Borer's Falls-Rock Chapel Heritage Lands

INVENTORY, ISSUES AND OPPORTUNITIES

Prepared for Cootes to Escarpment EcoPark System

October 2018

Cootes to Escarpment EcoPark System Partners

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Cootes to Escarpment EcoPark System

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1.0 Introduction

1.1 Study Context

Between 2007 and 2009, a group of public agencies and organizations consisting of the Royal Botanical Gardens (RBG), Hamilton Conservation Authority (HCA), Conservation Halton (CH), City of Hamilton, City of Burlington, Halton Region, Bruce Trail Conservancy, Hamilton Naturalists' Club, and Hamilton Harbour Remedial Action Plan (RAP), undertook to develop a strategy to protect, connect and restore natural lands and open space between the Niagara Escarpment and Cootes Paradise in Hamilton Harbour. The initiative resulted in the "Cootes to Escarpment Park System Conservation and Land Management Strategy Phase II Report" (October 2009). This report was based on extensive background research, public engagement and stakeholder consultation, and articulates the vision for a new park system in this area. The Phase II report divides the Cootes to Escarpment EcoPark System into six core natural areas referred to as "Heritage Lands", named to reflect the natural and cultural components of each area (Figure 1):

- Borer's Falls-Rock Chapel Heritage Lands;
- Burlington Heights Heritage Lands;
- Clappison-Grindstone Heritage Lands;
- Cootes Paradise Heritage Lands;
- Lower Grindstone Heritage Lands; and
- Waterdown-Sassafras Woods Heritage Lands.

The Cootes to Escarpment EcoPark System faces intense pressures from the surrounding urbanized portions of Hamilton and Burlington, including major transportation arteries such as Highways 403 and 6. The effects of urban growth include stressors such as increased use, additional infrastructure, demand for recreation and educational programs and facilities, and unauthorized use and access. These stressors can be expected to result in damage to sensitive habitats and will jeopardize the long-term health of natural features and their functions. In response to this, the Phase II report recommended a number of actions, one of which is the preparation of a Management Plan for each of the Heritage Lands.

The Management Plans will contribute to achieving the vision of the Cootes to Escarpment EcoPark System as a "protected, permanent and connected natural lands sanctuary from the Harbour to the Escarpment that promotes ecosystem and human health within Ontario's Greenbelt". Thus, the Management Plans will provide guidance for the protection and conservation of valuable natural and cultural heritage resources located within the Heritage Lands, and direct future development and management efforts. Because much of the Cootes to Escarpment EcoPark System is part of the Niagara Escarpment Parks and Open Space System (NEPOSS), the Management Plans will be prepared following the NEPOSS land classifications and zones as a basis for recommending future management initiatives. The Management Plans will provide guidance to the partner agencies in such a manner that they can implement their respective mandates while still providing consistency throughout the EcoPark System.

The Heritage Lands include both publicly- and privately-owned lands. The Management Plans are restricted to the publicly-owned lands, which are referred to as "Current EcoPark System Lands" in this report, although they will consider adjacent privately-owned lands with respect to context and

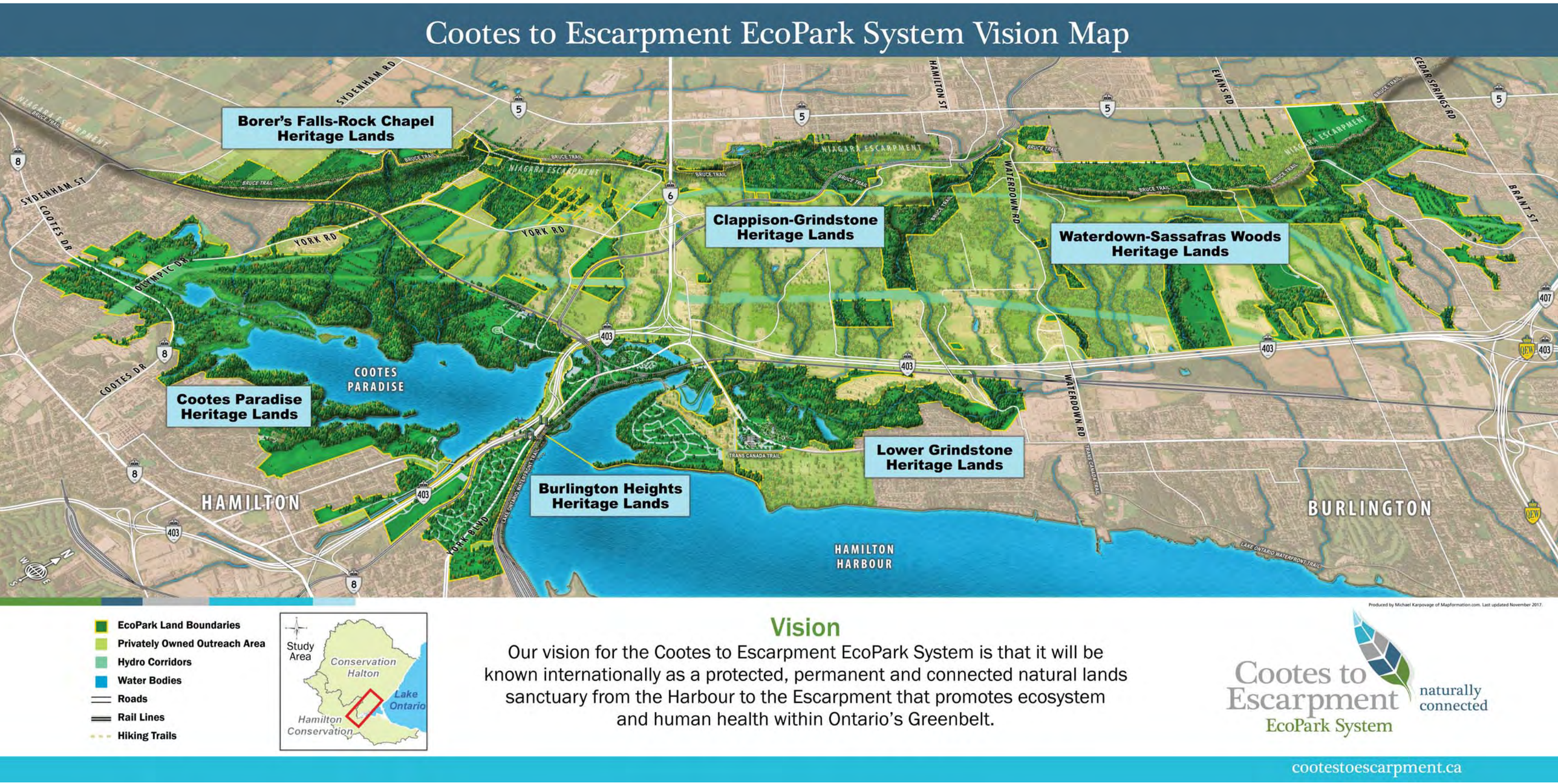


Figure 1. Cootes to Escarpment EcoPark System Study Area Location.

connectivity. The privately-owned lands in the Cootes to Escarpment EcoPark System are referred to as "Privately Owned Outreach Areas".

Management Plans for Burlington Heights Heritage Lands (Cootes to Escarpment EcoPark System 2014a), Clappison-Grindstone Heritage Lands (Cootes to Escarpment EcoPark System 2016b) and Waterdown-Sassafras Woods Heritage Lands (Cootes to Escarpment EcoPark System 2016c) have been completed. The Current EcoPark System Lands in the Borer's Falls-Rock Chapel Heritage Lands are owned and managed by four partner agencies: RBG, HCA, CH and the City of Hamilton (Figure 2).

1.2 Purpose and Scope of Work

1.2.1 Purpose of the Management Plan

The overall goal of this project is to develop a comprehensive Management Plan for the Borer's Falls-Rock Chapel Heritage Lands. The Management Plan will enhance protection of important natural and cultural features and improve sustainable recreation, research and education opportunities through addressing the following elements:

- protection and sustainable use of natural heritage resources;
- protection and sustainable use of cultural heritage resources;
- pressures and issues of concern identified by the four participating landowners, other Cootes to Escarpment EcoPark System partners, stakeholders and the public;
- wildlife corridors, eco-passages and pedestrian linkages;
- infrastructure maintenance, creation and decommissioning;
- recreation, education and research opportunities that are compatible with preserving the natural and cultural heritage of the area; and
- criteria and indicators for evaluation of the implementation and effectiveness of the Management Plan and an ongoing monitoring program to consistently collect supporting information.

1.2.2 Scope of Work

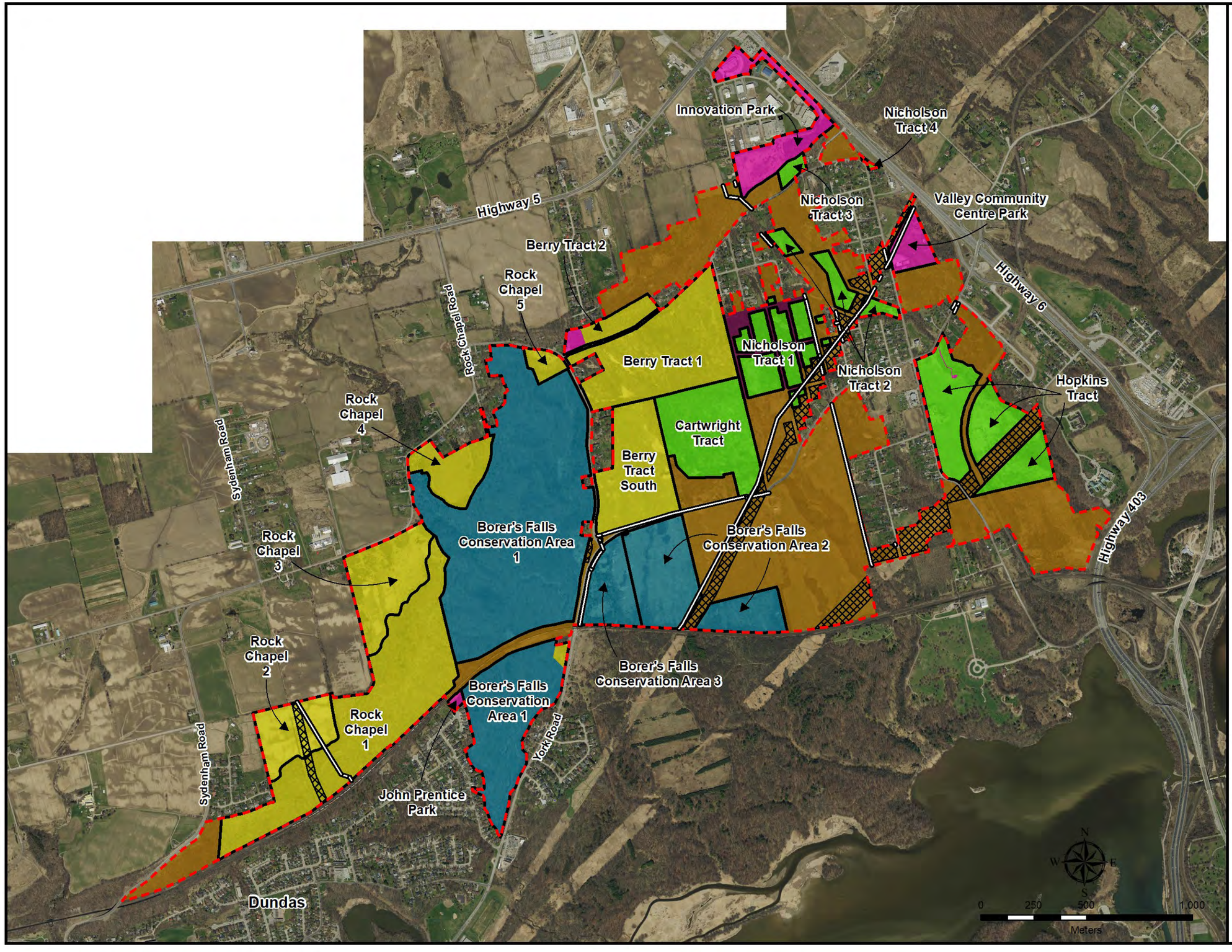
This report is a technical background report that will facilitate the development of the Management Plan for the Borer's Falls-Rock Chapel Heritage Lands (Figure 2). This overall study contains a number of important milestones, including (with approximate completion date):

1. Project Charter (undertaken by Steering Committee);
2. Resource Inventory, Issues and Opportunities Report (January 2018);
3. Draft Land Classifications and Zones (January 2018);
4. Final Land Classifications and Zones and Management Policies (April 2018);
5. Draft Management Plan (April 2018);
6. Public Meeting to Present Draft Management Plan (June 2018); and
7. Final Management Plan (September 2018).

This current report provides the planning context and policy framework for the entire Borer's Falls-Rock Chapel Heritage Lands. However, the inventory of the natural heritage, recreational and cultural resources is restricted to the Current EcoPark System Lands, as are the management issues and preliminary management opportunities. Later reports will provide land classification and zoning and present management recommendations.

Cootes to Escarpment EcoPark System

Figure 2: Borer's Falls - Rock Chapel Heritage Lands Management Units



Legend

- Heritage Lands Boundary
- Study Area Boundary
- Utilities
- Gas Pipeline
- Privately Owned Outreach Area
- City of Hamilton Owned Unopened Road Allowances

Current EcoPark Lands

- City of Hamilton
- Conservation Halton
- Hamilton Conservation Authority
- Royal Botanical Gardens

Sources of Information:
Royal Botanical Gardens
Conservation Halton
Hamilton Conservation Authority
City of Hamilton
Land Information Ontario

Cootes to Escarpment EcoPark System

October 12, 2018

1.3 General Overview

Management Plans for the Burlington Heights, Clappison-Grindstone and Waterdown-Sassafras Woods Heritage Lands were completed between 2014 and 2016. Management Plans for the Cootes Paradise and Borer's Falls-Rock Chapel Heritage Lands are currently being undertaken. A Management Plan for the Lower Grindstone Heritage Lands will be undertaken in the future.

The Borer's Falls-Rock Chapel Heritage Lands comprise 498 ha of land within the north end of the City of Hamilton. Borer's Falls-Rock Chapel Heritage Lands includes an area extending generally between Sydenham Road east to Highway 6 and from the CN railway north to Rock Chapel, Valley and Patterson Roads (Figure 2). Of the 498 ha within the Heritage Lands, 323 ha (65%) are currently owned and managed by partner organizations (the Current EcoPark System Lands) (Figure 2). The majority of the Current EcoPark System Lands are owned by Hamilton Conservation Authority (127 ha), RBG (124 ha), with smaller areas owned by Conservation Halton (57 ha) and the City of Hamilton (15 ha). To the south, Borer's Falls-Rock Chapel Heritage Lands is located adjacent to urban areas including the former Town of Dundas. North of Rock Chapel, Valley and Patterson Roads, the Borer's Falls-Rock Chapel Heritage Lands are bordered by privately-owned lands, some of which is open space, as well as rural residential areas. Borer's Falls-Rock Chapel Heritage Lands also connect directly to the Cootes Paradise Heritage Lands (on the south) and the Clappison-Grindstone Heritage Lands (on the east).

Borer's Falls-Rock Chapel Heritage Lands include several recognized environmental designations including: an Environmentally Significant Area and an Area of Natural and Scientific Interest (ANSI). Ecologically, Borer's Falls-Rock Chapel Heritage Lands is generally classified as deciduous Escarpment forest. This area contains multiple small watersheds and floodplains, including Spencer Creek, and several small "North Shore" watersheds. Borer's Falls-Rock Chapel Heritage Lands includes over 100 ha of Carolinian forest. The character of the Heritage Lands is defined by the Niagara Escarpment, creek valleys, including Borer's Creek and Hopkin's Creek, and Borer's Falls.

The Borer's Falls Rock Chapel Heritage Lands contain the second largest unfragmented area within the Cootes to Escarpment EcoPark System, Borer's Creek Valley. This area holds a unique characteristic of having interior forest habitat, found also in the largest, unfragmented western portion of the Cootes Paradise Heritage Lands; these two tracts of interior forest are divided by York Road.

The Heritage Lands include a diverse network of trails, including the Bruce Trail and the Ray Lowes Side Trail. The Heritage Lands also contain more traditional urban parks and sports fields (John Prentice Park and Valley Community Centre Park). Borer's Falls-Rock Chapel Heritage Lands are used extensively by hikers, dog-walkers, birdwatchers, nature enthusiasts and the surrounding community due to their aesthetic, recreational and natural values. The area provides spectacular views of Borer's Falls, the Niagara Escarpment, the City of Hamilton, Hamilton Harbour, deciduous forest and Cootes Paradise marsh.

Some of the Current EcoPark System Lands support existing infrastructure including hydro and gas lines which intersect the site. A number of utilities border the site including a railway situated across the southern edge.

1.4 Study Methods

1.4.1 Project Governance and Study Team

The Borer's Falls-Rock Chapel Heritage Lands Management Plan project is directed by a Steering Committee and will receive input and comment from a Stakeholder Advisory Committee and the public. The Steering Committee consists of representatives from RBG, HCA, CH, City of Hamilton, Hamilton Naturalists' Club and the Bruce Trail Conservancy, as well as the Cootes to Escarpment EcoPark System Coordinator.

Responsibilities of the Steering Committee are as follows:

- assist with substantive decisions concerning preparation of the Borer's Falls-Rock Chapel Heritage Lands Management Plan;
- organize input, feedback and review from the perspective of each organization at pertinent points through the process of Management Plan development; and
- provide guidance to Project Team and Cootes to Escarpment EcoPark System Coordinator.

The role of the Stakeholder Advisory Committee is to provide advice and input at various phases of the Borer's Falls-Rock Chapel Heritage Lands Management Plan, as determined by the Steering Committee and Cootes to Escarpment EcoPark System Coordinator. Members include individuals and representatives from organizations that are affected by and/or can provide useful input to the Management Plan.

The Project Team is led by North-South Environmental Inc. (project management and natural heritage expertise), and consists of LURA (public engagement expertise), Schollen & Company Inc. (recreation expertise), Cecelia Paine (cultural heritage expertise) and Andlyn Ltd. (planning expertise). Responsibilities of the Project Team are as follows:

- responsible for undertaking the project and all aspects of Management Plan development;
- facilitate and record stakeholder and public input;
- communicate with and take direction from the Cootes to Escarpment EcoPark System Coordinator and Steering Committee; and
- provide regular progress reports as required by the Cootes to Escarpment EcoPark System Coordinator.

1.4.2 Community Engagement

During Phase 2 of the management planning process (i.e., Inventory, Issues and Opportunities) the Project Team in collaboration with the Steering Committee developed a combined Community Engagement and Communication program for the Cootes Paradise Heritage Lands and Borer's Falls-Rock Chapel Heritage Lands Management Plans that provides an opportunity for key stakeholder groups, as well as the general public, to participate in the development of the Management Plans.

We identified a series of engagement strategies and six overarching goals to guide the engagement process. The goals are:

- ensure that all stakeholders (community groups, service clubs, local agencies and institutions, businesses, and municipal staff, etc.) have the opportunity to participate in the development of the Management Plans, to the extent that they are willing and/or able to do so;

- provide interesting and stimulating discussion forums, which will enable everyone to be engaged in meaningful discussion about the development of the Management Plans;
- actively engage and inspire key audiences in the creation of the Management Plans through the use of innovative tools and techniques;
- ensure that participants are informed and kept up to date on the progress of the Management Plans;
- inform the development of the Management Plans through a collaborative and participatory process; and
- promote and engage a natural resource stewardship ethic among Cootes to Escarpment EcoPark System users.

The engagement and communications program includes seven key engagement components that will be rolled out throughout the next phases of the project (Table 1).

Table 1. Key Engagement Components.

Developing a Stakeholder List

A comprehensive stakeholder list that included 18 individuals and stakeholder organizations with a potential interest in the Management Plans was developed and organized under three categories:

- Complete List: includes all potential stakeholders, the intent being that this represents all people who should be notified about the project and receive invitations to the Community Meetings.
- Stakeholders to gather information from: includes a subset of the complete list and represents stakeholders that we expect can provide information on inventory, existing conditions and potential management issues and opportunities. They were invited to Information Gathering Sessions.
- Stakeholder Advisory Committee: includes a smaller subset of the complete list and represents knowledgeable and interested individuals who were invited to review reports and provide guidance to the Project Team.

Stakeholder Advisory Committee

A Stakeholder Advisory Committee comprised of representatives from key stakeholder organizations with a broad geographic interest in the area has been established. The Stakeholder Advisory Committee will meet three times throughout the study process to discuss the development of the Management Plans, and is comprised of representatives from:

- Niagara Escarpment Commission
- Greenbelt Foundation
- Hamilton Harbour RAP
- Hamilton Waterfront Trust
- Environment Hamilton
- Ministry of Natural Resources and Forestry
- Iroquoia Bruce Trail Club
- Hamilton Burlington Trails Club
- Hamilton Trail Blazers Hiking and Outdoors Club
- Hamilton Burlington Mountain Bike/Cycling Club
- Hamilton Angling and Hunting Association
- Dundas Historical Society
- Pleasant View Rate Payers Association
- RBG Auxilliary
- McMaster University

Information Gathering Sessions

Four information gathering sessions were held on July 12th, 2017 to discuss management issues and gather information on natural heritage, cultural and recreation resources. A total of 21 people attended. Invitations were extended to external participants representing: Indigenous groups, government and conservation authorities (including the City of Hamilton, HCA and CH), committees to City of Hamilton Council, educational institutions, business and development organizations, local utilities and transit, as well as environmental, trails, community, agricultural and heritage groups. Each session began with welcoming remarks and a brief introduction to the project from the Cootes to Escarpment EcoPark System and Project Team members. Participants then engaged in a facilitated discussion to identify any data gaps, issues and opportunities for management of the Heritage Lands.

1.4.3 Data Collection and Analysis

In order to organize information and prepare a format for reporting information within the Borer's Falls-Rock Chapel Heritage Lands, the Current EcoPark System Lands were subdivided into management units and named based on ownership and habitat similarity (Figure 2). The 20 Management Units listed below are referred to throughout this report, and are as follows:

- Rock Chapel 1-5
- Borer's Falls Conservation Area 1-3
- John Prentice Park
- Berry Tract 1-2
- Berry Tract South
- Cartwright Tract*
- Nicholson Tract 1-4*
- Hopkins Tract*
- Innovation Park
- Valley Community Centre Park

* Management Units that are part of the Pleasant View Natural Area

For the sake of simplicity, the City of Hamilton-owned Hopkins Cemetery is included in this report as part of the Conservation Halton-owned Hopkins Tract (i.e., a separate Management Unit was not created for the cemetery based on its small size and location within Hopkins Tract) (Figure 2).

Available background information and data were collected from the various partner agencies and a list of available reports, data sets, and maps was compiled (Appendix 1). This list was used to keep track of requested and received information, as well as the source of each Geographic Information System (GIS) layer for metadata purposes.

Although not a principal component of this study, targeted fieldwork was undertaken within the Current EcoPark System Lands throughout 2017 to gain an understanding of recreational use patterns, management issues and opportunities. Table 2 provides dates and locations visited.

Table 2. Fieldwork dates and locations.

Date	Locations
April 25, 2017	Reconnaissance Site Walk with Project Team; Rock Chapel 1, Rock Chapel 3
July 4, 2017	Borer's Falls Conservation Area 1-3, Berry Tract 1-2, Berry Tract South, Nicholson Tract 1, Cartwright Tract
October 5, 2017	Hopkins Tract, Nicholson Tract 2-4, Valley Community Centre Park, John Prentice Park, Borer's Falls Conservation Area 1
October 18, 2017	Innovation Park
November 1, 2017	Rock Chapel 1- 4, Borer's Falls Conservation Area 1

1.4.4 Method for Planning Inventory

To prepare the planning review, the following source documents were referenced:

- Niagara Escarpment Plan;
- Niagara Escarpment Development Control Regulation;
- Parkway Belt West Plan, as amended;
- Greenbelt Plan – Plan of Boundary of Protected Countryside;
- Greenbelt Plan Maps;
- City of Hamilton Official Plan; and
- City of Hamilton Zoning Bylaw 05-200.

Information collected from the planning analysis was incorporated into a Planning Characterization Matrix (Appendix 2) that summarizes the planning, policy and legislative framework for each Management Unit. A detailed planning inventory was prepared and is provided in Appendix 2.

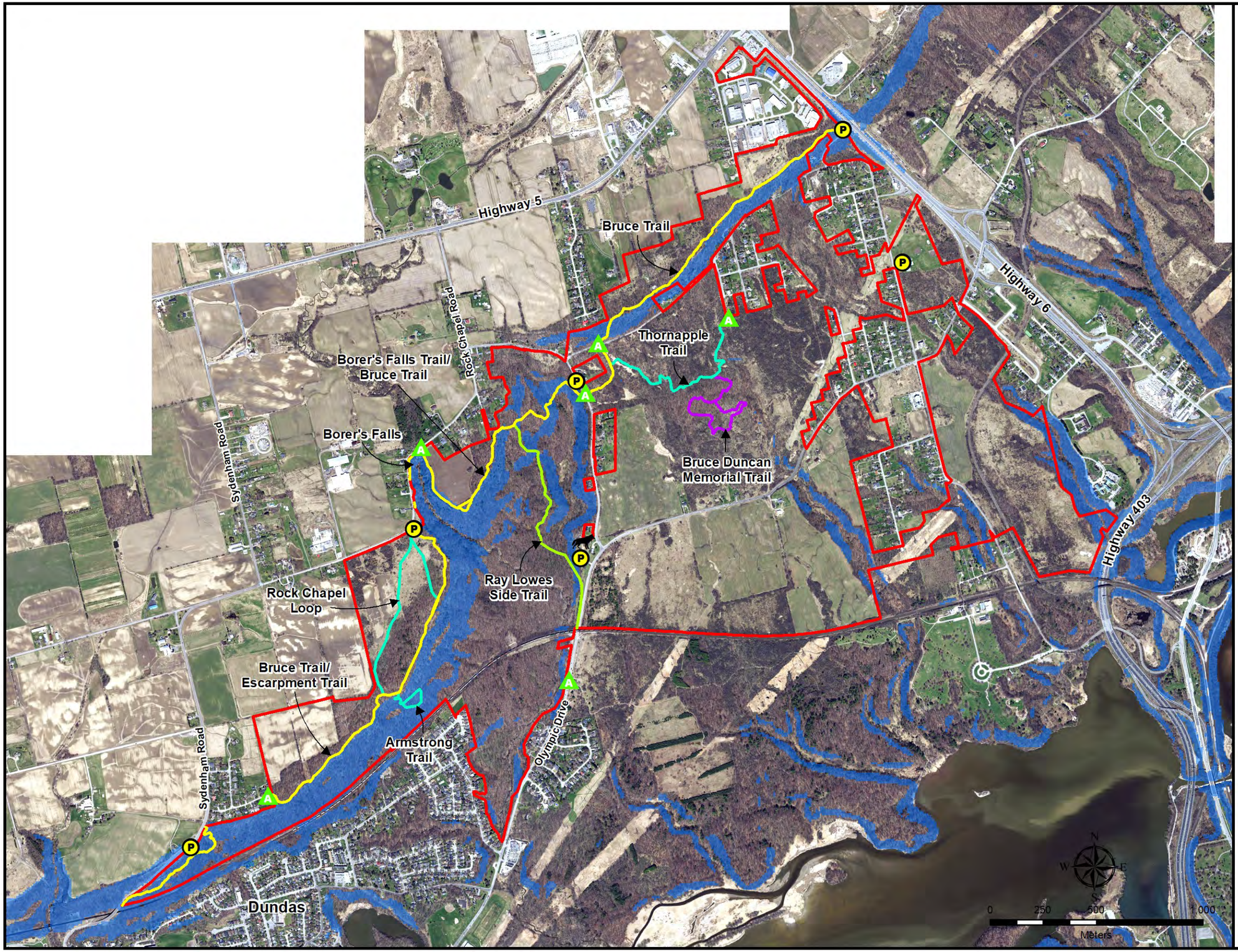
1.4.5 Method for Recreation Inventory

Members of the Steering Committee provided mapping both in digital (GIS) and hard copy format of existing official and known unsanctioned trails, and proposed trail and cycling networks within the Heritage Lands. Available parcel-specific reports provided by the Steering Committee were also reviewed with respect to recreational issues. The trails from these various reports and maps were compiled and layered in GIS. In addition, steeply sloped areas (>25%) were identified, along with access points, signage and locations where trails extend outside the Heritage Lands into neighbouring properties.

Representative sections of the Current EcoPark System Lands were visited between April-November 2017 (Table 2) to identify additional formal, informal and potential access points, walk trails and identify management issues. Where management issues and additional access points were noted, specific locations were recorded by GPS and compiled with the trails data. Trails and access point mapping (Figure 3) was prepared based on data provided by HCA, CH, RBG, City of Hamilton and fieldwork completed by North-South Environmental. Mapping was completed in ArcMap using GIS. The mapping will be used to evaluate opportunities and constraints in the context of developing classification and zoning (NEPOSS), and management recommendations subsequent to this phase of the project. The background review also included a review of the City of Hamilton's Recreational Trails Master Plan (2016) and City-Wide Transportation Master Plan (2007) with a focus on active transportation.

Cootes to Escarpment EcoPark System

Figure 3: Trails, Parking and Access Locations at Borer's Falls - Rock Chapel Heritage Lands



Legend

Trails

- Bruce Trail
- Bruce Side Trail
- RBG Trails
- Conservation Halton Trails

Parking and Access Locations

- Access Locations
- Parking
- Borer's Falls Dog Park
- Slopes > 25%
- Heritage Lands Boundary

Sources of Information:
Royal Botanical Gardens
Conservation Halton
Hamilton Conservation Authority
City of Hamilton
Land Information Ontario

Cootes to Escarpment EcoPark System

May 30, 2018

1.4.6 Method for Natural Heritage Inventory

A gap analysis was completed to identify areas where natural heritage data were lacking and to assist in the prioritization of fieldwork (Appendix 3). The Hamilton Natural Areas Inventory Project 3rd Edition (Schwetz 2014), various background reports prepared by RBG (e.g., Ecological Land Classification of Royal Botanical Gardens' Natural Lands (Barr 2014), and CH reports (e.g., Hopkins Tract Plant List, Hopkins-Cartwright-Nicholson Birds); see Appendix 1 for complete listing) were the primary sources of natural heritage information. Information was also compiled from HCA and CH's species occurrence data base, and rare species records from the Natural Heritage Information Centre (NHIC). Vegetation resources have been characterized following the Ecological Land Classification (ELC) for Southern Ontario (Lee et al. 1998). ELC data were provided by RBG, HCA and CH. Field surveys were completed by the Project Team to supplement information on vegetation communities, flora, and incidental observations of wildlife and any other noteworthy occurrences (e.g., wildlife habitat, seepages, disturbances, etc.).

Natural heritage data were entered into a Microsoft Access database. Data were analysed to determine the presence of rare species and species at risk, and to determine the floristic quality of the Current EcoPark System Lands. Percentages of native and non-native species, Floristic Quality Index (FQI) (Oldham et al. 1995), and Native Mean Coefficient of Conservatism (Native Mean C), were calculated for the Current EcoPark System Lands. These analyses provide a relative measure of vegetation quality. Where individual Management Units lack floristic data, FQI will be inaccurate. These values were still calculated, but indicated as likely inaccurate to highlight areas where data are lacking.

Species lists were screened for provincial, regional and local significance. Provincial flora and fauna rarity is based on rankings provided by the NHIC (identified as S1-S3) or species identified as Endangered, Threatened or Special Concern by COSEWIC[1], Federal Species at Risk Act (SARA) and/or COSSARO[2]. Regional flora and fauna rarity is based on listings provided by the Hamilton Natural Areas Inventory Project 3rd Edition (Schwetz 2014). Fauna area-sensitivity is based on species reported as area-sensitive in the Ministry of Natural Resources Significant Wildlife Habitat Technical Guide Appendix C (MNR 2000).

