilities and programs is required.

5.5 Fundraising Considerations

5.5.1 General Orientation to Fundraising at Crawford Lake Conservation Area

The development plan outlined here for Crawford Lake Conservation Area offers the potential to solicit two types of support: the first for capital projects such as (in the case of Crawford Lake Conservation Area, the $10 million interpretive and educational centre), and the second for on-going operational support. Possibilities in this regard are discussed below.

5.5.2 Potential Sources of Support

5.5.2.1 Organizations and Foundations

Conservation Halton has a history of working closely with a number of partners: municipalities and municipal agencies; provincial government departments and agencies; and various environmental and related foundations and agencies. These partnerships are expected to continue.

In addition to approaching these traditional sources in terms of development projects and support for programming activities, there are additional foundations and funding sources that could be considered. A small sample of possibilities includes GLOBE Foundation, TD Friends of the Environment Foundation, David Suzuki Foundation, The Evergreen Foundation, Harmony Foundation and Unilever Canada Foundation.

Deciding which of these foundations might be the appropriate ones to approach for sources of support will be dependent on the specific development plans prepared for each of the conservation areas.

Additional working partnerships with First Nations, Métis Nation and local historical societies would not only strengthen programming but could enhance funding opportunities or support.

5.5.2.2 Corporate Sponsorship Potential

Given Conservation Halton's situation in a growing region with increasing demand, the fact that it has several sites with high visibility and profile, and its conservation mandate places it directly 'on trend' with the increasing interest in the environment, it has significant potential to develop partnerships with the corporate sector. Even though this may be difficult in the short term, given the current economic

situation, over the long-term timeframe of the plan developed here, corporate sector sponsorship should be a real possibility.

A number of potential corporate sector partners for Conservation Halton should be considered. Generically, these will include:

- Major employers in Halton Region (e.g., any company with over 100 employees);
- Companies with a track record of supporting local activities and events ;
- Companies who have previously supported or been associated with Conservation Halton (for example, those who have advertised in *Focus on Conservation*);
- Major consumer-oriented companies whose target markets are young families, active individuals, etc. (e.g., running-shoe makers, sporting goods manufacturers); and
- Companies throughout the GTA producing 'environmental' products or services (or companies that wish to position themselves as having an environmental or 'green' focus).

The importance of this last point cannot be over-emphasized. Given the growing awareness of, interest in, and concern about environmental issues, companies increasingly will wish to be perceived as environmentally friendly and 'green.' Association with Conservation Halton, a well-recognized leader in environmental and conservation issues, will be a logical route to developing immediate credibility and legitimacy in this regard. Other organizations with conservation mandates – for example the World Wildlife Fund – have been very successful in exploiting this route.

The kinds of sponsorship possibilities that could be considered include:

- Sponsorship of admission for some period (e.g., this free weekend admission at Hilton Falls Conservation Area brought to you courtesy of…);
- Sponsorship of specific programs or activities (which may be oriented towards conservation projects such as species protection or public programs such as specific lecture series, interpretive tours, etc.);
- Sponsorship of outreach programs for schools, community groups, etc.;
- Sponsorship of festivals and events;
- Major donations for capital facilities such as interpretive and educational centre (which could involve naming rights); and
- For major innovative projects, public-private partnerships (PPP) could be considered.

There is a wide range of potential benefits to potential corporate sponsors that should be stressed in any approaches made. These include:

- Positive exposure to the hundreds of thousands of annual visitors to Conservation Halton's facilities;
- Positive exposure in the various print and web-based promotional and informational publications of Conservation Halton;
- Depending upon nature and location of projects supported, significant exposure along major transportation corridors;
- Potential benefits for employees of corporate sponsors (e.g., discount admissions, reduced-fee memberships, access for company picnics, etc.); and

- Positive publicity and public relations.

A strategic implication for Conservation Halton is that they may need to develop or refine their policy regarding the solicitation and identification of potential partners and sponsors to ensure that only those partners who are strategic, serious and long-term about their commitment to the environment and will reflect well on Conservation Halton's own image and identity, are eligible.

The following evaluation considerations must apply to the selection of partners and sponsors for any given initiative:

- Ability to contribute materially to a needed program or service (either in-kind or financially);
- Their commitment to the overall operation according to the same standards adopted by Conservation Halton;
- Overall image and reputation as a good employer;
- Overall positive image as good corporate citizen;
- Operation in the watershed;
- Willingness to participate with Conservation Halton on a longer-term basis; and
- Willingness to become involved in other projects.

Just as Conservation Halton will scrutinize potential partners and sponsors using these criteria, so, too, will the potential sponsor evaluate Conservation Halton. Accordingly, it is imperative to maintain a positive brand and identity throughout the watershed and beyond.

5.5.3 Next Steps

The implementation of the development plan for Crawford Lake Conservation Area will not be undertaken in isolation from other Conservation Halton projects. On the contrary, Conservation Halton will have several major development projects underway simultaneously over the next decade: these include development plans at other conservation areas. Each of these has capital elements and operating support possibilities. In approaching potential sources of support, it will be important to adopt a consistent and coordinated approach to the market.

Accordingly, after the development plans for all of the conservation areas subject to this master planning process have been approved, a specific fundraising plan should be designed to assess the amount of funding that could be raised (capital and operating) and the most appropriate approach to be taken to potential sponsors (matching the nature of the projects requiring support to the needs of potential sponsors). As well, once this plan has been developed, Conservation Halton will likely need to retain assistance to manage the many activities that will be involved such as event organizing and sponsor contacts. This would be done in conjunction with the Conservation Halton Foundation.

The fund raising program must consider three key areas:

1) Creation of an authority-wide **fundraising plan**, to coordinate all of the various fundraising initiatives, both capital and operating, that will need to occur to make this a reality. This effort must be coordinated – each conservation area cannot go out fundraising on its own – the overall effort needs to be managed properly because, in total, it will be a big 'ask.'

2) A **pricing review**, again authority-wide, to look at the potential to increase prices and to raise additional revenues through more intelligent pricing packaging and timing, and membership,

combinations. Similar reviews at other public offerings have shown that gross revenues can often be increased by 10% or more simply through differential pricing strategies.

3) Creation of a **new business model** for Conservation Halton that examines different, and fairer, ways and means of generating revenues from municipal participants and other users.

On-going monitoring of the progress of the master plan implementation should be addressed through adoption of an annual reporting procedure that identifies key projects and tasks including existing initiatives, new initiatives and assessment of overall progress relative to established targets.

Section Six: Sustainability Evaluation

Table 6-1 presents the evaluation structure used to assess the master plan (EDA 2010b). Within each of the three domains of environment, social and economic, the evaluation methodology lists several specific criteria to consider.

Table 6-1: Evaluation Criteria

Environmental
Avoidance of impacts and encroachment on very high and high priority protection areas (PPA's)
Avoidance of impacts on natural heritage functions such as spread of invasive species, trampling, loss of natural cover, habitat fragmentation, noise and increased imperviousness
Potential to restore or improve natural features and natural heritage systems, diversity and connectivity,
Achieve long-term ecological function and native biodiversity
Conformity to national, provincial, regional or local plans with respect to natural heritage objectives

Social
Accessibility – physical, visual, transportation, affordability
Provision of educational opportunities / facilities
Provision of outdoor recreational opportunities
Access to views, quiet spaces, contemplative areas
Conformity to provincial, regional & local recreational plans

Economic
Capital costs (cumulative over 10 year period)
Operating costs
Direct revenue generation potential
Sponsorship or partnership potential
Potential for positive economic impact upon the community

6.1 Environmental Sustainability Evaluation

This section provides an evaluation of the *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area* and its ability to protect the natural heritage system for the long-term. The evaluation of potential impacts integrates relevant policies of the *Species at Risk Act* (Government of Canada 2002), *Endangered Species Act* (Province of Ontario 2007), *Provincial Policy Statement* (Ministry of Municipal Affairs and Housing 2005), *Niagara Escarpment Plan* (Niagara Escarpment Commission, 2005), the *Regional Official Plan* (Regional Municipality of Halton 2006),

(e.g. ESAs) and *Town of Milton Official Plan* (Town of Milton, 1997). In line with the above documents, some of the items considered during the evaluation include the master plan's intention to:

- Protect natural features and areas for the long term;
- Maintain natural features and natural heritage systems (e.g. diversity and connectivity) and their long-term ecological function;
- Restore the natural heritage systems, where necessary;
- Not propose any development or site alteration in significant habitats (e.g. PSW, etc.);
- Maximize the overall benefit to the natural features or their ecological functions (e.g. woodlands, significant wildlife habitat; ANSIs' and ESAs;
- Ensure that proposed development and site alteration on adjacent lands does not impact significant natural heritage features;

The summary of the impact evaluation is provided in Table 4-1 in the *Inventory and Analysis: Stage One Report* (EDA 2010a).

6.1.1 Avoidance of Impacts and Encroachment on Nature Reserve Zone

The existing infrastructure of Crawford Lake Conservation Area occurs within areas designated as Development zone. The Development Zone will not be affected the expansion of facilities as well as new facilities occur outside ecologically important areas that are identified as Nature Reserve Zone and Natural Zone. No new trails are proposed in Nature Reserve Zone.

The re-routing of the entrance road and addition of sustainable parking and educational facilities to the north and west side of the Iroquoian village will have a positive impact, improving the separation between conservation area infrastructure and higher priority natural features. Decommissioning of the current entrance road would help expand cover adjacent to high quality natural features that exist southeast of the current access road. Similarly, the re-purposing of the existing parking area to natural vegetation and maintenance yard will help improve separation of high visitor traffic areas away from more sensitive natural features. Provided additional site servicing being planned falls within the areas identified as Development Zone, thus no impacts to the Nature Reserve Zone are anticipated.

The addition of a major visitor and education centre will not have a direct impact on Nature Reserve Zone or Natural Zone However, it is anticipated that the higher visitor volume and recreational activities associated with this traffic may affect the Nature Reserve Zone that are immediately adjacent to the trails. Provided trail use is carefully monitored and directed to less sensitive locations, impacts can be mitigated.

The plan to improve trails with limestone chip surfaces carries the risk of sedimentation of adjacent natural features via surface runoff. To avoid this impact, an erosion control plan should be implemented to avoid off site sedimentation of limestone chips.

6.1.2 Avoidance of Impacts on Natural Heritage Functions

The plan to decommission unauthorized trails, delineate trails, remove trails in areas of higher sensitivity and upgrade existing trails to prevent ponding and braiding will assist in protecting the natural features of the conservation area. In addition, the higher standard for amenities and service (e.g. trail maintenance) will help reduce localized impacts from visitor use. These proactive steps should help curtail the spread of invasive species, trampling and loss of natural cover. Strategic trail closure will reduce the impact of visitor noise in the most sensitive areas.

Decommissioning of the current entrance road will have a temporary minor negative impact by encouraging the growth of invasive species. This impact can be minimized provided an invasive species monitoring and curtailment program is implemented for the first few years until mature native vegetation becomes established. Similarly, efforts should be implemented for the existing eastern parking lot, which is to be rehabilitated to a natural vegetation community.

The development of additional infrastructure in the area northwest of the higher priority protection areas will not directly affect the natural heritage functions of the Crawford Lake Conservation Area.

6.1.3 Potential to Restore or Improve Natural Features

Crawford Lake Conservation Area is in a relatively high quality natural state. The forest area is fairly contiguous. Larger scale habitat restoration beyond the management of plantation towards a more diverse forest environment, would have limited ability to improve forest size, interior space, corridor connections or overall habitat quality. As a result, limited habitat restoration is proposed or warranted. Similarly, Crawford Lake Conservation Area is well connected to the surrounding natural heritage features. Connections occur to the west through Kilbride Swamp ANSI, Calcium Pits ESA and Lowville Re-entrant Valley ANSI. To the east, connection is maintained through the natural features forming part of Crawford Lake-Milton Outlier Valley ANSI and Crawford Lake-Rattlesnake Point Escarpment ESA. These natural features also connect to both the east and west branches of Limestone Creek, which flows south towards Lake Ontario and is a subwatershed of the larger Bronte Creek system. Connection with Guelph Junction Woods ESA and headwater areas of the east branch of Limestone Creek provides local connections to areas north of Crawford Lake Conservation Area. However, good connection to areas north of Highway 401 is constrained by this large transportation feature.

The master plan allows for the decommissioning of the existing access road and its rehabilitation immediately adjacent to Nature Reserve Zone and Natural Zone. . Although the decommissioning of the road will not increase diversity or natural feature connectivity, it will improve the overall condition of the existing forest edge through the addition of a natural vegetated buffer. Over time, impacts to the woodland edge will be displaced northwest away from the current forest edge. This displacement of impacts will improve the quality and function of the current forest edge.