Mapping was completed in ArcMap using GIS. ELC mapping was compiled based on existing data from CH, HCA, RBG and the City of Hamilton, and by fieldwork completed by the Project Team.

1.4.7 Method for Cultural Heritage Inventory

The Current EcoPark System Lands were examined first by windshield survey with the Project Team. Publications and technical reports provided background information on settlement of the sector, dating from First Nations to the present. Information on designated properties and those of heritage interest in the sector was provided by the City of Hamilton. Additional buildings of historical interest were identified in a publication by the Waterdown-East Flamborough Heritage Society (2003). The City of Hamilton Archaeological Master Plan, which is restricted to in-house use, provided information on the potential location of archaeological sites.

[1] Nationally rare species are assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and listed by the MOECC or the Governor in Council; they are subject to the Federal Species At Risk Act.
[2] Provincially rare species are assessed by the Committee on the Status of Species At Risk in Ontario (COSSARO) and are listed by the relevant Ministry; they are subject to the Ontario Endangered Species Act.

Interviews with RBG personnel provided details on specific concentrations of cultural heritage features and an overview of current plans for integrating cultural landscape features into interpretation and management planning. Sites of potential cultural heritage value were investigated in the field with the RBG field manager, and with two long-term residents of the area.

To identify potential cultural heritage sites and features a review was conducted of archival maps, topographic survey maps, air photographs and historical photographs held in the City of Hamilton Archives, the Dundas Museum, the Flamborough Archives, RBG's map collection, McMaster University Map Collection and the McMaster University Air Photo Collection. Field investigations were conducted of individual properties to identify or verify extant features.

A list of all references is found at the end of this report.

1.4.8 Method for Management Issues Inventory

Management issues and opportunities were documented during the review of background information, through targeted fieldwork as well as Information Gathering Sessions, Steering Committee meetings and additional meetings with key stakeholders, including RBG and HCA. A list of all individuals and/or agencies consulted is included in Appendix 4. Management issues were recorded in table format to provide a framework for organizing issues and identifying the general location of where a particular issue occurs. This table remains a work in progress, and will provide a concise summary for the Management Plan to be prepared later in the study process (Appendix 8).

2.0 Land Use

2.1 Existing Land Uses

The Borer's Falls-Rock Chapel Heritage Lands comprise approximately 498 ha of land located in the former Town of Dundas, now in the new City of Hamilton, generally bounded by Highway No. 6, the Niagara Escarpment, the Canadian National Railway line and the urbanized neighbourhoods of east Dundas. This large rural and semi-rural area lies, for the most part, outside the City of Hamilton urban designated area. The terrain in this area is dominated by the Escarpment with drainage in a southerly direction to the Cootes Paradise Heritage Lands. Current land uses include agriculture (e.g., farm fields at Rock Chapel 3), urban and rural residential, industrial and institutional uses (Appendix 2).

2.1.1 Utilities Adjacent and Within Current EcoPark System Lands

Canadian National Railway

Canadian National Railway (CN) operates a main track passenger and freight railway, known as "Dundas Subdivision", extending from the Burlington Heights junction west through the Town of Dundas to points west. The railway forms the south boundary of the Heritage Lands and divides Borer's Falls Conservation Area 1 into two parcels (Figure 2). During our background research and consultation with utilities, we were unable to make contact or receive a response from CN regarding planned changes to CN railway infrastructure adjacent to the Heritage Lands.

Canadian Pacific Railway

Canadian Pacific Railway (CP) operates a main track freight railway, known as the "Hamilton Subdivision", extending from the Burlington Heights junction north through Waterdown to points north. The railway divides the Pleasant View Natural Area – Hopkins Tract into two parcels (Figure 2). CP has advised that there are no current plans to construct new infrastructure in this area; however, in the future (10 years +), additional track capacity (i.e., construction of new tracks) could be required to accommodate increased freight volume.

CP maintains a vegetation control program, confined to the railway right-of-way, to control vegetation growth on the ballast portion (graveled section) of the track infrastructure. Herbicides are used to control grass, weeds and shrub growth for safe railway operations. Details of the annual spray locations and schedule are posted on the CP website Community Living window (www.cpr.ca).

TransCanada Pipelines

TransCanada Pipelines operates a high pressure natural gas pipeline, generally oriented northeast-southwest and alongside the Hydro One Dundas-Burlington Transmission Line. The pipeline is adjacent to several Heritage Land Management Units, including Valley Community Centre Park, Pleasant View Natural Area – Nicholson Tracts 1 and 2, Pleasant View Natural Area – Cartwright Tract and Borer's Falls Conservation Area 2, and is well-marked at road crossings, etc. (Figure 2). TransCanada advised that there are no known changes planned for the pipeline infrastructure within the pipeline easement or on pipeline lands. TransCanada intends to exercise the rights of the easement/agreements and its obligations for operating and maintaining the pipeline, which may include vegetation removal, access for maintenance, excavation, etc. as may be needed.

Union Gas

Union Gas operates two 500mm high pressure natural gas pipelines in the vicinity of the Heritage Lands. The eastern pipeline section is generally oriented north-south, between the RBG Arboretum and the Escarpment brow in the vicinity of Innovation Park. The pipeline is adjacent to the Pleasant View Natural Area – Nicholson Tracts 1 and 2, and Innovation Park (Figure 2). A regulatory station located south of Pleasant View Natural Area – Nicholson Tract 1 provides lower pressure gas line feed to Union Gas customers in the York Road area. The western pipeline section is also oriented north-south in association with a Hydro One transmission corridor which extends north from the Dundas Transformer Station and across Rock Chapel 1 and 2 (Figure 2). Union Gas advised that there are no current plans to alter the Union Gas system and infrastructure in the area. However, Union Gas continually works on long term asset management planning, which may identify future infrastructure changes. Union Gas intends to exercise the rights of easement/agreements and its obligations for operating, and maintaining the pipeline which may include vegetation removal, access for maintenance, excavation, etc. as may be needed.

Hydro One

Hydro One owns and operates two high voltage transmission lines extending from the Burlington Transformer Station at the Freeman Interchange (Highway 403/ Queen Elizabeth Way) to the Dundas Transformer Station on Olympic Drive at Cootes Drive, as follows:

- Mount Hope Transmission Line, and
- Dundas-Burlington Transmission Line.

These transmission line names are derived from the Parkway Belt West Plan 1978 mapping and may not be in use by Hydro One today.

Hydro One also owns and operates a third unnamed high voltage transmission line extending from the Dundas Transformer Station in a north direction through the York Road neighbourhood of Dundas, over the Escarpment and through the former Town of Flamborough.

The Mount Hope Transmission Line crosses the Pleasant View Natural Area – Hopkins Tract. The Dundas-Burlington Transmission Line is located alongside the TransCanada Pipeline facilities and crosses the Valley Community Centre Park, Pleasant View Natural Area – Nicholson Tracts 1 and 2, Pleasant View Natural Area – Cartwright Tract and Borer's Falls Conservation Area 3. The unnamed transmission line crosses Rock Chapel 1 and 2, above the Escarpment brow (Figure 2).

The February 2017 Burlington to Nanticoke – Regional Infrastructure Plan, prepared by Hydro One in association with the local hydro distribution companies, sets out investments in transmission and distribution facilities for the near-term (5 years) and mid-term (5 to 10 years) that should be planned, developed or implemented to meet electricity infrastructure needs in the Burlington to Nanticoke Region. From a review of the Regional Infrastructure Plan, it appears that no changes are planned to the transmission corridor infrastructure; the planned changes in the vicinity of the Heritage Lands appear to be within the Dundas Transfer Station proper. This has not been confirmed with Hydro One due to the inability to reach Hydro One technical staff.

Hydro One will exercise the rights of any easements/agreements or owned transmission properties, where they exist, for the purpose of operating and maintaining transmission facilities.

Hydro One owns and operates extensive high voltage transmission and low voltage distribution systems throughout the Province on corridors and rights-of-way owned by Hydro One, the Provincial government, private property owners, railway companies, Indigenous communities, etc. Many of the corridors have sufficient space for expansion of transmission/distribution facilities and potentially, secondary land uses. The Province implements a Provincial Secondary Land Use Program (PSLUP) to allow for secondary use of corridors while recognizing the primary purpose to facilitate electricity transmission and distribution (www.hydroone.com/business-services/secondary-land-use). Secondary use of corridors and rights-of-way are dealt with on a site-specific basis by way of municipal consultation, submission of a proposal by a proponent to Hydro One followed by stakeholder review to ensure technical compatibility. If approved and the proponent agrees to terms and conditions of use, an agreement is completed between the proponent and Infrastructure Ontario.

A number of key technical considerations apply to secondary land uses including minimum vertical clearance to transmission lines, access to transmission structures, roads and parking design and location, no permanent buildings, maximum mature height of landscape plantings, grading, drainage and storm drainage requirements. Secondary land uses of transmission corridor lands may also be subject to local municipal land use policy and regulation requirements.

Hydro One implements a preventative vegetation management program on a six to eight year cycle on transmission and distribution corridors. This includes promoting compatible vegetation on or beside rights-of-way. Compatible vegetation rarely grows to a height that would interfere with safe power line operation (www.hydroone.com/about/corporate-information/vegetation-management). Hydro One

vegetation practices include removing incompatible vegetation and trimming vegetation to meet clearance standards, and access requirements, removing trees that could interfere with safe and reliable delivery of electricity, use of compatible ground covers and selective application of herbicides to promote low-growing plant communities.

Hydro One follows applicable law for species at risk, and works to control the spread of invasive species.

2.2 Future Planned Uses

2.2.1 Niagara Escarpment Commission Development Permit Applications

The Niagara Escarpment Commission maintains an on-line searchable list of current and recent Development Permit applications in the former area municipalities in the City of Hamilton (in this instance, the former Town of Flamborough and former Town of Dundas). The applications are described by the nature of the proposal; some are identified by location where a technical staff recommendation report is required. For the 2016 and 2017 period to-date, there were 10 and 11 applications in Flamborough and Dundas respectively. A review of the applications on-line indicates that the majority are minor in nature consisting of construction of single-family dwellings and dwelling additions, accessory buildings, agricultural buildings, etc. Some applications were received but the file closed and no permit issued for a variety of reasons including that the application was determined to be exempt.

2.2.2 City of Hamilton Development Applications

From the City of Hamilton, the following is a summary of current and recent development applications under the Planning Act, affecting private and public property in the general vicinity of the Borer's Falls-Rock Chapel Heritage Lands. This summary was prepared based on information provided by the City. The bulk of the applications are within the urban serviced area of Innovation Park, and range from 2013 to 2016. In some instances, the developments which are subject of older applications may be built and complete.

71 Innovation Drive
City File SPA-14-160

The property known as 71 Innovation Drive is comprised of 0.82 ha of land located on the southeast corner of the intersection of South Drive and Innovation Drive, backing onto the Innovation Park Heritage Lands. The site plan approval application was to construct an office and warehouse building for the purpose of a transportation terminal. This was a permitted land use within the applicable Prestige Industrial M3 zone. As of May 2017, the application was in progress.

66 Innovation Drive
City Files UHOPA-16-004 and ZAR-16-014

The property known as 66 Innovation Drive is comprised of 0.4 ha of land located on the north side of Innovation Drive within the interior of Innovation Park. These lands do not share a common boundary with any Borer's Falls-Rock Chapel Heritage Lands. The applications are for a site-specific combined City Official Plan amendment and Zoning Bylaw amendment to permit a recreation and fitness centre within an office and warehouse building. As of May 2017, the applications were in progress.

60 Innovation Drive
City File SPA-13-191

The property known as 60 Innovation Drive is comprised of 0.45 ha of land located on the north side of Innovation Drive within the interior of Innovation Park. These lands do not share a common boundary with any Borer's Falls-Rock Chapel Heritage Lands. The site plan approval application was to construct a 1,024 sq m addition to an existing warehouse building. As of May 2017, the application was complete.

20 Innovation Drive
City File SPA-16-018

The property known as 20 Innovation Drive is comprised of 0.7 ha of land located on the south side of Innovation Drive within the interior of Innovation Park. These lands do not share a common boundary with any Borer's Falls-Rock Chapel Heritage Lands. The site plan approval application was to construct a second building on the southeast portion of the site with a 432 sq m two-storey front office and 324 sq m rear warehouse. As of May 2017, the application was in progress.

355 Rock Chapel Road
City File DAR-16-160

The property known as 355 Rock Chapel Road is comprised of 34.8 ha of land located on the north side of Rock Chapel Road, opposite the Rock Chapel 3 Management Unit (Figure 2). These lands are used for an indoor mushroom growing operation. The site plan approval application was to construct a 2,545 sq m addition to the existing agricultural building for the purpose of the mushroom growing operation. As of May 2017, the application was in progress.

2.2.3 Environmental Assessments

Included in this section are summaries of current Class Environmental Assessments of relevance to the Heritage Lands.

New Septage Waste Haulage Receiving Station

The City of Hamilton undertakes roads, water and wastewater projects which are subject to a municipal class environmental assessment (Class EA) planning and design process, approved under the Environmental Assessment Act. Under the Class EA process, projects are classified depending on the degree of impact to the environment, as follows:

- Schedule A projects involve normal or emergency operation and maintenance activities, and are pre-approved;
- Schedule B projects involve improvement and minor expansions to existing facilities, and are subject to a screening process with public consultation; and
- Schedule C projects involve new facilities or major expansion of existing facilities, and are subject to the full class environmental assessment process.

On its website, the City posts details of all current and recently completed class environmental assessments.

The City has initiated a Schedule B class environmental assessment to determine the preferred location for a new septage waste haulage receiving station. The purpose of the station is to receive hauled sanitary effluent resulting from rural septic system clean out, to be disposed into the urban sanitary sewer system. Based on the sanitary sewer system and potential receiving waste water treatment plants in the City, the study area is extensive, generally encompassing the Waterdown, Dundas,

Ancaster, Stoney Creek and south Hamilton urban areas. It may affect the Heritage Lands, as the study area includes the east Dundas urban area in the vicinity of Cootes Drive and Olympic Drive, as well as the Waterdown urban area in the vicinity of Dundas Street and Highway No. 6.

The first Public Information Centre was scheduled for November 9, 2017 at the Canadian Warplane Heritage Museum adjacent to the Hamilton Airport.

All other current and completed class environmental assessments posted by the City have no bearing on the Heritage Lands.

3.0 Planning Policy and Regulatory Framework

The existing planning policy and regulatory framework in this area consists of Provincial jurisdiction and municipal single tier jurisdiction. The Provincial planning policy framework has been recently updated through the Coordinated Provincial Plan Review. This section provides a summary outline of the current planning policy and regulatory framework. Planning documents are by nature living documents and subject to review and change. Existing available information has been used to establish the jurisdictional limits including Zoning Bylaws and Provincial land use regulations. At the time of detailed project planning, it is important to obtain updated information and confirm applicable requirements. A detailed review of the planning policy and regulatory framework is provided in Appendix 2, along with a Planning Characterization Matrix.

3.1 Planning Inventory Summary

For the Borer's Falls-Rock Chapel Heritage Lands, the current planning policy and regulatory framework reflects the on-going transition of this area from the past jurisdiction of multiple Provincial Plans, area municipal Official Plans, and Zoning Bylaws to a single Provincial Plan, Official Plan and Zoning Bylaw. The current City Official Plan reflects the Provincial Plans and Provincial Policy Statement in-place at the time of the Official Plan approval. It is anticipated that an update to the City Official Plan will be required to reflect the jurisdictional transfer of the Pleasant View Area to the Niagara Escarpment Plan and the results of the Coordinated Provincial Plans Review.

For the Heritage Lands within the designated Rural Area of the City Official Plan, the future development context was determined by the 1995 Ontario Municipal Board decision as confirmed in the City Official Plan. The update to reflect the Niagara Escarpment Plan jurisdiction will effect little fundamental land use policy change. This area will remain rural with servicing restrictions. For the Heritage Lands within the designated Urban Area of the City Official Plan, the development context already exists as these small areas are substantially built-out.

Depending on location, the permitted uses on the Heritage Lands and adjacent lands are restricted either by the Niagara Escarpment Plan and Development Control regulations or by the City Official Plan and Zoning Bylaws. The applicable Zoning Bylaws are current, in the case of the Pleasant View Area, implemented in the 1995 Ontario Municipal Board decision. Given the extent of the Natural Heritage System under the City Official Plan, individual permitted uses may require Environmental Impact Studies and servicing limitations in the designated Rural Area will be important considerations. Development in

proximity to key natural heritage features may require greater separation distances and vegetation protection zones in order to maintain the integrity of these features.

In the area of Niagara Escarpment Development Control, development permits may be required for individual projects on the Heritage Lands unless the nature of the project falls under the development control exemptions. For parklands within the Niagara Escarpment Plan, preparation of master plans and Management Plans in accordance with the NEPOSS planning framework will be required to facilitate projects which are not "minor". For areas outside of Niagara Escarpment Development Control, existing Zoning Bylaws will govern uses on the Heritage Lands; under Zoning Bylaw 3581-86, parks are a permitted use in most zones. Ultimately, the City may replace Zoning Bylaw 3581-86 by bringing the Pleasant View Area under Zoning Bylaw 05-200 with updated zoning.

In advance of any proposed development, site alteration or activity on the Heritage Lands, it is important to review the applicable land use policy and regulation in order to determine conformity of the proposal and any planning application, and approval requirements or exemptions.

4.0 Recreation Inventory

4.1 Study Area Recreational Resources

4.1.1 Trails

Figure 3 illustrates the existing trail network, access points and parking areas in the Borer's Falls-Rock Chapel Heritage Lands, and proposed trail network at Hopkins Tract. Within the Borer's Falls-Rock Chapel Heritage Lands, approximately 11.8 km of trail are maintained by the Bruce Trail Conservancy on behalf of HCA, RBG and Hamilton Naturalists' Club. For the most part, trails are narrow footpaths, which are appropriate for a natural environment area. The trail network is described below.

Main Bruce Trail

The Main Bruce Trail traverses the Niagara Escarpment, along the northern boundary of the Heritage Lands. To the west, the Bruce Trail begins at Sydenham Lookout, where parking is available and there are spectacular views of Hamilton and Dundas. The Bruce Trail follows Sydenham Road uphill for a short distance before turning right into a small subdivision to reach Romar Drive, which it follows to its end. The Trail enters Rock Chapel 2 where it joins with RBG's Escarpment Trail, paralleling the Escarpment brow, and crosses a narrow concrete bridge. The Trail continues along the Escarpment edge, past a lookout with a view of Hamilton and the Burlington Skyway Bridge, to the RBG Escarpment Trail parking lot at Rock Chapel Road (Figure 3).

The Bruce Trail continues north, along Rock Chapel Road, to a bridge across Borer's Creek and then turns right into Rock Chapel 4 with views and a lookout at Borer's Falls. The view from the top of Borer's Falls waterfall is easily accessed from the bridge on Rock Chapel Road. The section of trail along Rock Chapel Road is located behind the roadside guard rail. This trail section has inherent safety issues (see section 7.3.1). The Trail passes a viewpoint of Cootes Paradise and the City of Hamilton, then descends the Escarpment via a wooden stairway and enters the deciduous forest within Borer's Falls Conservation Area of Hamilton Conservation Authority (Figure 3). Throughout Borer's Falls Conservation Area, the Trail is maintained by the Bruce Trail Iroquoia Club on behalf of HCA. On RBG property, the trail is

maintained by RBG with the assistance from the Bruce Trail Iroquoia Club. The Trail continues through the forest and across a deep valley to Valley Road. Crossing the road, the Trail enters Berry Tract 1 and continues to Patterson Road. After crossing the road, the Trail climbs the Escarpment via a wooden and earthen staircase and follows its brow for 1.7 km. Eventually, the trail passes through a tunnel underneath Highway 6, to reach the Clappison-Grindstone Heritage Lands.

Rock Chapel Loop Trail

The Rock Chapel Loop Trail is 1.6 km long (including 550 m of the Bruce Trail), and is accessed from the Rock Chapel Road parking lot. Both ends of the loop trail pass through early successional fields, into deciduous forest along the Escarpment brow to connect with the Bruce Trail.

Ray Lowes Side Trail

The Ray Lowes Side Trail of the Bruce Trail branches off the Main Bruce Trail to the south, providing a link to the North Shore Trails of Cootes Paradise and RBG's arboretum. The Ray Lowes Side Trail is a 1.4 km packed earth trail, which crosses through hilly and forested terrain until it reaches York Road (Figure 3). The Trail then parallels the road following the broad grassy verge on the west side, passing underneath the CN railway bridge. The Trail then crosses York Road to reach the Cootes Paradise Heritage Lands and North Shore trails.

Armstrong Trail

The Armstrong Trail is a 375 m loop side trail, off of the main Bruce Trail in Rock Chapel 1 (Figure 3). This steep trail experience includes two steel staircases and boardwalks, which provide hikers with the opportunity to view the different layers of the Niagara Escarpment from the rim down to the talus at the bottom of the cliff. The various geological layers are labelled, as this trail is frequently used for educational purposes. After scaling the Escarpment, the trail continues along packed earth, eventually reaching a wooden staircase. The trail then continues along a short loop to re-connect with the trail which leads back to the main Bruce Trail.

Thornapple Trail

The Thornapple Trail is a 1.1 km packed earth trail maintained by RBG in Berry Tract 1 (Figures 2 and 3). This trail is accessed from the main Bruce Trail and from the dead end of Wesley Avenue. This trail includes a 30 m wooden boardwalk, and a short switchback. The Thornapple Trail was previously a loop trail with an additional access point off of Patterson Road, to the east of the current Bruce Trail access. The additional access point and northern portion of the loop was closed in 2014 and is currently regenerating. This trail provides the single connection to the Bruce Duncan Memorial Trail located in the Pleasant View Natural Area - Cartwright Tract to the south (Figure 3).

Bruce Duncan Memorial Trail

The Bruce Duncan Memorial Trail is a 1.1 km packed earth loop trail maintained by the Hamilton Naturalists' Club on behalf of CH in the Pleasant View Natural Area – Cartwright Tract. This trail begins at the south end of the Thornapple Trail, travels south for approximately 200 m to reach a 900 m loop through the successional areas of woodland and thicket of the Cartwright Tract (Figure 3). This trail is primarily used by members of the Hamilton Naturalists' Club, and is not widely used by the public, possibly due to its relatively isolated location and close proximity of the Bruce Trail.

Nicholson Tract 1 Trails

There are two unsanctioned trails in the Pleasant View Natural Area – Nicholson Tract 1, both of which are accessed from the south end of Wesley Avenue, the Thornapple Trail, and the hydro corridor located to the south (Figure 3). Both trails travel to the southeast, and consist of packed earth and trampled vegetation. Some sections of the eastern-most trail can be quite wet and muddy and any increase in use may result in unacceptable trail impacts, including trail widening to avoid wet and muddy sections. ATVs and dirtbikes are frequently used in the hydro corridor located to the south of Nicholson Tract, and evidence of motorized vehicle use was noted in Nicholson Tract 1 by the Project Team. It is possible that the unsanctioned trails in Nicholson Tract were formed by ATV use. Equestrian use was also noted on these trails.

A future recreation feature within the Berry Tract South will be named after the former owner's sister, such as 'Mattiacci Lookout' or 'Mattiacci Boardwalk', by RBG. There are also opportunities for future parking and a trail system at Berry Tract South, which will be explored by RBG in the future (section 7.3.2).

A proposed, conceptual trail system for Pleasant View Natural Area – Hopkins Tract was developed by CH and is illustrated on Figure 3. The proposed loop trail system utilizes ridges and high points on the property, and crosses drainage features the least amount possible. The proposed trail system provides a connection to the Hopkins Family Cemetery (Figures 3 and 6).

Unsanctioned trails occur in many locations within the Heritage Lands and many extend beyond the Current EcoPark System Lands onto neighbouring private property. One area where unsanctioned trails appear to be proliferating is from the unsanctioned access point at John Prentice Park into the south end of Borer's Falls Conservation Area, and across the CN railway (sections 7.3.1 and 7.4.1). It is important to note that unsanctioned trail development and trespassing is prohibited by the individual landowners within the EcoPark System. RBG has closed approximately 15 km of unsanctioned trails, and an additional eight km of old RBG trails to reduce impacts to the natural environment, minimize maintenance requirements, and simplify the trail network to avoid redundancy and duplication (see section 7.3.1).

The Hamilton Burlington Trails Council has put together a publicly accessible interactive Regional Trails Map available at: http://hamiltonburlingtontrails.ca/trail-map/. This map was put together through a Memorandum of Understanding with Cootes to Escarpment EcoPark System partners to provide the Hamilton Burlington Trails Council with GIS data available on trails.

RBG has put together a draft trail strategy to provide guidance for management of the trail network on RBG lands (RBG in progress). The guiding principles of the draft strategy are:

- focus to a single access for each area;
- maximize biodiversity protection;
- destination-based visitation;
- trailhead standardization (e.g., RBG, NEPOSS, Nodal Park, Cootes to Escarpment EcoPark System logos); and
- support educational programming.

4.1.2 Parking and Access Points

Figure 3 illustrates the sanctioned parking areas and access points provided by the land-owning partners in the Borer's Falls-Rock Chapel Heritage Lands. Unsanctioned access points are described below, but are not included in mapping.

- Sydenham Road Parking and Access: Parking for 7-8 vehicles is available at the Sydenham Lookout on the east side of Sydenham Road. This parking area serves as an access point to the Bruce Trail. Hikers must walk north on Sydenham Road to reach Romar Drive, and then hike along Romar Drive to reach the Bruce Trail.
- Romar Drive Access: Access to the Bruce Trail is provided at the end of Romar Drive. Parking is not permitted in this area.
- Rock Chapel Road Parking and Access: A large parking lot with space for up to 30 vehicles is located on the south side of Rock Chapel Road, west of Borer's Falls and east of Sydenham Drive. This parking and access point serves as the main access to the Bruce Trail, Rock Chapel Loop, and Borer's Falls Conservation Area. The parking lot is owned by RBG.
- Borer's Falls Access: Access to the top end of Borer's Falls occurs from Rock Chapel Road, east of the Rock Chapel Road Parking Lot. Hikers must walk along Rock Chapel Road to reach this access point.
- Unsanctioned Access from Rock Chapel Road Road Allowance: Ad hoc access into Rock Chapel 4 and Borer's Falls Conservation Area occurs from the road allowance located at the curve of Rock Chapel Road, 280 m south of Valley Road.
- Valley Road Parking and Access: A parking pulloff for two to three vehicles is located on the west side of Valley Road, just north of the Bruce Trail crossing of Valley Road. Sight lines along Valley Road are poor owing to its winding character. Parking and access from Valley Road is a safety issue that is explored further in section 7.2.1.
- Patterson Road and Valley Road Corner: A gravel parking area exists at this intersection capable of holding up to 10 vehicles. As this area sits at the intersection of the two roads, it has also been identified as a safety issue that is explored further in section 7.2.1.
- Borer's Falls Dog Park Parking and Access: Parking for up to 20 vehicles is provided at the Borer's Falls Dog Park, located on York Road, just south of Valley Road (Figure 3). This parking lot is also for accessing local nearby trails; hikers routinely park in the lot. Parking under the dripline of trees occurs when the parking lot is full (see section 7.2.1). From the parking lot, it is not obvious where the trail head is located (see section 7.3.1). Use of this parking lot for trail access may be exacerbated by the recent closure of the nearby York Road parking to access RBG lands.
- York Road Access: The Ray Lowes Side Trail and Borer's Falls Conservation Area can be accessed from York Road. Since the York Road parking lot (located in the Cootes Paradise Heritage Lands) has been closed down, people routinely park on the shoulder of York Road in this location, which is a major safety concern (see section 7.3.1). The frequency at which the public park on York Road in order to access the Borer's Falls Conservation Area is not known. RBG has the site posted as not a preferred parking location, recommending users park at the Arboretum; however, this is a Cootes Paradise Heritate Lands access recommendation.
- Unsanctioned Access from John Prentice Park: Unsanctioned access from John Prentice Park occurs into the southern end of Borer's Falls Conservation Area. Chainlink fencing has been cut and pulled back to provide entry from the north corner of the park, just south of the CN railway (see section 7.2.1).

- Patterson Road Access: The Bruce Trail crosses Patterson Road, just east of Valley Road. Limited roadside parking is available on the gravel shoulder on the south side of Patterson Road at the trail crossing, and just east of the trail crossing.
- Unsanctioned Access from Wesley Avenue: Access to the Thornapple Trail and Nicholson Tract 1 occurs from the south end of Wesley Avenue. Parking at the dead end and along the shoulder of the road occurs, and signage is not posted to indicate whether or not parking and/or access is permitted from this area.
- Old Guelph Road Bruce Trail Parking and Access: A parking lot for the Bruce Trail is located at the end of Old Guelph Road, just west of Highway 6. Parking for up to 10 vehicles is provided. This parking lot is maintained by City of Hamilton Public Works. From this location, hikers can choose to access the Bruce Trail from the north side of the parking lot to travel west along the trail, toward Borer's Falls Conservation Area, or head south from the parking lot, down concrete steps to reach the tunnel the passes under Highway 6 to the west end of Clappison Woods (Clappison-Grindstone Heritage Lands).
- Valley Community Centre Parking and Access: Valley Community Centre Park includes a parking lot for approximately 40 vehicles. Visitors primarily use this parking lot two access the two baseball diamonds located at this park.
- Proposed Hopkins Tract Parking: A 10-car gravel parCycking lot is proposed at the Hopkins Tract, located at the end of Harmer Road, on the east side of Old Guelph Road (Figure 3).

4.1.3 Recreational Uses

Trail use within the Heritage Lands primarily consists of walking, jogging, hiking (ranging from casual outings by local residents, to more serious day-hikers) and dog walking. Some cycling occurs on a regular basis; however, this use is not permitted on trails owned and maintained by RBG, or those maintained by the Bruce Trail. Cycling is permitted on CH, HCA and City of Hamilton lands; however, opportunities are limited with the Heritage Lands. Cross-country skiing is also not permitted on RBG trails, as trails are not maintained for this use and trails are very steep in many sections and are not suitable for this use. CH and HCA do not groom or maintain trails for cross-country ski use within the Heritage Lands; the public is not permitted to cross-country ski on CH and HCA trails. Running/jogging is not permitted on RBG trails. Generally, the current level of recreational use appears to be having little impact on the surrounding natural system. However, there are some specific locations where there is an unacceptable amount of bare soil, root exposure, erosion, etc. These areas would benefit from trail management or closure with commensurate restoration, and management to address existing impacts (e.g., sections of the Bruce Trail and Ray Lowes Side Trail). These issues and locations are described in section 7.4.1 and will be addressed in the Management Plan.

Walking/Jogging/Hiking

Walking, jogging, running, and hiking are all permitted uses of City of Hamilton, CH, and HCA sanctioned trails. Recreational uses on RBG trails are limited to hiking and walking. RBG policy does not permit cross-country skiing, cycling, or running as trails are not set up for these types of higher-impact uses.

Bicycles, motorized vehicles, and horses are not permitted on the Bruce Trail. Avid Bruce Trail hikers traverse the entire Borer's Falls-Rock Chapel Heritage Lands within one day and connect to other areas, such as Clappison-Grindstone Heritage Lands to the east, and Cootes Paradise Heritage Lands to the south. On weekends, the access points described in section 4.1.2 are busy with parked cars and EcoPark System users. During weekdays these same points regularly contain multiple vehicles at any given time.

This attests to the current popularity of the Bruce Trail and other recreational trails, including unsanctioned ones, in this area of the Cootes to Escarpment EcoPark System.