6.1.4 Achieve Long-term Ecological Function and Native Biodiversity

The conservation area is made up of 50 distinct Ecosite and/or Vegetation Types (EDA 2010a). Of these, various dry to moist deciduous forest communities are the most abundant. Three ecological land classification (ELC) communities in the conservation area are considered *Very Rare* (G2) *to Uncommon* (G3) globally, as well as provincially rare (S2 to S3S4). An additional four vegetation communities documented in the conservation area are considered provincially *Vulnerable* (SRank - S3/S3S4) and three are or are likely to be ranked as *Imperiled (S2/ S2?/ S2S3)*. Crawford Lake Conservation Area contains some of the most extensive Fresh – Moist Sugar Maple Carbonate Treed Talus in Halton, which is considered provincially rare throughout Ontario. Several *Rare* and *Uncommon* and species at risk flora and fauna occur.

The protection and restoration of sensitive communities and species, and maintaining corridor connections are paramount concerns in this master plan. As a result, the protection of the long-term ecological function and majority of native biodiversity is also protected. However, the higher visitor traffic that will result from this scenario increases the potential for local impacts to vegetation in areas of higher use and degradation of some sensitive habitat. Degradation of ecological function and native

biodiversity could occur from increased unauthorized trails, which access interior areas of the conservation area.

6.1.5 Conformity to National, Provincial, Regional and Local Plans

The master plan conforms to national, provincial, regional and local plans with the exception of the proposed overnight accommodation which is not currently in conformity with the *Niagara Escarpment Plan*. The overnight accommodation will not be developed until a detailed feasibility study is completed as well as the Niagara Escarpment Plan Review in 2015 is complete and revised to include educational accommodations.

6.2 Social Sustainability Evaluation of Master Plan

6.2.1 Accessibility

The master plan offers improved physical access insofar as the trails, roads and parking areas are improved and many features are made accessible to people with disabilities. It also improves physical access by increasing parking and picnic facilities. It will also make interpretative materials more available to people whose first language is not English.

6.2.2 Education Opportunities

The master plan offers many opportunities for natural and cultural heritage education and interpretation through the proposed Visitors Centre and the continued school programming. This may be supplemented by arrangements with universities or informal (perhaps web-based) interpretive materials.

6.2.3 Recreation Opportunities

Recreation opportunities will be similar to what currently exists at the conservation area; however, enhanced Visitor Impact Management will allow the area to accommodate an increase in visitors. The special events area will encourage trail access and activities about the natural heritage features.

6.2.4 Open Space Functions

The master plan fulfills open space functions and provides visual relief from the urban landscape. It also offers access to quiet spaces and access to views.

6.2.5 Conformance with Policy

<u>Conservation Halton Strategic Plan 2009-2013</u>

The master plan conforms to the *Conservation Halton Strategic Plan 2009-2013* to a great degree. A summary of the relevant themes and objectives from the *Strategic Plan:*

> ***Parks***
>
> *Build awareness of Conservation Halton parks as regional destinations*
>
> *Promote healthy lifestyles by providing access to green spaces for quality year round recreation experiences*
>
> *Significantly enhance the amenities at Conservation Halton's parks to ensure an enjoyable experience for visitors*
>
> *Demonstrate leadership in environmental management of Conservation Halton properties*

Education

Deliver innovative and curriculum linked experiential education programs

Offer outdoor education and interpretive programs that promote lifelong learning experiences

Deliver strong community stewardship programs to promote watershed health

Create awareness of climate change and water conservation within the watershed community and encourage social change among watershed residents

Community

Offer a variety of volunteer and community engagement opportunities to enhance the natural environment in the watershed

Governance

Provide quality full-time, seasonal and part-time employment to enhance economic activity in the watershed

Over and above ample recreational opportunities, the *Master Plan for Crawford Lake Conservation Area and Crawford Tract II Resource Management Area* includes interpretive, educational and volunteer opportunities that will help the Conservation Halton achieve the above objectives. Moreover, the LEED and SITES standards as well as the Visitor Impact Management program demonstrate leadership in environmental management.

Niagara Escarpment Parks and Open Space System (NEPOSS)

The objectives of the Niagara Escarpment Parks and Open Space System are:

To protect unique ecological and historical areas;

To provide adequate opportunities for outdoor education and recreation;

To provide for adequate public access to the Niagara Escarpment;

To complete a public system of major parks and open space through additional land acquisition and park and open space planning;

To secure a route for the Bruce Trail;

To maintain and enhance the natural environment of the Niagara Escarpment;

To support tourism by providing opportunities on public land for discovery and enjoyment by Ontario's residents and visitors;

To provide a common understanding and appreciation of the Niagara Escarpment; and

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.

The master plan fulfills the objectives of the NEPOSS in preserving valuable ecological resources and providing adequate public access to them and the unique recreational opportunities they afford. All of Conservation Halton's six conservation areas contribute greatly, especially with the commitment to bringing an enhanced level of services to visitors to all conservation area and by having consistent signage promoting the Niagara Escarpment as a precious natural heritage resource.

The *Master Plan for Crawford Lake Conservation Area* recognizes its designation as a Nodal Park (as described in Section 3.1.2 of the NEP), as well, and will fulfill this role through Conservation Halton's

more aggressive marketing stance, overall, and through interpretive displays and tourism related materials to be made available in the interpretive and education centre.

Halton Region Official Plan

In the regional context, the *The Regional Official Plan* (2006) Part 4 - Healthy Communities: Cultural and Recreational Services include the following:

> *161. The objective of the Region is to support the provision of a diverse range of accessible cultural and recreational facilities and services.*
>
> *162. It is the policy of the Region to:*
>
> *162(2) Encourage the coordination of recreational services in Halton between the Conservation Authorities and Local Municipalities to avoid duplication and to increase diversity in programming.*

The master plan meets the criteria, as unique recreational opportunities, in a pristine natural environment, are made available in addition to more picnic facilities.

Town of Milton Official Plan

In the local context, the master plan contributes to the *Town of Milton Official Plan* objectives as cited below:

> *2.5.2.1 To provide and maintain a system of parks, open space and leisure facilities for both active and passive pursuits, with a diversity of recreational experience for special use groups. [. . . .]*
>
> *2.5.2.2 To develop an open space system which incorporates a full range of environmental, open space and recreation facilities, recognizing that extensive recreation facilities are also provided by the Conservation Authorities which serve the residents of the Town, as well as the Greater Toronto Area.*
>
> *(Section 2.5 Community and Cultural Services, 2.5.2 Objectives).*

Conservation Halton is uniquely positioned to offer recreation experiences in a natural environment.

In summary, the plan offers many social, cultural and recreational benefits to the community as well as being strongly geared towards environmental protection.

6.3 Economic Sustainability Evaluation

6.3.1 Capital Costs

Over the 10-year development period for the Crawford Lake Conservation Area, total development costs are estimated to be approximately $17.3 million (measured in 2010 dollars). Given the unique status of Crawford Lake Conservation Area within the overall portfolio of conservation areas within Conservation Halton's purview, the investment in this asset is a very cost effective one (see next section on operating costs). Moreover, as has been pointed out, relative to the capitalized value of the conservation area as a generator of economic and ecosystem benefits, this proportionately represents quite a small investment with significant payback potential.

6.3.2 Operating Costs

As shown, Crawford Lake Conservation Area is currently a 'profit centre' for Conservation Halton (enabling the Authority to subsidize operations in other conservation areas). The development plan

presented here shows that the conservation area has the potential in the longer term to become an even greater economic engine for the authority.

6.3.3 Direct Revenue Generation Potential

Further to the points raised above, there is significant potential for Crawford Lake Conservation Area to generate direct revenues. Attendance will increase significantly as a result of three factors: natural population growth within the area; increased amenities and services within the conservation area to attract users; and a significantly enhanced and focused marketing orientation. This significantly increased visitation, with a higher admission fee reflecting the enhanced amenities and services, has the potential to generate greatly enhanced revenues.

6.3.4 Sponsorship or Partnership Potential

Crawford Lake Conservation Area is one of the more visible and known assets in the Conservation Halton portfolio. This iconic status should be a key asset in developing corporate, foundation and individual sponsorship and support for both the capital and operating cost dimensions of this project. (See Section 5.6 for a more in-depth discussion of fundraising considerations.)

6.3.5 Potential for Positive Economic Impact upon the Community

The *Stage One Report* outlined the significant economic impact that the overall Conservation Halton operation had upon the regional and provincial economies. It was pointed out that because of the difficulty of isolating specific costs for each conservation area it would be effectively impossible to undertake a separate economic impact assessment at that level. However, there can be no doubt that insofar as Crawford Lake Conservation Area will attract and serve even more visitors than it has in the past, and that these additional visitors will all spend time and money in the area, therefore it will help Conservation Halton overall become an even more powerful economic engine in the community and region.

Section Seven: Recommendations and Implementation

7.1 Infrastructure Development

Conservation Halton will endeavor to the complete the following works at the Crawford Lake Conservation Area in the following phased and orderly manner as funds permit. Certain variances may occur due to funding availability or changed circumstances.

It is recommended that all the upgrades necessary to bring Crawford Lake Conservation Area up to the enhanced base level of services and amenities called for by this master plan (see Section 3.2 above for further details) be done in the first three years of the 10-year development program. These upgrades, meant to help Conservation Halton develop a standard of excellence within their conservation area system, include entrance and directional signage, trail upgrades and delineation, and site furnishings as detailed in Table 7-1 below.

It is especially necessary for the Conservation Halton to complete the trail management improvements in preparation for welcoming larger numbers of visitors. In the mid-term phase of the project, the larger infrastructure items, most notably the education centre, should be constructed. Leaving these items to years 4, 5 and 6 allows Conservation Halton enough time to raise the funds and complete any design studies and public consultation necessary for these larger projects. The final phase will incorporate items that are not a high priority.

Table 7-1: Short, Mid and Long Term Capital Costs

Short Term **Years 1 through 3**	**Mid Term** **Years 4 through 6**	**Long Term** **Years 7 through 10**	**Total**
Main entrance and directional signage Trails directional signage Trailheads Site furnishings Upgraded toilets Automated gate Decommissioned, fence or delineate, and upgraded trails and boardwalk Gatehouse renovations Palisade replacement Visitor Impact Management System*	Building 1 new longhouse Village features upgrades (including existing longhouses) Repurpose existing buildings Interpretive centre New interpretive and educational centre site services Accessibility upgrades New interpretive and educational centre site development Interpretive signage with language outreach upgrades Picnic shelter Palisade replacement Road and parking upgrades with bioswales and trees (with new educationa centre) Visitors Impact Management System*	Rehabilitate existing road Existing parking lot restoration New native/indigenous gardens Build 2 more longhouses Overflow parking Palisade replacement Visitors Impact Management System*	
$2,676,700	**$13,653,001**	**$1,184,463**	**$17,514,163**

*The Visitors Impact Management Plan has allotted $60,000 per year to be divided between the four parks based on need. For budgeting purposes $15,000 has been allotted for each park per year.

For detailed costing by year over the 10-year development program, see Table 5-2 in Appendix II.

7.2 Critical Path

In order to implement this master plan, Conservation Halton will need to undertake the following:

- Initiate a feasibility study for the visitor interpretive and education centre;
- Review and revise the Visitor Impact Management plan, set standards for indicators, form an action committee, recruit volunteers and hire a VIM coordinator;
- Begin monitoring visitor impacts, carry out necessary management actions and periodically review carrying capacity guidelines;
- Finish writing all resource management plans such as for species at risk, forestry and invasive species and then ensure operations are brought into conformance with them;
- Develop appropriate recreation management plans for activities including hiking, snow shoeing and cross country skiing; involve the public in this process;
- Develop design guidelines for facilities and site furnishings;
- Develop an interpretive program, identifying specific topics and places to install signage;
- Develop a marketing and tourism promotion plan;
- Develop a fundraising plan and hire a fundraising advisor;
- Define strategies and priorities for use of such funds as can be obtained; and
- Hire an architect to design the education centre and other buildings such as the longhouses in consultation with stakeholder groups.

7.3 Plan Approvals and Review

Following approval of this master plan, certain additional approvals will still need to be obtained from the appropriate agencies as shown in Table 7-2. (**X** indicating approval and or review and an x indicating approval if within a Conservation Halton regulated area), including NEC Development Permit, Milton Building Permit, Milton Site Plan Approval or Site Alteration Permit.

Certain works are automatically exempt from the requirement of obtaining a Development Permit under *Ontario Regulation 828* including maintenance of lands, buildings, structures maintenance, renewal or repair of septic systems connected to public utilities, tree plantings and trail development within Conservation Halton lands. The master plan components that are exempted from the development permit process are set out in the "Master Plan Approval Only" column of Table 7-2. Typical development components such as buildings, roads and picnic shelters may be exempt from requiring a NEC Development Permit if the requirement under section 41 of Ontario 829/90 is met.

Section 41 of Ontario Regulation 828/90 states that development permits in Parks and Open Space Systems are exempted if;

> *"The construction of buildings, structures, facilities and related undertakings identified in a Parks and Open Space Plan as defined in the Niagara Escarpment Plan (2005) for a park or open space area listed in Appendix 1 of the Niagara Escarpment Plan (2005) if:*
>
> (i) *The plan has been approved by the Niagara Escarpment Commission and* Ontario *Ministry of Natural Resources under Part 3 of the Niagara Escarpment Plan (2005) after coming into force of Regulation 423/13 (Note: Regulation came into force on January 1, 2013);*

(ii) *The plan has specifically identified and detailed the buildings, structures, facilities and related undertakings that are to be exempted under this section.*

(iii) *The construction and installation of buildings, structures and facilities and related undertakings occurs within 5 years of the approval of the master plan under subparagraph i."*

Proposed water distribution works and sewage disposal or treatment works will also require approval under the *Ontario Water Resources Act* as administered under the Ministry of the Environment (MOE) and through which additional public input will be available.

Depending on the location and component of the master plan, a permit for activities with conditions to achieve overall benefit to species at risk may be needed from the MNR. Under Ontario Regulation 230/08 of the Endangered Species Act, 2007 (ESA), habitat protection is granted under subsection 10(1)(a) for Threatened and Endangered species.

Any works proposed in areas regulated by Conservation Halton under Ontario Regulation 162/06 will be reviewed by appropriate Watershed Management Division staff through the internal review process as detailed in Section 6.4.1.

Prior to any developments affecting the cultural heritage features of the conservation area, it will be necessary to complete a full Stage 3 assessment, conducted according to the Ministry of Tourism and Culture's *2010 Standards and Guidelines for Consultant Archaeologists*, which came into effect January 1, 2011.

Table 7-2: Plan Approvals and Review

7.3.1 Phase One

Master Plan Component	MASTER PLAN Approval Only	NEC Dev. Permit	Milton Bldg. Permit	Milton Site Plan Approval or Site Alteration Permit	Ministry of Tourism and Culture	CH Watershed Internal Review Process
Main entrance and directional signage	X					
Trails directional signage	X					
Trailheads	X					
Road and parking upgrades with bioswales and trees		X		X		X
Upgraded toilets	X					x
Automated gate	X	X				
Decommissioned, fenced or delineated, and upgraded trails	X					X
Site furnishings	X					
Palisade replacement	X					

7.3.2 Phase Two

Master Plan Component	Master Plan Approval Only	NEC Dev. Permit	Milton Bldg. Permit	Milton Site Plan Approval or Site Alteration Permit	Ministry of Tourism and Culture	CH Watershed Internal Review Process
Building three new longhouse	X	x	x		X	
Village features upgrades (including existing longhouses)	X	x				
Repurpose existing buildings		X	X	X		X
Visitor centre		X	X	X	X	X
Interpretive signage with language outreach upgrades	X					
Interpretive and educational centre site services		X	X		X	x
Interpretive and educational centre site development		X		X	X	X
Accessibility upgrades	X			X		X
Picnic shelter		X	X	X		x
Special events area		X				X
Palisade replacement	X					

7.3.3 Phase Three

Master Plan Component	Master Plan Approval Only	NEC Dev. Permit	Milton Bldg. Permit	Milton Site Plan Approval or Site Alteration Permit	Ministry of Tourism and Culture	CH Watershed Internal Review Process
Rehabilitate existing road	X				X	X
Existing parking lot restoration	X					X
New native/indigenous gardens	X					X
Refurbish existing longhouses		X	X		X	
Palisade replacement	X					

7.4 Plan Review and Amendment

This master plan shall be the prevailing policy document for the planning and development of the Crawford Lake Conservation Area for the next ten years from signed approval. Periodic review may be undertaken as required with amendments processed under the following means:

- A major amendment would involve any change that would represent a marked departure from the plan's original intent and direction. Such changes could have significant impacts

on the conservation area's environment, affect users of adjacent lands or result in significant public reaction. Major amendments will require an application to the Ontario Ministry of Natural Resources with full public consultation

- A minor amendment would involve administrative or housekeeping changes that would not alter the plan's intent, affect the conservation area's objectives or its ability to meet those objectives, or have any significant impacts on the conservation area's environment. Any minor amendments will be processed simply as a Development Permit under the Niagara Escarpment Plan.

7.5 Niagara Escarpment Development Control

Subject to prior consultation with the Niagara Escarpment Commission, the following development may be exempted from requiring a Niagara Escarpment Commission Development Permit upon approval of the Crawford Lake Conservation Area Master Plan provided that the Niagara Escarpment Commission is satisfied that the developments are in accordance with Section 5.41 of Ontario Regulation 828/90:

- **Automated gate:** This gate will be located adjacent to the kiosk building, which will allow pass holders to swipe and entre the park.
- **Access Road**: Improve and re-align existing access road. Improve 3100Sq meters of existing access road, to be regarded, compacted and resurfaced. Create a new granular road 2000sq meters to the west of the village.
- **Upgrade Gatehouse Parking Lot:** Improve existing parking area 2000 m² (80 car). Re-grade, compact and resurface parking lot.
- **New Overflow Parking Areas**: Create a new overflow parking are north of the Gathering Place, area to be 2500m² and consist of a grass paver system.
- **New Parking Lot:** New granular parking lot 7600sq meters (250 car), to be located behind new interpretive and educational centre north west of the village.
- **Picnic Shelter-** 125 m²: an open picnic shelter, available to rent, in the special events area located in close proximity to the gathering place.
- **Interpretive and Educational Centre (New Visitor Centre):** Build a new interpretive and educational centre 1300sq meters north of the village. The new educational centre will include; classroom space, a theater, exhibit space, multipurpose space, washrooms, a gift shop, kitchen and administration offices. The interpretive and educational centre will include a septic system, potable water and hydro services.
- **Maintenance Building 150 sq. meters:** The maintenance compound to be located north of the Gathering Place. The area will also have a fenced maintenance yard 500 sq. meters around the maintenance building. This will allow for storage of equipment, and an onsite workspace.
- **Longhouses:** Build a one longhouse 260sqm, partially reconstruct frame of additional longhouse and refurbish the two existing longhouses.
- **Toilets:** Upgrade three standard vault toilets
- **Gatehouse Renovation:** Upgrade and renovate existing gatehouse.

ACRONYMS

ASA	Archaeologically Sensitive Area
ESA	Environmentally Sensitive Area
MNR	Ontario Ministry of Natural resources
NEC	Niagara Escarpment Commission
NEP	Niagara Escarpment Plan
NEPOSS	Niagara Escarpment Parks and Open Space System

Glossary of Terms

Adjacent Lands: Those lands bordering the Crawford Lake Conservation Area.

Area of Archaeological Potential: Areas of a property on which archaeological sites may be present. The Ministry of Culture has established criteria and a checklist for determining areas of archaeological potential.

Area of Natural and Scientific Interest (ANSI): Areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education.

Bruce Trail Corridor: The Bruce Trail Conservancy is committed to establishing a public footpath along the Niagara Escarpment in order to protect its natural ecosystems and to promote environmentally responsible public access to this UNESCO World Biosphere Reserve. The corridor includes Main and Side Bruce Trails as well as the optimum route.

Conservation Halton: In 1956, the Sixteen Mile Creek Conservation Authority was formed followed by the formation of the Twelve Mile Creek Conservation Authority in 1957. In 1963, these conservation authorities amalgamated to form the Halton Region Conservation Authority [Conservation Halton]. The concept of conservation authorities was developed at a conference in Guelph, Ontario in the early 1940's. At that time, it was noted that extensive quarrying was taking place in escarpment areas and there was a risk of losing many significant natural sites. In fact, it was a quarry operation at Mount Nemo in 1958 that contributed to the formation of the Twelve Mile Creek Conservation Authority, which acquired 88 acres at Mount Nemo as their first action.

Cultural Heritage Features and Areas: These features and areas, including significant historic sites, significant ruins, and those areas deemed of heritage value, known archaeological sites, areas of archaeological potential and significant areas of historic and scientific interest, which are important for their historical and social values as a legacy of the cultural landscape of the area.

Development: As it pertains to the *Planning Act*, *Provincial Policy Statement*, *Greenbelt Plan* and *Conservation Halton Land Use Planning Policies* (Section 4) is defined as the creation of a new lot; a change in land use; or the construction of buildings and structures, requiring approval under the *Planning Act,* but does not include: (a) activities that create or maintain infrastructure authorized under an environmental assessment process; (b) works subject to the *Drainage Act*.

Development: As it pertains to the *Conservation Authorities Act,* is defined as:

- the construction, reconstruction, erection or placing of a building or structure of any kind,

- any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,
- site grading, or
- The temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

Ecological Function: The natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. These may include hydrological, biological, physical, chemical and socio-economic interactions.

Ecological Land Classification (ELC): The Ontario Ministry of Natural Resources defines ecological units based on bedrock, climate (temperature, precipitation), physiography (soils, slope, aspect) and corresponding vegetation, creating an Ecological Land Classification (ELC) system. This classification of the landscape enables planners and ecologists to organize ecological information into logical integrated units to enable landscape planning and monitoring.

Endangered Species: Species listed or categorized as an "Endangered Species" on the Ontario Ministry of Natural Resources' official species at risk list or on the COSEWIC list of endangered species, as updated and amended periodically.

Endangered Species Act: A provincial Act with three distinct purposes including: to identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge; protect species that are at risk and their habitats, and to promote the recovery of species that are at risk; and to promote stewardship activities to assist in the protection and recovery of species that are at risk in Ontario.

Hydrologic Function: The functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment including its relation to living things.

Natural Heritage Features and Areas: These features and areas, including significant wetlands, significant coastal wetlands, fish habitat, significant woodlands, significant valleylands, significant habitat of endangered species and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscape of the area.

Natural Heritage System: A system made up of natural heritage features and areas, linked by natural corridors necessary to maintain biological and geological diversity, natural functions, viable populations and indigenous species and ecosystems. These systems include lands that have been restored and areas with the potential to be restored to a natural state.

Negative impacts: In regard to natural heritage features and areas, degradation that threatens the health and integrity of the natural features or ecological functions for which and areas is identified due to single, multiple or successive development or site alteration activities.

NEPOSS: The Niagara Escarpment Parks and Open Space System is a linear system of over 140 parks and open spaces owned / managed by public agencies or conservation authorities. The System is based on public lands acquired to protect significant areas and features along the Niagara Escarpment, the majority of which are linked by the Bruce Trail. Park managers are required to develop management / master plans that are not in conflict with the objectives and policies of the NEP.

Niagara Escarpment Commission (NEC): An agency of Ontario's Ministry of Natural Resources, the NEC works to preserve the Niagara Escarpment as a continuous natural landscape and a vital corridor of green space through south-central Ontario.

Ontario Heritage Act: The Ministry of Culture enforces Part VI of the *Ontario Heritage Act*. This portion of the act determines priorities, policies and programs for the conservation of archaeological resources determined to have cultural heritage value.

Ontario Ministry of Natural Resources (MNR): This Ministry manages and protects Ontario's natural resources for wise use across the province, contributing to the environmental, social and economic well-being of Ontario.

Provincially Significant Wetlands (PSW): Provincially Significant Wetlands are wetlands that, in the opinion of the Ontario Ministry of Natural Resources contain habitats of critical importance to fish or wildlife, have a significant hydrologic role in the watershed in which they exist, provide significant social or economic benefits and have unique or provincially significant features. Development is not permitted in Provincially Significant Wetlands.

Species at Risk (SAR): A federal Act for the purposes of preventing wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.

Threatened Species: As defined by the Ontario Ministry of Natural Resources, a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

Visitor Impact Management (VIM): This tool covers a range of processes and techniques for managing visitors, their activities and their impacts, in a specific area. It is a key aspect of tourism management by both private and public organizations, especially in natural areas with special values that need protection.

Watershed: An area that is drained by a watercourse and its tributaries.

Wetland: As defined in the Provincial Policy Statement (2005) are lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens.

Wildlife: All wild mammals, birds, reptiles, amphibians, fish, invertebrates, plants, fungi, algae, bacteria and other wild organisms.

Wildlife Habitat: Areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas important to migratory or non-migratory

Woodlands: Treed areas that provide environmental and economic benefits to both private landowners and the public, such as erosion protection, hydrological and nutrient cycling, provision of clean air, provision of wildlife habitat, outdoor recreational opportunities and the sustainable harvest of a wide range of woodland products. These include treed areas, woodlots or forested areas and can vary in their level of significance at the local, regional and provincial levels.

References

ASI (Archaeological Services Inc.). 1998. The Master Plan of Archaeological Resources of the Regional Municipality of Halton. Report on file, Regional Municipality of Halton.