There are some risks associated with hiking on nature trails and individuals must accept personal responsibility for their safety on the trails. Some trails follow along edges of ravines, often with no barriers from steep slopes. RBG provides a "Trail User's Resource Guide" on their website, which provides safety tips and alerts users of these potential safety concerns (https://www.rbg.ca/files/pdf/gardenareas/trails/TrailUsersResourceGuide.pdf, Accessed November 21, 2017). Similarly, CH and HCA provide information on their websites on conservation trail ethics, which include safety messages. HCA Trail Safety & Etiquette (https://conservationhamilton.ca/trail-safety-etiquette/), Accessed May 3, 2018, provides guidance on general trail rules and specific etiquette for Hikers and Dog Walkers. CH Hiking Etiquette & Safety (http://www.conservationhalton.ca/hiking), Accessed May 24, 2018, identifies guidance for trail users to protect sensitive natural areas and communicates risks and mitigations for safely navigating CH trails.

In order to minimize risks, RBG, HCA, CH, City of Hamilton, Bruce Trail Conservancy and the Hamilton Naturalists' Club work to ensure trail blazes and other signs are visible, trails are clear of fallen tree limbs, hazard trees are removed, and bridges and boardwalks are in a good state of repair.

Dog Walking

Dog walking occurs frequently in the Heritage Lands, and may represent the largest single user group in terms of the number of visits per year. Many dogs are walked off-leash through the Current EcoPark System Lands. Neither HCA, CH, RBG or the City of Hamilton allow off-leash dogs within the Borer's Falls-Rock Chapel Heritage Lands (with the exception of the off-leash dog park, discussed below) Identified impacts of off-leash dogs on natural areas include:

- soil nutrient enrichment resulting from urination and defecation, which can ultimately affect the type of vegetation and wildlife supported in the area and change the composition of natural areas;
- risk of spread of disease from domestic dogs to wildlife or vice versa;
- trampling, denuding and altering vegetation structure can result in damage to low-growing plants, resulting in a change of structural diversity in the natural area;
- near-surface tree roots are also often damaged resulting in tree die-back and death;
- introduction of non-native seeds carried into natural areas on dog fur; and
- wildlife disturbed and bird opportunities affected due to hunting, chasing and scent impacts by dogs.

Off-leash dogs may also impact the experience of other visitors by charging or jumping up on individuals or other dogs. As some people are afraid of dogs a number of users do not visit the Borer's Falls – Rock Chapel Heritage Lands, or visit it once and never return due to an upsetting experience, an outcome reported to RBG on many occasions and similarly voiced during the Public Open House consultation. Other issues include the lack of proper disposal of dog feces (e.g., either not picked up and left on or beside the trail, or picked up in a bag and left along the trail or at an access point). Both on- and off-leash dog walking activities will likely increase with the anticipated increase in urban development.

Off-leash Dog Park

An off-leash dog park is located on York Road at the eastern edge of Borer's Falls Conservation Area 1, just south of Valley Road. This dog park appears to be well-used by the public in the morning and in the late afternoon/early evening. The off-leash dog park may be helping to diminish the need for off-leash dog walking on trails, at least in close proximity to the dog park. The dog park is operated by the City of Hamilton, under a unique arrangement with HCA, who own the land.

Birdwatching/Nature Appreciation

Birdwatching and other forms of nature appreciation, which includes botanizing and photography, occur throughout the Heritage Lands, which are rich in biodiversity and scenic landscapes. Users undertaking these forms of recreation tend to stick to sanctioned trails, and have minimal impact on the natural environment. RBG offers free hikes for the public through Rock Chapel on the 5th Sunday of each month. Birding and botanical hikes are hosted and well attended by members of the Hamilton Naturalists' Club.

Cycling

Cycling is not permitted on the Bruce Trail or on RBG nature trails. Cycling is permitted on CH and HCA lands; however, opportunities for cycling within the Borer's Falls-Rock Chapel Heritage Lands are quite limited. In general, the desire for cycling within the Borer's Falls-Rock Chapel Heritage Lands is limited by the topography, which is variable and steep in many sections, particularly on lands south of the CN railway in Borer's Falls Conservation Area. For the most part, avid cyclists, especially mountain bikers, would like to utilize the trail network within the Borer's Falls-Rock Chapel Heritage Lands as a means to connect to the trail network at Clappison Woods located within the Clappison-Grindstone Heritage Lands, east of Highway 6 (Cootes to Escarpment EcoPark System 2016a), i.e., they do not want to use the Borer's Falls-Rock Chapel lands as a destination, only to access another area without using roads, which do not accommodate cycling safety.

Unsanctioned cycling does occur, however, along the Bruce Trail and Ray Lowes Side Trail to a limited extent. Cyclists use the Borer's Falls Conservation Area to connect to Valley Road, and then take Patterson Road to Old Guelph Road, to pass under Highway 6 to access Clappison Woods. A primary concern related to the overall cycling issue is the unsafe nature of York Road for cyclists as a result of the speed limit, narrow road width and lack of road shoulder. Observations from fieldwork revealed that in most cases, cycling activity is confined to defined trails with limited areas of impact resulting from trampling and soil erosion. In a few locations, noticeable impacts to understory vegetation and soil conditions were noted, particularly on steep sections of the Bruce Trail Trail (Figure 3), which can in part be attributed to cycling use.

The City of Hamilton Cycling Plan (2009) identifies a plan for paved shoulders on the full length of York Road; however, the City of Hamilton intends to modify this plan given the challenge of widening the York Road platform (City of Hamilton, Daryl Bender, pers. comm. February 15, 2018). The updated Cycling Master Plan, which is part of the Transportation Master Plan for the City of Hamilton (planned to be approved in spring of 2018), proposes a multi-use trail along a powerline corridor to bypass a large portion of York Road. The portion of the multi-use trail along the York Road Right-of-Way is planned to be along the north side of the roadway. The Hamilton Burlington Trails Council is currently pursuing funding to proceed with a functional design for this facility, which is part of a route they are calling the 'Cootes Loop' (City of Hamilton, Daryl Bender, pers. comm. February 15, 2018).

Rock Climbing/Ice Climbing

Rock climbing and ice climbing occur occasionally at Borer's Falls. All HCA lands are closed to rock climbing. Whereas HCA and the Alpine Club of Canada have signed Memorandums of Understanding (MOUs) for ice climbing on lands administered by HCA, the MOUs do not include any falls within the Borer's Falls – Rock Chapel Heritage Lands; as such, there is no ice climbing permitted on HCA lands in the Heritage Lands. A number of active and archival websites (including personal websites, magazines, and hiking websites cite Borer's Falls as an ice-climbing destination.

Equestrian Use

This non-permitted use of the Heritage Lands includes limited equestrian use at Rock Chapel 5, Berry Tract 1 and Nicholson Tract 1.

Motorized Vehicle Use

Some unsanctioned trails and utility corridors receive occasional motorized vehicle use (i.e., ATVs, dirt bikes, e-bikes and snowmobiles). For example, ATV use allegedly created the existing trail network at Nicholson Tract. ATV use frequently occurs at Hopkins Tract. Motorized vehicle use is not permitted within the Current EcoPark System Lands and has been observed to cause destruction to vegetation, wildlife, wildlife habitat and soils.

Additional Recreational Uses

Additional recreational uses of the Heritage Lands include baseball at Valley Community Centre Park (Figure 2).

Hunting/Poaching/Foraging

Hunting allegedly occurs within the Heritage Lands, including both bow-hunting and with firearms. Hunting is prohibited within the Current EcoPark System Lands. Poaching of wildlife also occurs and is illegal. Foraging for mushrooms and wild plants also occurs, and although not illegal, RBG has created a policy to address the impacts associated with this use (see section 7.6.1 for additional detail on this issue).

Unsanctioned Party Spots/Fire Pits

Unsanctioned after-hour gathering locations ("party spots") were noted in several locations within the Heritage Lands (**REDACTED**), all of which are accessed through the existing trail network, mostly on unsanctioned trails. People, most likely youth, visit these locations to enjoy the surrounding natural setting, socialize and recreate. Issues associated with unsanctioned party spots/fire pits largely involve safety concerns and vandalism. Unsafe behavior can be associated with this type of use, including the setting of fires, consumption of alcohol and drugs, thrill-seeking acts, etc. Vandalism of surrounding trees, spreading of garbage and disturbance to understory vegetation and soils can result. This type of unsanctioned use can also cause other trail users to feel unsafe (see section 7.4.1 for additional detail on this issue and management opportunities).

Illegal Cannabis Grow-ops

Illegal cannabis grow-ops have been found at Nicholson Tract 1 and Borer's Falls Conservation Area 3 in the past.

4.1.4 Existing Infrastructure

The Borer's Falls-Rock Chapel Heritage Lands contain the following existing forms of infrastructure that facilitate recreational use.

- Rock Chapel 1: There is a picnic shelter, viewing platform and a concrete block building located along the Bruce Trail in Rock Chapel 1. The picnic shelter and viewing platform are used by school groups and day hikers. The concrete block building was previously used as a maple syrup shack, where collected maple sap was boiled down to make maple syrup in the early spring.
- Borer's Falls Dog Park: The Borer's Falls Dog Park consists of a parking lot and an approximately 100 m by 60 m area that contains two areas (small and large dog) enclosed by chain-link fencing.
- Valley Community Centre Park: Valley Community Centre Park consists of two baseball diamonds and a playground. The community centre was torn down in 2017. The City of Hamilton is designing a pavilion for this location, and future plans could be implemented here in 2022.
- Innovation Park: A stormwater pond is located in Innovation Park.
- John Prentice Park: Other than a wooden park bench and signage kiosk, no other infrastructure is present at John Prentice Park.

There are several major roads that occur within, but are not formally part of the Cootes Paradise Heritage Lands, including: York Road, Rock Chapel Road, Valley Road, and Old Guelph Road. The existing road network directly affects recreational transportation through the area as well as impacting wildlife corridors.

4.1.5 Existing Programming

The natural setting of Borer's Falls-Rock Chapel Heritage Lands lends itself to passive recreational pursuits including hiking and nature appreciation. RBG Auxiliary leads nature walks from Rock Chapel, along the Bruce Trail and Ray Lowes Side Trail. To become a trail volunteer, RBG Auxiliary Trailwatchers must provide 40 hours of service per year/volunteer, and attend instructional hikes that occur once a month, guide hikes to RBG natural areas that occur weekly, and report issues related to trail conditions and trail use. The RBG Auxiliary provide important educational programming for participants, and report wildlife sightings to RBG staff.

Stewards of Cootes Watershed were recognized with an award of merit by the Hamilton Environmentalists of the Year Awards Committee (2016). Volunteer members remove natural and human-made waste from the watersheds that flow into Cootes Paradise. This organization has been in operation for five years and has successfully removed 380,000 lbs of waste to date.

The Cootes to Escarpment EcoPark System has a full-time Stewardship Technician who works with private landowners residing in the Cootes to Escarpment EcoPark System area to provide on-site consultation, assist in developing habitat restoration projects, and provide information on financial incentive opportunities. The Cootes to Escarpment EcoPark System also offers a series of workshops throughout the year on various topics related to stewardship on urban, suburban, and rural properties.

Together, the Bay Area Restoration Council, HCA and CH initiated a Hamilton Watershed Stewardship Program in 1994 which strives to protect, enhance, and restore environmentally significant areas, watercourses and drinking water sources in the Hamilton watersheds. Today, the Hamilton and Halton Watershed Stewardship Programs partner to deliver the Hamilton Watershed Stewardship Program. The program works with landowners in the HCA watershed, providing advice on environmentally

friendly ways of managing properties with natural features. A number of workshops have been hosted by the Hamilton Watershed Stewardship Program.

Summer camps are provided annually by RBG, which provide recreation and education opportunities that are based in Borer's Falls-Rock Chapel Heritage Lands. These camps also provide important stewardship opportunities for participating youth.

RBG provides a wide variety of cross-curricular resources and school programs for preschool, kindergarten, grades 1-8, and grades 9-12. Programs focus on early years exploration, self-guided exploration, science, cross-curricular – arts/language/social studies + science, physical education and healthy living, team building and leadership, science/environment/geography. Rock Chapel 1 and the Armstrong Trail (Figure 3) is a popular destination for class trips to view the geology of the Niagara Escarpment up close in a safe environment along the Armstrong Trail (section 4.1.1). There is a plant succession exhibit in Rock Chapel 3, which shows fields meeting forest in progressive strips.

RBG hosted Ontario's first known maple syrup demonstration in 1963, in Rock Chapel 1. This demonstration no longer takes place due to lack of site capacity and a shortage of maple trees; however, the maple syrup shanty remains, along with a network of roads down below the Escarpment rim for collecting sap.

RBG has an interpretation plan that looks at key messaging for all of their properties. More than 250 signs, including approximately 50 interpretive signs are included as part of RBG's programming.

Research is currently being carried out on RBG lands by the following organizations:

- McMaster University;
- University of Guelph;
- University of Toronto;
- City of Hamilton;
- Ontario Ministry of Natural Resources and Forestry; and
- local high schools and elementary schools.

HCA has a forest biodiversity monitoring plot, which follows the Ecological Monitoring and Assessment Network (EMAN) protocol, located in Borer's Falls Conservation Area. RBG has two EMAN plots located in the Rock Chapel Nature Sanctuary as well as five bird point count monitoring plots (two in Rock Chapel 1, one in Rock Chapel 3, 1 in Berry Tract 1, and 1 in Berry Tract South.

RBG has a Trail Monitoring Program to assist in the management of the trail network and supporting infrastructure. Trail monitoring also includes a hazard trees maintenance schedule, which generally examines RBG trails on a three year rotation. Highly-used educational program trails are assessed on an annual basis. All scheduled hazard tree removal and maintenance is carried out between October and March to minimize impacts to the natural environment. RBG is currently updating their Hazard Tree Assessment procedure.

Active sports facilities are offered in one location within the Borer's Falls-Rock Chapel Heritage Lands: baseball at Valley Community Centre Park (see section 2.1).

The most recent master plan for RBG was completed in 2003 by The Landplan Collaborative Ltd. (Landplan 2003), and there is a desire to create a new one. RBG is currently completing an overall visioning exercise to provide direction to the master planning process, and the master plan process is expected to begin in 2018. Steps will need to be determined for how best to mesh the current Management Plan study with the master planning process.

4.2 Adjacent Recreational Resources

4.2.1 Trails

Recreational resources on lands adjacent to the Borer's Falls-Rock Chapel Heritage Lands are limited by the lack of suitable land uses, most areas being agricultural fields, residential development and major roadways. Existing adjacent recreational resources include:

- Ray Lowes Side Trail/Pinetum Trail is used to connect to the adjacent Cootes Paradise Heritage Lands;
- the Bruce Trail connects Borer's Falls-Rock Chapel Heritage Lands to Clappison-Grindstone Heritage Lands to the east, under Highway 6;
- the Bruce Trail connects Borer's Falls-Rock Chapel Heritage Lands to Spencer Gorge Wilderness Area along the Niagara Escarpment, beyond the Cootes to Escarpment EcoPark System;
- Trails within the Borer's Falls – Rock Chapel Heritage Lands are used by cyclists to connect to the road network and Clappison Woods, east of Highway 6 in the Clappison-Grindstone Heritage Lands.

Additional trail connections to the Borer's Falls-Rock Chapel Heritage Lands are desired by the Cootes to Escarpment EcoPark System partners and the community. However, opportunities for additional trail connections to lands adjacent to the Cootes Paradise Heritage Lands are limited by existing residential development, lands in private ownership, and the constraints associated with major roadways (e.g., Olympic Drive and Cootes Drive), including how to provide safe crossing areas. This issue is discussed further in section 7.3.

4.2.2 Access Points

In several cases, portions of the unsanctioned trail system rely on accessing the Current EcoPark System Lands through adjacent privately-owned lands (see section 7.2.1 on the issue of trespassing):

- access to the south end of Nicholson Tract 1 is achieved through the adjacent hydro corridor and gas plant access road off of York Road;
- access from the south end of Best Avenue through the hydro corridor adjacent to Nicholson Tract 2; and
- access to Borer's Falls Conservation Area from John Prentice Park, which requires crossing the CN railway (privately-owned) to access the northern portion.

There are a number of locations where new access points, parking areas and trail linkages could potentially be developed on recently acquired lands in the Borer's Falls-Rock Chapel Heritage Lands, adjacent to the Cootes Paradise Heritage Lands (e.g., Borer's Falls Conservation Area 3, Hopkins Tract).

There are no sanctioned trail connections from north shore nature trails in the Cootes Paradise Heritage Lands to the Borer's Falls-Rock Chapel Heritage Lands, particularly the Pleasant View Natural Areas (Cartwright Tract, Nicholson Tracts, Hopkins Tract). Opportunities to develop multi-use trails on

roadside shoulders, in rights-of-way and/or utility corridors to create these much-needed trail linkages will be explored in more detail as part of the Management Plan. It should be noted, however, that trail connections may not be feasible in all desired locations due to the presence of significant species and steep slopes and ravines, as well as the location, character and safety of the roads and railways. Considerations should also be given for future planned road works such as potential re-alignments, opportunities to improve on-road cycling, trail safety, and/or widening or geometric improvements within the surrounding road network.

4.2.3 Recreational Uses

Motorized vehicle (e.g., ATV, dirtbike) trails are apparent along the utility corridors in the Heritage Lands. The appropriateness of recreational motorized vehicle use is dependent on the authorization of the landowners. In the Current EcoPark System Lands it is considered an unsanctioned use and is viewed as trespassing.

There is a forest/outdoor education school located adjacent to the Borer's Falls-Rock Chapel Heritage Lands (The Barn School). To date, the school has not contacted the Cootes to Escarpment EcoPark System partners.

4.2.4 Existing Infrastructure

The surrounding road network is actively used by on-road cyclists and includes routes that incorporate York Road, Rock Chapel Road, Valley Road, Patterson Road and Old Guelph Road. Cycling on York Road in particular has been raised as a major safety concern due to the narrow width of the road, poor sight-lines, traffic volume and the speed at which motorized vehicles travel (see section 7.3.1).

The current City of Hamilton Cycling Master Plan (2009) identifies a plan for paved shoulders on the full length of York Road. The City of Hamilton has identified a challenge in widening the road platform in this area and modifications to the Cycling Master Plan will be required. The Updated Cycling Master Plan (which is part of the Transportation Master Plan current update) proposes a multi-use trail along a pwerline corridor to bypass a large portion of York Road. The portion of the multi-use trail along the York Road Right of Way is planned to run along the north side of the roadway. The Hamilton-Burlington Trails Council is currently pursuing funding to proceed with a functional design for this facility – part of a route that they are calling the Cootes Loop. The City of Hamilton's Recreation Trails Master Plan (2016) includes the same facility.

The CNR railway bisects the Borer's Falls-Rock Chapel Heritage Lands, as well as the adjacent Cootes Paradise Heritage Lands (Figure 2), which presents challenges for north-south trail connections between the two Heritage Lands. An existing pedestrian bridge over the CNR railway is located between Cootes Paradise Sanctuary 3 and Cootes Paradise Sanctuary 5, just west of the Rasberry House in the Cootes Paradise Heritage Lands. Opportunities for this connection will be addressed in the Management Plan, as well as the general topic of addressing safe railway crossings in the Cootes to Escarpment EcoPark System.

5.0 Natural Heritage Inventory

5.1 Physiography and Surface Geology

The Borer's Falls-Rock Chapel Heritage Lands are located within the Niagara Escarpment and Iroquois Plain physiographic regions. Borer's Falls-Rock Chapel Heritage Lands possess significant earth science features comprising provincially significant Niagara Escarpment landform and geological exposures including portions of south-east facing Niagara Escarpment slopes and associated upland plains (Schwetz 2014). The main landscape features of this area are two major creek valleys which cut deep into the Escarpment: Hopkin's Creek and Borer's Creek. They are situated in the central portion of the Heritage Lands where the shale slopes of the Queenston Formation dominate. The Borer's Creek Gorge, topped by the dolostone capstone Lockport Formation, includes the steep upper Escarpment (25 to 30 m high) and includes sub-vertical rock faces. The slope of the dissected lower section of the Escarpment varies from moderate to steep (3 to 10%). The Lake Iroquois shoreline, which marks the boundary between the Niagara Escarpment and Iroquois Plain physiographic regions, lies along the lower Escarpment slopes. This section of the Lake Iroquois shoreline consists of a stranded beach at approximately 110 m elevation (Schwetz 2014). Borer's Creek drops over the Escarpment at Borer's Falls, which is a 25 m high punchbowl waterfall. Downstream of the falls, the underlying Upper Grimsby Formation and occasional red shales of the Queenston Formation are exposed along the creek bed and valley (Riley et al. 1996).

To the west of the Borer's Falls Gorge, the area is characterized by intermittent cliffs exposing the Lockport and Whirlpool Formations of underlying sandstone. To the north, above these cliffs, the Escarpment plain is overlain by clay-rich Halton Till. The development of soils is limited in many areas due to the steep Escarpment slopes and the thin layers of overburden. For this reason, many slopes have little to no organic layer and may be prone to erosion. The overall angles of the rock layers creates the unusual condition of firecting water south resulting in an abundance of springs emerging along the length of the escarpment face in this area. The lack of an organic layer on slopes also influences vegetation and the ground layer is often sparse. Along the Escarpment rim, well-drained Farmington loam has developed, while below the Escarpment the soil is dominated by well-drained Oneida loam (Schwetz 2014).

5.2 Surface Water

The Borer's Falls – Rock Chapel Heritage Lands comprises: the Lower Spencer Creek Subwatershed, Borer's Creek Subwatershed, North Cootes Paradise Watershed, and the Lower Grindstone Creek Watershed.

5.2.1 Lower Spencer Creek Subwatershed

The headwaters of Lower Spencer Creek originate above the Niagara Escarpment north west of Sydenham Road where it flows over Dyment Falls into the former Town of Dundas to connect with the stream network, with a small reach passing through the far west edge of the Heritage Lands.

5.2.2 Borer's Creek Subwatershed

The Borer's Creek Subwatershed is made up of two major creeks: Borer's Creek and Hopkins Creek. Hopkins originates at the northern extend of the subwatershed, downstream of the Escarpment. The headwaters are characterized by steep channels and gullies (GEO Morphix Ltd., 2016). The main branch

flows south through a deep, defined valley alongside Valley Road, then meets the main branch of Borer's Creek upstream of the rail line. The main branch of Borer's Creek originates to the west and flows over the Escarpment (Borer's Falls) just south of Rock Chapel Road. The falls are approximately 25 m in height and are located on RBG property in Rock Chapel 4 (Figure 2). Borer's Creek continues to flow east, crosses the Borer's Falls Conservation Area where it joins Hopkins Creek, then travels south beyond the confluence to discharges into Cootes Paradise. The flow in the creek is permanent across the Heritage Lands, although during the summer the flow is very low.

The upstream limit of the Borer's Creek Watershed coincides with the Niagara Escarpment and is characterized by very steep topography. This watershed contains numerous waterfalls. GEO Morphix Ltd. (2016) reported that the valley walls in the Borer's Creek Watershed were very steep and entrenched due to the presence of the Escarpment, creating watercourses that are confined within the valleys and have very steep gradients. Erosion is high due to the high degree of stream power from creeks flowing off the Escarpment (GEO Morphix Ltd., 2016). Both the headwater of Borer's Creek and Hopkins Creek are similar in this way, though with Hopkins Creek originating just below the Escarpment, waterfalls were not as common. Some braiding was observed on the main branch of Borer's Creek, indicating an unstable system with high stream power, high amounts of erosion on the banks, and deposition of woody debris, cobble, and gravel on the bed (GEO Morphix Ltd., 2016). Hopkins Creek is relatively unaltered and has good vegetation growth on its banks. Water flow is intermittent.
Water quality for Borer's Creek above the Niagara Escarpment has been impaired by urban development and agriculture. Groundwater discharge along the Escarpment and in the moraines in the Dundas Valley improves water quality as the stream falls over the Niagara Escarpment. The Escarpment slopes here are well-forested and the shade provided by the trees keeps temperatures cool and provides leaf litter that supports macro-invertebrate communities in the streams. The stream gradient is very steep, with pool-riffle sequences providing good habitat for fish. The stream substrate is generally made up of large cobbles and gravel.

A small brook flows from the meadow above the Escarpment but disappears approximately 200 m back from the Escarpment edge. It reappears at the end of Armstrong Trail, and is thus referred to as the Disappearing Brook. This is evidence of karst, formed when water dissolves limestone bedrock and creates underground passages.

The drainage pattern and discharge areas of the many small tributaries and springs above and below the Escarpment rim in Rock Chapel 1 is poorly understood. An extensive network of groundwater emerges along the escarpment west of Borer's Creek resulting in a number of small tributaries. The full extent of these small tributaries and where they drain to is unmapped.

5.2.3 North Cootes Paradise Watershed

The North Cootes Paradise Watershed shares its western border with the eastern extent of Borer's Creek Subwatershed. It contains several major tributaries: Mink Brook, Long Valley Brook, Hickory Brook, and three unnamed tributaries (GEO Morphix Ltd., 2016). The watershed is bound by the limits of the Niagara Escaprment ot the north near Patterson Road, and Cootes Paradise to the south. Through the Heritage Lands, the headwaters of the watershed are generally characterized by low gradients.
The upstream limits of the North Cootes Paradise Watershed are significantly different from the other watersheds (GEO Morphix Ltd., 2016) described in this section. The headwaters possess low to medium

gradients and relatively unconfined valleys with low sinuosity. The headwaters are characterized as low order channels with limited erosion potential (GEO Morphix Ltd. 2016). Transitional valleys in the North Cootes Watershed are consistently steep and very deep (20 to 30 metres in depth in some areas) (GEO Morphix Ltd. 2016). Gradients are moderate to high and sinuosity was defined by the valleys. Erosion is common in this area, with valley wall contacts being commonly observed as well as bank erosion on alternating banks and valley walls.

Several small tributaries flow through the Pleasant View Natural Area. From west to east, Hickory Brook drains through Cartwright Tract, and Highland Creek drains through Nicholson Tract 1. Hickory Brook and Highland Creek both drain directly to Cootes Paradise, and are part of the North Cootes Paradise Subwatershed.

5.2.4 Lower Grindstone Creek Watershed

The Pleasant View Tributary Subwatershed and the Clappison-Bridgeview Tributaries of the Lower Grindstone Creek Watershed are found within the eastern portion of the Heritage Lands. Both tributaries tend to originate south of the Escarpment and connect with the main branch of Lower Grindstone Creek outside of the Borer's Falls – Rock Chapel Heritage Lands.

The Niagara Escarpment creates a high topographic gradient; drainage over this slope has led to the formation of deeply incised valleys. The main branches of creeks are largely constrainted and confined wihitn these steep and narrow valleys.

Pleasant View Tributary (West Tributary 6) drains through Nicholson Tract 2 and Hopkins Tract, and into Grindstone Creek, which outlets to Hamilton Harbour, and is part of the Grindstone Creek Watershed.

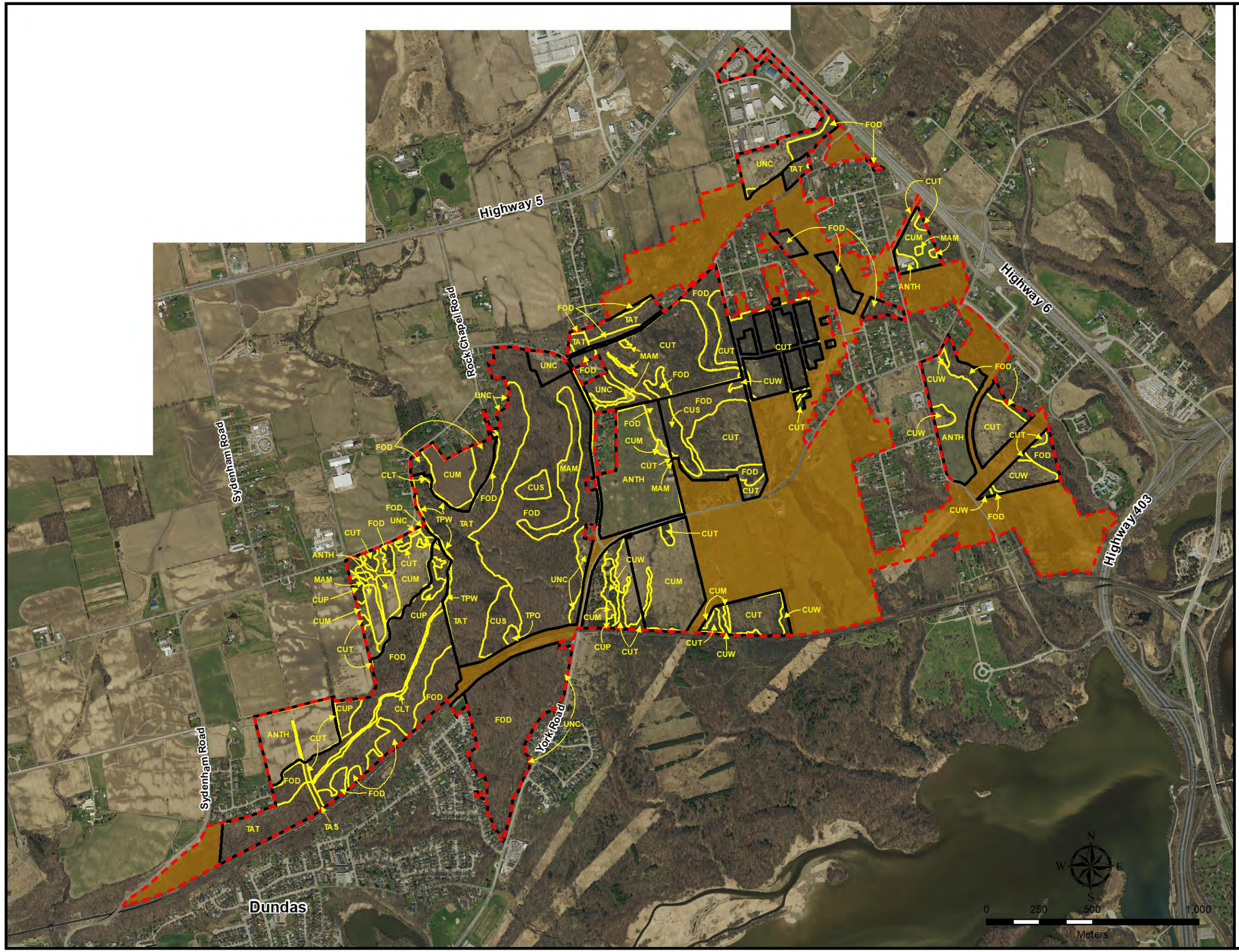
5.3 Vegetation Communities

5.3.1 Inventory

There are 32 vegetation community types identified in the Current EcoPark System Lands. This diversity results from the varied topography and exposure, with a subsequent effect on temperature, moisture availability and soil development. Figure 4 illustrates the vegetation communities of the Current EcoPark System Lands to Ecosite Level. Table 3 summarizes the number of polygons, area and percentage of the Current EcoPark System Lands that each ELC vegetation community comprises. Table 4 summarizes ELC composition of each parcel.

Cootes to Escarpment EcoPark System

Figure 4: Ecological Land Classification of Borer's Falls - Rock Chapel Heritage Lands



Legend

Ecological Land Classification

- **ANTH** - Anthropogenic
- **CLT** - Treed Cliff
- **CUM** - Cultural Meadow
- **CUP** - Plantation
- **CUS** - Cultural Savannah
- **CUT** - Cultural Thicket
- **CUW** - Cultural Woodland
- **FOD** - Deciduous Forest
- **MAM** - Meadow Marsh
- **TAS** - Shrub Talus
- **TAT** - Treed Talus
- **TPO** - Open Tallgrass Prairie
- **TPW** - Tallgrass Woodland
- **UNC** - Unclassified

Privately Owned Outreach Area

Heritage Lands Boundary

Study Area Boundary

Sources of Information:
Royal Botanical Gardens
Conservation Halton
Hamilton Conservation Authority
City of Hamilton
Land Information Ontario

Data Disclaimer:
All boundaries on this map should be considered approximate. No responsibility or liability is assumed by the C2E EcoPark System partners or their employees, officers and agents for any errors, omissions or inaccuracies, whether due to their negligence or otherwise. Some data on this map is used under license from the Ministry of Natural Resources. © Queen's Printer for Ontario, 2016. © Teranet Enterprises Inc. and its suppliers. All rights reserved. NOT A PLAN OF SURVEY.