ASI (Archaeological Services Inc.). 2008. Master Plan of Archaeological Resources of the Regional Municipality of Halton, 2008 Update. Report on file, Regional Municipality of Halton.

City of Burlington Official Plan. 2008. Official Plan.

Conservation Halton. 1996. Forest Management Plan for Authority Forests.

Conservation Halton. 2002. Master Plan for the Kelso Conservation Area. Conservation Halton. 51 pp + Appendices.

Conservation Halton. 2005. Toward a Healthy Watershed: Strategic Conservation Plan 2005-2007.

Conservation Halton. 2009. Species at Risk Database. Conservation Halton. Unpublished database.

Conservation Halton. 2010. Website: www.conservationhalton.on.ca

Dwyer. J.K. 2006. Halton Natural Areas Inventory 2006. Volume 1: Site Summaries. Conservation Halton. Milton, ON. Data CD.

EDA Collaborative Inc. 2010a. Master Plan for Crawford Lake Conservation Area: Inventory and Analysis, Stage One Report. Prepared for Conservation Halton. 191 pp. With Appendix I: Species Tables, 31 pp.

EDA Collaborative Inc. 2010b. Master Plan for Crawford Lake Conservation Area: Concept Alternatives and Management Considerations, Stage Two Report. Prepared for Conservation Halton. 95 pp.

Florida Department of Environmental Protection, Division of Recreation and Parks. n.d., Visitor capacity guidelines. Accessed on November 20, 2010 from: http://www.dep.state.fl.us/parks/planning/forms/CarryingCapacityGuidelines.pdf

Government of Canada. 2002. Species at Risk Act. Ottawa, ON: Communications Canada.

Havinga, D. and Ontario Invasive Plants Working Group. 2000. Sustaining biodiversity: A strategic plan for managing invasive plants in Southern Ontario. Ontario Invasive Plants Working Group.

Kelly, P.E. and D. W. Larson. 2008. The Last Stand: A Journey Through the Ancient Cliff-Face Forest of the Niagara Escarpment.

Maller C, M Townsend, L St. Leger, C Henderson-Wilson, A Pryor, L Prosser and M Moore. 2008. Healthy parks, healthy people: The health benefits of contact with nature in a park context, A review of relevant literature. 2nd edition. School of Health and Social Development, Faculty of Health, Medicine, Nursing and Behavioural Sciences. Deakin University. Burwood, Melbourne.

Ministry of Municipal Affairs and Housing. 2005. Provincial Policy Statement. Toronto, ON: Queen's Printer for Ontario.

Ministry of Public Infrastructure Renewal. 2006. Places to Grow: Growth Plan for the Greater Golden Horseshoe. Toronto, ON: Queen's Printer for Ontario.

Ministry of the Environment. 2002. Clean Water Act. Toronto, ON: Queen's Printer for Ontario.

Ministry of Tourism and Culture. 2010. Standards and Guidelines for Conservation of Provincial Heritage Properties. Toronto, ON: Queen's Printer for Ontario.

Niagara Escarpment Commission. 2005. Niagara Escarpment Plan. Office Consolidation Version 2010. Halton Hills, Ontario.

Ontario Ministry of Natural Resource . 2011. Draft Niagara Escarpment Parks and Open Space System Planning Manual. Halton Hills, Ontario.

Ontario Ministry of Natural Resources. 2000. A Silvicultural Guide to managing Southern Ontario Forests, Version 1.1. Ontario Ministry of Natural Resources. Queen's Printer for Ontario. Toronto. 648 p.

Ontario Ministry of Natural Resources. 2000. A Silvicultural Guide to managing Southern Ontario Forests, Version 1.1. Ontario Ministry of Natural Resources. Queen's Printer for Ontario. Toronto. 648 p.

Parks and Recreation Ontario. 2009. Use and Benefits of Local Government Recreation and Parks Services: An Ontario Perspective – Research Summary.

Province of Ontario. 1990. *Conservation Authorities Act*. Toronto, ON: Queen's Printer for Ontario.

Province of Ontario. 1990. Niagara Escarpment Planning and Development Act.

Province of Ontario. 1990. Planning Act. Toronto, ON: Queen's Printer for Ontario.

Province of Ontario. 2005. Provincial Policy Statement.

Province of Ontario. 2007. Endangered Species Act. Toronto, ON: Queen's Printer for Ontario.

Regional Municipality of Halton. 2006. Official Plan. Oakville, ON. Regional Municipality of Halton.

Regional Municipality of Halton. 2007. 2007-2010 Halton Region Strategic Plan.

Regional Municipality of Halton. 2009. Regional Official Plan Amendment 38.

Town of Milton. 1997. Official Plan.

Master Plan for Crawford Lake Conservation Area

Stage Three Report
Appendix I:
Natural Resource Management

TCI Management Consultants
DILLON CONSULTING
EDA Collaborative

Appendix I: Resource Management

Carrying Capacity Calculations

- Understanding of **carrying capacity**
  - The term carrying capacity no longer refers to an absolute number or formula-based decision.
  - Rather, it refers to the desired experience and resource conditions that are to be sustained (limits of acceptable change).
  - By managing to stay within desired resource & social conditions, the area is being managed within the "carrying capacity."

- Emphasis is on protection and enhancement of the **natural environment** and the **visitor experience** as opposed to accommodation of unlimited numbers of visitors.
  - This is not a finite or absolute science – there are social values and judgments that enter into the equation;
  - Management actions and weather conditions also influence the ability of the facilities to accommodate visitors.

- **Method of Computation**
  - "People-at-one-time" carrying capacity (PAOT) for each activity such as:
    - Trails,
    - Picnicking,
    - Climbing areas;
  - Extrapolation to annual sustainable use based on traditional patterns of percentage of use in a particular period (peak season, shoulder season and off-season, for example).
  - Comparison with market projections:
  - The results:
    - Too many people / can't accommodate the numbers, whether due to environmental or social considerations – adjust downward;
    - Within acceptable limits or room to grow - no adjustment required.

- **On-going management and budgeting commitment**
  - Confirm and adopt Visitor Impact Management program;
  - Provide adequate operational budgeting to support VIM programs and ongoing monitoring and mitigation programs;
  - Continue to refine established indicators (see Visitor Impact Management Matrix)

Adopting a recreational carrying capacity approach is not a one-off exercise, but requires a continuing commitment to monitoring and decision-making.

Desired Conditions / Objectives

Trails

Management Considerations: Recent site inventory has revealed that some trails are currently in the level 1 priority protection areas. Conservation Halton will review these sections of trail during the trail upgrade process (years 1-3 of the plan) and will decide on a case-by-case basis whether to close or re-route these trails, or if delineation and signage are adequate measures. If any of these trails are designated Bruce Main or Side Trails, management options will be discussed with the Bruce Trail Conservancy.

Trail Upgrades

This will include regrading, resurfacing, drainage control and potential re-routing of trails.

Trail Delineation

This will consist of natural materials such as rocks or logs lining the trail. In some cases, boardwalks or fences may be required.

Interpretive Signage

The intention is for signs to alert visitors to the presence of a natural heritage feature and explain why it is necessary to stay on the designated trail.

These measures have shown to be very effective in garnering cooperation from park users (Marion and Reid 2007).

People At One Time (PAOT) – Assumptions

The following assumptions are applicable to the PAOT calculations that are summarized below:

Trails: Number of people at one time per 1500 m of trail

- All groups are assumed to be 2 people;
- If more people per group, time between encounters will be greater;
- Frequency of encounters depends on whether traffic is going two directions and from how many trailheads;
- Turnover is 2 times per day;
- A day is considered to be 6 hours, given 80 – 85% of usage is traditionally within this period.

Single-track Trail

- 5 groups per 1500 m of trail = 300 metres, or 3.6 minutes, between groups (if all are going one direction)

Medium Service Nature Trail

- 10 groups; assume they are going TWO directions and evenly spaced over the trail – there is still 300m or 3.6 minutes between groups

High Capacity / Service Access Trail

- 20 groups, 75 metres between groups
  - If going two directions as above – 150 m between encounters = 2 minutes.
  - If viewshed is assumed to be 100 m – at some moments, you won't see anybody.
  - Within earshot, 10 m
  - Again, larger groups would be more infrequent, if daily capacity remains the same.

Picnicking

Calculated for 54 peak days per year (weekends + one long weekend over 6-month peak season)

- *Tables or Grass* – (turnover 2 times a day)
  - Mount Nemo Conservation Area – current capacity, 10 people
- *Shelters* – assume capacity is 50 people (no turnover)

Washroom Facilities

- 4 stalls each male and female, assume 10 persons at one time
- Turnover 50 times per day (~7 minutes)
- = 500 per day per 'comfort station' or visitor centre
- Vault toilets have not been factored in. On above peak days and for special events, portable toilets are rented to augment supply.

Extrapolating to Get Peak-Day and Annual Sustainable Visitation Figures

The site's "total at-one-time recreational capacity" figure will be the sum of the figures for each of the activities. Knowledge of visitors' length of stay at the site or the area (= turnover) will allow a calculation of the "peak day number." It is important to realise that this number is not scientifically reached and is only a starting point for the exercise.

From these "at-one-time capacity" and "peak day numbers," it is possible to derive a sustainable annual visitation rate by applying a percentage of the peak day capacity figure to different days of the year, depending on the known temporal distribution of tourism and recreational activity (see table below). Peak season was assumed to be 6 months for walking trails. Peak days are assumed to be 9 days per peak month (weekends, including one long weekend per month).

Peak day rates are better than yearly figures to use for management decisions and may vary according to weather conditions.

Management Consideration: It is understood that there are a few days per year, up to five, when visitation is beyond the peak acceptable levels given here. Past practice has been to limit the number of people at one time based on parking capacity. These 'above-peak' days have not proved to cause a noticeable increase in damage to the facilities.

The following table shows the method of calculation of annual sustainable use, distributed according to current attendance patterns. It is shown to illustrate how yearly sustainable levels were derived in the spreadsheet (*sample only*). It assumes that the peak day capacity for the trails is 100 people.

Months	**Days**	**Estimate**	
(assume 12 months at 30 days each)		**Percentage of calculated capacity**	**Total**
Peak Season 6 months	54 weekend days in peak months (9 per month x 6 months = 54)	100% = Peak Day (total of all trails) **Sample figure 100**	54 x 100 PAOT = 5400
	126 weekdays in peak months (21 per month)	60%	126 x 60 = 7560
Shoulder Season 3 months	27 weekend days in shoulder season	60%	27 x 60 = 1620
	63 weekdays in shoulder season	40%	63 x 40 = 2520
Off Season 3 months	27 weekend days in off-season	30%	27 x 30 = 810
	63 weekdays in off-season	10%	63 x 10 = 630
Yearly Total			**18,540**

Summaries of calculations for this conservation area based on current and proposed facilities are provided below; spreadsheet follows.

PAOT = People at One Time

1. Current Facilities

Current School Group – Peak Day 280, Yearly 42,000

8 groups of 35 = 280 children per day x 20 days = 5600 x 7.5 months = 42,000 per year

Current use – approximately 30,000 (2009)

Current Visitor (Non-school) Capacity - Village and Visitor Centre - Peak Day 480, Annual Sustainable Use 25,920

Capacity of Current Facilities

Longhouse	Wolf Clan Longhouse	Day-Use Area	Gardens	Theatres	Turnover	Total
10	30	30	20	30	4	480

Currently visitors who visit on a weekday during the school year may find that the Turtle Clan Longhouse is in use by a school group and will be denied entry.

Trails – results of computations based on trail classifications - Peak Day 464, Annual Sustainable Use 86,115 (using percentage table shown as example in assumptions section above)

Single-track Trails – Peak Acceptable Loading

# of groups	Total people per 1500 m	length of trail 4532 m	Total on all Trails	Total peak day rounded
5	10	multiplier 3.02	30.2	60

Explanation: If the carrying capacity for single-track trails is 5 groups of 2 people at one time per 1500 metres of trail (as in assumptions listed above) and Crawford Lake Conservation Area has 4532 metres of single-track trail, these trails can accommodate 30.2 people at one time. With an assumed turnover rate of twice a day, the Total Peak Day carrying capacity for these trails is 60.4 people.

Medium Nature Trails – Peak Acceptable Loading

# of groups	Total people per 1500m	length of trail 5451m	Total on all Trails	Total peak day rounded
10	20	multiplier 3.63	72.68	145

High Capacity and Service Access Trails – Peak Acceptable Loading

# of groups	Total people per 1500m	length of trail 4851m	Total on all Trails	Total peak day rounded
20	40	multiplier 3.23	129.36	259

Picnicking – Peak Day 100, Annual Sustainable Use 5,400

50 people at one time x 2 = 100

Total of visitor centre and village (non-school), trails and picnicking: 159,435

2. Proposed Facilities

School Group Capacity – Peak Day 560, Annual Sustainable Use 84,000

Carrying Capacity at One Time (turnover assumed to be once a day)

Expect to double school group numbers = 16 groups of 35

Program 10 a.m. - 2 p.m.

1 hour trails, ½ hour longhouse, ½ hour play area, ½ hour lunch, ½ hour theatre, ½ hour for village site including gardens, ½ hour classroom

Number of groups engaged in one activity at one time

Longhouse	Archaeology Site	Play Area	Village Site	Theatres	Classrooms	Trail	Total
3	1	2	2	4	4	4	16

Lunch space – need to be able to accommodate ½ the students at one time (280)

Village, Boardwalk and Visitor Centre Non-school Use – Peak Day 2000, Annual Sustainable Use 108,000

Assumption is that half the people are in the visitor centre, while the other half are on the boardwalk or in the village.

Management Consideration: Calculated Capacity is 3440 tourists per day; however, visitation will be capped at 2000 per day.

Village – Tourist Use

Longhouse	Archaeology Site	Play Area	Gardens	Turnover	Total
50	20	30	60	4	640

Lake

800 m of boardwalk – 50 people at one time - turnover x 18 = 900 (group size average = 3; seventeen (17) groups on boardwalk at one time = 48 metres between groups)

Visitor Centre

Theatres	Exhibit Area	Café	Gift Shop	General	Turnover	Total
60	140	50	45	45	4	1900

Assumptions: Café – 1.4 m2 per person, Exhibit Space and Gift Shop – 1.8m2 per person

Events / Meetings – would never exceed capacity

Special Events Area / Camping – Peak Day 500, Annual Sustainable Use 2000

500 people at one time x 1 days per month over 4 months of the year = 2000

Location of new built features / special events area: ELC None – Cultural Meadow (old-field) with hedgerows, Development Zone, Priority Protection Level 4

Trails – Peak Day 451, Yearly 83,615

Decommission 513 metres of Medium Service Nature Trails = -13 people per day – recalculated below

Medium Nature Trails – Peak Acceptable Loading

# of groups	Total people per 1500 m	length of trail 4938 m	Total on all Trails	Total peak day rounded
10	20	multiplier 3.29	65.8	132

Potentially add 1000 m Medium Service Nature Trails = +27 people per day – not entered into calculations, as sites have not been determined

Picnicking – Peak Day 250, Annual Sustainable Use 13,500

100 people at one time x 2 = 200

Add one picnic shelter 100 m2; capacity 50 x 54 = 2,700

Total of non-school use visitor centre and village use, trail and picnicking:

3. Results

Sustainable Annual Visitation Rate

With Current School Group Facilities – Peak Day 280, Annual Sustainable Use 42,000

With Current Tourist Facilities and Trails – Peak Day 1045 (+280 students), Annual Sustainable Use 159,435 (includes school trips)

With Proposed School Group Facilities – Peak Day 560, Annual Sustainable Use 84,000

With Proposed Tourist Facilities and Trails – Peak Day 2701 (+560 students), Annual Sustainable Use 291,115 (includes school trips but does not include special events, 2000 yearly)

Visitation

Actual Current Annual Attendance – 84,000

Potential Market for the year 2021 (estimate from Table 5-4, Appendix II of this *Master Plan*) – 227,456

The potential visitation rate for Crawford Lake Conservation Area is well within the calculated sustainable annual visitation rate, which assumes trails will be upgraded at the beginning of the planning period and the entire visitor impact management program is funded. Limitations on both trail use and tourist facilities will need to be applied.

Crawford Lake Conservation Area

	Picnic Area				Shelters		
	PAOT	Turnover	Days	Total	PAOT	Days	Total
Current	50.00	2.00	54.00	**5,400.00**	0.00	54.00	**0.00**
Proposed	100.00	2.00	54.00	**10,800.00**	50.00	54.00	**2,700.00**

	Visitor Centre	School Trips
Current	**25,920.00**	**42,000.00**
Proposed	**108,000.00**	**84,000.00**

Special Events Area	
	2,000.00

Trails		
Current		
Days	PAOT	Total
54.00	464.48	25,081.92
126.00	278.69	35,114.69
27.00	278.69	7,524.58
63.00	185.79	11,704.90
27.00	139.34	3,762.29
63.00	46.45	2,926.22
		86,114.59

Proposed		
Days	PAOT	Total
54.00	451.00	24,354.00
126.00	270.60	34,095.60
27.00	270.60	7,306.20
63.00	180.40	11,365.20
27.00	135.30	3,653.10
63.00	45.10	2,841.30
		83,615.40

Total	
Current	**159,435**
Proposed	**291,115**

Table 3-1 Natural Heritage System Evaluation Matrix

Category	Primary Evaluation Criteria	Secondary Evaluation Criteria	Rationale	Priority Level
Core Conservation Lands	Environmental Sensitive Areas		Regional designation based on an area meeting several primary and secondary criteria which generally include relatively high native species richness, connections to natural system, diverse/rare plant and animal communities, relatively undisturbed, species at risk, earth science features, contribution to groundwater recharge/discharge/quality, surface water quality, scientific research and/or education.	**3**
	Area of Natural and Scientific Interest	Life Science	MNR designation for areas of land and water containing natural landscapes or features which have been identified as having values related to natural heritage protection, scientific study, or education. Development and site alteration shall not be permitted in significant areas of natural and scientific interest unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions (PPS 2005).	**3**
		Earth Science		**4**
	Provincially Significant Wetlands		Historically, wetland coverage within the Great Lakes Basin exceeded 10% (Detenbeck et al. 1999). The number of wetlands remaining in the Southern Ontario Landscape has been reduced to allow for urban settlements, shoreline development and agriculture. Wetlands have been shown to reduce the amount of water flowing out of a watershed, reduce flooding, create higher base flows, and reduced occurrence of high flows (Hey and Wickencamp 1996). Development and site alteration shall not be permitted in significant wetlands (PPS 2005).	**1**
		30 m Buffer		**2**
		31 – 120 m Buffer		**4**
	Niagara Escarpment Planning Areas	Escarpment Natural Area	"Escarpment features which are in a relatively natural state and associated stream valleys, wetlands and forests which are relatively undisturbed are included within this designation. These contain important plant and animal habitats and geological features and cultural heritage features and are the most significant natural and scenic areas of the Escarpment. The policy aims to maintain these natural areas." (NEC 2009)	**3**
		Escarpment Protection Area	"Escarpment Protection Areas are important because of their visual prominence and their environmental significance. They are often more visually prominent than Escarpment Natural Areas. Included in this designation are Escarpment features that have been significantly modified by land use activities such as agriculture or residential development, land needed to buffer prominent Escarpment Natural Areas, and natural areas of regional significance. The policy aims to maintain the remaining natural features and the open, rural landscape character of the Escarpment and lands in its vicinity." (NEC 2009)	**4**
		Escarpment Rural Area	"Escarpment Rural Areas are an essential component of the Escarpment corridor, including portions of the Escarpment and lands in its vicinity. They provide a buffer to the more ecologically sensitive areas of the Escarpment." (NEC 2009)	**5**
Areas of Functional Ecological Importance	Forest Cover	Sensitive Deep Forest Interior (≥ 200 m)	Recognition of the Hilton Falls Conservation Area interior forest northwest of Sixteen Mile Creek. "The Halton Forest South includes a major portion of the largest continuous tract of forest and wetland along the Niagara Escarpment south of Grey County, one of the largest natural areas within 100 km of Toronto, and the largest natural area in Halton Region. This woodland corridor covers approximately 35 square km, providing refuge for a high diversity of species requiring large tracts of forest to maintain viable populations" (Riley, et at. 1996).	**1**
		Deep Forest Interior (≥ 200 m)	Factors such as overall forest cover, patch size and shape (i.e. interior forest) all have a positive effect on the viability of habitat for flora and fauna. Overall forest cover appears to be the single most important factor in protecting bird species diversity but at the very large scale (160,000 ha), forest interior the amount of 200m forest in a patch was correlated with species richness. Forest cover is based on Ecological Land Classification.	**2**
		Forest Interior (≥ 100 m)		**3**
		Fringe Forest (<100 m)		**4**
		Plantation		**4**
	Hedgerows		Hedgerows can provide corridor function for a variety of wildlife species and can help maintain overall biodiversity in the landscape. Species within hedgerows tend to be less sensitive to disturbance as more sensitive species have likely been extirpated due to previous disturbances (e.g. agriculture).	**4**
	Regenerating Habitat (Habitat Restoration)		Similar to forest ecosystems, non-forest habitat cover (e.g. meadow), patch size and shape all have a positive affect on the viability of flora and fauna. Patch size and interior space has been maximized, where possible.	**4**
	Watercourse		Maintenance or rehabilitation of natural watercourse abiotic and biotic conditions including thermal regime and cover are important factor which influences a variety of attributes including dissolved oxygen concentrations, photosynthesis, metabolic rates of aquatic organisms, timing of life-history stages, and the decomposition rates of organic material. These influences in turn, affect ecosystem components such as algal, invertebrate, and fish communities.	**2**
		15 m Buffer		**3**
	Fish Community Class	Coldwater and potential ~~coolwater~~ / Redside Dace (30 m from	Fish habitat is comprised of those physical, chemical and biological attributes of the environment, which are required by fish to carry out their life processes (e.g.,spawning, nursery, rearing, feeding, overwintering, migration). It consists of those environments that directly or indirectly support fish communities. These guidelines can be applied to habitat, which may not directly support fish, but may provide	**1**

Category	Primary Evaluation Criteria	Secondary Evaluation Criteria	Rationale	Priority Level
Areas of Functional Ecological Importance		meanderbelt, if not mapped 30 m from watercourse)	nutrients and/or food supply to adjacent or downstream habitats and may contribute to increased water quality for fish. Changes to riparian vegetation can alter watercourse temperatures, reduce stability of stream banks and decrease overhead cover and refugia for fish. A vegetate buffer adjacent to a watercourse can also assist in the removal of sediment, pesticides and other deleterious substances which degrade water quality and fish habitat. Fish require appropriate fish habitat to carry out their life processes and the provision of adequate vegetated buffers is essential to the maintenance and enhancement of fish habitat. With the exception of the Redside Dace setbacks (*draft* Redside Dace Recovery Strategy 2009) the remaining setbacks are from Ontario Regulation 162/06.	
		Potential coolwater and warmwater sportfish (30 m from watercourse)		**2**
		Warmwater forage fish (15 m from watercourse)		**4**
	Drinking Water Source Protection – Municipal Wellhead Protection Area	100 m radius	A wellhead is simply the physical structure of the well above the ground. A wellhead protection area is a surface projection of the zone surrounding the wellhead through which groundwater is reasonably likely to travel to the well. The various capture zones that make up a wellhead protection area are based on how long it takes water to reach the well. The amount of land involved in a wellhead protection area is determined by a variety of factors such as the amount of water being pumped and the type of soil/rock through which the water moves. Well capture zones differentiate the potential risks to water quality from contaminants that could move with groundwater to the well. -100-metre radius: The area where the risk to the well is highest and the greatest care should be taken in handling any potential contaminant. -100 m to 2-year time of travel: Bacteria and viruses from human and animal waste are a concern, as are hazardous chemicals. -2 to 5-year time of travel: Chemical pollutants are the primary concern, however, microbiological risks may still be a concern. -5 to 25-year time of travel: The most persistent and hazardous contaminants remain a concern.	**1**
		100 m to 2-year time of travel		**2**
		2 to 5-year time of travel		**3**
		25-year time of travel		**4**
	Rare Vegetation Community	G1 - G3 and S1 - S3	Globally and provincially rare vegetation communities may arise as a result of rare growing conditions including, soil attributes (nutrients), water availability, and sun exposure. Or, more commonly in urbanized environments, rare vegetation communities arise as a result of being one of the few remaining examples of a once more common community.	**1**
	Species at Risk		Species at risk and habitat for endangered and threatened species are protected by the Federal Species at Risk Act (birds and fish) and Provincial Endangered Species Act (2007).	**1** (See Table 4-1)
		Critical Function and Protection Zone	Legislation mandates that species at risk habitat be protected. To protect it for the long-term, critical areas based on life process must be identified and protected from degradation. See species specific Table 5-1.	
	Globally and Provincially Rare Species	G1 - G3 and S1 - S3	Similar to species at risk, species considered globally rare should be protected to maintain current biodiversity.	**1** (See Table 4-1)
		Critical Function and Protection Zone		
	Halton Region Rare Species		Similar to species at risk, species considered rare at the regional level should be protected to maintain current biodiversity.	**2** (See Table 4-1)
		Critical Function and Protection Zone	See species specific Table 5-1.	
	Non-Provincially Significant Wetlands		The preservation of all wetlands help preserve native plant and animal species, wildlife habitat, ecological process, maintenance of biological diversity and erosion and flood control.	**2**
		Wetlands > 2ha 30 m Buffer	Wetlands that are greater than or equal to two hectares in size and not Provincially Significant are regulated 120 metres from the limit of the wetland. (Policy 3.38, Ontario Regulation 162/06). Wetlands less than two hectares in size and not Provincially Significant are regulated 30 metres from the limit of the wetland (Policy 3.39, Ontario Regulation 162/06).	**2**
		Wetlands > 2 ha 31 – 120 m Buffer		**4**
		Wetlands < 2ha 15 m Buffer		**2**
		Wetlands < 2 ha 16 – 30 m Buffer		**4**
	Vernal Pools		Vernal pools provide critical habitat for a variety of species, most notably amphibians during the breeding season. Many amphibian species have evolved to be obligate, or near obligate, vernal pool species and are therefore necessary to maintain existing populations.	**1**
		Critical Function Zone 30 m Buffer	Adjacent uplands (0-30m) provide important foraging habitat for amphibian species as well as providing important water quality functions. Natural habitat that is located further from vernal pools can be particularly important to the maintenance of functions and species populations that are more terrestrial during their adult stage.	**2**
	Seeps		Seeps provide base flows to streams and help in the regulation of coldwater / coolwater thermal designations. Development and site	**1**