Cootes to Escarpment EcoPark System

October 12, 2018

Table 3. Vegetation communities of Current EcoPark System Lands in Borer's Falls-Rock Chapel Heritage Lands

ELC Code	# of Polygons	Hectares	% of Current EcoPark System Lands
ANTH - Anthropogenic	6	36.6	11.1
CLT – Treed Cliff	2	1.6	0.5
CUM – Cultural Meadow	11	30.7	9.3
CUP – Cultural Plantation	4	2.8	0.8
CUS – Cultural Savannah	3	7.4	2.2
CUT – Cultural Thicket	26	57.7	17.5
CUW – Cultural Woodland	8	6.6	2.0
FOD – Deciduous Forest	27	117.3	35.7
MAM – Meadow Marsh	9	6.5	2.0
TAS – Shrub Talus	1	0.3	0.1
TAT – Treed Talus	7	42.85	13.0
TPO – Open Tallgrass Prairie	1	0.5	0.2
TPW – Tallgrass Woodland	7	0.4	0.1
UNC – Unclassified	38	17.5	5.3
TOTAL:	**149**	**328.8**	**100.0**

Cliff Communities

Treed Cliff (CLT) communities have between 25% and 60% tree cover. This vegetation type is typically restricted to the narrow cliff rim of the Niagara Escarpment, and is dependent upon how broken and fractured the cliff rim and face are. Cover varies from patchy and barren to more closed in nature (i.e., savannah or woodland) in relation to the cliff rim and face. Within this vegetation type, coring of Eastern White Cedar (*Thuja occidentalis*) trees along the cliff-edge has revealed a small area of old-growth cliff-edge forest (Schwetz 2014). According to Kelly and Larson (2008), on the east side of Borer's Falls-Rock Chapel Heritage Lands, nine old Eastern White Cedar trees occur on the Niagara Escarpment cliff edge or face. Their germination dates range from 1603-1799 making the oldest tree 416 years old in 2018.

Treed Cliff communities occur in Borer's Falls Conservation Area 1, Rock Chapel 1, 3 and 4. A total of 1.6 ha (0.5%) occur in the Current EcoPark System Lands (Figure 4, Tables 3 and 4), and include the following vegetation types:

- White Cedar Treed Carbonate Cliff Type (CLT1-1); and
- Sugar Maple – Ironwood – White Ash Treed Calcareous Cliff Type (CLT1-2).

Talus Communities

Talus vegetation communities occur on slopes of rock rubble at the base of the Niagara Escarpment. Coarse rocky debris must comprise greater than 50% of the substrate surface, with average substrate depth of less than 15 cm. Shrub Talus and Treed Talus vegetation communities occur within the Current EcoPark System Lands.

Shrub Talus (TAS) vegetation communities have less than 25% tree cover and greater than 25% shrub cover. Cover varies from patchy and barren to continuous thicket, depending on the proportion of bare rock surfaces and substrate available (Lee et al. 1998). A total of 0.3 ha (0.1%) of Carbonate Shrub Talus Ecosite (TAS1) occurs within the Current EcoPark System Lands within Rock Chapel 1 (Figure 4, Tables 3 and 4).

Treed Talus (TAT) vegetation communities have between 25% and 60% tree cover with cover varying from patchy and barren to more closed in nature (i.e., savannah or woodland), depending on the availability of substrate accumulated between rocks (Lee et al. 1998). A total of 42.85 ha (13.0%) of Treed Talus vegetation communities have been documented at Berry Tract 2, Borer's Falls Conservation Area 1, Rock Chapel 1 and 4, and Nicholson Tract 3. The following Treed Talus vegetation types have been documented: Dry-Fresh Chinquapin Oak Carbonate Treed Talus Type (TAT1-1) and Fresh-Moist Sugar Maple Carbonate Treed Talus Type (TAT1-4).

Prairie Communities

Drier conditions support some prairie elements including remnants of open tallgrass prairie, tallgrass woodland and open oak woodland. In "The Historical and Present Extent and Floristic Composition of Prairie and Savanna Vegetation in the Vicinity of Hamilton, Ontario", Goodban and others (1997) estimated that at least 3,800 ha of prairie and savannah occurred in Hamilton and vicinity at the time of settlement, and that a more realistic estimate of the former extent of this vegetation type is between 5,000 and 6,000 ha. These areas were dominated by prairie grasses with scattered oak, and included many other species with prairie and open ground affinities. Currently, far less than 1% of the presettlement prairie and savannah remains in southern Ontario. Therefore, prairie and savannah remnants represent the rarest and most threatened community type in the City of Hamilton (Goodban et al. 1997). Prairie elements scattered throughout Rock Chapel were restored by local conservationists, and are not naturally occurring.

Open Tallgrass Prairie (TPO) communities have ground flora dominated by prairie graminoids such as Big Bluestem (*Andropogon gerardii*), Little Bluestem (*Schizachyrium scoparium*) and Indian Grass (*Sorghastrum nutans*). Open Tallgrass Prairies have less than 25% tree cover and less than 25% shrub cover. Trees in this community are typically open-grown (i.e, have spreading crowns). Dry Tallgrass Prairie Type is generally subject to prolonged periods of drought and may include prairie associates such as Cylindric Anemone (*Anemone cylindrica*) and Scribner's Panic Grass (*Dichanthelium oligosanthes scribnerianum*), among others. Small areas of Dry Tallgrass Prairie Type (TPO1-1) occur in Borer's Falls Conservation Area 1 (Figure 4, Tables 3 and 4).

Tallgrass Woodland (TPW) communities consist of open-grown trees, particularly oaks, with an understorey of prairie graminoids and forbs. Pennsylvania Sedge (*Carex pennsylvanica*) is especially common in these communities. Tallgrass Woodlands have less than 60% tree cover, and undergo prolonged periods of drought. Small areas of Dry Black Oak – White Oak Tallgrass Woodland Type (TPW1-1) occur in Borer's Falls Conservation Area 1, Rock Chapel 1 and Rock Chapel 4 (Figure 4, Tables 3 and 4).

Cultural Communities

Regenerating cultural communities are scattered throughout the Current EcoPark System Lands. They sustain old fields, thickets of Grey Dogwood (*Cornus racemosa*), Staghorn Sumac (*Rhus typhina*), European Buckthorn (*Rhamnus cathartica*) and hawthorn (*Crataegus* spp.) as well as successional

groves of White Ash (*Fraxinus americana*), Large-toothed Aspen (*Populus grandidentata*), Trembling Aspen (*P. tremuloides*) and White Elm (*Ulmus americana*).

Cultural Meadows (CUM) represent a very early stage of natural succession. They have less than 25% tree cover and less than 25% shrub cover, and often have a large proportion of non-native plant species (Lee et al. 1998). They lack woody species and are dominated primarily by opportunistic forbs and grasses. Cultural meadows generally result from or are maintained by modern cultural or anthropogenic-based disturbances. Depending on soil moisture regimes, these communities can vary from dry pasture grass-dominated areas to aster and goldenrod assemblages on fresh to moist substrates. Dry-Moist Old Field Meadow Type (CUM1-1) and other cultural meadow communities have been documented in Berry Tract 1, Berry Tract South, Borer's Falls Conservation Area 2-3, Rock Chapel 1, 3-4 and Valley Community Centre Park (Figure 4, Tables 3 and 4). This vegetation community type represents approximately 31 ha of the Current EcoPark System Lands in Borer's Falls-Rock Chapel Heritage Lands (9.3%), and is the fifth most widespread community.

Cultural Thickets (CUT) include areas in a somewhat later stage of succession than cultural meadows. They have less than 25% tree cover and greater than 25% shrub cover, and also often have a large proportion of non-native plant species (Lee et al. 1998). Cultural thicket communities are dominated by woody shrubs and often have an understory of forbs and grasses. Like cultural meadows, cultural thickets generally result from, or are maintained by modern cultural or anthropogenic-based disturbances. Cultural thickets have been documented within the following management units: Berry Tract 1, Berry Tract South, Borer's Falls Conservation Area 1-3, Cartwright Tract, Hopkins Tract, Nicholson Tract 1, Rock Chapel 1-3 and Valley Community Centre Park. Cultural thickets represent approximately 58 ha of the Current EcoPark System Lands (17.5%). The following cultural thicket vegetation types occur in the Current EcoPark System Lands (Figure 4, Tables 3 and 4):

- Sumac Cultural Thicket Type (CUT1-1);
- Gray Dogwood Cultural Thicket Type (CUT1-4); and
- Raspberry Deciduous Shrub Thicket Type (CUT1-5).

Savannahs (CUS) have between 25% and 35% tree cover, and often have a large proportion of non-native plant species resulting from cultural or anthropogenic disturbances (Lee et al. 1998). They are generally open in character, with scattered trees and shrubs and an understory dominated by forbs and grasses. Savannahs are located at Berry Tract South, Borer's Falls Conservation Area 1 and Cartwright Tract, always in small amounts (less than 5 ha) (Figure 4, Tables 3 and 4). Savannah vegetation types include Hawthorn Deciduous Savannah Type (CUS1-4).

Woodlands (CUW) are treed areas that have between 35% and 60% tree cover, and often have a large proportion of non-native plant species resulting from cultural or anthropogenic disturbances (Lee et al. 1998). Woodlands have been documented in Berry Tract 1, Borer's Falls Conservation Area 2-3, Cartwright Tract and Hopkins Tract, representing a small portion of the Current EcoPark System Lands (6.6 ha) (Figure 4, Tables 3 and 4). Woodlands in the Current EcoPark System Lands are dominated by Red Oak, with Dry Red Oak Woodland Type (CUW1-2) occurring most frequently. These areas may represent small inclusions that are not always visible on Figure 4.

Cultural Plantations (CUP) have greater than 60% tree cover and consist of deciduous and/or coniferous trees that have been planted (Lee et al. 1998). Cultural plantations cover 2.8 ha (0.8%) of the Current EcoPark System Lands and are located in Borer's Falls Conservation Area 3 and Rock

Chapel 1 and 3 (Figure 4, Tables 3 and 4). Many of the cultural plantations that occur within the Heritage Lands are not described adequately in the ELC for southern Ontario (Lee et al. 1998). Where an appropriate ELC vegetation type was not available, these areas were classified only to ecosite (e.g., cultural plantation). The following cultural plantation types have been documented in the Current EcoPark System Lands:

- Sugar Maple Deciduous Plantation Type (CUP1-1); and
- Hybrid Poplar Deciduous Plantation Type (CUP1-4).

Forested Communities

Forested communities have greater than 60% tree cover and can be dominated by deciduous and/or coniferous trees. The Current EcoPark System Lands contain **Deciduous Forests** (FOD), which have greater than 75% canopy cover of deciduous tree species (Lee et al. 1998). Deciduous forests are found throughout the Current EcoPark System Lands, above and below the Niagara Escarpment (Figure 4, Tables 3 and 4), with 14 different deciduous forest vegetation types covering 117.3 ha (35.7%). Above the Escarpment, forests are dominated by Sugar Maple, oaks and hickories and below the Escarpment forests are often dominated by Sugar Maple, oak (*Quercus* spp.), hickory (*Carya* spp.), Black Maple (*A. nigrum*) and Black Walnut (*Juglans nigra*).

The following Deciduous Forest vegetation types have been documented within the Current EcoPark System Lands:

- Dry-Fresh White Oak Deciduous Forest Type (FOD1-2);
- Dry-Fresh Mixed Oak Deciduous Forest Type (FOD1-4);
- Dry-Fresh Oak-Hickory Deciduous Forest Type (FOD2-2);
- Dry-Fresh Oak – Hardwood Deciduous Forest Type (FOD2-4);
- Dry-Fresh White Ash Deciduous Forest Type (FOD 4-2);
- Dry-Fresh Sugar Maple – Oak Deciduous Forest Type (FOD5-3);
- Dry-Fresh Sugar Maple – Ironwood Deciduous Forest Type (FOD5-4);
- Dry-Fresh Sugar Maple – White Ash Deciduous Forest Type (FOD5-8);
- Dry-Fresh Sugar Maple – White Birch – Aspen Deciduous Forest Type (FOD5-10);
- Fresh-Moist Sugar Maple – Black Maple Deciduous Forest Type (FOD6-2);
- Fresh-Moist Green Ash – Hardwood Lowland Deciduous Forest Type (FOD7-2);
- Fresh-Moist Black Walnut Lowland Decidous Forest Type (FOD7-4);
- Fresh-Moist Black Maple Lowland Deciduous Forest Type (FOD7-5); and
- Fresh-Moist Shagbark Hickory Deciduous Forest Type (FOD9-4).

Very small inclusions of Dry-Fresh White Pine Sugar Maple Mixed Forest Type (FOM2-2) occur in the Current EcoPark System Lands. Due to their small size (less than 0.5 ha), these vegetation communities are not mapped on Figure 4 or included in Tables 3 and 4.

Table 4. Vegetation communities of Current EcoPark System Lands in Borer's Falls-Rock Chapel Heritage Lands per management unit

Management Unit	Vegetation Community (ha)														Total (ha)
	ANTH	CLT	CUM	CUP	CUS	CUT	CUW	FOD	MAM	TAS	TAT	TPO	TPW	UNC	
Rock Chapel 1	0.02	1.23	0.27	2.00		0.62		20.55		0.32	16.71		0.00	0.07	41.79
Rock Chapel 2	9.21					0.21		0.08						0.16	9.66
Rock Chapel 3	3.05	0.00	6.00	0.63		1.46		2.07	0.59					0.14	13.94
Rock Chapel 4		0.00	4.61					3.55			0.00		0.00		8.16
Rock Chapel 5								0.00						2.12	2.12
Borer's Falls Conservation Area 1		0.40			4.90	0.07		63.40	4.86		21.76	0.50	0.38	1.63	97.90
Borer's Falls Conservation Area 2			13.80			5.94	1.22								20.96
Borer's Falls Conservation Area 3			2.87	0.17		1.70	1.14							2.72	8.60
Berry Tract 1			0.10			17.61	0.00	6.83	0.76					1.91	27.21
Berry Tract 2								1.04			3.19			0.16	4.39
Berry Tract South	15.30		0.30		0.00	0.00		1.40						0.19	17.19
Cartwright Tract					2.51	9.30	0.22	6.55						0.00	18.58
Nicholson Tract 1						10.76		0.10						0.15	11.01
Nicholson Tract 2								4.60						0.00	4.60
Nicholson Tract 3											1.13			0.02	1.14
Nicholson Tract 4								0.13						0.02	0.15
Hopkins Tract	8.22					5.30	4.06	4.37							21.95
Innovation Park								1.75						7.83	9.58
John Prentice Park								0.02						0.40	0.42
Valley Community Centre Park	0.79		2.71			0.30			0.24						4.04
Unclassified	0.00		0.04			4.38	0.00	0.88	0.01		0.06			0.01	5.38
Total:	**36.59**	**1.63**	**30.70**	**2.80**	**7.41**	**57.65**	**6.64**	**117.31**	**6.46**	**0.32**	**42.85**	**0.50**	**0.38**	**17.53**	**328.77**

*Total area reported (which is 329 ha) is greater than the total area of the Current EcoPark System Lands (which is 323 ha) due to slivers of overlap present in ELC data layers.

Open Wetland Communities

Meadow Marsh (MAM) vegetation communities have less than 25% tree and shrub cover and are characterized by emergent hydrophytic macrophytes and tend to be dominated by species that are less tolerant of prolonged flooding (Lee et al. 1998). Areas of Meadow Marsh tend to receive seasonal flooding, where soils are flooded in the spring but become moist to dry during the summer. These vegetation communities represent the interface between wetland and terrestrial ecosystems. Within the Current EcoPark System Lands, the following Meadow Marsh vegetation types have been documented within Berry Tract 1, Borer's Falls Conservation Area 1, Rock Chapel 3 and Valley Community Centre Park (Figure 4, Tables 3 and 4):

- Reed-canary Grass Mineral Meadow Marsh Type (MAM2-2); and
- Forb Mineral Meadow Marsh Type (MAM2-10).

Anthropogenic

Several Anthropogenic (ANTH) areas are present within the Current EcoPark System Lands (Figure 4, Tables 3 and 4). These lands contain land uses that are not easily classified using the ELC for southern Ontario (Lee et al. 1998). Anthropogenic areas include manicured areas present along natural area boundaries, parking lots, sports fields, lawns and agricultural fields. Anthropogenic areas occur in Berry Tract South, Hopkins Tract, Rock Chapel 1-3 and Valley Community Centre Park.

Unclassified

Several Unclassified (UNC) areas are present within the Current EcoPark System Lands (Figure 4, Tables 3 and 4). These areas have not been assessed using ELC protocols.

5.3.2 Significant Vegetation Communities

There are eight provincially significant vegetation communities present within the Borer's Falls-Rock Chapel Heritage Lands (Figure 5):

- White Cedar Treed Carbonate Cliff Type (CLT1-1);
- Sugar Maple – Ironwood – White Ash Treed Carbonate Cliff Type (CLT1-2);
- Fresh-Moist Sugar Maple – Black Maple Deciduous Forest (FOD6-2);
- Fresh-Moist Black Walnut Lowland Deciduous Forest (FOD7-4);
- Fresh-Moist Black Maple Lowland Deciduous Forest (FOD7-5);
- Fresh-Moist Sugar Maple Carbonate Treed Talus (TAT1-4);
- Dry Tallgrass Prairie Type (TPO1-1); and
- Dry Black Oak – White Oak Tallgrass Woodland (TPW1-1).

Historical records indicate that prairie and oak savannah communities were associated with well-drained, sandy sites in the Cootes to Escarpment EcoPark System. Currently, only a handful of tiny prairie-savannah remnants remain within the Borer's Falls-Rock Chapel Heritage Lands. Tallgrass Prairie (TPO) occurs at Borer's Falls Conservation Area 1, and Tallgrass Woodland (TPW) occurs at Borer's Falls Conservation Area 1, and Rock Chapel 1 and 4 (Table 4), although these areas were too small to delineate on Figure 4. Far less than 1% of the pre-settlement prairie and savannah remains in southern Ontario (Goodban et al. 1997) making it one of the rarest native vegetation communities in the province. The remnant prairie/savannah communities also represent the rarest and most threatened community types within the Borer's Falls-Rock Chapel Heritage Lands.

Sources of Information:
Royal Botanical Gardens
Hamilton Conservation Authority
City of Hamilton
Land Information Ontario

Data Disclaimer:
All boundaries on this map should be considered approximate. No responsibility or liability is assumed by the C2E EcoPark System partners or their employees, officers and agents for any errors, omissions or inaccuracies, whether due to their negligence or otherwise. Some data on this map is used under license from the Ministry of Natural Resources. © Queen's Printer for Ontario, 2016. © Teranet Enterprises Inc. and its suppliers. All rights reserved. NOT A PLAN OF SURVEY.

Cootes to Escarpment EcoPark System

Figure 5: Provincially Significant Vegetation Communities

Legend

Significant Vegetation Communities

CLT1-1 - White Cedar Treed Carbonate Cliff
CLT1-2 - Sugar Maple-Ironwood-White Ash Treed Carbonate Cliff
FOD6-2 - Fresh-Moist Sugar Maple-Black Maple Deciduous Forest
FOD7-4 - Fresh-Moist Black Walnut Lowland Deciduous Forest
FOD7-5 - Fresh-Moist Black Maple Lowland Deciduous Forest
TAT1-4 - Fresh-Moist Sugar Maple Carbonate Treed Talus
TPO1-1 - Dry Tallgrass Prairie
TPW1-1 - Dry-Black Oak-White Oak Tallgrass Woodland
WODM4-4 - Dry-Fresh Black Walnut Deciduous Forest

Privately Owned Outreach Area

Heritage Lands Boundary

Management Units

Innovation Park
Nicholson Tract 4
Valley Community Centre Park
Nicholson Tract 3
Nicholson Tract 2
Highway 5
Berry Tract 2
Rock Chapel 5
Rock Chapel Road
Highway 6
Nicholson Tract 1
Berry Tract 1
Rock Chapel 4
Hopkins Tract
Cartwright Tract
Berry Tract South
Borer's Falls Conservation Area 1
Sydenham Road
Rock Chapel 3
Borer's Falls Conservation Area 2
Highway 403
York Road
Borer's Falls Conservation Area 3
Rock Chapel 2
Borer's Falls Conservation Area 1
John Prentice Park
Rock Chapel 1
Dundas

TAT1-4
FOD7-4
WODM4-4
TPW1-1
CLT1-1
CLT1-2
TPW 1-1
FOD7-5
TAT1-4
TPO1-1
FOD 6-2
FOD7-4
CLT1-2

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Cootes to Escarpment EcoPark System

October 12, 2018

The Borer's Falls-Rock Chapel Heritage Lands are covered in older forests of oak, hickory and maple with trees in excess of 100 years old in various locations. By some definitions, these forests would qualify as old growth. Principally owing to their size, age and proximity to watercourses much of the forest within the Current EcoPark System Lands would qualify as significant woodland under the policies of the City of Hamilton's Official Plans (urban and rural).

Some of the vegetation communities found within the Current EcoPark System Lands may qualify as Significant Wildlife Habitat, which includes rare vegetation communities or specialized habitat for wildlife including tallgrass prairie, old growth forest, other rare vegetation communities, and seeps and springs (MNRF 2015). Seeps and springs are typical of headwater areas and are often at the source of coldwater streams. These communities often also support species considered Threatened or Endangered, although these are very likely under-reported, especially bats. Identification and delineation of Significant Wildlife Habitat and the habitat of Threatened and Endangered Species contributes to the identification of habitat to protect as well as provides guidance for targeted restoration and management activities. Coordination with current and future planned uses should have regard for Significant Wildlife Habitat and the habitat of Threatened and Endangered species.

5.4 Flora

A conservative approach was used to summarize flora within the Borer's Falls – Rock Chapel Heritage Lands; records without specific location information and that could not be confirmed to have been documented within the Borer's Falls – Rock Chapel Heritage Lands were not included in this summary.

5.4.1 Inventory

A total of 798 flora species have been documented in the Borer's Falls-Rock Chapel Heritage Lands. Of the 798 species, 448 (56%) are native. See Appendix 5 for the complete listing of flora documented within Borer's Falls-Rock Chapel Heritage Lands. A total of 21 Carolinian Indicator species (*sensu* Riley *et al.* 1989) and 29 plant species with prairie - savannah affinities (*sensu* Riley *et al.* 1989) have been noted (Appendix 6).

Table 5 provides the number of native flora species, their Floristic Quality Index (FQI), and Native Mean C for the Borer's Falls -Rock Chapel Heritage Lands. FQI is a measure of vegetation quality and is based on both the fidelity of each species for a particular habitat (habitat conservatism) and species richness. It is calculated from the average Coefficient of Conservatism (CC) divided by the square root of the number of plant species in the community (Oldham et al. 1995). CC is a measure of a species' specificity of habitat requirements, with a coefficient of 0 indicating a plant tolerant of a wide range of conditions (typically weedy species) and 10 indicating a plant that has the most specific habitat requirements (typically plants that occur in undisturbed, high quality native communities). Mean CC is thus also a measure of the quality of the flora, but without consideration of the species richness of a community.

The Native FQI of the Current EcoPark System Lands in the Borer's Falls-Rock Chapel Heritage Lands as a whole is an very high value (FQI= 96.5, Mean C= 5.0). In southern Ontario, most natural areas within urban or urbanizing landscapes have Native FQI values of around 70-80. Remnant patches of natural habitat in urban areas of Ontario typically have FQIs in the 15-30 range. FQIs of 40-45 are

fairly high for agricultural landscapes. A mean C under 4 indicates that the site is primarily vegetated with adaptable species that can withstand a variety of habitat changes. Areas with high coefficients (higher than 4) are likely to be more sensitive to disturbance, for example a change in hydrology, influx of non-native species, or change in canopy cover.

Table 5. Floristic Quality of the Borer's Falls-Rock Chapel Heritage Lands

Management Unit	# Native Flora Species	Native FQI	Native Mean C
Borer's Falls-Rock Chapel: Natural Areas	372	96.5	5.0
Borer's Falls-Rock Chapel: Roadsides	98	29.46	2.98
Borer's Falls-Rock Chapel: Waste Places	14	5.30	1.42

5.4.2 Invasive Flora Species

Invasive species have been identified as one of the greatest threats to the integrity of the ecosystems within the Borer's Falls-Rock Chapel Heritage Lands. Table 6 lists the major invasive species and provides an indication of whether they are dominant in their respective habitats. This table has been prepared based on several background reports, data sets and field observations. Professional judgement of the characteristics of invasive species was applied to identify the major invasive plant species that are considered high priorities for management.

Table 6. Major invasive flora species found within Borer's Falls-Rock Chapel Heritage Lands

Common Name	Scientific Name	Locally Dominant
Herbaceous Plants		
Garlic Mustard	*Alliaria petiolata*	x
Dog-strangling Vine	*Cynanchum rossicum*	x
English Ivy	*Hedera helix*	
Japanese Knotweed	*Polygonum cuspidatum*	
Phragmites	*Phragmites australis*	x
Purple Loosestrife	*Lythrum salicaria*	
Reed Canarygrass	*Phalaris arundinacea*	
Shrubs		
White Mulberry	*Morus alba*	
Common Buckthorn	*Rhamnus cathartica*	x
Non-native Honeysuckles	e.g., *Lonicera tatarica*	x
Multiflora Rose	*Rosa multiflora*	x
Japanese Barberry	*Berberis thunbergii*	
Trees		
Norway Maple	*Acer platanoides*	

Common Name	Scientific Name	Locally Dominant
Manitoba Maple	*Acer negundo*	x
Black Locust	*Robinia pseudo-acacia*	x

5.4.3 Significant Flora

A number of significant flora species are identified in the Borer's Falls – Rock Chapel Heritage Lands, including:

- 4 nationally and provincially Endangered species;
- 20 provincially rare species (ranked S1-S3); and
- 51 regionally rare and 46 regionally uncommon species in the City of Hamilton (Schwetz 2014).

Table 7 lists flora species at risk and provincially rare species (S1-S3) noted within the Borer's Falls-Rock Chapel Heritage Lands.

Table 7. Provincially significant flora species in Borer's Falls – Rock Chapel Heritage Lands

Scientific Name	Common Name	S-Rank	COSEWIC	SARA	ESA
Carex oligocarpa Schkuhr ex Willd.	Eastern Few-fruited Sedge	S3			
Sporobolus vaginiflorus (Torr. ex A.Gray) Alph.Wood	Sheathed Dropseed	S2S3			
Ranunculus hispidus Michx. var. hispidus	Bristly Buttercup	S3			
Thalictrum thalictroides (L.) A.J.Eames & B.Boivin	Rue-anemone	S3			
Desmodium cuspidatum (Muhlenb. ex Willd.) DC. ex G.Don	Largebract Tick-trefoil	S3			
Polygala verticillata L.	Whorled Milkwort	S3?			
Potentilla canadensis L.	Canada Cinquefoil	S2?			
Morus rubra L.	Red Mulberry	S2	END	END	END
Juglans cinerea L.	Butternut	S2?	END	END	END
Carya glabra (Mill.) Sweet	Pignut Hickory	S3			
Euonymus atropurpureus Jacq.	Eastern Burning-bush	S3			
Hybanthus concolor (T.F.Forst.) Spreng.	Eastern Green-violet	S2			

Scientific Name	Common Name	S-Rank	COSEWIC	SARA	ESA
Viola striata Aiton	Striped Cream Violet	S3			
Lythrum alatum Pursh var. alatum	Winged Loosestrife	S3			
Arabis pycnocarpa var. adpressipilis M. Hopkins	Soft-haired Rockcress	S1			
Mirabilis nyctaginea (Michx.) MacMill.	Heart-leaved Four-o'clock	S2			
Phlox subulata L. subsp. subulata	Moss Phlox	S1?			
Frasera caroliniensis Walter	American Columbo	S2	END	END	END
Pycnanthemum incanum (L.) Michx. var. incanum	Hoary Mountain-mint	S1	END	END	END
Solidago rigida L. subsp. rigida	Stiff Goldenrod	S3			

COSEWIC – Committee on the Status of Endangered Wildlife in Canada (END = Endangered; THR = Threatened)
SARA – Species at Risk Act (END = Endangered)
ESA – Endangered Species Act (END = Endangered)

S-Rank = Sub-national Rank
Ontario Ministry of Natural Resources. 2018. Vascular Plant Species List. Peterborough, Ontario.
S1 – Extremely rare in Ontario
S2 – Very rare in Ontario
S3 – Rare to uncommon in Ontario
? – Uncertain classification due to insufficient information

5.5 Fauna

A conservative approach was used to summarize fauna within the Borer's Falls – Rock Chapel Heritage Lands; records without specific location information and that could not be confirmed to have been documented within the Borer's Falls – Rock Chapel Heritage Lands were not included in this summary.

A total of 198 fauna species have been documented within the Borer's Falls-Rock Chapel Heritage Lands, including 190 native species and 8 introduced species (Appendix 7). Table 8 summarizes provincially significant fauna species found within the Current Borer's Falls-Rock Chapel Heritage Lands. In this report, provincially significant species are those that are identified as Endangered, Threatened, of Special Concern, or ranked S1-S3. Regional rarity is also listed and is based on rankings provided by Schwetz (2014) for the City of Hamilton.

5.5.1 Inventory

Butterflies and Moths (Lepidoptera)

A total of 51 species of butterfly or moth have been recorded within the Borer's Falls-Rock Chapel Heritage Lands. Two of these species are non-native (Cabbage White (*Pieris rapae*) and European Skipper (*Thymelicus lineola*)) (Appendix 7). This group, in particular moths, is likely under-studied and these numbers should be considered to be very conservative. Significant species are listed in Table 8 (provincial) and Appendix 7 (regional).

- 1 S1-S3 species - Monarch (*Danaus plexippus*);
- 1 nationally and provincially listed species - Monarch (ESA/SARA: Special Concern, COSEWIC: Endangered)
- 2 species rare in Hamilton; and
- 5 species uncommon in Hamilton (two historical records).

Dragonflies and Damselflies (Odonata)

A total of 22 species of dragonfly or damselfly have been identified within the Borer's Falls-Rock Chapel Heritage Lands, all of which are native (Appendix 7). Provincially rare species are listed in Table 8. Regionally significant species are listed in Appendix 7. These rankings should be considered tentative as this group is not well studied in Ontario and the distributions of some species are likely not fully understood.

- 2 S1-S3 species (Azure Bluet (*Enallagma aspersum*) and Painted Skimmer (*Libellula semifasciata*);
- 1 species rare in Hamilton; and
- 3 species uncommon in Hamilton.

Fish

Fish community sampling has been undertaken by HCA at Borer's Creek. A total of 11 fish species have been documented within the Borer's Falls-Rock Chapel Heritage Lands. No provincially or regionally rare fish species are known to the Borer's Falls – Rock Chapel Heritage Lands. One species is considered to be introduced in Ontario, the Rainbow Trout (*Oncorhynchus mykiss*).

Amphibians

A total of five species of amphibians (four anurans and one salamander) have been recorded in the Borer's Falls-Rock Chapel Heritage Lands, all of which are native. Provincially and regionally rare species are not known to be present within the Borer's Falls – Rock Chapel Heritage Lands. RBG has created vernal pools in Rock Chapel 1, which have been noted to provide habitat for Northern Leopard Frog (*Lithobates pipiens*) (Area-sensitive Species) and American Toad (*Anaxyrus americanus*).

Reptiles

A total of five species of reptile have been recorded in the Borer's Falls – Rock Chapel Heritage Lands, all five species are considered native to Ontario. Provincially rare species are listed in Table 8, and regionally rare species are listed in Appendix 7.