Category	Primary Evaluation Criteria	Secondary Evaluation Criteria	Rationale	Priority Level
Areas of Functional Ecological Importance		30 m Buffer	alteration shall be restricted in or near sensitive surface water features such that these features and their related hydrologic functions will be protected, improved or restored (PPS 2005).	**3**
	Bat Hibernacula		Banding studies have confirmed that bats normally show high fidelity to specific hibernation sites over the years. Bats are particularly sensitive to disturbance during hibernation, and their ability to survive through winter is often jeopardized if disturbed (Stebbings 1969, OMNR 1984). Arousal is energy expensive, equivalent to about 65 days of hibernation (Brack 2004). The availability of suitable winter hibernacula is limited. Consequently, those caves that are presently used by hibernating bats are considered significant habitat and are critical to the survival of existing populations (OMNR 2006).	**1**
	Floodplain	Hazard Component	Floodplains occur adjacent to watercourse features and experience occasional and periodic flooding. These areas tend have higher biodiversity as they represent the transition zone between ecosystem types. As well, these areas tend to have greater natural vegetation due to their flood prone nature and have regulations limiting their development. Policy 3.25.2.4 (Ont. Reg. 162/06) states that, "Except as provided for in Policies 3.25.2.1–3.25.2.3, no new development is permitted within 15 metres of the flood plain" of major valley systems.	**2**
		15 m Buffer		**3**
	Meander Belt	Hazard Component	Policy 3.26.2.4 (Ontario Regulation 162/06) states that, "Except as provided for in Policies 3.26.2.1 – 3.26.2.3, no new development is permitted within 15 metres of the meander belt allowance" for major valley systems.	**2**
		15 m Buffer		**3**
	Stable Top of Bank	Hazard Component	Policy 3.35.3 (Ontario Regulation 162/06) states that, "Except as provided for in policies 3.35.1 and 3.35.2, no new development or redevelopment is permitted within 15 metres of the stable top of bank of major valley features".	**2**
		15 m Buffer		**3**
Significant Natural and Cultural Features	Look Outs		The vista or open area often focuses on a specific feature in the landscape. Views add an additional dimension to landscape quality and enhance opportunities for appreciation of the landscape for park visitors.	**4**
	Veteran Tree		Veteran trees are rare in many southern Ontario forest due to selective cutting of wood for timber. These older trees (>60dbh) play and important role in diversify the age structure of forest and can signify areas with fewer disturbances in the past. Older trees often produce large masts which ensure regeneration of a new forest canopy.	**3**
	Ancient Cedars		The Niagara Escarpment is the most significant site for ancient Eastern White Cedars in Ontario. The Niagara Escarpment Ancient Tree Atlas Project (NEATAP) was started in 1998 to search for the oldest living trees at numerous cliff sites along the Escarpment. Germination dates for these trees date back to as early as 1134 A.D. In total 111 trees have been identified in Halton, the majority of which are found at Mount Nemo, Rattlesnake Point, Crawford Lake and Kelso Conservation Areas.	**1**
	EMAN Plot / MOE Plot / Forest Bird Monitoring Program Station / Fish Sampling Station		The Ecological Monitoring and Assessment Network is a Canada wide monitoring program overseen by Environment Canada designed to better detect, describe, and report on ecosystem changes. The program and requires protection to ensure the accuracy of long-term datasets. The Forest Bird Monitoring Program is designed to monitor habitat specific population changes of Ontario birds breeding in mature forests. Fish Sampling Stations are part of Conservation Halton's Long-term Environment Monitoring Program for fish diversity.	**1**
		EMAN Plot / MOE Plot 30 m Buffer		**1**
		EMAN Plot / MOE Plot 31 - 100 m Buffer		**2**
	Steep Slopes	Scarp Face Slope (45-80%)	The near vertical escarpment face and steep talus slope are part of the larger Niagara Escarpment. The scarp face is a distinctive regional landmark, boasts magnificent views and vistas and contains significant ecological features. While providing dramatic visual presence and some limited recreational opportunities, the steep slopes require careful management to ensure the protection of their physical and ecological attributes.	**1**
		Talus & Other Slope (8-25% & 25-45%)		**2**
Other	Agricultural Fields		Low diversity and ecological function	**5**
	Existing Facilities	e.g. parking lot, building, and access / maintenance road		**5**
	Cultural Heritage	e.g. historic foundations, ruins, archeological sites		**3**
	Utility Easements	See Table X.X		**5**
	Cultural Meadows	CUM 1-1	Provides an ecological function and supports surrounding environments. Not present in enough area to maintain fully functioning meadow ecology. Deemed appropriate for restoration or to accommodate facilities in limited areas.	**5**

TABLE 4-2: VISITOR IMPACT MANAGEMENT MATRIX FOR CRAWFORD LAKE CONSERVATION AREA (BASED ON KELSO CONSERVATION AREA MASTER PLAN)

Activity	Permitted Uses Areas	Ecological and Physical Impact Indicators	Service Level	Development and Operational Guidelines	Probable Impact Cause	Potential Management Strategies
Trail Uses (Hiking)	Trails selectively permitted in any Park Management Zones except 'Special' Nature Reserve Zone	▪ Evidence of loss of vegetation and / or soil-litter in excess of designated trail width (i.e., trampling damage or compaction) ▪ Trail rutting, ponding or expanding wet areas ▪ Surface soil erosion, gullying or compaction ▪ Tree root exposure or damage ▪ Unauthorized new trail development – braiding, widening ▪ Waste litter ▪ Breeding disturbance, nest abandonment	Primitive (i.e., Single Track Bruce Trail)	▪ Avoid poor soil conditions ▪ Maximize sheet water drainage and utilize water bars and gutters ▪ maximum 120 cm trail width ▪ Packed earth or natural bedrock path ▪ Route away from rare or endangered plant or animal species ▪ Maximum slope 20% on erodible soils ▪ Avoid wet areas unless protection measure provided ▪ Avoid habitat fragmentation and minimize intrusion into interior forest habitat or wildlife corridors	▪ Lack of trail etiquette knowledge ▪ Excessive group size and / or supervisions ▪ Improper behaviour ▪ Curiosity seekers exploring off trails ▪ Seasonal weather or unsuitability ▪ Unauthorized use ▪ Improper trail route	▪ Informational signage ▪ Temporary trail closure ▪ Better trail definition with wood chip or stone surfacing and bordered with an edging of rocks, logs or simple barriers ▪ Native material trail surfacing with bark chips or limestone screenings on high capacity trails or problem sections ▪ Remedial drainage works: water bars, ditches, culverts, footbridges, etc. ▪ Boardwalks for wet areas ▪ Limit group sizes ▪ Increased trail supervision or trails monitoring – trail stewards, bike patrols ▪ Reroute users to less / under used areas ▪ User trail maps come with responsibility code ▪ Educational programs ▪ Barriers to prevent non-pedestrian usage ▪ Adopt-a-Trail maintenance program ▪ Convenient waste receptacles ▪ Remediation of impacted areas
			Medium Service Nature Trail	▪ Maximum 200cm trail width ▪ Avoid highly sensitive habitats ▪ Maximum 18% slope for short distances ▪ Additional as above		
			High Capacity Nature Trail	▪ Maximum 300 cm trail width ▪ Handicapped accessible ▪ Packed granular surfacing ▪ Maximum slope 12% ▪ Additional as above		
Group Picnicking	Designated picnic areas in Development or Resource Management Zones	▪ Turf trampling and destruction ▪ Noise pollution ▪ Litter / garbage ▪ Sewage odours or overflow	General	▪ Provide healthy turf cover ▪ Provide accessible sanitary facilities within 100 metres ▪ Provide scattered shade tree plantings throughout area ▪ Provide surface walking trails on major area linkages	▪ High use area in variable weather conditions ▪ Shortcut route to designation ▪ Excessive peak day loading	▪ Provide additional picnic facilities (i.e., washroom facilities, trails, waste receptacles) ▪ Develop additional picnic facilities throughout park to disperse crowds ▪ Limit peak day attendance
Group Camping	Designated campsites in Development or Resource Management Zones	▪ Turf trampling and destruction ▪ Noise pollution ▪ Litter /garbage ▪ Sewage odours or overflow ▪ Unauthorized campfires ▪ Foraged firewood	Recreation group camping by permit	▪ Provide healthy turf cover ▪ Provide accessible sanitary facilities within 100 metres ▪ Provide plantings for privacy between group campsites ▪ Provide convenient waste receptacles	▪ High use area in variable weather conditions ▪ Shortcut to designation ▪ Lack of knowledge of campground regulations ▪ Lack of supervision	▪ Rotate campsite bookings to allow overused sites to rest or re-establish turf growth ▪ Provide additional campground facilities (i.e., washroom facilities, waste receptacles) ▪ Provide increased supervision ▪ Provide improved campground regulation signage

Table 4-3: Schedule of Restoration Costs

GENERAL EARTHWORK ITEMS	Size	Qty.	Unit	Unit Price	Price/m2	Total
Mobilization / Demobilization	-	0	L.S.	$5,000.00	$ -	$ -
Trail Signage	-	0	ea	$200.00	$ -	$ -
Access paving protection and restitution	-	0	L.S.	$1,000.00	$ -	$ -
Heavy Equipment Clearing and Grading	-	0	m²	$1.50	$ 1.50	$ -
mudtracking/road clean-up		0	L.S.	$1,000.00	$ -	$ -
Trail Markers		0	ea	$10.00	$ -	$ -
Wood Box Culvert		0	ea	$220.00	$ -	$ -
CMP culvert		0	ea	$ 300.00	$ -	$ -
Light Equipment Clearing and Grading		0	m²	$6.50	$ 6.50	$ -
Topsoil Stripping and stockpile for reuse		0	cu.m.	$28.00	$ 9.30	$ -
Midden / Refuse / Fence Removal		0	hec	$5,000.00	$ 0.50	$ -
Site sourced woody debris		0	L.S.	$500.00	$ -	$ -
Bridge Crossing single wood		0	m²	$86.00	$ 86.00	$ -
Trailhead Closures		0	ea	$1,500.00	$ 100.00	$ -
Dewatering (pump-and-pipe)	-	0	L.S.	$5,500.00	$ -	$ -
Pedestrian and tree protection fencing	-	0	l.m.	$10.00	$ -	$ -
Silt fence-install, maintain and remove	-	0	l.m.	$15.00	$ -	$ -
Excavation and Grading (removal offsite)	-	0	m²	$16.66	$ 16.66	$ -
Trail Double granular		0	m²	$46.00	$ 9.20	$ -
Trail Double Mulch		0	m²	$7.50	$ 7.50	$ -
invasive species removal		0	m²	$0.50	$ 0.50	$ -
Eagle bridge single wide 7.5m x 1.8m		0	ea	$20,000.00	$ 1,500.00	$ -
ecoblanket terraseed		0	m²	$ 3.50	$ 3.50	$ -
Imported topsoil	-	0	cu.m.	$35.00	$ 11.66	$ -
400-500mm Rip Rap	-	0	cu.m.	$76.50	$ 38.25	$ -
700g/sq.m. Coir Cloth (ECB - 4m wide)	-	0	m²	$8.00	$ 8.00	$ -
Straw much / photodegradable netting ECB	-	0	m²	$1.95	$ 1.95	$ -
REVEGETATION ITEMS						
Caliper Trees						
Acer saccharinum, Silver Maple	40mm cal.	0	ea	$ 300.00		$ -
Quercus macrocarpa, Bur Oak	40mm cal.	0	ea	$ 300.00		$ -
Whip Size Trees						
Juniperus viginiana, Red Cedar	150cm hgt	0	ea	$ 85.00		$ -
Acer saccharum, Sugar Maple	150cm hgt	0	ea	$ 85.00		$ -
Quercus macrocarpa, Bur Oak	150cm hgt	0	ea	$ 85.00		$ -
Tilia americana, Basswood	150cm hgt	0	ea	$ 85.00		$ -
Populus tremuloides, Trembling Aspen	150cm hgt	0	ea	$ 85.00		$ -
Native Shrub Mix						
Rosa palustris , Wetland Rose	50cm hgt #2	0	ea	$ 40.00		$ -
Spirea latifolia , Meadowsweet	50cm hgt #2	0	ea	$ 40.00		$ -
Rhus typhina, Staghorn Sumac	50cm hgt #2	0	ea	$ 40.00		$ -
Amelanchier canadensis, Serviceberry	100cm hgt. #5	0	ea	$ 85.00		$ -
Lindera benzoin, Spicebush	50cm hgt #2	0	ea	$ 40.00		$ -
Cornus alternifolia, Alternate leaved Dogwood	50cm hgt #2	0	ea	$ 40.00		$ -
Cornus sericea, Red Osier Dogwood	50cm hgt #2	0	ea	$ 40.00		$ -
Salix exigua, Sandbar Willow	75cm hgt #2	0	ea	$ 35.00		$ -
Symphoricarpos albus, Snowberry	75cm hgt #2	0	ea	$ 35.00		$ -
Rubus idaeus, Wild Raspberry	50cm hgt #2	0	ea	$ 35.00		$ -
Sambucus canadensis, Elderberry	50cm hgt #2	0	ea	$ 35.00		$ -
Viburnum lentago, Nannyberry	50cm hgt #2	0	ea	$ 35.00		$ -
Plugs and other forms						
Upland basic grass mix	drill seed	0	m²	$ 0.25	$ 0.25	$ -
Aquatic Plugs	50mm plug	0	ea	$ 3.50		$ -
Forbs	100cm pot	0	ea	$ 5.00		$ -
VPL Shrubs	20-60cm	0	ea	$ 35.00		$ -
I year Transplant	125cm hgt #1	0	ea	$ 25.00		$ -
2 year Transplants	200cm hgt #2	0	ea	$ 45.00		$ -
conifer seedlings	15cm hgt	0	ea	$ 5.00		$ -
Live willow stakes	-	0	ea	$ 5.00	$ 10.00	$ -
Shoreline Herbaceous Native Regeneration Seed Mix	-	0	m²	$ 4.50	$ 4.50	$ -
					Revegetation subtotal	**$ -**