- 1 Federally listed Special Concern – Eastern Milksnake (*Lampropeltis triangulum*) (COSEWIC/SARA);
- 1 species assessed by COSEWIC as Special Concern – Midland Painted Turtle (*Chrysemys picta marginata*)
- 1 Locally Rare species – Ring-necked Snake (*Diadophis punctatus*)

Birds

A total of 89 bird species have been noted within the Borer's Falls-Rock Chapel Heritage Lands, including five non-native species, all of which have confirmed breeding status in the Hamilton region and are considered to possibly breed within the Current EcoPark System Lands (Hamilton Naturalists' Club 2006). Provincially rare species are listed in Table 8, and regionally rare species are listed in Appendix 7.

- 4 S1-S3 species;
- 2 Federally and Provincially Endangered species (one historical record);
- 5 Federally and Provincially Threatened species;
- 1 Federally and Provincially Special Concern species;
- 1 Federally Special Concern and Provincially Threatened species;
- 2 Provincially Special Concern and Federaly Threatened Species;
- 1 Provincially Special Concern species not listed Federally;
- 9 species rare in Hamilton;
- 25 species uncommon in Hamilton; and
- 14 area sensitive species.

Mammals

A total of 15 mammal species have been recorded within the Borer's Falls-Rock Chapel Heritage Lands. Provincially and Regionally rare mammals have not been identified within the Borer's Falls – Rock Chapel Heritage Lands. Notably, targeted surveys for bats have not been completed and there are likely a number of bats, including species at risk bats, present in the Heritage Lands given the diversity of habitats present.

Table 8. Significant fauna species within Borer's Falls-Rock Chapel Heritage Lands

Scientific Name	Common Name	G-Rank	S-Rank	COSEWIC	SARA	ESA
Butterfly/Moth						
Danaus plexippus	Monarch	G4	S2N,S4B	END	SC	SC
Dragonfly/ Damselfly						
Enallagma aspersum	Azure Bluet	G5	S3			
Libellula semifasciata	Painted Skimmer	G5	S2			
Reptile						
Lampropeltis triangulum	Eastern Milksnake	G5	S4	SC	SC	NAR
Bird						
Sturnella magna	Eastern Meadowlark	G5	S4B	THR	THR	THR
Dolichonyx oryzivorus	Bobolink	G5	S4B	THR	THR	THR
Ammodramus savannarum	Grasshopper Sparrow	G5	S4B	SC	SC	SC
Icteria virens	Yellow-breasted Chat	G5	S2B	END	END	END
Parkesia motacilla	Louisiana Waterthrush	G5	S3B	THR	SC	THR
Vermivora chrysoptera	Golden-winged Warbler	G4	S4B	THR	THR	SC
Hylocichla mustelina	Wood Thrush	G5	S4B	THR	THR	SC
Riparia riparia	Bank Swallow	G5	S4B	THR	THR	THR
Hirundo rustica	Barn Swallow	G5	S4B	THR	THR	THR
Contopus virens	Eastern Wood-pewee	G5	S4B	SC	SC	SC
Chaetura pelagica	Chimney Swift	G5	S4B,S4N	THR	THR	THR
Lanius ludovicianus	Loggerhead Shrike	G4	S2B	END	END	END
Haliaeetus leucocephalus	Bald Eagle	G5	S2N, S4B	NAR		SC
Buteo lineatus	Red-shouldered Hawk	G5	S4B		SC*	

5.5.2 Significant Wildlife Habitat

Based on a preliminary assessment of the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, January 2015), the Borer's Falls-Rock Chapel Heritage Lands may provide the following types of significant wildlife habitat:

1. Seasonal Concentration Areas of Animals
    - Bat Hibernacula
    - Bat Maternity Colonies
    - Migratory Butterfly Stopover Areas
    - Landbird Migratory Stopover Areas
    - Deer Winter Congregation Areas
2. Rare Vegetation Communities
    - Tallgrass Prairie
    - Old Growth Forest
    - Savannah
    - Other Rare Vegetation Communities

3. Specialized Habitat for Wildlife
    - Woodland Raptor Nesting Habitat
    - Seeps and Springs
    - Woodland Area-sensitive Breeding Bird Habitat
    - Shrub/Early Successional Bird Breeding Habitat
4. Habitat for Species of Conservation Concern
    - Special Concern and Rare Wildlife Species
5. Animal Movement Corridors

A thorough analysis of the extent of significant wildlife habitat is not possible at this scale of study, however we are confident that substantial areas of the Current EcoPark System Lands would qualify as significant wildlife habitat.

5.6 Other Natural Heritage Designations

The following designations apply to lands found within the Borer's Falls-Rock Chapel Heritage Lands.

Area of Natural and Scientific Interest

The following Areas of Natural and Scientific Interest (ANSI) are found within the Borer's Falls-Rock Chapel Heritage Lands:

- Rock Chapel Escarpment Regional Life Science ANSI; and
- Rock Chapel Regional Earth Science ANSI.

Environmentally Significant Areas

The following Environmentally Significant Areas are found within the Borer's Falls-Rock Chapel Heritage Lands:

- Cootes Paradise Environmentally Significant Area (DUND-15); and
- Borer's Falls-Rock Chapel Environmentally Significant Area (DUND-16).

Other Designations

The Niagara Escarpment, including portions of the Borer's Falls-Rock Chapel Heritage Lands, is designated as a UNESCO MAB Reserve (United Nations Educational, Scientific and Cultural Organization Man and Biosphere Reserve).

5.7 Natural Heritage Connections and Linkages

Natural Heritage connections and linkages occur at various scales: (1) large-scale, provincial, connections through natural areas located along the Niagara Escarpment and Lake Ontario; (2) connections and linkages among the Heritage Lands; and (3) connections and linkages among parcels within individual Heritage Lands. The Heritage Lands within the Cootes to Escarpment EcoPark System and their linkage function are captured within the Region of Halton's and City of Hamilton's Natural Heritage Systems. In terms of inter-Heritage Land connections, creek valleys provide natural corridors for species moving between Borer's Falls-Rock Chapel Heritage Lands and Cootes Paradise Heritage Lands, and in the east from the Niagara Escarpment to Lake Ontario. Within Borer's Falls-Rock Chapel Heritage Lands, Current EcoPark System Lands are fairly well connected and configured. Natural area patch size is large and contiguous, and forest interior habitat is available for area-sensitive species. See section 7.1.1 on the

critical corridor for connection of Cootes Paradise to the Niagara Escarpment, and section 7.7.1 on wildlife crossing and corridors. In addition, much of the land outside of natural heritage features (woodland, wetland, etc.), both within and among Heritage Lands, is open and relatively undeveloped and thus offers few barriers to movement for most wildlife species. Because of this, there is a high degree of connectivity within Borer's Falls-Rock Chapel Heritage Lands and adjacent Heritage Lands to the south, including connectivity between Cootes Paradise and the Niagara Escarpment, which is the core mission for the Cootes to Escarpment EcoPark System. Connectivity to the Heritage Lands to the east (i.e., Clappison-Grindstone Heritage Lands and Waterdown-Sassafras Woods Heritage Lands) is limited by Highway 6.

The Heritage Lands extend along the Niagara Escarpment for approximately 5 km, towards Clappison-Grindstone Heritage Lands to the east and to Cootes Paradise Heritage Lands to the south, forming a significant natural corridor. The significant valleys also contribute to regional connections between forested lands in the Dundas Valley and those in the Hamilton Harbour area. They are characterized as possessing significant ecological functions due to these connections and the presence of significant species, interior forest habitat, rare biotic communities, and a high diversity of native plant species.

Connectivity and linkage opportunities are, however, significantly impeded by the fact that the Cootes to Escarpment EcoPark System is bisected by provincial highways (Highway 403, Highway 6) and many regional highways. For example, York Road limits the connectivity between the Cootes Paradise Heritage Lands and Borer's Falls-Rock Chapel Heritage Lands. Within the Borer's Falls – Rock Chapel Heritage Lands, current EcoPark System Lands are bisected by York Road, Valley Road, and Old Guelph Road (Figure 2). Rock Chapel and Borer's Falls Conservation Area 1 are wellconnected and configured, and forest interior habitat is available for area-sensitive species. The remainder of the Borer's Falls – Rock Chapel Heritage Lands is fragmented, but opportunities exist for improving the connectivity among areas that contain forest interior habitat; some limitations to connectivity exist associated with existing infrastructure and development.

Significant wildlife corridor issues have been identified with major roadways within the Cootes to Escarpment EcoPark System, and within the Borer's Falls – Rock Chapel Heritage Lands. Locations with wildlife corridor issues within the Borer's Falls – Rock Chapel Heritage Lands include York Road at multiple points including Hickory Brook and Long Valley Brook where the existing culverts are undersized relative to wildlife and along York Road between Borer's Fall Conservation Areas 2 and 3 and Borer's Falls Conservation Area 1 and Berry Tract South where regular at-grade crossing occurs by wildlife. Old Guelph Road west of Hopkin's Tract experiences a great deal of White-tailed Deer at-grade crossing. Less travelled roads such as Valley Road and Patterson Road similarly lack safe wildlife crossing opportunities and failed at-grade crossings have been observed.

Additional discussion on wildlife crossing and corridor issues is provided in section 7.6.1.

5.8 Natural Heritage Inventory Summary

The following table includes some natural heritage-related policy designations such as Environmentally Significant Area, significant woodland and significant wildlife habitat, as well as strictly natural heritage inventory summary information for Borer's Falls-Rock Chapel Heritage Lands. The inventory excludes historical records and records of non-breeding bird species. Species at risk listings refer to the Ontario Endangered Species Act, where END=endangered, THR=threatened.

Table 9. Summary of natural heritage inventory findings for Borer's Falls-Rock Chapel Heritage Lands.

Features	Borer's Falls-Rock Chapel Heritage Lands
Environmentally Signficant Area	• City of Hamilton Environmentally Significant Area; Cootes Paradise Environmentally Significant Area (DUND-15); Borer's Falls-Rock Chapel Environmentally Significant Area (DUND-16)
Area of Natural and Scientific Interest (ANSI)	• Rock Chapel Escarpment Regional Life Science ANSI • Rock Chapel Regional Earth Science ANSI
Species at Risk	• 4 END (ESA/SARA) and 1 THR (ESA/SARA) flora species • 1 SC (ESA/SARA) butterfly species • 1 SC (SARA) snake species • 2 END (SARA and ESA), 5 THR (ESA and SARA), 1 SC (ESA and SARA), 1 THR (ESA)/SC (SARA), 2 SC (ESA)/THR (SARA), and 1 SC(ESA) bird species
Significant Wildlife Habitat	Examples of Significant Wildlife Habitat within the Borer's Falls-Rock Chapel Heritage Lands: • Seasonal Concentration Areas of Animals ▪ Bat Hibernacula ▪ Bat Maternity Colonies ▪ Deer Winter Congregation Areas • Rare Vegetation Communities ▪ Old Growth Forest ▪ Other Rare Vegetation Communities • Specialized Habitat for Wildlife ▪ Seeps and Springs ▪ Woodland Area-sensitive Breeding Bird Habitat ▪ Shrub/Early Successional Breeding Bird Habitat • Habitat for Species of Conservation Concern • Animal Movement Corridors
Surface water and fisheries resources	• Borer's Creek provides important fish habitat • Permanent and intermittent streams • Cold-water fish habitat
Flora	• 798 flora species; 448 native flora species • 21 Carolinian Indicators; 29 Prairie-Savannah Indicators • 96.5 FQI; 5.0 Mean C • 4 END (ESA/SARA) flora species • 20 S1-S3 species • 51 regionally rare species in Hamilton

Features	Borer's Falls-Rock Chapel Heritage Lands
Butterflies and Moths	• 51 species; 49 native species • 1 SC (ESA/SARA) species • 1 S1-S3 species • 2 regionally rare species in Hamilton
Dragonflies and Damselflies	• 22 native species • 2 S1-S3 species • 1 regionally rare species in Hamilton
Fish	• 11 species; 10 native species
Amphibians	• 5 native species • 1 area sensitive species
Reptiles	• 5 native species • 1 regionally rare species in Hamilton
Birds	• 89 species; 84 native species • 2 END (SARA and ESA), 5 THR (ESA and SARA), 1 SC (ESA and SARA), 1 THR (ESA)/SC (SARA), 2 SC (ESA)/THR (SARA), and 1 SC(ESA) bird species • 4 S1-S3 species • 9 regionally rare in Hamilton • 14 area-sensitive species
Mammals	• 15 species • Note: bat surveys not completed to date

6.0 Cultural Heritage Inventory

6.1 Overview

This section of the report presents an overview of the cultural heritage of the Borer's Falls-Rock Chapel Heritage Lands. Early settlement history of the region, including that of First Nations, the British and Loyalist settlers, has been documented in previous reports including the Clappison-Grindstone and Waterdown-Sassafras Woods Heritage Lands inventory reports (Cootes to Escarpment EcoPark System 2016b and c), and most recently in the City of Hamilton Archaeology Management Plan (ASI 2016). Similar to the Clappison-Grindstone Heritage Lands, early cultural activity is reflected in features originating from First Nations use, such as trails and archaeological sites, overlaid with the grid system of concessions and lots that subdivided the land in the late 1700s. After being logged, much of the land was used for agricultural purposes, primarily as pasture for dairy cows and sheep, with crops that included hay and corn and some orchards. A 1954 air photo shows much of the land configured in small fields supporting pastures and crops (JD Barnes/Ontario Ministry of Natural Resources). By 1960, some land had been left to naturally regenerate (Conservation Halton Cartwright Tract Stewardship Plan Draft 2009, p. 3). Today, numerous subdivisions and small residential parcels occupy what was once

farmland. Many farm fields now held as Current EcoPark System Lands have regenerated to cultural meadow, thicket and/or woodland (e.g., Borer's Falls Conservation Area 2).

Dundas, although not within the Borer's Falls-Rock Chapel Heritage Lands, is the principal settlement area associated with this sector of the Cootes to Escarpment EcoPark System (Dundas today is part of the City of Hamilton). After the American Revolution, Loyalists moved westerly from the Niagara region, many eventually settling where Dundas is located today. The first road in Ontario, Dundas Street (also known as Governor's Road and later as Highway 8, opened in 1799 (Brown and Brink 1970) and contributed greatly to the growth of Dundas. This area includes several of the earliest roads in Ontairo, including York Road, Valley Road, Patterson Road, and Rock Chapel Road (Theysmeyer pers. comm., 2017). The various roads were all version of Dundas Street as it evolved between Toronto and Nigara. These roads were also the linking roads between some of the earliest mills in Upper Canada located in Dundas, Rock Chapel, Greensville, and Aldershot (Theysmeyer pers. comm., 2017). As noted in a report on Spencer Creek:

> "…Dundas was accessible by flat-bottom boats and because of its convenient location between the western farm productions and the only road that opened up access to the interior of the province, the village became the commercial and industrial centre of the head of Lake Ontario in the early part of the 1800s (Spencer Creek Conservation Authority, 1965, as cited on p. LS-11, Hamilton Conservation Authority 2010)."

Construction of the Grand Trunk Railway in the 1850s, later to be named the Great Western Railway and then the Canadian National Railway, contributed greatly to the growth of Dundas. Dundas was an economic and transportation hub of Lake Ontario until the mid-1800s, when it was surpassed in size and economic activity by the Town of Hamilton, later to become the City of Hamilton.

Borer's Falls is the principal natural feature of the Current EcoPark System Lands and one that significantly influenced the cultural history of the Heritage Lands. Borer's Falls is a 25 m waterfall, at the top of which the Rock Chapel Village Sawmill was established in 1799 by Moses Morden (Theysmeyer pers. comm., 2017). In 1865, John Borer was hired to operate the mill and later purchased it and the surrounding property (Waterdown-East Flamborough Heritage Society 2003). The Borer family operated the mill for more than 100 years (Hamilton Region Conservation Authority 2000). Both Borer's Creek and Borer's Falls were named after the Borer family, whose decedents live near the Heritage Lands today. The presence of Borer's Falls and its capacity for milling made this an essential landscape features on which the British government, settlers and later residents relied for lumber and employment.

6.2 Borer's Falls-Rock Chapel Cultural Heritage Inventory

The following cultural heritage resources have been identified within the Borer's Falls-Rock Chapel Heritage Lands but are not all within the Current EcoPark System Lands.

6.2.1 Milling

Rock Chapel Village Sawmill (also known as Borer's Mill) was established on Borer's Creek, downstream from Rock Chapel Road at the top of Rock Chapel Falls, within the Current EcoPark System Lands. The steep drop provided sufficient power for sawing wood. The creek is now intermittent, "…likely due to the increase in spring floods and summer droughts that followed forest and native vegetation removal

upstream (Hamilton Region Conservation Authority 2000, p. 5)". In 1940, the sawmill was torn down. There is no tangible evidence remaining of the Rock Chapel Village Sawmill.

6.2.2 Farming

Farming in the area is documented in general historic accounts and shown in an 1851 survey map and in the map of Flamborough West in the 1875 Wentworth County Atlas (Page and Smith 1875). Farming was a principal source of employment and land continued to be farmed by fifth and sixth generations of early settlers (Waterdown-East Flamborough Heritage Society 2003). Over time, agricultural land has been greatly reduced in area and become more fragmented. Physical remnants of nineteenth and early twentieth century farming activity were found on the following Management Units:

Borer's Falls Conservation Area 2 (Nolan Property)

Building remnants are located in the northeast quadrant of Borer's Falls Conservation Area 2 (Parcel 1 of the Nolan Property), on the south side of York Road (Figure 6). Features include concrete debris, two standing walls and a visible foundation, stone rubble, fruit trees and asparagus. The building is estimated to have been in use between 1934 and 1978 (Pinchin Environmental Ltd. 2013).

Pleasant View Natural Area – Hopkins Tract

The Hopkins Tract was owned by the Dillon family as indicated in the 1875 Wellington County Atlas (Page and Smith). The name 'Hopkins Tract' was given to this property by CH because the Hopkins family cemetery was relocated to this site (see section 6.2.3). J. Hopkins owned the property to the east of the Dillon famiy, based on the 1875 Wellington County Atlas (Page and Smith). The Hopkins family owned many lands throughout the area.

Within Hopkins Tract, remnants of a farmstead are located on Old Guelph Road within Parcel A, as noted in the recent archaeological assessment report (Archaeological Assessments Ltd. 2017). In 1912, construction of a spur of the Canadian Pacific Railway, linking Hamilton to Guelph, severed this property and required a bridge to be built to provide farm access to land south of the railway. A 1934 air photo shows the farmstead and bridge (Conservation Halton 2017). The bridge is thought to have been destroyed as a result of a train fire in the latter half of the twentieth century. Earthen abutments and wood beams remain (Photograph 1). Although the bridge has not been replaced, the right to a railway crossing potentially remains. Accurate details regarding this have not been confirmed.

Borer's Falls Conservation Area 1

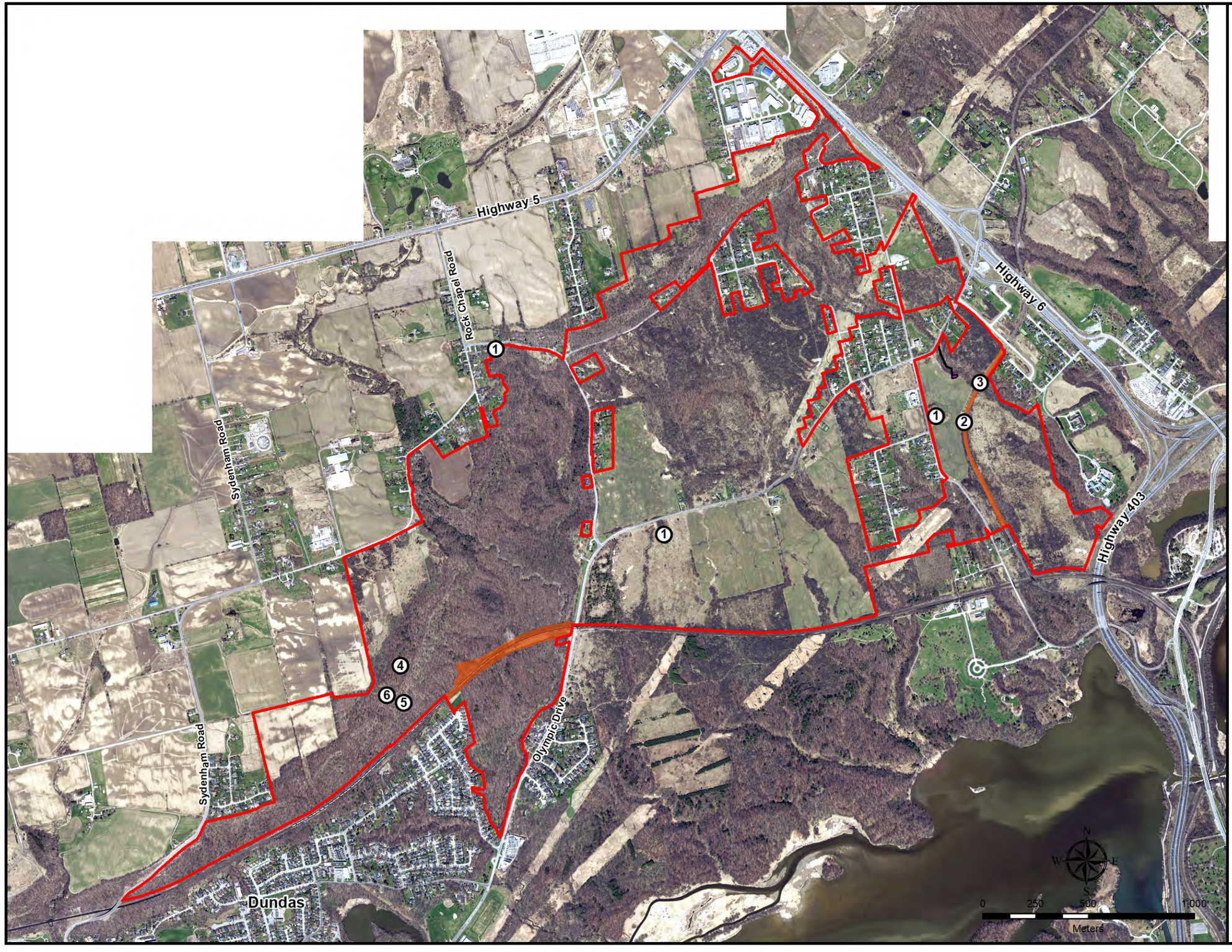
Remnants of a fieldstone ramp are located on the south side of Valley Road, near 190 Valley Road (Figure 6). This ramp may have been built to provide access to a barn or a farm outbuilding (Photograph 3). The 1954 air photo shows a building and a field in this location.

6.2.3 Hopkins Cemetery

The Hopkins Family Cemetery was first registered to James Morden in 1798 and to Joseph Hopkins in 1803 (Hamilton's Heritage Volume 6, 2005). Currently located within the northeast corner of Hopkins Tract, the cemetery is sited at the top of a wooded ravine that leads down to Pleasant View Tributary (Figure 6). Pedestrian access is provided via a trail from the south side of York Road near the creek. A total of 25 people are recorded to have been buried in the cemetery. All the grave markers but one have been damaged or broken and are now embedded in a concrete plinth. One marker remains intact: a granite column located east of the concrete plinth (Photograph 4). The Hopkins Cemetery is listed on

Cootes to Escarpment EcoPark System

Figure 6: Cultural Heritage Resources in Borer's Falls - Rock Chapel Heritage Lands



Legend

- ① Farmstead Remnants
- ② Earthen Abutments of Former Bridge
- ③ Stone Drainage Structure
- ④ Rotary Club Building
- ⑤ Former Sugar Shack Foundation
- ⑥ 3-Arched Stone Bridge
- Railway Corridor
- Hopkins Family Cemetery
- Heritage Lands Boundary

Sources of Information:
Royal Botanical Gardens
Conservation Halton
Hamilton Conservation Authority
City of Hamilton
Land Information Ontario

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the City of Hamilton Inventory of Cemeteries and Burial Sites but is not designated. The cemetery is maintained by the City of Hamilton.

6.2.4 St. Joseph's Convent

St. Joseph's Convent (Sisters of Saint Joseph of Hamilton), located at 574 Northcliffe Avenue, was designed by a Hamilton architect and constructed of local limestone in 1950. The property is located on a secluded site at the intersection of Northcliffe Avenue and Zellens Road (Figure 6). The site is not open to the public, and is outside the Current EcoPark System Lands. The convent building is a heritage property designated by the City of Hamilton. In November 2017, this property was put up for sale.

6.2.5 Rotary Club Building

A masonry and steel structure is located within Rock Chapel 1 on the edge of the Escarpment adjacent to the Bruce Trail (Photograph 5). This structure was built by the Rotary Club of Burlington (Lakeshore) around 1980 (Royal Botanical Garden Plan CONS 33). Pancakes were served there on weekends during the maple syrup season. A sugar shack was located on the slope below the hill, along Armstrong Trail, and the foundation is still visible (Photograph 6). It burned in the mid-1970s. The RBG maple syrup program started here in the early 1960s and is thought to be the first public maple bush program in Ontario (personal conversation with RBG staff). The pavilion could be mistaken by visitors as being 'Rock Chapel' due to it being located within RBG's Rock Chapel Sanctuary (Rock Chapel 1, Figure 6).

The Rotary Club structure is within the Current EcoPark System Lands but is not designated or listed on the City of Hamilton Inventory of Buildings of Architectural Value and/or Historical Interest.

6.2.6 Trails

A trail located on Berry Tract 1 has been described as "a [potential] temporary supply route during the War of 1812" (personal conversation with RBG staff). A 3-arched stone bridge, built by RBG, is located on the RBG Escarpment Trail (Bruce Trail is concurrent) where it crosses Rock Chapel 1 (Photograph 7, Figure 6).

6.2.7 Roads and Railways

The City of Hamilton Archaeology Master Plan (2016) identifies road and railway corridors within the Borer's Falls-Rock Chapel Heritage Lands that are potentially worthy of heritage conservation. These include segments of York Road (previously known as Old York Road), Old Guelph Road, Valley Road and Patterson Road. Railway corridors include a segment of the Grand Trunk Railway corridor, later to become the Canadian National Railway, and a segment of the former Great Western Railway Line, later to become the Canadian Pacific Railway corridor (Figure 6).

During the course of conducting this study, a stone drainage structure was found at the Hopkins Tract where the property line intersects the Canadian Pacific Railway corridor. It appears to have been constructed to divert water runoff away from the rail line (Photograph 2). A stone culvert, associated with the Pleasant View Tributary, is located under the railway crossing.

6.3 Adjacent Properties: Rock Chapel Settlement

Adjacent properties, located outside the Heritage Lands, include the Rock Chapel Settlement. Although outside the Heritage Lands, a description of Rock Chapel Settlement is provided due to its importance in influencing the settlement pattern of the area. The settlement of Rock Chapel grew along Rock Chapel

Road, near the top of Borer's Falls, reaching its peak in the second half of the 1800s (Waterdown-East Flamborough Heritage Society 2003). By that time the 'Village' included an implement shop, a wagon and buggy works, a butcher's shop and a sawmill. Extant buildings of heritage interest include the homes of a number of early settlers and their descendants, including the Morden house at 351 Rock Chapel Road; the Bain house, a stone house and stone outbuilding at 353 Rock Chapel Road; the Borer House at 378 Rock Chapel Road; and the Cummins house at 414 Rock Chapel Road (Waterdown-East Flamborough Heritage Society 2003) (Figure 6).

The Methodist Episcopal Church, known as Rock Chapel, was erected in 1822 at 394 Rock Chapel Road. According to a report prepared by HCA (1975, p.5), it was named Rock Chapel "….because its foundation was the solid ledge of rock that just at that point on the mountainside jutted out to the earth's surface". This same report states that the church was "built of wood with clapboard sides that boasted the fact that they had never been painted" (p. 5). Rock Chapel was demolished in 1948 and a commemorative plaque, erected by Rock Chapel United Church, is now located on the site of the original church. Placement of the commemorative plaque was confirmed by the Project Team. Evidence of a rock ledge is not visible on the surface. A new church, Rock Chapel United Church, was built at 451 Rock Chapel Road. Neither the site of the original church nor the new church is within the Borer's Falls-Rock Chapel Heritage Lands (Figure 6). The new Rock Chapel Church on Rock Chapel Road is listed on the City of Hamilton Register of Property of Cultural Heritage Value or Interest.

All four houses noted above are listed on the City of Hamilton Heritage Register of Property of Cultural Heritage Value or Interest.

Photograph 1: Remnant earthen abutments of former bridge over railway tracks at Hopkins Tract. Facing northwest. Photograph courtesy of Nigel Finney, Conservation Halton.

Photograph 2: Stone drainage structure located north of the railway corridor on the banks of Pleasant View Tributary, on the eastern edge of Hopkins Tract. Facing northeast. Photograph by Leah Lefler, North-South Environmental.

Photograph 3: Remnants of fieldstone ramp located in Borer's Falls Conservation Area 1, south of Valley Road. Photograph by Cecelia Paine.

Photograph 4: Hopkins Cemetery, located to the west of Pleasant View Tributary in Hopkins Tract. Facing south. Photograph by Leah Lefler, North-South Environmental.

Photograph 5: Rotary Club masonry and steel structure located in Rock Chapel 1. Facing east. Photograph by Leah Lefler, North-South Environmental.

Photograph 6: Former sugar shack foundation located along Armstrong Trail in Rock Chapel 1. Facing north. Photograph by Leah Lefler, North-South Environmental.

Photograph 7: Three-arch stone bridge on Bruce Trail in Rock Chapel 1. Facing northeast. Photograph by Markus Hillar, Schollen & Company Inc.

7.0 Management Issues and Opportunities

Generally, the natural features within the Borer's Falls-Rock Chapel Heritage Lands are in good condition. They support a diverse assemblage of flora, fauna and vegetation communities, including many significant species. However, the Current EcoPark System Lands are used for passive recreation, and this is a source of impact to natural and cultural heritage features. Given the popularity of several of the management units (e.g., Borer's Falls Conservation Area), and anticipated increased use in the future, it is important to identify sources of impact, and initiate management prescriptions tomanage use and hopefully reverse current impacts through restoration. Similarly, and concurrently, it is important to manage the public on these lands.

At present, impacts to the natural features and functions of the Borer's Falls-Rock Chapel Heritage Lands is primarily from current use, although there are a number of impacts that have resulted from influences from beyond the EcoPark System boundaries (e.g, commercial, rural and agricultural run-off). Impacts noted from the existing extent of use are generally realtively minor, as evidenced by the overall good condition of the area. However, given that considerably greater use of the Heritage Lands is anticipated, these impacts could increase if left unmanaged. Management recommendations thus should be viewed as being important as preventative tools, as much as being corrective. This section provides a summary of the identified management issues, with a focus on highlighting overlap between and among recreational resources, natural heritage resources and cultural heritage resources to assist in identifying integrated options and solutions. These items are set out below, and will guide the development of recommendations in the future Management Plan. This section also identifies preliminary management opportunities. Although this is not a required component of the Inventory and Issues report, ideas and solutions that have been identified thus far are presented for preliminary discussion and feedback.

The Management Plan is being developed predicated on the expectation that use is going to increase in the Current EcoPark System Lands. The Project Team is of the opinion that the Cootes to Escarpment EcoPark System as a whole, including Borer's Falls-Rock Chapel Heritage Lands are at a critical juncture. Recent and on-going land acquisitions, current management and restoration initiatives by the partner agencies, recognition of the need for protection in policy documents and the development of these Management Plans are all positive steps that, if continued and focused on potential problem areas, will help protect and improve the long term integrity of the Borer's Falls-Rock Chapel Heritage Lands. If management is not implemented where needed, current and anticipated increases in impacts are expected to result in eventual degradation of the natural, recreational and cultural value of the area. Prioritizing management of these lands is extremely important and timely to preserve the condition of the existing natural features and instigate management practices to accommodate future use.