The Conceptual Cost Estimates provided herein is for budgetary purposes only and may vary considerably from a Contractor's quotation. All plant material is restoration quality. One year warranty at 70% take.

COST SUMMARY	
General Earthworks Items	$ -
Revegetation Items	$ -
Subtotal	$ -
15% contingency	$ -
TOTAL COST	**$0.00**

Table 4-4: Supplementary Restoration Costs

Reference Project	Size	Project Description
Solar Farm - Under Construction Estimated Cost: $575,000	4.12ha	Combination of tall grass prairie, nucleation plant cells and pit and mound micro-topography.
Industrial Restoration Site - Completed 2007 Total Cost: $92,000	<5ha	Enhancement of existing woodlot and repair of industrial disturbances using successional forest buffers and open meadow restoration treatments.
Restoration of Rouge River Riparian Areas - Under Construction. Estimated Cost: $500,000	>1km of river	Extensive repair and restoration to several Rouge River Tributary sites protecting municipal infrastructure and enhancing the ecological system. Work included riparian habitat improvements and channel realignment to provide flood relief.
West Side Marsh - Completed 2004 Total Cost: ~$2,300,000	<25ha	Enhancement to existing wetlands as well as construction of new wetland areas, providing multiple habitat types including: pike nursery, littoral shelves, raptor poles, nesting islands, bass basin shelters and hibernacula.
Edge Management Plan - Under Construction Estimated Cost: $250,000	>10ha	Woodlot management in new community development. Works included trail design, successional planting and trailhead closures.
Industrial Restoration Site - Under Construction Estimated Cost: $85,000	<5ha	Restoration to woodlot edge and lakeside slope disturbed by industrial activity using nucleation plant cells.

Master Plan for Crawford Lake Conservation Area

Stage Three Report
Appendix II: Financials

TCI Management Consultants

Appendix II

Financial Calculations

Table 5-1: Crawford Lake Conservation Area Development Timeframe Assumptions

Capital Cost Element	Total Cost ($2010)	Development Timeframe Assumptions
Signage		
Main Entrance	$30,000	year 1
Conservation Halton Parks Wayfinding/cross marketing	$25,000	year 1
Trail directional signage	$7,000	years 1, 2, 3
Interpretive Signage	$50,000	year 4
Language Outreach Upgrades	$20,000	year 4
Road		
Tar and chip surface road	$450,000	years 5, 6
Bioswales	$70,000	years 5, 6
Base Parking		
Tar and chip	$920,000	years 5, 6
Bioswales	$17,500	years 5, 6
Shade tree planting (caliper)	$30,000	years 5, 6
Overflow Parking		
Stabilized surface	$100,100	years 8, 9
Bioswales	$10,000	years 8, 9
Shade tree planting (caliper)	$2,000	years 8, 9
Picnic and Site Furnishings		
Picnic Shelter	$80,000	year 4
Group Campsites	$30,000	year 6
Upgraded Toilets	$10,000	year 1
Site Furnishing	$50,000	year 1
Other Infrastructure and Upgrades		
Automated Gate	$40,000	year 1
Maintenance Building	$150,000	year 3
Gatehouse Renovations	$40,000	year 3
New Longhouses with fixtures, display elements	$600,000	years 4, 7 and 8
Reclade and refurbish existing longhouses	$105,000	years 3, 4 and 5
Renovate Wolf Clan Longhouse	$150,000	years 3, 4 and 5
Village Features Upgrades	$65,000	year 5
Palisade Replacement (spread out over 10 years)	$100,000	years 1 through 10
Repurpose existing buildings	$470,000	years 4 through 7
Visitor Centre Site Services	$150,000	years 4 and 5
Rehabilitate existing road	$6,525	year 8
Existing parking lot restoration(2500 sq m)	$75,000	year 8
New Native/Indigenous Gardens	$100,000	year 9
Site Service Upgrades	$50,000	year 4
Accessibility Upgrades	$20,000	year 4

Table 5-1: Crawford Lake Conservation Area Development Timeframe Assumptions, continued

Capital Cost Element	Total Cost ($2010)	Development Timeframe Assumptions
Trails		
Decommissioned trails	$25,000	year 1
Upgrading walking trails	$76,000	year 3
Boardwalk replacement & upgrade	$300,000	years 2 and 3
Fencing/Trail Delineation	$100,000	years 2 and 3
Trailhead(s)	$11,000	years 1, 2, 3
Interpretive Programming and Equipment	$60,000	year 4
Visitors Impact Management Plan*	$150,000	Year 1,2,3,4,5,6,7,8,9,10
Restoration Planting	$1,035,000	years 1, 2, 3
Sub-Total	$5,780,125	
Professional Fees /Soft Costs	$867,019	calculated for each year
Contingency	$867,019	calculated for each year
Grand Total, excluding Visitor Centre	**$7,514,163**	
Visitor Centre/ Education Building & Access Road	$10,000,000	years 4 and 5
Grand Total, including Visitor Centre	**$17,514,163**	

*The Visitors Impact Management Plan has allotted $60,000 per year to be divided between the four parks (Hilton Falls, Rattlesnake Point, Mount Nemo and Crawford Lake) based on need. For budgeting purposes we have averaged the amount to $15,000 per park, per year.

Table 5-2: Crawford Lake Conservation Area Site Development Costs Over 10-Year Period

Facility	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total Cost
Signage											
Main Entrance	$30,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$30,000
Conservation Halton Parks Wayfinding/cross marketing	$25,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$25,000
Trail directional signage	$2,333	$2,333	$2,333	$0	$0	$0	$0	$0	$0	$0	$7,000
Interpretive Signage	$0	$0	$0	$50,000	$0	$0	$0	$0	$0	$0	$50,000
Language Outreach Upgrades	$0	$0	$0	$20,000	$0	$0	$0	$0	$0	$0	$20,000
Road											
Tar and chip surface road	$0	$0	$0	$0	$225,000	$225,000	$0	$0	$0	$0	$450,000
Bioswales	$0	$0	$0	$0	$35,000	$35,000	$0	$0	$0	$0	$70,000
Base Parking											
Parking lot redevelopment	$0	$0	$0	$0	$460,000	$460,000	$0	$0	$0	$0	$920,000
Bioswales	$0	$0	$0	$0	$8,750	$8,750	$0	$0	$0	$0	$17,500
Shade tree planting (caliper)	$0	$0	$0	$0	$15,000	$15,000	$0	$0	$0	$0	$30,000
Overflow Parking											
Stabilized surface	$0	$0	$0	$0	$0	$0	$0	$50,050	$50,050	$0	$100,100
Bioswales	$0	$0	$0	$0	$0	$0	$0	$5,000	$5,000	$0	$10,000
Shade tree planting (caliper)	$0	$0	$0	$0	$0	$0	$0	$1,000	$1,000	$0	$2,000
Picnic and Site Furnishings											
Picnic Shelter Comfort Station	$0	$0	$0	$80,000	$0	$0	$0	$0	$0	$0	$80,000
Group Campsites	$0	$0	$0	$0	$0	$30,000	$0		$0	$0	$30,000
Upgraded Toilets	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10,000
Site Furnishing	$50,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$50,000
Other Infrastructure and Upgrades											
Automated Gate	$40,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$40,000
Maintenance Building	$0	$0	$150,000	$0	$0	$0	$0	$0	$0	$0	$150,000
Gatehouse Renovations	$0	$0	$40,000	$0	$0	$0	$0	$0	$0	$0	$40,000
New Longhouses with fixtures, display elements	$0	$0	$0	$200,000	$0	$0	$200,000	$200,000	$0	$0	$600,000
Reclad and refurbish existing longhouses	$0	$0	$35,000	$35,000	$35,000	$0	$0	$0	$0	$0	$105,000
Renovate Wolf Clan Longhouse	$0	$0	$50,000	$50,000	$50,000	$0	$0	$0	$0	$0	$150,000

Table 5-2: Site Development Costs Over 10-Year Period, continued

Facility	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total Cost
Village Features Upgrades	$0	$0	$0	$0	$65,000	$0	$0	$0	$0	$0	$65,000
Palisade Replacement (spread out over 10 years)	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$100,000
Repurpose existing buildings	$0	$0	$0	$117,500	$117,500	$117,500	$117,500	$0	$0	$0	$470,000
Visitor Centre Site Services	$0	$0	$0	$75,000	$75,000	$0	$0	$0	$0	$0	$150,000
Rehabilitate existing road	$0	$0	$0	$0	$0	$0	$0	$6,525	$0	$0	$6,525
Existing parking lot restoration(2500sm)	$0	$0	$0	$0	$0	$0	$0	$75,000	$0	$0	$75,000
New Native/Indigenous Gardens	$0	$0	$0	$0	$0	$0	$0	$0	$100,000	$0	$100,000
Site Service Upgrades	$0	$0	$0	$50,000	$0	$0	$0	$0	$0	$0	$50,000
Accessibility Upgrades	$0	$0	$0	$20,000	$0	$0	$0	$0	$0	$0	$20,000
Trails											
Decommissioned trails	$25,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$25,000
Upgrading walking trails	$0	$0	$76,000	$0	$0	$0	$0	$0	$0	$0	$76,000
Boardwalk replacement & upgrade	$0	$150,000	$150,000	$0	$0	$0	$0	$0	$0	$0	$300,000
Fencing/Trail Delineation	$0	$50,000	$50,000	$0	$0	$0	$0	$0	$0	$0	$100,000
Trailhead(s)	$3,667	$3,667	$3,667	$0	$0	$0	$0	$0	$0	$0	$11,000
Interpretive Programming and Equipment	$0	$0	$0	$60,000	$0	$0	$0	$0	$0	$0	$60,000
Visitors Impact Management Plan*	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$150,000
Restoration Planting	$345,000	$345,000	$345,000	$0	$0	$0	$0	$0	$0	$0	$1,035,000
Sub-Total	$556,000	$576,000	$927,000	$782,500	$1,111,250	$916,250	$342,500	$362,575	$181,050	$25,000	$5,780,125
Professional Fees /Soft Costs	$83,400	$86,400	$139,050	$117,375	$166,688	$137,438	$51,375	$54,386	$27,158	$3,750	$867,019
Contingency	$83,400	$86,400	$139,050	$117,375	$166,688	$137,438	$51,375	$54,386	$27,158	$3,750	$867,019
Grand Total, excluding Visitor Centre	$722,800	$748,800	$1,205,100	$1,017,250	$1,444,626	$1,191,125	$445,250	$471,348	$235,365	$32,500	**$7,514,163**
Visitor Centre and Access Route	$0	$0	$0	$5,000,000	$5,000,000	$0	$0	$0	$0	$0	**$10,000,000**
Grand Total, including Visitor Centre	$722,800	$748,800	$1,205,100	$6,017,250	$6,444,625	$1,217,125	$445,250	$471,348	$235,365	$32,500	**$17,514,163**

*The Visitors Impact Management Plan has allotted $60,000 per year to be divided between the four parks (Hilton Falls, Rattlesnake Point, Mount Nemo &Crawford Lake) based on need. For budgeting purpose we have averaged the amount to $15,000 per park, per year.