Although the Management Plan will focus on Current EcoPark System Lands within the Borer's Falls-Rock Chapel Heritage Lands, there are also pressures being placed on Privately Owned Outreach Areas within and adjacent to the Heritage Lands. In some instances, management issues on these lands may affect the Current EcoPark System Lands, and will influence the efficacy of management initiatives. Thus, communication, education and stewardship with adjacent landowners will be a key consideration for future management. Where appropriate, consideration of these adjacent pressures is provided.

Appendix 8 provides a detailed summary of the management issues and preliminary opportunities that have been identified within the Borer's Falls-Rock Chapel Heritage Lands. This table organizes the identified management issues under the following headings:

- overarching Cootes to Escarpment EcoPark System management issues;
- land use planning issues;
- access, parking and infrastructure issues;
- recreation issues;
- encroachment issues;
- hydrologic impacts;
- ecosystem management issues; and
- cultural heritage issues.

Many of these issues are inter-related and, in many cases, management issues cannot be addressed individually. For example, over-use of trails from hiking and/or cycling has in places resulted in erosion issues, which can lead to ecological management issues. The organization of issues under the headings provided above provides a framework for the development of management recommendation to be provided in the Management Plan.

A description of the management issues and/or opportunities is provided. This table currently focuses only on identification of issues although some preliminary management recommendations are also provided. The table is a work in progress and will be refined as the management process continues. Figure 7 illustrates known locations for management issues within the Borer's Falls-Rock Chapel Heritage Lands. It does not provide an exhaustive inventory of where all of the management issues are occurring as it is based primarily on existing information with only limited field work. Photographs of representative examples of management issues are provided and are linked to the locations provided in Figure 6. These are provided in Appendix 9 and in the sections that follow.

7.1 Overarching Cootes to Escarpment EcoPark System Management Issues

Several management issues are not specific to the Borer's Falls-Rock Chapel Heritage Lands and span the entire Cootes to Escarpment EcoPark System. Although strictly beyond the mandate of this Management Plan (which is restricted to Current EcoPark System Lands in the Borer's Falls-Rock Chapel Heritage Lands), it was deemed important to bring them forward for consideration, as they have for previous Management Plans (Waterdown-Sassafras Woods Management Plan and Clappison-Grindstone Management Plan). These issues are related to the recognition and identification of the EcoPark System, both in terms of boundary identification and the public perception or knowledge of the EcoPark System. These issues are elaborated on in section 7.1.1.

7.1.1 Issues

Awareness of the Cootes to Escarpment EcoPark System

The Cootes to Escarpment EcoPark System is a relatively recent initiative and is novel in its concept. Each of the partner agencies operate under their own policies and protocols in response to their individual mandates and governance. However, there are commonalities among the partners with respect to natural heritage, recreation and cultural heritage. In particular is the desire to facilitate connections between Lake Ontario and the Escarpment, which was the impetus for the C2E EcoPark

Sources of Information:
Royal Botanical Gardens
Hamilton Conservation Authority
City of Hamilton
Land Information Ontario

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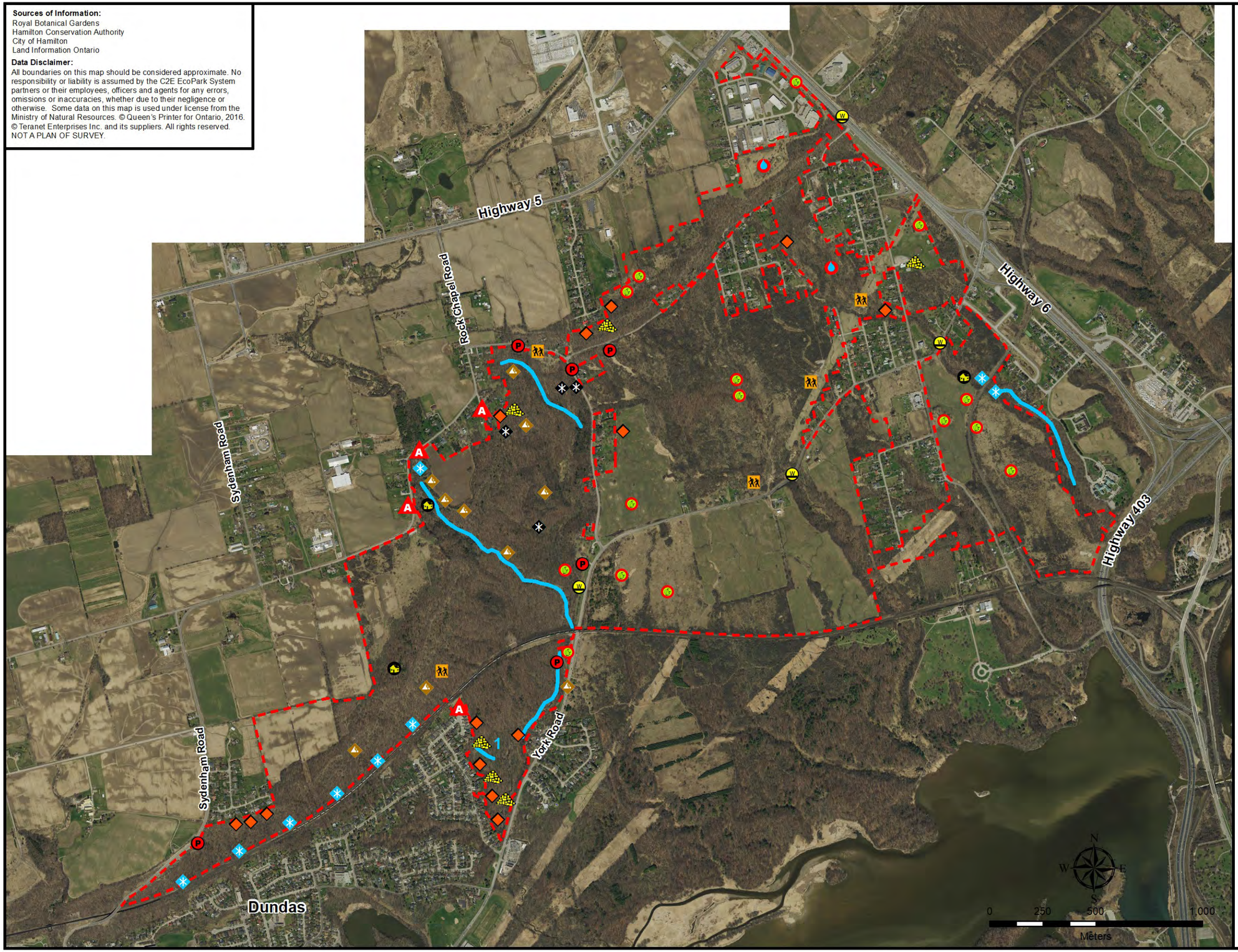

Cootes to Escarpment EcoPark System

Figure 5: Management Issues and Opportunities in Borer's Falls - Rock Chapel Heritage Lands

Legend

Management Issues

- Access Issues
- Cultural Heritage Opportunity
- Dumping
- Encroachment
- Erosion Issues
- Invasive Species
- Parking Issues
- Trail Issues
- Trail Structure Issues
- Unsanctioned Use
- Water Quality Issues
- Wildlife Crossing
- Watercourse Erosion Sensitivity
- 1 — Refer to Map - Geomorphix Fig 5.3a and 5.3c
- Heritage Lands Boundary

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System. One challenge in implementing the initiative is achieving recognition of these commonalities without impinging on the identity or mandate of the individual partners. Establishing a distinct identity for the EcoPark System and raising its profile would benefit the overall intent, however achieving this cannot compromise the mandates and branding of the land-owning partners.

To promote identity, some signage has been posted along roadways to identify the boundaries of the system and more signage is planned for installation in the future; however, at present the signage is scattered and it is very difficult to determine when a user is in the EcoPark System or leaving it. The lack of signage and poor general public knowledge of where and what the EcoPark System is hinders opportunities to engage the public in stewardship, educate EcoPark System users about the cooperative arrangement among the partners, the importance of managing use, and garnering support for management. It is important to note that awareness is continuing to increase through Cootes to Escarpment EcoPark System stewardship programming and community events. Notably, the substantial fund-raising event "A Dinner on the Bridge" held in the summer of 2017 served to raise the general awareness of the EcoPark System. Events such as that, held on a regular basis are important for increasing the general awareness of the initiative.

Delineation of Current EcoPark System Lands

It is often difficult to determine when EcoPark System users are within Current EcoPark System Lands, or within Privately Owned Outreach Areas. Signage is often limited, the natural areas (woodlands, open lands, etc.) that compose the majority of the Heritage Lands extend well beyond individual property boundaries, and the Current EcoPark System Lands are owned by multiple agencies. This makes it practically impossible to enforce policies regarding use and encroachment in areas around the periphery of Current EcoPark System Lands. This creates issues for both adjacent landowners (e.g., trespassing and privacy issues) and Current EcoPark System Lands (e.g., encroachment of manicured areas and structures from adjoining lands). Furthermore, when property ownership is unknown, users are unable to determine to whom issues should be reported.

Need to Better Communicate the Multi-agency Management of the EcoPark System

Each partner agency has their own set of policies and rules that respond to their individual mandates. As noted above, this creates a challenge to communicate the structure of the EcoPark System to the public, since the varying permitted land uses, signage, branding, etc. of the individual owners does not convey the traditional notion of a single park, and nor is this the intent of the EcoPark System mandate. For example, the Bruce Trail Conservancy and RBG allow only pedestrian traffic on their trails; however, cycling is permitted by other partner agencies. Not only is this mixture of permitted uses confusing to EcoPark System users, but users are generally not aware of the relevant rules and regulations of use. Different rules and permitted uses will continue to apply to different properties, depending on who owns the land and the sensitivity of the property. However, partner agency rules and policies need to be more clearly communicated along with the unique structure of the EcoPark System. Also, to the extent that it is possible within their individual mandates, the partner agencies for each of the Current EcoPark System Lands should identify and build on commonalities to better promote the overall connection between Lake Ontario and The Niagara Escarpment that is achieved through the EcoPark System.

Population and Use

A major overarching management issue is the anticipated increase in use that will result from future development adjacent to all the Heritage Lands and the associated population growth. Despite the limited opportunity for major development on adjacent lands, the City of Hamilton has been dubbed the "City of Waterfalls" and "Waterfall Capital of the World" (Tourism Hamilton); as such, there is the potential for thes Heritage Lands to experience stress from increased use by waterfall-seekers. Future development on lands in proximity to the Heritage Lands has the potential to degrade the natural, recreational and cultural resources unless mitigation in the way of increased management initiatives is implemented. Such developments will be desirable communities to live in partly because of the proximity of the aesthetic beauty and recreational opportunities provided by the Heritage Lands. It is thus fitting that management or mitigation of any population-induced negative impacts on nearby Heritage Lands resulting from development, and the increased cost of management needs, should be contributed to by development proponents, where appropriate.

At present, there are no policies that would directly facilitate the implementation of relevant management recommendations in the Management Plan through development approvals. However, where geographic-specific park or public land Management Plans exist, the Greenbelt Plan 2017 indicates that municipalities, agencies, and other levels of government must consider them when making decisions on land use or infrastructure proposals. As the Cootes to Escarpment EcoPark System represents such a park, it would be incumbent on planning authorities to consider increased use pressures and likely environmental impacts in their assessment of development applications.

Several planning policies require proponents of development applications to consider impacts on adjacent natural features and areas resulting from their development proposals, and to mitigate them accordingly. It is especially important that the impacts associated with future developments adjacent to the Heritage Lands be clearly identified and assessed in Environmental Impact Studies (or similar studies) in the context of the role the Heritage Lands play in the overall Cootes to Escarpment EcoPark System. In other words, the value and significance of the natural features captured in the Heritage Lands is greater because they are part of the EcoPark System, and because they have an ecological function that goes beyond the feature itself. In determining impact mitigation for future development, this higher value should be considered when determining the limits of the developable area, buffer widths, management needs such as design and provision of trails within the Heritage Lands. The management issues and opportunities identified for the Heritage Lands provide information on current impacts that could be exacerbated by future adjacent development. Management recommendations may assist in the determination of appropriate mitigation that could be implemented through the development process.

Owing to the multi-agency agreement to implement the EcoPark System and the public resources that have already been spent on the acquisition and management of the Heritage Lands, potential population-induced negative impacts from development should be mitigated through conditions of the approval process wherever possible. More generally, the partner agencies that are directly involved in the development approval process (in the case of the Borer's Falls-Rock Chapel Heritage Lands these are the City of Hamilton, the Niagara Escarpment Commission, Hamilton Conservation Authority and Conservation Halton), should continue to consider and incorporate the significance of the Heritage Lands in their reviews and the subsequent conditions they impose on development applications. This is viewed as part of their commitment to implementing the Vision of the Cootes to Escarpment EcoPark

System. Partner agencies that are not directly involved in the development approval process should be encouraged to comment as landowners on development applications that may impact their lands. Where a public or private development proposal may exacerbate existing management issues and/or create new ones, adjacent landowners should make such concerns known so they may be addressed accordingly through the development approval process.

Funding

There are differences in approach to management by the partner agencies. These differences should not be at the expense of the asset that the designation of the Cootes to Escarpment EcoPark System brings. Individual partners manage lands in a variety of models, from pay to use to free to use. Future operating and capital costs associated with the Cootes to Escarpment EcoPark System will be high and no clear or uniform model for allocating these and financing them has been proposed. Cootes to Escarpment EcoPark System does not own land; partnering agencies do and manage them according to their own policies. Funding estimates will not be included in the Management Plan; however, funding as a broad management issue is included as the Cootes to Escarpment EcoPark System creates both challenges and opportunities in this regard.

Trail/Railway Crossings

A key overarching issue for the Cootes to Escarpment EcoPark System is the need for trail crossings of railways. There is a need for a formal discussion with railway companies to engage in a conversation about trail crossings at key locations in the Cootes to Escarpment EcoPark System.

Critical Corridor for Connection of Cootes Paradise to the Niagara Escarpment

The acquisition of three properties in the Borer's Falls-Rock Chapel Heritage Lands since 2015 has now established a solid potential wildlife corridor of natural lands on partner-owned properties between Cootes Paradise and the Niagara Escarpment. However, critically located privately-owned lands in the Borer's Falls-Rock Chapel Heritage Lands limit a complete connection. These lands are key to the success of the Cootes to Escarpment EcoPark System in achieving the goal of connecting and restoring natural lands and open space between the Niagara Escarpment and Cootes Paradise in Hamilton Harbour, and should thus be a focus of land acquisition efforts. This critical area is located in the Pleasant View Area of the Borer's Falls-Rock Chapel Heritage Lands.

Desire and Need for Trail Connections and Recreation Plan

Pedestrian and cycling use along York Road has been described as the top recreation issue within the Borer's Falls-Rock Chapel and Cootes Paradise Heritage Lands, mainly due to major safety concerns. York Road is an old, narrow and winding road without a shoulder and with limited sight-lines. It is used as a commuter route, but it is also desired by recreational cyclists. The desire for trail connections between Cootes Paradise, Borer's Falls-Rock Chapel, and Clappison-Grindstone Heritage Lands is well-documented. In particular, need for improved trail connections to the Pleasant View Natural Areas (Cartwright, Nicholson and Hopkins Tracts) and cycling access to Clappison Woods has been emphasized. There is the potential for a trail connection through the pipeline/utility line, extending from Cootes Paradise Sanctuary 9 through Borer's Falls Conservation Area 3, Pleasant View Natural Area – Cartwright and Nicholson Tracts to Old Guelph Road, just south of the Bruce Trail crossing of Highway 6. The Cootes to Escarpment EcoPark System does not currently have a recreation plan in place to provide guidance on trail-related issues that span individual Heritage Lands boundaries.

7.1.2 Opportunities

Preliminary management opportunities to be explored include the following:

- While recognizing the identity of the partner agencies, standardize elements of signage used in the Cootes to Escarpment EcoPark System. Signage, promotional material, advertising, educational material, etc. should emphasize and headline the Cootes to Escarpment EcoPark System and Heritage Lands first, and then provide partner ownership. This will raise the EcoPark System profile, contribute to name-recognition and promote the EcoPark System as a collaborative initiative.
- Encourage partners to collaborate on standardizing signage within the EcoPark System. For example, standardization of colour, size, messaging, graphics, font, AODA compliance, placement and size of the Cootes to Escarpment EcoPark System and partner logos, etc. could be established.
- Develop and implement a consistent system to locate and mark boundaries of Current EcoPark System Lands within the Cootes to Escarpment EcoPark System. This includes the posting of signage to indicate when users are entering and leaving the Cootes to Escarpment EcoPark System;
- Permitted uses for each of the land-owning partners should be clearly communicated throughout the Current EcoPark System Lands. Permitted uses do not have to be consistent throughout all properties or areas, and should be established based on the sensitivity of the area and the mandate of the landowning agency. Current EcoPark System Lands may also have specific uses/restrictions applied as a result of NEPOSS classification and zoning (to be provided in future reporting);
- When reviewing development applications within the EcoPark System, partners should require the evaluation of potential impacts in the context of the entire Cootes to Escarpment EcoPark System, and encourage mitigation measures that are consistent with the recommendations in the Management Plans.
- There is currently no clear policy direction for planning authorities to consider Heritage Lands Management Plan recommendations. Consideration could be given to encouraging recognition of the Cootes to Escarpment EcoPark System in Official Plans as part of the next round of Official Plan Reviews. It would also be beneficial to identify the Cootes to Escarpment EcoPark System on Official Plan mapping;
- Per the Greenbelt Plan 2017, municipalities, agencies and other levels of government must consider the Cootes Paradise Heritage Lands Management Plan when making decisions on land use or infrastructure proposals;
- Consider updating the funding formula for the Cootes to Escarpment EcoPark System;
- Continue to purchase or receive donations of lands within the Cootes to Escarpment EcoPark System, as they become available through the Land Securement Strategy, with a priority placed on “joining” Current EcoPark System Lands and lands located within the critical corridor that provides the connection between Cootes Paradise and the Niagara Escarpment (i.e., Pleasant View area).
- Opportunities to develop connecting nature trails, as well as multi-use trails on roadside shoulders, in rights-of-way and/or utility corridors to create these much-needed trail connections will be explored in more detail as part of the Management Plan. In addition, consideration should also be given to incorporating multiuse trails in future planned road works such as potential re-alignment, widening or geometric improvements within the surrounding road network.

- Explore the potential for a trail connection through the pipeline/utility corridor, extending from Cootes Paradise Sanctuary 9 through Borer's Falls Conservation Area 3, Pleasant View Natural Area - Cartwright Tract and Nicholson Tracts to Old Guelph Road, just south of the Bruce Trail crossing of Highway 6.
- Prepare a recreation plan for the Cootes to Escarpment EcoPark System to provide guidance on trail-related issues that span individual Heritage Lands boundaries, with an emphasis placed on addressing the need for trail connections throughout the EcoPark System. The Hamilton Burlington Trail Council should be engaged to provide comment and review of the recreation plan, and the City of Burlington Community Trails Strategy (2015) and the City of Hamilton Recreational Trails Master Plan (2016) should be referenced.

7.2 Access, Parking and Infrastructure Issues

Issues and opportunities related to access, parking and infrastructure are described below. It is acknowledged that transportation is an important issue in order to bring users to the lands, but it is beyond the scope of the Management Plan.

7.2.1 Issues

Parking and Access Issues

Several issues related to parking and access have been identified in association with the Borer's Falls-Rock Chapel Heritage Lands:

- Borer's Falls Conservation Area 1 – north portion: Borer's Falls is a destination spot, but parking is located on a curve, and pedestrians must walk along the road for several hundred metres before reaching the access point for the falls. There is no good vantage point, and as a result trail users have created many unsanctioned trails to view the falls. Locally, the Rock Chapel parking lot is currently the best place to park to access the Bruce Trail and Borer's Falls-Rock Chapel Heritage Lands. When that parking lot is full, people park on Rock Chapel Road. There is an increasing demand to visit the Borer's Falls-Rock Chapel Heritage Lands, particularly Borer's Falls Conservation Area 1; however, there is currently not enough infrastructure to accommodate it. There is a need for better parking and access to the trail system, and also a proper viewing location of the falls to accommodate current and future use, and mitigate safety issues associated with pedestrian traffic on Rock Chapel Road.
- Borer's Falls Conservation Area 1 – south portion: The main section of Borer's Falls Conservation Area 1, north of the railway, is where activity is currently concentrated. The area south of the railway is difficult to access due to steep slopes from York Road. The area within the subdivision, south of the railway, is surrounded by residences and is primarily intended to protect the ravine.
    - Unsanctioned Access from John Prentice Park: Unsanctioned access occurs from John Prentice Park into the south end of Borer's Falls Conservation Area 1. The existing chainlink fence has been cut and pulled back and an unsanctioned trail from this point leads to the railway track, and continues over the tracks into Rock Chapel 1, where the trail connects to the Armstrong Loop trail.
    - Unsanctioned Access from Watson's Lane: Unsanctioned access occurs from Watson's Lane into the south end of Borer's Falls Conservation Area 1. This unsanctioned access

point does not appear to be heavily used, nor do connecting trails extend far up the valley.

- Rock Chapel Road Road Allowance: The road allowance located on the curve on Rock Chapel Road is used as an unsanctioned access point.
- Valley Road Parking Pull-off: The parking pull-off located just north of the main Bruce Trail on Valley Road is a safety issue. The road crossing of the Bruce Trail at Valley Road is dangerous, due to insufficient sightlines and limited opportunities for safe roadside parking. Over time, with anticipated increase in usage, these issues will likely worsen, thus there is a need to provide improvements and facilitate safe road crossing. Current access from Valley Road is insufficient. This poses an issue for access to the trail system in the east portion of Borer's Falls-Rock Chapel Heritage Lands.
- Valley Road and Patterson Road Corner: The parking area located at the south-east corner of Valley Road and Patterson Road is a safety issue. Limited sightlines and limited opportunity for safe roadside parking. Spillage of parked cars on to the intersecting roads may be expected over time as interest in the area increases; thus, there is a need to provide improvements and facilitate safe roadside parking and access.
- Borer's Falls Dog Park: Although intended solely to accommodate dog-walkers, the Borer's Falls Dog Park is also used by hikers to access nearby trails. Parking for hikers is not currently provided. When the parking lot is full, parking occurs under the drip-line of trees. Furthermore, it is not obvious from the dog park parking lot where the trail head is. If the parking lot is to be used by hikers then appropriate signage needs to be provided and a formalized trail to the current access point established.
- Ray Lowes Side Trail: There is no formal alignment for the Ray Lowes Side Trail along the west side of York Road. Hikers use the grassed boulevard to make the connection to the Pinetum Trail in Cootes Paradise Heritage Lands. The actual access point to the side trail is not well signed. Parking at the dog park is not sufficient to accommodate usage of both the dog park and the trail and cars frequently park under the drip-line of trees.
- Berry Tract 1: Although the top segment of the former loop trail in Berry Tract has been closed, fewer people park on Patterson Road at the former access point at the top of the loop. However, there is still a parking issue here.
- Sydenham Road Access: Access to the Bruce Trail from Sydenham Road currently requires hikers to climb over a roadside guard rail from the parking lot.
- York Road Crossing: Pedestrians using the Ray Lowes Side Trail/Pinetum Trail to access Cootes Paradise Heritage Lands are forced to cross York Road and there is no formal crossing point, resulting in a potential safety issue. This crossing is dangerous due to limited sightlines and the speed of vehicular traffic.

Lack of Access to Lower Borer's Falls

Lower Borer's Falls has no formal access point. As a result, hikers try to find the falls through unsanctioned access points (i.e., from John Prentice Park and Watson's Lane). An inventory of Hamilton's waterfalls was recently prepared by a local citizens group, and a coffee table book of Hamilton's waterfalls is available. Both publications likely encourage visitation to Lower Borer's Falls (as well as others outside the Heritage Lands), but netiher provide details on sanctioned access points. Region #3 Tourism Organization (regions created by the Ontario Government to increase visitors, generate more economic activity, and create more tourism jobs) lauds Hamilton as the Waterfall Capital

of the World. The tourism page https://theheartofontario.com/places-to-go/waterfalls/ does request that visitors follow posted rules, stay on marked trails, and not climb or bypass fencing.

Lack of Access to Hopkins Tract South of Railway

The Hopkins Tract is divided into three parcels by the CN railway and hydro corridor (Figure 2). The northern most parcels is accessible from York Road and Old Guelph Road. Access to the two southern parcels is restricted by the railway corridor. At present, there are no plans to provide visitor access south of the CN railway.

CNR Safety Issue

EcoPark System users currently cross the CNR railway to connect to unsanctioned trails in both the Borer's Falls-Rock Chapel and Cootes Paradise Heritage Lands. Users may also walk along the railway to access unsanctioned trails. This presents a substantial safety issue and is a potential liability, as well as being an obvious gap in the trail system for the area. For these reasons further consideration and discussion with CNR to identify options for safe access across the tracks is warranted (section 7.2.1).

Trespassing

Trespassing on privately-owned lands within the Heritage Lands is an issue. Many "No Trespassing" signs have been posted by adjacent landowners as a result, and conflicts between landowners and EcoPark System users have been noted. This issue ties into the need to identify and mark boundaries of the Current EcoPark System Lands. Trespassing also includes unsanctioned trail construction on Current EcoPark System Lands and encroachment from adjacent private properties and these topics are covered in sections 7.1.1 and 7.4.1).

Failing Trail Structures

Staircases are incorporated into trail systems where needed to address steep terrain. Several of these staircases in the Borer's Falls-Rock Chapel Heritage Lands are in poor condition and require repair/replacement (e.g., staircase on Ray Lowes Side Trail in Borer's Falls Conservation Area 1). A timber crib wall and footbridge located in Borer's Falls Conservation Area 1 is also failing and needs to be assessed in a more comprehensive fashion (i.e., erosion control study) on the gulley where the footbridge is located. Heavy scouring of the gully appears to occur from two roadside outfall pipes, upslope from the gully. Figure 7 illustrates known locations of failing trail structures, and Appendix 9 provides photographs.

7.2.2 Opportunities

Preliminary management opportunities to be explored include:

- All proposed access points, parking areas and trail linkages should be reviewed in the context of the Cootes to Escarpment EcoPark System Management Plans and the City of Hamilton's Recreational Trails Master Plan.
- Evaluate the feasibility and complete the appropriate investigations to determine if shifting the Rock Chapel Parking Lot west of its existing location will reduce hazards identified with entering and exiting the lot relative to the curve in Rock Chapel Road.
- Determine how to best mesh the current Management Plan study with the RBG and HCA master planning process.
- Consider the option of fencing John Prentice Park to limit unsanctioned access.
- Consider closing the unsanctioned access point at the Rock Chapel Road allowance.

- Develop options for improving parking and access from Valley Road.
- Improve parking and signage at Borer's Falls Dog Park to improve access and mitigate impact associated with overflow parking occurring under the drip-line of trees.
- A publication that specifies recognized access points for appropriate access to Hamilton's waterfalls would help to mitigate unsanctioned access and the creation of unsanctioned trails associated with the falls. Consultation with Tourism Hamilton is required for waterfall publications.
- Consider adding a parking lot at Hopkins Tract to facilitate visitor access.
- Standardize construction and maintenance of trail structures.
- Consider offering bike parking racks at trail access points.
- An Erosion Control Study should be conducted in order to comprehensively assess the heavily eroding gully and failing timber crib wall and footbridge located in Borer's Falls Conservation Area 1 (Figure 7).

7.3 Recreation Issues

Through the review of background information, conversations with key stakeholders, and fieldwork, it is clear that the management plans need to be as much about managing people as they are about managing the natural environment. In fact, people management is key to effective management of the Heritage Lands/Cootes to Escarpment EcoPark System. Managing impacts that result from recreation must carefully balance the provision of recreational opportunities with natural and cultural heritage protection. The current management planning process provides an excellent opportunity to take a holistic approach to addressing recreational impacts with multiple stakeholders. Issues and opportunities related to recreation are described below.

7.3.1 Issues

Trail Overuse and Erosion

The majority of the existing trail network is frequently used throughout the Borer's Falls-Rock Chapel Heritage Lands. Some impact from trail use is inevitable and acceptable, however there are portions of the trail system that show signs of overuse, including excessive exposure of tree roots, unacceptable impacts to ground flora, soil compaction and widening of trails to circumvent areas that periodically flood. Trail overuse has resulted in soil erosion in places. Some erosion, compaction, and water ponding is considered acceptable on trails within natural areas and as long as it is sustainable (i.e., not expanding) and not impacting significant species, habitats or hydrological functions. Use of unsurfaced footpaths is considered to be part of the trail experience. Unacceptable erosion on trails was noted, and can be attributed to inappropriate trail surface for the location and/or level of use, overuse, improper trail construction, poor trail alignment and/or drainage issues. In a few locations, water ponding has led to trail widening or braiding to avoid wet patches on trails (Figure 7). Widened erosion areas occur on the Bruce Trail and Ray Lowes Side Trail in Borer's Falls Conservation 1 where cyclists and hikers have created alternate paths on steep slopes to avoid staircases with steps which are too high, uneven and falling apart (see section 7.2.1, Figure 7 and Appendix 9). The use of grade bars (i.e., hewn logs and iron bars) is helping to successfully prevent erosion, but their unevenness is difficult to navigate and they create a tripping hazard. Major issues with erosion have been identified at Rock Chapel 4 near Borer's Falls outlook point and cliff side trail where heavy erosion in several sections of the trail occurs (Figure 7 and Appendix 9).

Trails Proximate to Escarpment Brow

It appears that there are many unsanctioned trails being formed off of Borer's Falls Trail in Rock Chapel 4 to access views from the Escarpment brow. There are safety and erosion issues, as well as trail duplication, associated with many of these unsanctioned trails. At least one unsanctioned trail along the cliff appears to be used to access the valley below to gain a better vantage point of the waterfall (Figure 7 and Appendix 9). This is a potential safety issue and the trail alignment may not be in the best location.

Bruce Trail along Rock Chapel Road

The Bruce Trail, as it exits the Rock Chapel parking lot and enters Rock Chapel 4, meanders on and off Rock Chapel Road creating a potential safety issue and detracting from the hiking experience. Hikers must pass through narrow gaps in the guard rail to gain access to the trail which follows a narrow trail between the guard rail and the Escarpment brow. It is difficult to see the sharp drop off while hiking this section of trail.

Unsanctioned Cycling Use

HCA and CH permit cycling on their trails in appropriate locations. RBG and the Bruce Trail Conservancy manage their trails and do not permit cycling on them. However, cycling inevitably and unavoidably occurs on both RBG and Bruce Trails. This is in part a result of the intrinsic appeal of these trails for cycling, and also as the route through RBG provides a much needed connection to Clappison Woods, a known and accepted cycling destination, located east of Borer's Falls-Rock Chapel Heritage lands (see below). Issues with erosion associated with cycling have been identified on Ray Lowes Side Trail and this use continues despite there being signage posted that indicates that cycling is not permitted. RBG has identified the desire to impose fines on people who choose to cycle on RBG lands to resolve unsanctioned cycling activity. The cycling community is eager to work with RBG and the Bruce Trail Conservancy to identify appropriate places where cycling may be permitted. In light of the huge and ever growing popularity of cycling, there is an opportunity to re-open the discussion on its acceptability , and, if appropriate, manage it as a permitted use. In addition, people park on Patterson Road and cut through Berry Tract 2 to reach an old foundation which is used to BMX/cycle and skateboard. This old foundation is located on private lands, and this use is trespassing (section 7.2.1).

Cycling Route Connectivity

There is a very difficult issue with the cycling, overall, insofar that cycling should be encouraged as a healthy, energy-efficient activity, but that the location of desirable cycling locations and existing road infrastructure makes it impossible to fully realize cycling opportunities. It would be irresponsible to encourage cycling and/or identify cycling routes on roads that are unsafe. The City of Hamilton's Cycling Master Plan addresses cycling route connectivity (City of Hamilton 2017). The recommendations made in the Master Plan will assist in improving connectivity and opportunities for safe cycling in the City of Hamilton and the western portion of the Cootes to Escarpment EcoPark System. For example, recommendations include road repair and retrofit initiatives to create safe and functional cycling routes, including connections to the entrances of the Cootes Paradise Heritage Lands and the Cootes to Escarpment EcoPark System. The Management Plan should encourage the implementation of the Cycling Master Plan.

Trail Connectivity

Several management units within the Borer's Falls-Rock Chapel Heritage Lands are disconnected from the trail network but a desire for trail connectivity for these areas has been expressed by the partners. In some cases, absence of trails and disconnect of certain areas may be the result of specific management objectives; therefore it should not be assumed that all properties without trails require them. The Hopkins Tract is currently disconnected from the existing trail network. Future installation of trails at Hopkins Tract and in the surrounding area should consider options for connecting Hopkins Tract to the rest of the Heritage Lands. Options would only occur by means of City of Hamilton multiuse trails (parallel to road network). Proposed trails at Hopkins Tract could easily link to any future City of Hamilton roadside multiuse trail. A priority should be placed on resolving the safety issues associated with the dangerous crossing of Old Guelph Road. Berry Tract South does not have any trails. Trail connectivity amongst management units is considered a major management recommendation. Also, there is a strong desire to create safe connection through the Borer's Falls Rock Chapel Heritage Lands to link urban areas to the south and west with destinations to the east, particularly for cyclists. This needs to be considered through this Management Plan, although the issue is really an over-arching Cootes to Escarpment EcoPark System Issue (7.1.1). Notably, much of the trail connectivity is not within the Study Area and is outside of the scope of work.

Nicholson Tract Transfer of Lots and Road Allowances

The ongoing transfer of remaining undevelopable lots in the vicinity of Nicholson Tract 1 is anticipated to occur over time. The City of Hamilton should consider donating the unused City-owned road allowances to CH. There is no intent to develop these rights-of-way into roads, and at present they fragment the property and create a management issue. Dissolving the rights-of-way would improve connectivity and facilitate the development of options for trail connections. All undevelopable lots must come in to public ownership before the City of Hamilton can donate the ROW to Conservation Halton. Road allowances currently constitute hurdles to recreation management in Nicholson Tract 1.

Unsanctioned Trails

Unsanctioned trails are occasionally constructed and used within the Heritage Lands without consultation or authorization from the land-owning agency. According to HCA, there is not a lot of unsanctioned trail use in Borer's Falls Conservation Area 1. Unsanctioned trails connecting John Prentice Park to the Armstrong Trail in Rock Chapel 1 (Figure 3) were noted by the Project Team. Unsanctioned trails are routinely closed by the Bruce Trail Conservancy, RBG and the Hamilton Naturalists' Club on their properties by posting signage, placing brush and planting vegetation that deters access (e.g., Prickly Ash, *Xanthoxylum americanum*). Use of unsanctioned trails is exacerbated by the fact that some unsanctioned and closed trails have been posted on Google Maps.

Trail Proliferation

Trail proliferation was noted in several management units within the Borer's Falls-Rock Chapel Heritage Lands. In some areas, three or more parallel trails occur at Rock Chapel 4 (Figure 7 and Appendix 9). Various short unsanctioned trails branch off the main Bruce Trail in Rock Chapel 1 and Borer's Falls Conservation Area 1 to access views from the Escarpment edge. Multiple trail alignments need to be evaluated and rationalized to minimize impacts to natural features and enhance the user experience.

Signage

In general, the Borer's Falls-Rock Chapel Heritage Lands are inconsistently signed and the Cootes to Escarpment EcoPark System logo is not always present on signage. Partner agencies are encouraged to display the Cootes to Escarpment EcoPark System logo on future signage, and indicate that the parcel is part of the larger EcoPark System. For example, new signage was posted at the Bruce Duncan Memoral Trail access to Cartwright Tract in summer 2017 by CH, which included the Cootes to Escarpment EcoPark System logo and above it the wording "part of the" to indicate that the parcel is part of the larger EcoPark System.

Site-specific issues related to signage include the following:

1. a cut down sign post located at the edge of a trail in Borer's Falls Conservation Area is now a tripping hazard (Figure 7, Appendix 9);
2. interpretation of the area around the Armstrong Trail could be improved through interpretive signage; and
3. little to no signage is present within the Nicholson Tracts and Berry Tract South, likely because these Management Units were quite recently acquired by CH and RBG, respectively.

User Conflicts

Potential conflicts between different trail user groups can impact the enjoyment and safety of EcoPark System users. Principal trail user groups include hikers, on- and off-leash dog walkers, and cyclists. Off-leash dog use is not permitted within Current EcoPark System Lands, and cycling is not permitted on the Bruce Trail or RBG trails. Conflicts among hikers, dog walkers and cyclists while not noted as a major concern at present, arise on occasion, and are often related to fast-moving bicycles or runners and off-leash dogs. With the anticipated increased use in the future, conflicts are expected to increase in frequency. Some dog walkers do not understand that they must remain in control of their dog at all times, and cyclists must exercise extra care when encountering other trail users. Additional education, probably through better signage, is needed regarding the appropriate use of trails and trail etiquette.

Off-leash Dogs

Off-leash dog use has been reported as a major problem in the Cootes to Escarpment EcoPark System. This use is unsanctioned, but enforcement is generally lacking. Off-leash dog use can negatively impact natural areas by causing erosion, soil compaction, water quality impacts, and effects on vegetation and wildlife. Unsanctioned signs are posted at Rock Chapel 3 that indicate the area is an off-leash dog park, which it is not. RBG signage is also posted indicating that dogs must be on-leash at all times. This represents a communications issue, as conflicting messages are currently presented to the public. Off-leash dog use may be deterred by the increasing number of ticks in the area. Traditionally, municipalities offer the service of dog parks as part of their tax-supported Parks and Recreation programs and facilities. It is recommended that off-leash dog parks are located away from environmentally sensitive areas.

Motorized Vehicle Use

Use of motorized vehicles is prohibited throughout the Current EcoPark System Lands. ATV, dirt bike and snowmobile activity has been noted in various locations, including Berry Tract South, Nicholson Tract 1 and 2 (Figure 7). Most motorized vehicle use is carried out by local individuals; however, some people allegedly bring in ATVs on trailers to use the trail system in Nicholson Tracts 1 and 2, Berry Tract

South and the adjacent hydro corridor. Motorized vehicles disproportionately impact trails and the natural environment due to aggressive tire treads and ability to travel through muddy site conditions.

Equestrian Use

Some equestrian use occurs within the Borer's Falls-Rock Chapel Heritage Lands, within Nicholson Tract 1, Berry Tract 1 and Cartwright Tract. Equestrian use is prohibited throughout the Current EcoPark System Lands as this use disproportionately impacts trails and the natural environment due to the aggressive impact of horse hooves and ability to travel through, and exacerbate, wet and muddy trail sections.

Hunting

Hunters use utility corridors and unopened road allowances to access the Heritage Lands to illegally hunt wildlife using bow and arrow, and firearms. The discharging of firearms (including bows) is illegal in the urban portion of the City of Hamilton, in which all of the Borer's Falls-Rock Chapel Heritage Lands are located. Several deer stands and hunting blinds are regularly removed from the Current EcoPark System Lands by CH and RBG. Hunting can pose safety issues for other users.

Foraging

Wildlife plant and mushroom foraging takes place within the Heritage Lands. Issues associated with over-harvesting have been reported (e.g., notable impacts to Wild Leek (*Allium tricoccum*) populations). Over-harvesting negatively affects biodiversity, and can also cause other indirect impacts such as the spread of invasive species and trampling. The impacts of this activity are largely anecdotal and some quanitifcation of the impact would be helpful to enable prioritization of a management response.

Fire Pits and Party Spots

Fire pits and party spots have localized impacts which can include accumulation of garbage and degradation of the quality of natural areas by creating an eye-sore, removing or trampling vegetation, contributing to creation of enlarged areas of compacted soil that can cause or exacerbate erosion, damaging or vandalizing trees and signs, and can lead to the introduction and spread of invasive species. Fire pits and party spots were noted at **REDACTED**.

7.3.2 Opportunities

Preliminary management opportunities to be explored include:

- There is a need for improved public education and awareness of trail use between and within user groups (e.g., hikers, dog walkers and cyclists). There is an opportunity to work with bike shops in the area to educate cyclists about appropriate trail use and trail etiquette and engage the cycling community in bicycle trail planning, as well as building and maintenance. Consider including a trail use pamphlet with the sale/maintenance of bicycles in area cycling shops, HBMBA, and HBTC agencies. HCA has pamphlets for the different user groups that could provide a useful starting point.
- Create an EcoPark System-wide Recreation Plan, including a plan for cycling use. This plan could build on the recommendations made in existing trail and/or cycling plans such as the City of Hamilton's Cycling Master Plan (2017) and the City of Burlington's Trail Plan;
- Create a trails map for Cootes to Escarpment EcoPark System. Need for a trail rationalization plan spanning the Cootes to Escarpment EcoPark System. Show all trails identify

problems/issues and prioritize management issues.

- Collaborate with the Hamilton Burlington Mountain Biking Association to develop a functional trail network for mountain biking that respects the area's natural and cultural heritage while providing safe passage among cycling destinations.
- Complete trail connections throughout the EcoPark System through a comprehensive trail plan. Consider using utility corridors and/or unopened road allowances as additional access points or trail connections. Open discussion on the limited use of cycling on specific trails to provide a solution to the current lack of connectivity issue. The Hamilton Burlington Trails Council could play a pivotal role in completing a comprehensive trail plan. Relevant City of Hamilton departments involved in transportation planning should be included;
- Consider the following principles when assessing options for trail closure, rationalization and formalization:
    - limit access to physically and ecologically sensitive habitats, including riverbanks and seepage areas, as trail location should be placed in a manner which creates the least disturbance to habitat and wildlife;
    - ensure appropriate routing of trails and trail activities as to minimize the potential for harm, minimize the potential for damage to wildlife habitat and avoid impact to the habitat of species at risk and other significant and/or rare species and ecological communities;
    - where possible and appropriate, consider adopting the approach of 'preferred' trail use rather than promoting single-use trails (e.g., bike and hiking trails);
    - as an alternative to permanent trail closure, consider seasonal trail closure where the limitation is to keep users out of seasonally wet parts of the trail system;
    - improve signage, trail marking (e.g., blazes) and implement measures to assess and close redundant trails;
    - when trail closure is undertaken, post signage to communicate reasons why the closure was necessary as people are more apt to respect the trail closure if they know why it has occurred;
    - construct bridges and boardwalks to address erosion and wet trail conditions where they are perennial, segments consistute key connections in the trail system (i.e., can't be closed seasonally), and where they result in unacceptable impacts;
    - investigate alternative trail surfaces that are commensurate with the intensity and type of trail use and location;
    - consider retrofitting remnant logging roads/old cart trails and incorporating them into the trail system where they may complete logical connections; and
    - prepare a protocol, including post-closure monitoring, for active trail closure.
- Initiate a survey to determine the awareness of the EcoPark System, how the area is currently being used, what the desires of the EcoPark System users are, etc.
- Provide consistent signage that clearly explains permitted uses (e.g., cycling permitted, off-leash dog area), or conversely, uses that are prohibited (e.g., dogs must be on-leash, no cycling).
- Monitor cycling activity and take appropriate action to address management concerns such as closing unauthorized trails and notifying individuals locations in which cycling is not permitted;
- Securement tends to focus on highly sensitive lands; however, consideration could be given to purchasing lands that are less ecologically sensitive that could provide opportunities for activites that are inappropriate in ecologically significant/sensitive lands, for example lands that would be more suitable for dog walking, cycling or other forms of more intensive recreation.

Furthermore, pressures arising from the GTHA are making land secrurement challenging, all land in this area should be considered.

- The City of Hamilton has a Dog Leash Free Program Policy, which should be referred to when exploring opportunities for dog parks within the City of Hamilton to assist with reducing impacts to the natural environment. Future intensive off-leash dog activities would ideally be located in disturbed open space areas with low natural heritage value. For example, the City of Hamilton could consider building a dog park at the Valley Community Centre Park.
- Consider options for Armstrong Trail, including trail closure, to mitigate impacts associated with connecting unsanctioned trail use.
- Consider options for potential parking and trail system at Berry Tract South, and incorporate future feature, such as a lookout or boardwalk, to be named after the Mattiaci family.
- Continue to monitor for trail erosion and implement appropriate trail construction and remediation measures on steeper slopes where warranted.
- Consult with Bruce Trail Conservancy on their future volunteer model for trail maintenance;
- Encourage increased dialogue with all trail user groups to ensure that all opinions and users' needs are being heard and incorporated into trail management considerations.
- Engage cyclists to educate on appropriate use of the trail system, in collaboration with and with approval from the landowner.
- Offer bike parking racks at trail heads, especially at access points to trails where cycling is not permitted.
- Consider alternatives to traditional signs. Signs are not always effective tools for informing trail users and are often targeted for vandalism/removal. Suggestions for specific signage themes will be provided in the Management Plan.
- Post signage indicating permitted uses including an educational component that identifies impacts associated with unsanctioned uses, and stating fines for illicit uses.
- Ensure local ordinances and by-law policies are updated to include prohibition of unsanctioned uses in natural areas. This is necessary to be able to engage by-law enforcement officers if and when needed.
- Identify locations of dumped garbage and yard waste, and facilitate clean up.
- Close and restore unsanctioned party spots.
- Look for appropriate locations for additional benches and picnic tables to facilitate small social gatherings in desired locations.
- Improve communication of spill prevention and response by ensuring that spill prevention plans, contingency plans and emergency response plans are updated for the purpose of protecting natural features along roads, railway lines and pipelines.
- Reach out to The Barn School to gain an understanding of their use (if any) of the Current EcoPark System Lands, and explore opportunities for partnership.

7.4 Encroachment Issues

The Borer's Falls-Rock Chapel Heritage Lands are surrounded by various landuses, including residential and rural properties (refer to section 2.1). Various impacts associated with encroachment have been noted on Current EcoPark System Lands, particularly from residences abutting the Current EcoPark System Lands. Encroachment works both ways, with EcoPark System users trepassing on adjacent private lands, and adjacent private landowners accessing and/or encroaching illegitimately on Current

EcoPark System Lands. At Borer's Falls Conservation Area 1, encroachment from residential use is limited by the fact that it is mostly surrounded by agricultural lands, and the terrain is very steep which deters access. Many by-laws exist to address encroachment; however, due to the lack of staffing resources, municipalities are often unable to enforce them and are thus unable to address encroachment issues through this approach.

7.4.1 Issues

Private Unsanctioned Trails

Unsanctioned trails are occasionally created from private residences, into the Current EcoPark System Lands, to connect with a nearby or adjacent sanctioned (or widely used unsanctioned) trail. Sometimes, gates are installed into rear-lot fencing to facilitate access, while retaining privacy. The gate construction speaks to the frequency of use that some of these trails experience. When combined, the cumulative effect can have an impact on the quality of the natural area and can also impact wildlife through an increased level of disturbance.

Structures and "Yard Extension"

Structures such as retaining walls, picnic tables, small sheds, and household objects such as lounge chairs and composters were noted within the Current EcoPark System Lands, adjacent to residential properties. Also, yards are occasionally extended by mowing, and by the placement of flowerbeds within the natural area boundary (sometimes referred to as "property creep"). This has an impact on edge vegetation and reduces the overall size of the natural area.

Dumping

Yard waste, such as grass clippings and trimmed branches, is often thrown inside the edge of natural areas from adjacent residences. Yard waste dumping can be a vector for the spread of non-native invasive species. It also smothers existing vegetation and degrades the aesthetic and floristic quality of an area. Dumping of garbage was noted in several places within the Current EcoPark System Lands (Figure 7), for example along the interface of residential properties and the Current EcoPark System Lands. Although not within the Current EcoPark System Lands, dumping frequently occurs over the edge of the Escarpment from Sydenham Lookout into a Privately Owned Outreach Area of the Borer's Falls-Rock Chapel Heritage Lands. Local stewardship groups routinely collect garbage and refuse from this area (Appendix 9).

Vegetation Removal/Trampling

Removal of vegetation occasionally occurs along the edges of natural areas. For example, tree cutting of both dead and living trees occurs, as well as clearing of brush, and tree topping to maintain views. These activities reduce the quality of natural areas by reducing or degrading the structure of edge vegetation, and removing snags which have high wildlife value. Specific examples of vegetation removal and trampling at Borer's Falls-Rock Chapel Heritage Lands include tree cutting at Berry Tract 2 to maintain views (Figure 7), and impacts to species at risk have occurred (**REDACTED**).

Septic Drainage

Improper functioning of septic systems in the Pleasant View Neighbourhood may result in water quality impacts downstream in the Pleasant View Tributary subwatershed (Figure 7).

Cats/Domestic Pets

Domestic pets, in particular cats, many of which roam freely within natural areas, have a significant impact on native wildlife populations. Cats are very proficient predators and are responsible for killing millions of birds, small mammals, reptiles and amphibians throughout North America each year (Marks and Duncan 2009).

7.4.2 Opportunities

Preliminary management opportunities to be explored include:

- Close unsanctioned trails from private residences, including the removal of gates with commensurate education.
- Clarify Current EcoPark System Lands boundaries to prevent accidental trepassing.
- In conjunction with appropriate authorities, investigate and where possible levy fines based on trespass and/or local tree-cutting by-laws when tree topping/pruning and/or removal is noted.
- Establish a program to educate adjacent residential landowners by providing information on the impacts of free-roaming cats, disposing yard waste, garbage and other forms of encroachments in natural areas.
- Enhance edge vegetation, for example living fencing, where Current EcoPark System Lands are bordered by residential development to better delineate Current EcoPark System Lands boundary, improve buffer and mitigate impacts, including “property creep” and dumping of garden refuse.
- Review and evaluate the effectiveness of existing by-laws and identify gaps in by-laws to facilitate the enforcement of use policies, including a cat control by-law.
- Post signage to educate the public about the impacts associated with encroachment.
- Continue to remove structures, flower beds, composters, etc. as well as garbage and dumped refuse from the areas adjacent to private residences.
- Initiate contact with the local health unit and municipal engineering departments to verify water quality issues in the Pleasantview Neighbourhood and develop a better understanding of potential impact to Current EcoPark System Lands and potential solutions.

7.5 Hydrologic Impacts

7.5.1 Issues

High Run-off and Peak Flows

There is an over-arching EcoPark System issue related to high run-off and peak flows associated with the increase in impervious surfaces associated with development. Within the Current EcoPark System Lands, the Pleasant View Tributary subwatershed is 50% impervious. High run-off and peak flows have caused erosion of streams (e.g., sections of Borer’s Creek and Pleasant View Tributary – West Tributary 6). Any steps to mitigate run-off through Low Impact Development (LID) techniques or ecological restoration (e.g., small wetlands and/or pit and mound) would be beneficial.

Drainage and Erosion

Impacts from drainage and erosion can significantly damage riparian vegetation and can affect water quality. The tributaries draining through the Borer’s Falls-Rock Chapel Heritage Lands have natural rates of erosion that result in natural down-cutting, which slowly increase the incised nature of the valleys. In some places, vertical banks occur. Although some rates of erosion have been accelerated due to higher

peak runoff volumes, much of the Borer's Falls-Rock Chapel Heritage Lands have not undergone significant landuse change. The majority of down-cutting is natural and a result of the topographic difference between the Niagara Escarpment and Lake Ontario. A bank erosion study completed by Geo Morphix in 2016 highlights stream reaches that were assessed as 'very sensitive' in terms of sensitivity to erosion. These reaches are illustrated on Figure 7 as 'Watercourse Erosion Sensitivity'.

Site-specific issues related to drainage and erosion include:

- Erosion resulting from uncontrolled run-off along road edges and roadside outfalls on Valley Road at the top of Borer's Falls (Figure 7). There is a need to improve municipal infrastructure in this location.
- Erosion upstream and downstream of the culvert located under the railway at Hopkins Tract (Figure 7). The culvert appears to be undersized and perched.
- Major bank failure and slumping has been reported from neighbourhoods located to the south of Rock Chapel 1, where layers of clay occur over bedrock in conjunction with groundwater discharge from the Niagara Escarpment (Figure 7).
- Drainage re-alignments along Old Guelph Road have redirected a tributary formerly travelling through Hopkins Tract via a ditch along Old Guelph Road to its outlet at Highland Creek. Since the re-alignment, accelerated rates of erosion have been documented in this reach.
- Issues with water quantity and quality have been reported for Pleasant View Tributary – West Tributary 6 (part of the North Cootes Paradise Subwatershed). This tributary runs parallel to Highway 6, within the Innovation Park management unit, then enters the SWM pond and discharges to the ravine that runs through Nicholson Tract 2 and Hopkins Tract. Upstream of the SWM pond in Innovation Park, this tributary is channelized and heavily impacted by Phragmites. Planting in riparian areas to improve buffer and stream habitat improvement of the tributary in Innovation Park would be beneficial for mitigating water quantity and quality impacts in the Pleasant View Tributary subwatershed, including drainage through Nicholson Tract 2 and Hopkins Tract (Figures 2 and 7).
- Issues have been reported regarding the Stormwater Management (SWM) pond located in Innovation Park. The SWM pond was designed as a dry pond. At the present time, there are no active City work plans to update this facility. Potential retrofits are limited due to karst and wildlife habitat. An alternative approach may be to install oil-grit separators within the road allowance, outside of the storm pond block.

Water Quality

A number of water quality issues have been identified in the Borer's Falls-Rock Chapel Heritage Lands:

- Hickory Creek has been identified as being exposed to residential septic system overflows.
- Chloride from de-icing agents discharge into creek systems from roads and snow-dumps during snowmelt in the spring.
- Turbidity and warmed water caused by stormwater runoff, erosion, siltation, limited vegetative buffer on coldwater streams, etc.
- Issues with water contamination in shallow groundwater resulting from rural and agricultural runoff and improperly functioning septic systems.
- Local funeral homes have posted on their websites that cremated remains (ashes) can be scattered in various parts of the EcoPark System, including Borer's Falls. This activity is not sanctioned, and has the potential to negatively impact water quality. There is an opportunity to reach-out to funeral homes to educate on the potential impacts of this activity and to request

that the suggestion be removed from their website and associate platforms.

Polluting Spills

Due to the presence of roadways, pipelines and railway lines within the Heritage Lands, there is a potential for polluting spills to occur. Spill prevention and response protocols and Management Plans should be clarified and where necessary improved by ensuring that spill prevention plans, contingency plans and emergency response plans are updated and disseminated among all relevant agencies for the purpose of protecting natural features along roads, railway lines and pipelines, as well as human safety.

7.5.2 Opportunities

Preliminary management opportunities to be explored include the following:

- Continue to engage in discussion and initiatives to improve urban infrastructure to mitigate stormwater management, high run-off and peak flows. Hamilton RAP released a report in 2014 addressing urban runoff in Hamilton which touches on opportunities for Low Impact Development (Ministry of Environment 2014).
- Any planned impervious surfaces as part of future infrastructure within the EcoPark System should be required to present and evaluate options for Low Impact Development solutions.
- Complete detailed erosion mitigation monitoring for watercourses that showed the highest potential for erosion (Geo Morphix 2016).
- Develop a plan to address instream erosion through bio-engineering restoration (Geo Morphix 2016).
- Improve municipal infrastructure and outfalls located at top of Borer's Falls, on Valley Road.
- Look for opportunities to improve vegetated buffers on coldwater streams.
- There is an opportunity to improve climate change resiliency in the area through the creation of a comprehensive and long-term plan for climate change mitigation and adaptation, with particular attention paid to impacts resulting from spring flooding. This is an issue that transcends the Current EcoPark System Lands and would be lead by another agency, and would benefit from representation of EcoPark System partners.
- Investigate and resolve the issues that have been reported regarding the function of the Innovation Park SWM pond.

7.6 Ecosystem Management

Management issues and opportunities related to ecosystem management are aimed at conserving major ecological services and restoring natural resources while meeting the recreational needs of the Heritage Lands. The principal objective of ecosystem management is the restoration of natural ecosystems, the maintenance and improvement of ecological services, preservation of significant species, as well as efficient maintenance and ethical use of natural resources.

Ecological restoration is underway at several of the management units in the Current EcoPark System Lands (CH Draft 2017). CH is in the process of finalizing a detailed restoration plan for Hopkins Tract, which includes:

- protection of existing features and functions;
- enhancement of landform and soil conditions;
- rehabilitation of altered hydrology, historical natural cover and connectivity; and
- creation of wildlife habitat and headwater wetlands.

RBG has plans for ecological restoration at Berry Tract South (Figure 2). Berry Tract South was seeded in 2017, in preparation for ecological restoration. The vast majority of tableland in the Current EcoPark System Lands was historically farmed, and all wetlands have been removed in the process. The restoration plan for these two management units is to restore historical natural cover and create some wetland nodes. It is recognized that meadow habitat is important for wildlife and pollinators, and should be encouraged in key areas such as York Road Old Field (Berry Tract South and Borer's Falls Conservation Area 1 and 2). To successfully convert an old field (dominated by non-native species) to native meadow, the field must be cultivated for a minimum of two years and herbicide must be applied to deplete the non-native seed bank and prepare the site for restoration. Without these steps, restoration of native meadow can not be achieved.

7.6.1 Issues

Forest Fragmentation

Within the Current EcoPark System Lands, some forest patches are fragmented and poorly configured, which provides restoration opportunities to increase forest area, including interior habitat. In the past, the majority of tableland forests in and adjacent to the Current EcoPark System Lands were removed for agriculture. There is a need to restore tableland forest between the Escarpment brow and Rock Chapel Road/Sydenham Road. Currently, the narrowest tract of forest within the Current EcoPark System Lands along the Escarpment brow is only 35 metres wide (Barr 2014). Opportunities for making ecological connections are limited in some areas due to land in private ownership, adjacent urban land uses and major transportation corridors. See section 7.1.1 on the critical corridor for connection of Cootes Paradise to the Niagara Escarpment.

Decline in Natural Feature Quality

An overall decline in the overall quality of natural features, including biodiversity, has resulted from increased pressures from adjacent lands, and intensification of recreational uses. For example, 19% of taxa listed as historically occurring could not be re-found at Rock Chapel based on a botanical report prepared by RBG (Stover 2014). This report provides evidence that flora richness is in decline, even in remote areas, suggesting causes may be widespread and originate outside of the Current EcoPark System Lands (see section 7.1.1 on accommodating stresses from increased use, and section 7.5.1 on hydrologic impacts). A key theme in the Management Plan will be how the Current EcoPark System Lands can be managed for biodiversity values in the face of habitat fragmentation, climate change, human uses, etc.

Forest Health Decline

Several factors are currently impacting the health of forests in southern Ontario. Oak Decline, Beech Bark Disease, Emerald Ash Borer, Gypsy Moth, Chestnut Blight, Dogwood Anthracnose, Butternut Canker, and other diseases are currently impacting the health of trees and forests overall. Asian Long-horn Beetle has not yet been noted in the area, but is a potential threat. Non-native earthworms also appear to be contributing to the decline of forest health, particularly impacting the diversity of the ground flora, soil micro-invertebrate communities (with subsequent issues higher up in the food chain) as well as soil structure and chemistry. Earthworms are keystone detritivores that can act as "ecosystem engineers" and have the potential to change fundamental soil properties, with cascading effects on ecosystem functioning and biodiversity. Tree blowdowns associated with the death of trees, and slope

erosion can also impact the health of forests by creating large gaps in forest canopy. If within the natural range in terms of extent and intensity, tree death, and natural slope erosion are part of providing habitat heterogeneity within an ecosystem and may not be an issue. Many of the forests pests, such as Emerald Ash Borer, are causing significant death and dieback of trees, which create hazard tree and safety issues. Gaining access to and managing dead trees creates a secondary management issue, along with invasive species management. Proper disposal of infected trees is also a concern in areas of poor access. Fortunately, ash is a relatively minor component of the forest ecosystem within the Heritage Lands. Where stands of ash trees previously stood, non-native, invasive Common Buckthorn now dominates.

Urban-adapted Wildlife

Some wildlife species benefited from the forest cutting and agricultural intensification that followed European settlement in North America, resulting in an increase in their population sizes and ranges (Naughton 2012, p. 517). Some of these species have also become well-adapted to urban life. Within the Borer's Falls-Rock Chapel Heritage Lands, urban-adapted wildlife species include squirrels, racoons, skunks and deer. Over-population of meso-predators, such as raccoons and skunks, impact other wildlife through predation, resource depletion and by dominating habitat. Their ability to capitalize on urban land use provides them with a competitive advantage over other wildlife.

Fragmented landscapes favour White-tailed Deer, a species which prefers forest edge. In addition, in urban areas the added complexity of intense highway development interrupts natural wildlife movement patterns. Urban areas also have few natural predators and no hunting. MNRF completed a wintering deer survey in the Ancaster Area in 2009. This study concluded that "concerns regarding health, public safety, vehicle collisions, impacts to forest ecosystems, biodiversity, conservation of species at risk, damage to ornamental plants, landscaping, agricultural crops and nursery stocks indicate that in some areas deer populations have exceeded society's tolerance levels", and "in areas where normal deer movement behaviours are impaired, and there is no predation, deer populations have likely exceeded the carrying capacity of their habitat".

RBG has taken some steps to control deer populations on their lands and has partnered with local indigenous communities to organize a cull which resulted in the removal of seven deer. HCA has in place a hunting model for a nearby conservation area (Dundas Valley) but not within these Heritage Lands. Although controversial, deer management of some kind must continue within the Current EcoPark System Lands in order to address impacts to natural heritage and human safety.

Loss of Open Woodland/Prairie/Savannah Habitat

There is significant literature noting the vast open oak woodland and grassland understory that formerly occurred within and around the Cootes to Escarpment EcoPark System due to several centuries of indigenous peoples' periodic burning to maintain hunting areas, tree seed and fruit production (e.g., Goodban et al. 1997). Due to the presence of prairie indicators in the Heritage Lands (Appendix 6), it is likely that pre-contact vegetation communities would have been comprised of a substantially greater area and coverage of open oak woodland, prairie and savannah habitats. Where possible, open oak woodland, prairie and savannah should be incorporated into restoration targets.

Over time, these habitats have been lost or diminished, primarily due to the loss of disturbances, probably including fire, which would have maintained a more open landscape character. Over time,

forest canopies have closed, reducing the amount of light that is able to penetrate to the forest floor. This has had an impact on the flora in the area, which has resulted in a reduction of the abundance of prairie, savannah and open woodland-dependent species. Some habitat for these species remains within the Current EcoPark System Lands and others may yet be identified (Figure 4). Current plans for ecological restoration within the Current EcoPark System Lands includes prairie, savannah and woodland restoration, and include prescribed burning as a management technique (e.g., Hopkins Tract and Berry Tract South). Conservation Halton conducted a controlled burn in Cartwright Tract on April 12, 2017.

Conservation and Recovery of Species at Risk

The current conservation and recovery of species at risk in the Borer's Falls-Rock Chapel Heritage Lands is focused on conserving and restoring habitat for Red Mulberry (*Morus rubra*), Butternut (*Juglans cinerea*), Eastern Flowering Dogwood (*Cornus florida*), American Columbo (*Frasera caroliniensis*), Eastern Meadowlark (*Sturnella magna*) and Bobolink (*Dolichonyx oryzivorus*). Management activities focused on the conservation and recovery of species at risk and their habitats in the Current EcoPark System Lands include:

- removal of White Mulberry (*M. alba*), a non-native species which hybridizes with Red Mulberry, and genetically confirmed hybrid mulberry;
- detailed assessment of Red Mulberry sapling health and survival;
- removal of invasive species in proximity to known locations of species at risk and species at risk habitat;
- closure of trails in proximity to known locations of species at risk and species at risk habitat;
- maintaining open woodland characteristics for species at risk that rely upon gaps in the canopy (e.g., American Columbo).

The conservation and recovery of species at risk is an important component of maintaining biodiversity and should continue to be supported and expanded to include other species.