Table 5-4: Crawford Lake Conservation Area Attendance Projection

Average Annual Attendance (2005 - 2009)	**84,000**					
Weighted Annual Population Growth Factor	4.72% (based upon population projections of municipalities in the catchment areas of the Conservation Area)					
Year	**(A) Attendance Increase Due to Regional Population Growth Factor**	**(B) Increment Due to Marketing Factor (2%)**	**(C) Increment Due to 'Staycation' Factor (1%)**	**Resulting Attendance Projection**	**(D) Increment from Major New Facilities Coming On-Stream***	**Final Attendance Estimate**
2010	88,021	1,760	880	90,662	0	90,662
2011	92,235	1,845	922	95,002	0	95,002
2012	96,650	1,933	966	99,549	0	99,549
2013	101,277	2,026	1,013	104,315	0	104,315
2014	106,125	2,122	1,061	109,308	0	109,308
2015	111,205	2,224	1,112	114,541	0	114,541
2016	116,528	2,331	1,165	120,024	0	120,024
2017	122,106	2,442	1,221	125,770	62,885	188,655
2018	127,952	2,559	1,280	131,790	65,895	197,685
2019	134,077	2,682	1,341	138,099	69,050	207,149
2020	140,495	2,810	1,405	144,710	72,355	217,065
2021	147,220	2,944	1,472	151,637	75,819	227,456

** completion of the $10 million Visitor Centre by 2017 (Year 5) expected to result in additional 50% attendance in Year 6 and on.*

Table 5-6: Crawford Lake Conservation Area Attendance and Revenue Forecast

	Attendance	Revenue per User	Total Revenue from Attendance
Base Year (2005 - 2009 Average)	84,000	$4.40	$369,500
Year 1	99,549	$5	$497,745
Year 2	104,315	$5	$521,575
Year 3	109,308	$5	$546,540
Year 4	114,541	$5	$572,705
Year 5	120,024	$5	$600,120
Year 6	188,655*	$6	$1,131,930
Year 7	197,685*	$6	$1,186,110
Year 8	207,149*	$6	$1,242,894
Year 9	217,065*	$6	$1,302,390
Year 10	227,456*	$6	$1,364,736

** in Year 6 and on, the Visitor Centre will be operational and will facilitate a spike in attendance levels*

Table 5-7: Crawford Lake Conservation Area Current Operating Budget

Budget Line Item Category	2010 Preliminary Budget	2009 Budget
Expenditures		
Salaries & Wages (Full Time)	$79,627	$78,645
Benefits (Full Time)	$16,114	$15,762
Salaries & Wages (Seasonal/Pt)	$86,726	$77,767
Benefits (Seasonal/Pt)	$8,500	$9,028
Staff Travel	$3,000	$3,500
Vehicle Rental	$11,651	$18,173
Bank Service Charges & Delivery	$4,500	$4,500
Telephone	$8,500	$8,244
Utilities - Hydro And Fuel	$21,000	$20,000
Insurance	$4,600	$4,500
Student Program Supp	$0	$0
Public Program Supp	$6,000	$6,000
Materials & Supplies - Cleaning	$4,300	$3,938
Mat & Supplies - Cross-country Skiing	$0	$0
Office Equipment - Maintenance	$4,500	$5,757
Infrastructure Maintenance	$4,000	$5,000
Gatehouse	$1,000	$1,200
Interpretive Centre (70%)	$1,000	$1,000
Indian Village (75%)	$2,000	$2,000
Gathering Place (70%)	$1,000	$1,000
Marketing/Promotion (85%)	$3,000	$4,000
Gift shop Supplies (Cost Of Sales)	$62,000	$68,000
Gift shop Supplies Materials	$3,500	$4,500
Donations In Kind-Special Events	$0	$0
Gathering Place Loan Payment	$0	$0
Sub Total Expenditures	**$336,518**	**$342,514**
Revenues		
Entry Fees	$224,000	$214,939
Interpretation	$0	
Gift Shop	$132,000	$145,000
Facilities Rental	$5,000	$5,500
Misc/Maple Syrup Non-Tax/X-Country Ski	$8,500	$2,500
Donations In Kind-Special Events	$0	$0
Sub Total Crawford Lake Revenue	**$369,500**	**$367,939**
Excess Of Revenues Over Expenditures	**$32,982**	**$25,425**

Table 5-9: Crawford Lake Conservation Area Staffing Projections

	Incremental Staffing Increase (FTJEs)	Total Staffing Complement (FTJEs)	Incremental Direct Staffing Costs
Base Year (2011)	**0**	**3.07**	$0
Year 1	2.30	5.37	$174,627
Year 2	2.41	5.48	$182,988
Year 3	2.52	5.59	$191,747
Year 4	2.64	5.71	$200,926
Year 5	2.77	5.84	$210,544
Year 6	4.35	7.42	$330,936
Year 7	4.56	7.63	$346,776
Year 8	4.78	7.85	$363,378
Year 9	5.01	8.08	$380,772
Year 10	5.25	8.32	$399,000

Table 5-10: Crawford Lake Conservation Area Maintenance Costs Associated with New Development

Year	Capital Development in Year	Cumulative Development	Maintenance Costs (at 2% of cumulative costs to previous year)
Year 1	$703,300	$703,300	$0
Year 2	$729,300	$1,432,600	$14,066
Year 3	$1,133,600	$2,566,200	$28,652
Year 4	$5,997,750	$8,563,950	$51,324
Year 5	$6,451,125	$15,015,075	$171,279
Year 6	$1,197,625	$16,212,700	$300,302
Year 7	$425,750	$16,638,450	$324,254
Year 8	$451,848	$17,090,298	$332,769
Year 9	$215,865	$17,306,163	$341,806
Year 10	$13,000	$17,319,163	$346,123

Table 5-11: Crawford Lake Conservation Area Enhanced Standard of Care Budget

Year	New Trails Coming On-Stream	Cost of Trails Maintenance Allowance	Hectares of Park Area	Cost of Hazard Tree Allowance	Total Additional Maintenance Costs
Year 1	17	$17,000	336	$13,104	$30,104
Year 2	17	$17,000	336	$13,104	$30,104
Year 3	18	$18,000	336	$13,104	$31,104
Year 4	18	$18,000	336	$13,104	$31,104
Year 5	18	$18,000	336	$13,104	$31,104
Year 6	18	$18,000	336	$13,104	$31,104
Year 7	18	$18,000	336	$13,104	$31,104
Year 8	18	$18,000	336	$13,104	$31,104
Year 9	18	$18,000	336	$13,104	$31,104
Year 10	18	$18,000	336	$13,104	$31,104

Table 5-12: Crawford Lake Conservation Area Invasive Species Management and Monitoring Costs

Year	Invasive Species Control Costs	Species Monitoring Costs	Total Species Management / Monitoring Costs
Year 1	$4,400	$11,880	$16,280
Year 2	$2,200	$11,880	$14,080
Year 3	$2,200	$14,080	$16,280
Year 4	$2,200	$11,880	$14,080
Year 5	$2,200	$11,880	$14,080
Year 6	$2,200	$14,080	$16,280
Year 7	$0	$11,880	$11,880
Year 8	$2,200	$11,880	$14,080
Year 9	$0	$14,080	$14,080
Year 10	$2,200	$11,880	$14,080
Total Costs	**$19,800**	**$125,400**	**$145,200**

Table 5-13: Crawford Lake Operating Cost Projection

	Continuation of Existing Budget	Additional Capital Maintenance Costs	'Enhanced Standard of Care' Costs	Species Management & Monitoring Costs	Incremental Direct Staffing Costs	Additional Marketing Costs (including TODS)	Total Estimated Operating Budget
Year 1	$337,000	$0	$30,104	$16,280	$174,627	$49,000	$607,011
Year 2	$337,000	$14,066	$30,104	$14,080	$182,988	$49,000	$627,238
Year 3	$337,000	$28,652	$30,104	$16,280	$191,747	$49,000	$652,783
Year 4	$337,000	$51,324	$31,104	$14,080	$200,926	$49,000	$683,434
Year 5	$337,000	$171,279	$31,104	$14,080	$210,544	$49,000	$813,007
Year 6	$337,000	$300,302	$31,104	$16,280	$330,936	$49,000	$1,064,621
Year 7	$337,000	$324,254	$31,104	$11,880	$346,776	$49,000	$1,100,014
Year 8	$337,000	$332,769	$31,104	$14,080	$363,378	$49,072	$1,127,403
Year 9	$337,000	$341,806	$31,104	$14,080	$380,772	$50,560	$1,155,322
Year 10	$337,000	$346,123	$31,104	$14,080	$399,000	$52,118	$1,179,426

Table 5-14: Crawford Lake Net Financial Operating Position

	Estimated Operating Revenues	Estimated Operating Costs	Net Financial Operating Position
Year 1	$497,745	$607,011	($109,266)
Year 2	$521,575	$627,238	($105,663)
Year 3	$546,540	$652,783	($106,243)
Year 4	$572,705	$683,434	($110,729)
Year 5	$600,120	$813,007	($212,887)
Year 6	$1,131,930	$1,064,621	$67,309
Year 7	$1,186,110	$1,100,014	$86,096
Year 8	$1,242,894	$1,127,403	$115,491
Year 9	$1,302,390	$1,155,322	$147,068
Year 10	$1,364,736	$1,179,426	$185,310

Table 5-15: Crawford Lake Conservation Area Revenues per Visitor to Break Even

Year	Anticipated Operating Deficit	Attendance in that Year	Additional Surcharge per Visitor Required to Break Even	Assumed per Visitor Revenue for that Year	Total Target Revenue per Visitor
2012	$109,266	99,549	$1.10	$5.00	$6.10
2013	$105,663	104,315	$1.01	$5.00	$6.01
2014	$106,243	109,308	$0.97	$5.00	$5.97
2015	$110,729	114,541	$0.97	$5.00	$5.97
2016	$212,887	120,024	$1.77	$5.00	$6.77
2017	$0	188,655	$0.00	$6.00	$6.00
2018	$0	197,685	$0.00	$6.00	$6.00
2019	$0	207,149	$0.00	$6.00	$6.00
2020	$0	217,065	$0.00	$6.00	$6.00
2021	$0	227,456	$0.00	$6.00	$6.00

Master Plan for Crawford Lake Conservation Area

Stage Three Report
Appendix III:
Limestone Legacy Visions, Goals and Objectives

TCI Management Consultants
DILLON CONSULTING
EDA Collaborative

Appendix III - Halton Escarpment Parks, A Limestone Legacy

October 1, 2007

LL Vision: A sustainable network of world class conservation parks for ecological health and to provide public green space for quality education and recreation experiences.

LL Goal: To build and maintain a network of spectacular natural parks in Halton that demonstrate and explain the rich natural history, cultural heritage and global significance of Ontario's Greenbelt and the Niagara Escarpment and to provide high quality recreational and educational experiences for watershed residents and beyond.

LL Objectives:

- A Halton gateway to the Niagara Escarpment with access to the Bruce Trail and future municipal trail connections, thereby linking our natural parks with other natural elements both in and beyond Halton Region.
- An outstanding premier ranked tourism attraction with multiple themed parks and features.
- A network of parks with consistent quality signage encompassing entrance signs, interpretive stations, information kiosks and internal directional signs.
- A wide range of educational and recreational opportunities for park visitors including one of the few downhill skiing and snowboarding facilities in southern Ontario.
- A planning and funding model that will enhance the Escarpment Parks and enable infrastructure improvements, capital expansion and quality maintenance standards.
- The development of guidelines for standards to ensure quality facilities, services and programs.
- The development of a sustainability plan for the Escarpment Parks that is complementary to the Sustainable Halton Plan and Halton's natural heritage system of greenlands. This would involve using Conservation Halton's parks as core lands, that would contribute to the range of habitat conditions (wetlands, forests, etc.) needed to maintain a high species biodiversity in the Region.
- The development of a management protocol for master planning the Escarpment Parks including the aspect of the Region's extensive forest tracts which are part of Halton's significant greenlands.
- The development of a partnership agreement for the development and funding of the Escarpment Parks.