Invasive Species

Table 6 summarizes the major invasive species noted within the Current EcoPark System Lands. Invasive species tend to spread aggressively and out-compete native species with resulting losses in species diversity and ecosystem function. Invasive species management is a major priority requiring considerable management effort as many invasive species occur in the Heritage Lands. Some of these are very difficult and/or resource-intensive to eradicate. RBG is in the process of creating an organization-wide policy to help manage the spread of non-native species.

Site-specific examples of invasive species issues include the following:

- Dog-strangling Vine is particularly prevalent within hydro corridors, adjacent to railways and at the south end of Ray Lowes Side Trail (Figure 7).
- The way hydro corridors are currently managed through the Heritage Lands, including the access roads used by utility companies to access these corridors through the Heritage Lands' steep ravines, creates vectors for the spread of invasive species.
- CH is currently managing Common Buckthorn populations at Hopkins Tract and Cartwright Tract as part of ecological restoration.
- There is a small remnant prairie just north of the CN railway in Borer's Falls Conservation Area 1 where non-native invasive species are invading (Figure 7).
- Non-native cool-season grasses and agricultural weeds, which inhibit the establishment of

native grassland species, are prevalent in old fields, including those present at Berry Tract South, Borer's Falls Conservation Area 2 and 3 and Hopkins Tract (Figure 7).

Noxious Plants

Poison ivy and other noxious native plants pose health and safety issues for park users. Poison ivy is found throughout the Current EcoPark System Lands in various concentrations. Giant Hogweed has been noted within the Current EcoPark System Lands (Appendix 5).

Wildlife Crossing/Corridors

Wildlife mortality associated with road crossing has been identified as a major issue of concern for the Cootes to Escarpment EcoPark System. The issue includes impacts to wildlife populations as well as human safetly issues in the case of collisions involving deer. The existing assemblage of land parcels that comprise the Current EcoPark System Lands are fragmented by transportation infrastructure. As a result, wildlife are forced to cross roads, hydro corridors and railways in order to access lands that are required for fulfilling their various life processes (e.g., nesting, foraging, over-wintering). Highway 6 likely serves as a significant barrier to east-west wildlife movement through the Ecosystem Park Lands owing to the cut through the Niagara Escarpment creating vertical faces just south of Highway 5 until just south of the northern terminus of Old Guelph Road, whereupon large quantities of fill raise the Highway 6 to its intersection with Highway 403. Three rows of jersey barrier bounding and dividing the highway further hinder movement in the raised portion of Highway 6 where, while steep, the slope may still be traversable by some wildlife. Vehicular speed and wildlife collision on roads severely impacts the safe passage of wildlife, and ultimately wildlife populations. For example, road mortality is a large contributor to declines in amphibian and reptile populations. The City of Hamilton has established a wildlife corridors committee to examine key wildlife crossings and movement as they relate to the City of Hamilton's Natural Heritage Plan. Several issues related to wildlife crossing and corridors have been identified for the Borer's Falls-Rock Chapel Heritage Lands, including the following:

- There is a large population of White-tailed Deer within the Borer's Falls-Rock Chapel Heritage Lands and the adjoining Cootes Paradise Heritage Lands. Crossing of urban and rural roads by White-tailed Deer poses issues for wildlife and for the safety of the public. Deer and other wildlife crossing hotspots have been identified in several locations on York Road:
    - at Hickory Brook through the valley system extending from Borer's Falls-Rock Chapel Heritage Lands to Cootes Paradise Lands;
    - through stream valley east of Valley Road, across York Road; and
    - from the bottom end of Borer's Falls Conservation Area across York Road and into Cootes Paradise Sanctuary 9 (Figures 2 and 7).
- Reptiles, particularly snakes, are at risk as multiple roads through this area run east west parallel with the escarpment eliminating north south movement to Cootes Paradise (i.e., movement from candidate overwintering areas to foraging and reproduction areas).

See section 7.1.1 on the critical corridor for connection of Cootes Paradise to the Niagara Escarpment, and the need for an appropriate wildlife corridor and forest connectivity through the north shore of Cootes Paradise Heritage Lands and Borer's Falls-Rock Chapel Heritage Lands to the Niagara Escarpment.

Watershed/Sub-watershed Boundary Issues

In reviewing background information and mapping for the Borer's Falls-Rock Chapel Heritage Lands Management Plan, discrepancies in watershed boundary mapping were encountered. The watershed boundary available from Land Information Ontario (LIO) differed from watershed boundary information provided by CH and HCA. Issues with consistency in the mapping of sub-watershed boundaries were also encountered. According to some map layers, a portion of CH appears to be within HCA's watershed/drainage, and HCA owns lands within CH's jurisdiction (Borer's Falls Conservation Area 2 and 3), which is confusing. In addition, current mapping of small tributaries and springs that originate from the Niagara Escarpment requires updating.

7.6.2 Opportunities

Preliminary management opportunities to be explored include:

Ecosystem Rehabilitation, Restoration, and Naturalization

- For newly acquired properties, landowners are encouraged to develop property-specific conservation, restoration and management plans.
- Where feasible and beneficial, install low maintenance wildlife habitat structures to provide features under represented in the landscape.
- Consider incorporating the City of Hamilton's Hopkins Cemetery into the interpretation of the CH-owned Hopkins Tract by providing access to the cemetery via a potential future trail network. Consideration could also be given to restore the cemetery grounds as a tall-grass prairie, which would decrease maintenance requirements and enhance the area's natural heritage function.
- Increase interior forest cover and promote the natural succession of native forest communities.
- Develop a map that identifies and prioritizes potential forest restoration areas to maximize the ecological gain from restoration initiatives.
- Promote the succession of forest habitat and prioritize restoration that increases the area to edge ratio of forests (i.e., maximizes forest area relative to its edge).
- Expand Borer's Falls-Rock Chapel Heritage Lands through ongoing acquisition to increase the extent of develop interior forest in public ownership.
- Improve the buffer along the forest edge through ecological restoration and removal of invasive, non-native species.
- Initiate a program to restore tableland forest and/or meadow habitat on agricultural fields bordering forest along the Escarpment brow, south and east of Rock Chapel Road/Sydenham Road.
- Develop a plan for identifying ecosystem restoration targets for the Heritage Lands, based on historical and current composition:
    - include considerations for reference ecosystems and adaptability to climate change;
    - include considerations for habitat creation for SAR and the restoration/management of provincially rare vegetation communities;
    - include guidelines for local prairie restoration, including target amount, patch size, and best management practices;
    - include recommendations for the use of prescribed burns, which are considered the best means of managing prairie, savannah and open oak woodland habitats; and
    - incorporate land use impacts to the study area and subwatershed, such as the amount of impervious surfaces and loss of wetlands.

- Improve the condition of rare and uncommon ecosystems, such as prairie, savannah and open oak woodlands. Where feasible and appropriate, explore opportunities to restore new rare and uncommon ecosystems.
- CH conducted a controlled burn at Cartwright Tract in 2017. Additional burns may be considered and should be based on follow up monitoring at Cartwright Tract.
- Support restoration of tableland wetlands as part of managing surface run-off. Wherever possible, tableland restoration should aim to achieve pre-settlement run-off conditions to reduce peak flows to watercourses (e.g., kettle and palustrine tableland wetland pockets could be retained in any future development proposals and restoration should be encouraged to manage run-off).
- Restore plantations to native communities. Plantations of non-native species should be removed over time and plantations of native species should be managed to encourage healthy trees and understory growth.
- Conduct research into the ecological disturbances that maintained the original forest ecosystems, including the feasibility of re-introducing or emulating such disturbances, including fire/prescribed burning.
- Continue to discourage off trail use and disturbance to minimize impacts to native ground vegetation layer and understory.
- Continue to work with Hydro One to manage hydro corridors as natural communities such as native grassland, shrub thickets or meadow habitat, wherever appropriate.
- Implement management recommendations provided in RBG's Ecological Land Classification Report (Barr 2014), which include:
    - increase interior forest cover and promote the natural succession of a native forest community;
    - control invasive species, especially in proximity to hydro corridors;
    - remove plantations of non-native species over time and manage plantations of native species to encourage healthy trees and understory growth;
    - plant other native species in areas where there is a high presence of ash to mitigate some of the impacts of Emerald Ash Borer;
    - enhance wildlife habitat through pit and mound restoration, ephemeral pond creation and the addition of woody debris where soil conditions permit.
- As part of ecosystem restoration, look for opportunities to re-establish features that have been removed in the past (e.g., tableland wetlands). Habitat creation for amphibians may be possible through wetland construction in previously disturbed areas of the Heritage Lands.
- Improve mapping of small tributaries and springs to gain a greater understanding of drainage patterns and discharge areas below the Escarpment rim.
- Remove the Rotary Club building and restore the area.
- The Rotary Club masonry building on the Bruce Trail/Escarpment Trail (Figures 3 and 7) should be removed if not actively in use, and the area should be restored.

Management of Species at Risk and Rare Species Habitat

- Continue and expand ongoing monitoring of the populations of significant plants and wildlife found in the Current EcoPark System Lands.
- Continue and expand the conservation and recovery of species at risk in the Current EcoPark System Lands. Utilities corridors should not be overlooked when considering Species at Risk but

recovery activities should take in to consideration future operational and maintenance requirements of the service providers.

- Develop and implement species at risk recovery strategies applicable to the Current EcoPark System Lands. Recovery strategies should be ecosystem-based and where possible integrated with broader restoration initiatives. Species-specific restoration should be implemented only where necessary.
- Continue and expand, ongoing inventory of flora and fauna in the Current EcoPark System Lands, with an emphasis on species at risk and rare species.
- Undertake an analysis of trail locations (including unsanctioned trails) with respect to their proximity to rare and/or significant species and communities to identify where there are potential conflicts and ensure that trails and recreational uses are not impacting species at risk and rare species habitat

Stream Habitat Improvement

- Restore the creek that runs parallel to Highway 6, within the Innovation Park management unit, including Phragmites removal, in-stream habitat improvements, and planting native vegetation in the riparian area to improve buffer function.
- Restore hydrologic connections and watercourses in Hopkins Tract, Berry Tract South, and Borer's Falls Conservation Area 2 and 3.
- Remove historical dumping from creek valley channels.

Invasive Species Management

- Coordinate management efforts to control/remove invasive species populations among Cootes to Escarpment EcoPark System partners.
- Continue to document and map the locations of major aggressive invasive species.
- A management protocol for mitigating the impacts of Emerald Ash Borer should be developed that could include:
    - identifying areas with a high proportion of ash and prioritizing them for management so that areas that priority is given to areas that would suffer the greatest impact on biodiversity (e.g., of size, dominance of ash, quality of understory, etc.);
    - planting other tree species native to the area to replace the loss of ash-dominated canopy
    - interpretive signage for affected areas proximate to trails that explains why trees are dying and conveys the broader message of the impact of invasive non-native species and possibly climate change.
- As part of other monitoring and inventory programs, continue to watch for signs of new forest pathogens (e.g., Asian long-horned beetles) to enable a response at the outset of infestation.
- Continue the monitoring and removal/control of priority invasive plant species;
- Continue to educate the public on the impact that invasive plants have on biodiversity and the cost of controlling them once established.
- Encourage and support RBG's initiative to develop policy for non-native species.
- Address the issue of feral and domestic cats within the Current EcoPark System Lands by disseminating educational material to adjacent landowners and establishing an acceptable approach to trapping/removal of free-ranging cats where persistent issues are identified.

Management of Noxious Plants

- Post educational signage noting the identification and toxic properties of Poison Ivy in a few key trailhead locations within the Heritage Lands where this species is abundant.
- Continue to monitor and remove populations of Giant Hogweed as they are encountered.

Wildlife Crossing

- Continue to look for opportunities to enhance the continuity and integrity of natural corridors connecting the Niagara Escarpment and Cootes Paradise through the Borer's Falls-Rock Chapel Heritage Lands, particularly across York Road.
- Identify additional areas where wildlife habitually cross roads within the Borer's Falls-Rock Chapel Heritage Lands to gain a better understanding of where wildlife passages or other mitigation needs to be initiated. This may include:
    - collect and map road kill data from municipal and other sources;
    - establish a program that encourages the reporting of all road kill from the public and partner agencies, and enters it into a database to facilitate analysis;
    - include wildlife impact analyses into the Terms of Reference of all road upgrade projects within the Heritage Lands; and
    - stay informed of current and future alternatives for improving wildlife road crossings, traffic calming, signage, etc. through review of relevant literature, participating in conferences, workshops, etc., addressing wildlife road mortality.
- Develop a strategy to prioritize and upgrade existing crossing structures (e.g., road culverts) where they may be used by wildlife. Partner agencies could undertake quick investigations of culverts scheduled for replacement to determine if they are used for by wildlife (e.g., track studies) to determine if larger culverts or more sophisticated eco-passages are warranted.
- Contribute to long-term monitoring opportunities by continuing to monitor wildlife crossing and road mortality.
- Continue to explore options for managing deer populations within the Current EcoPark System Lands.

7.7 Cultural Heritage Issues

7.7.1 Issues

A number of issues were identified through the inventory and evaluation of cultural heritage resources as follows.

Cultural Heritage Importance of Borer's Mill

There is little that remains to convey the importance of the Rock Chapel Village Sawmill (Borer's Mill) as acultural resource in the Borer's Falls-Rock Chapel Heritage Lands.

Cultural Heritage Importance of Farming Remnants

Farming was an important activity in the Borer's Falls-Rock Chapel Heritage Lands for over 200 years, yet few cultural resources remain within the Heritage Lands other than building foundations and building remnants to convey this history.

Designation of Hopkins Cemetery

The Hopkins Cemetery is a tangible connection to the settlement history of Borer's Falls-Rock Chapel Heritage Lands but has not been designated for protection by the City of Hamilton, is not generally known to the public and is not easily accessible.

Rotary Club Masonry Building

The Rotary Club masonry building on the RBG Escarpment Trail may create confusion for visitors who assume it is the Rock Chapel for which the Rock Chapel Nature Sanctuary and trail are named (Figures 3 and 7).

7.7.2 Opportunities

Preliminary management opportunities to be explored include:

- Indigenous Peoples have interest in the historic land use, current occupancy and traditional rights associated with the Cootes to Escarpment EcoPark System heritage lands, including access to these areas for harvesting as part of their traditional culture and diet. Continue on-going consultation and meaningful engagement in recognition of Indigenous Peoples rights and traditions as part of developing management strategies for the heritage lands, as well as advancing reconciliation.
- Through education, interpretation and commemoration, the history and importance of Rock Chapel Village Sawmill (Borer's Mill) has potential to be communicated to local residents and the public in general. Among the themes to investigate is the reliance early settlers had on water and timber and the later loss of a primary economic generator, the Village Sawmill, due to unsustainable resource management.
- The Hopkins Cemetery provides the opportunity to connect the names of local settlers to the history of those who settled, lived and worked on land in the Borer's Falls-Rock Chapel Heritage Lands. It has the potential to be designated as a Heritage Property, drawing further attention to the social history of the area. Visitor use plans for the Hopkins Tract could include a trail network that includes the cemetery as a destination point.
- Although outside the Current EcoPark System Lands, the cluster of buildings and church sites on Rock Chapel Road are strongly connected to the early settlement history of Rock Chapel. These properties and Rock Chapel Road have the potential to be designated as a Heritage District, conveying the history of Rock Chapel and, like the sawmill, the residents' reliance on the natural resources of the area.
- The Rotary Club masonry building on the Bruce Trail/Escarpment Trail (Figures 3 and 7) should be removed if not actively in use, or named and distinguished from the original Rock Chapel to avoid confusion for visitors.
- Although outside the Current EcoPark System Lands, following further research and documentation, the trail through Berry Tract 1, roads including Old Guelph Road, York Road, Valley Road and Patterson Road, and segments of railways including the CP and CN Railways have the potential for designation and interpretation as part of a system of early trails and settlement roads.
- As an integral part of one of Canada's earliest settled areas, the Borer's Falls-Rock Chapel Heritage Lands are deserving of more intensive investigation to expand knowledge of its cultural history and documentation of its cultural heritage resources.

8.0 Next Steps

Following the review of this Inventory, Issues and Opportunities Report, work will continue on the preparation of the Management Plan for the Borer's Falls-Rock Chapel Heritage Lands. A large number of issues and preliminary management opportunities have been identified through the preparation of this report and have been presented at this early stage in the process to allow adequate time for review and discussion with the Steering Committee, Staekholder Committee and the public. These opportunities will be further developed and discussed in greater detail to refine the recommendations, as the project moves forward.

Preparation of the Management Plan includes preparing a land classification system based on the Niagara Escarpment Parks and Open Space System (NEPOSS) zones, followed by the development of the actual Management Plan that will guide future management activities. Further public consultation will occur through the development of the NEPOSS zones and the Management Plan, and public meetings will be held to gain and incorporate feedback.

This Inventory, Issues and Opportunities Report is intended to be used in conjunction with the Management Plan.

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Appendix 1: Data Sources

Appendix 1. Data sources referenced to prepare the Inventory, Issues and Opportunities report for Borer's Falls-Rock Chapel Heritage Lands.

NAME OF RECEIVED GIS LAYER	SOURCE
Approx_Reg_Limit_CH_20120514	Conservation Halton
C2E_HeritageSystemBoundary	Conservation Halton
C2E_PartnerLandHoldings	Conservation Halton
C2E_RoadEcology	Conservation Halton
CH_Ponds	Conservation Halton
CH_SubwatershedBoundary	Conservation Halton
CONS_AUTH_ADMIN_AREA	Conservation Halton?
ELC_CH_20090903	Conservation Halton
ELC_CH_Updates_2016	Conservation Halton
HWFP_Haz_PO_CH_20120514	Conservation Halton
JurisdictionBoundary_CH	Conservation Halton
MBelt_Haz_PO_CH_20120514	Conservation Halton
Privately_Owned_Outreach_Area	Conservation Halton
SL_100yr_Flood_Elev_Haz_PO_CH	Conservation Halton
SL_Haz_PO_CH_20120514	Conservation Halton
STOB_Haz_PO_CH_20120514	Conservation Halton
Waterflow_CH	Conservation Halton
Wetland_Haz_PO_CH_20120514	Conservation Halton
Bird Data for Cartwright, Hopkins and Nicholson Tracts 2017	Conservation Halton
Plant Data for Hopkins Tract 2017	Conservation Halton
ASSET_BRIDGES	City of Hamilton
BIKEWAYS	City of Hamilton
BUILDINGS	City of Hamilton
C2E_ANSI	City of Hamilton
C2E_CArea	City of Hamilton
C2E_ESA	City of Hamilton
C2E_LandUse	City of Hamilton
C2E_NECdes	City of Hamilton
C2E_Parks	City of Hamilton
C2E_Shore	City of Hamilton
C2E_Streets2	City of Hamilton
C2E_Trails	City of Hamilton
C2E_Watercourse	City of Hamilton
C2E_Zoning	City of Hamilton
C2Econtour02	City of Hamilton
C2EcultHeritage	City of Hamilton
C2EDevAppsRec	City of Hamilton
C2EsewerMain	City of Hamilton
C2Eutpipe	City of Hamilton
C2EwildlifeIncidents	City of Hamilton
C2EwildlifeIncidentsSR	City of Hamilton
C2Ewoodlands	City of Hamilton

NAME OF RECEIVED GIS LAYER	SOURCE
CootesEcoParkStudy	City of Hamilton
PARK_AMENITIES	City of Hamilton
PARKS	City of Hamilton
PLANNING_UNITS	City of Hamilton
RIVERS	City of Hamilton
Trails_HCA_updated	Hamilton Conservation Authority
Contours	Hamilton Conservation Authority
data_clip	Hamilton Conservation Authority
Elc_areas	Hamilton Conservation Authority
Flood_screening	Hamilton Conservation Authority
Trails_HCA	Hamilton Conservation Authority
Waterbody	Hamilton Conservation Authority
Waterflow	Hamilton Conservation Authority
2010_turtlewatch	Hamilton Conservation Authority
Common Carp	Royal Botanical Gardens
CP Groundwater Sites	Royal Botanical Gardens
DTW_Turtles	Royal Botanical Gardens
DTW2013	Royal Botanical Gardens
MarshVegetation2016	Royal Botanical Gardens
Physiography_RBG	Royal Botanical Gardens
RBG_ELC_1	Royal Botanical Gardens
RBG_Infrastructure	Royal Botanical Gardens
RBG_Interior_Forest	Royal Botanical Gardens
RBG_Parkinglots	Royal Botanical Gardens
RBG_Property	Royal Botanical Gardens
RBG_property_outline	Royal Botanical Gardens
RBG_SemiAccessible_Trails	Royal Botanical Gardens
RBG_Signs	Royal Botanical Gardens
RBG_Site_ammenities	Royal Botanical Gardens
RBG_Special_Management_Areas	Royal Botanical Gardens
RBG_Structures	Royal Botanical Gardens
RBG_trailsystem	Royal Botanical Gardens
RBG_water	Royal Botanical Gardens
RBGroadmonitoring2015	Royal Botanical Gardens
Service_Roads_RBG	Royal Botanical Gardens
Streams_RBG	Royal Botanical Gardens
Borers_AMP_HistoricaRailway	City of Hamilton
Cootes_AMP_HIstoricActivity	City of Hamilton
Cootes_AMP_HistoricRailway	City of Hamilton
Cootes_AMP_HistoricRoad	City of Hamilton
Cootes_HistoricSettlement	City of Hamilton
Cootes_ArchSites	City of Hamilton
Cootes_Cemeteries	City of Hamilton
Cootes_CHL	City of Hamilton
Cootes_HeritageProperties	City of Hamilton

NAME OF RECEIVED GIS LAYER	SOURCE
NEPOSS	Niagara Escarpment Commission

REPORTS	SOURCE/REFERENCE	FORMAT	RECEIVED
Hamilton Natural Areas Inventory Project 3rd Edition – Site Summaries Document (2014)	Hamilton Conservation Authority, City of Hamilton, Hamilton Naturalists' Club	Digital Copy	x
Lower Grindstone Creek, Borer's Creek and North Cootes Paradise Subwatersheds. Preliminary Geomorphological Assessment (2016)	GEO Morphix Ltd.	Digital Copy	X
Hamilton Harbour and Watershed Fisheries Management Plan (2010)	Ontario Ministry of Natural Resources, Royal Botanical Gardens	Digital Copy	X
Report on Lake JoJo (York Road Pond) (1990)	Hamilton Region Conservation Authority	Digital Copy	X
Lower Spencer Creek Subwatershed Stewardship Action Plan (2010)	Hamilton Conservation Authority	Digital Copy	X
Ainslie Wood/Westdale Neighbourhood – Background Report 2002	City of Hamilton	Digital Copy	X
Preliminary Report – McMaster University – Cootes Paradise, Site I, Hamilton, Ontario	McMaster University	Digital Copy	X
Cootes to Escarpment Park System Land Securement Strategy 2011	ORLAND Conservation	Digital Copy	X
Dundas Business Park Self Storage Facility Scoped EIS (2008)	Dougan & Associates	Digital Copy	X
Hamilton Harbour and Watershed Fisheries Management Plan (2009)	Ontario Ministry of Natural Resources, Royal Botanical Gardens	Digital Copy	X
Niagara Escarpment Parks and Open Space System Planning Manual (2012)	Ontario Ministry of Natural Resources	Digital Copy	X
The Nursery (AhGx-8) Site: 2006 Stage 4 Archaeological Field School Excavations in Cootes Paradise, Hamilton, Ontario (2008)	Scott Martin	Digital Copy	X
Stage 2 Archaeological Assessment, Valley Inn Road, Hamilton, Ontario (2008)	Jacques Whitford Stantec Limited	Digital Copy	X
Stage 1 Archaeological Assessment and Archaeological Monitoring of the Proposed Soccer Pitch, Churchill Park, Part of Lot 60, Concession 1, Former Township of Ancaster, Wentworth County, Now the City of Hamilton (2010)	Archaeological Services Inc.	Digital Copy	X
Stage 1 Archaeological Assessment Valley Inn Road Bridge Class Environmental Assessment City of Hamilton, Ontario (2007)	Archaeological Services Inc.	Digital Copy	X
The Historical and Present Extent and Floristic Composition of Prairie and Savanna Vegetation in the Vicinity of Hamilton, Ontario (1997)	Proceedings of the 15th North American Prairie Conference	Digital Copy	X
An Archaeological Survey of Cootes Paradise Hamilton, Ontario (1969)	David Stothers	Digital Copy	X
A Vision for an Urban Eco Park, Hamilton, Ontario (2009)	Urban Strategies Inc.	Digital Copy	x

REPORTS	SOURCE/REFERENCE	FORMAT	RECEIVED
Wetlands Conservation Plan 2016 – 2021 (2016)	Royal Botanical Gardens	Digital Copy	X
Analysis of Soil Cores in Cootes Paradise North Shore Using Ecological Land Classification Protocols (2014)	Royal Botanical Gardens	Digital Copy	X
Churchill Park Management Plan (2014)	City of Hamilton, Dillon Consulting	Digital Copy	X
Project Paradise 2015	Royal Botanical Gardens	Digital Copy	X
Floristic Inventory of Rock Chapel Nature Sanctuary (2014)	Royal Botanical Gardens	Digital Copy	X
Checklist of the Spontaneous Flora of Royal Botanical Gardens' Nature Sanctuaries (2003)	Royal Botanical Gardens	Digital Copy	X
20 Year Trends in Water Quality: Cootes Paradise and Grindstone Creek Marsh (2011)	Royal Botanical Gardens	Digital Copy	X
Emergent and Meadow Marsh Vegetation Summary (2012)	Royal Botanical Gardens	Digital Copy	X
Western Desjardins Canal and West Pond Conditions Summary Report (2017)	Royal Botanical Gardens	Digital Copy	X
Royal Botanical Gardens' Red Mulberry *Morus rubra* Site Specific Recovery Plan (2016)	Royal Botanical Gardens	Digital Copy	X
Royal Botanical Gardens' Few-flowered Club-rush *Trichophorum planifolium* Site Specific Recovery Plan (2015)	Royal Botanical Gardens	Digital Copy	X
Turtles of Royal Botanical Gardens Site Specific Recovery Plan (2014)	Royal Botanical Gardens	Digital Copy	X
Butternut Compensation Project: 2015 Annual Progress Report (2015)	Royal Botanical Gardens	Digital Copy	X
Royal Botanical Gardens' Species at Risk Annual Summary Report (1st edition) (2014)	Royal Botanical Gardens	Digital Copy	X
An Invasive Plant Strategy for Royal Botanical Gardens' Terrestrial Lands (2016)	Royal Botanical Gardens	Digital Copy	X
Royal Botanical Gardens Emerald Ash Borer Management Strategy (2010)	Royal Botanical Gardens	Digital Copy	X
Management Strategy for Phragmites on RBG Property 2014 - 2018	Royal Botanical Gardens	Digital Copy	X
Invasive Potential of *Magnolia kobus* as Demonstrated by Seedling Establishment in Natural Lands Adjacent to a Horticultural Collection (2016)	Royal Botanical Gardens	Digital Copy	X
Assessment of Deer Browse in Cootes Paradise and the Implications for Restoration Projects (2015)	Royal Botanical Gardens	Digital Copy	X
Ancaster Wintering Deer Survey 2009 – with Management Recommendations March 2010	Ontario Ministry of Natural Resources	Digital Copy	X
Arboretum White-tailed Deer Survey Report: Browse and Rub Surveys	Royal Botanical Gardens	Digital Copy	X
Impact Assessment of Deer Exclosures on Few-flowered Club-rush (*Trichophorum planifolium*) and Deer Count of Cootes Paradise (2013)	Royal Botanical Gardens	Digital Copy	X
Forest Monitoring Report 2010	Royal Botanical Gardens	Digital Copy	X

REPORTS	SOURCE/REFERENCE	FORMAT	RECEIVED
Status Report on Princess Point: Prescribed Burn Monitoring and Restoration Initiatives (2017)	Royal Botanical Gardens	Digital Copy	X
Prescribed Burn Monitoring Report: 2003 – 2010 (2011)	Royal Botanical Gardens	Digital Copy	X
Ecological Land Classification of Royal Botanical Gardens' Natural Lands (2014)	Royal Botanical Gardens	Digital Copy	X
Hamilton Natural Areas Inventory Project, 3rd Edition – Species Checklist Document (2014)	Hamilton Conservation Authority, City of Hamilton, Hamilton Naturalists' Club	Digital Copy	X
Ecological Survey of the Niagara Escarpment Biosphere Reserve. Volume I: Significant Natural Areas (1996)	Ontario Ministry of Natural Resources	Paper Copy	X
City of Hamilton Archaeology Management Plan, 2016	City of Hamilton	Digital Copy	X
Test Excavations at the Lilac Gardens Site (1984)	Archaeological Research Associates Ltd	Digital Copy	X

MAPS	SOURCE	RECEIVED
Cootes to Escarpment EcoPark System Heritage Lands (2017)	Conservation Halton	X
Hydro Corridors 120 and 140 passing through Royal Botanical Gardens Property – Sections for Vegetation Control Recommendations (no year)	Royal Botanical Gardens	X
Map 1: Ecological Land Classification of Royal Botanical Garden Nature Sanctuaries	Royal Botanical Gardens	X
Map 2: Historical Land Use of Cootes Paradise North Shore ELC Polygons	Royal Botanical Gardens	X
Map 3: Historical Land Use of Cootes Paradise South Shore ELC Polygons	Royal Botanical Gardens	X
Map 6: Cootes Paradise North Shore ELC Polygons by Habitat Type	Royal Botanical Gardens	X
Map 7: Cootes Paradise South Shore ELC Polygons by Habitat Type	Royal Botanical Gardens	X
Map 10: Cootes Paradise North Shore Land Management Units	Royal Botanical Gardens	X
Map 11: Cootes Paradise North Shore Land Management Units and ELC Polygons	Royal Botanical Gardens	X
Map 12: Cootes Paradise North Shore Land Management Units and Soil Polygons	Royal Botanical Gardens	X
Map 13: Cootes Paradise North Shore Coefficient of Conservatism	Royal Botanical Gardens	X
Map 14: Cootes Paradise North Shore Floristic Quality Index	Royal Botanical Gardens	X
Map 15: Cootes Paradise North Shore Common Buckthorn Abundance	Royal Botanical Gardens	X
Map 16: Cootes Paradise North Shore Invasive Honeysuckle Abundance	Royal Botanical Gardens	X
Map 17: Cootes Paradise North Shore Garlic Mustard Abundance	Royal Botanical Gardens	X
Map 18: Cootes Paradise North Shore Dog Strangling Vine Abundance	Royal Botanical Gardens	X
Map 19: Cootes Paradise South Shore Land Management Units	Royal Botanical Gardens	X

MAPS	SOURCE	RECEIVED
Map 21: Cootes Paradise South Shore Land Management Units and Soil Polygons	Royal Botanical Gardens	X
Map 22: Cootes Paradise South Shore Coefficient of Conservatism	Royal Botanical Gardens	X
Map 23: Cootes Paradise South Shore Floristic Quality Index	Royal Botanical Gardens	X
Map 24: Cootes Paradise South Shore Common Buckthorn Abundance	Royal Botanical Gardens	X
Map 25: Cootes Paradise South Shore Invasive Honeysuckle Abundance	Royal Botanical Gardens	X
Map 26: Cootes Paradise South Shore Garlic Mustard Abundance	Royal Botanical Gardens	X
Map 27: Cootes Paradise South Shore Dog Strangling Vine Abundance	Royal Botanical Gardens	X
SAR Location Map (2017)	Royal Botanical Gardens	X

Appendix 2: Planning Characterization Matrix and Detailed Planning Policy and Regulatory Framework

Appendix 2. Borer's Falls-Rock Chapel Heritage Lands Planning Characterization Matrix

PROPERTY NAME	OWNERSHIP	CURRENT LANDUSE	AREA (ha)	Conservation Authority	PROVINCIAL		CITY OF HAMILTON OFFICIAL PLAN		
					NEP/GREENBELT	NEC DEV CONTROL REG	PLAN	LANDUSE DESIGNATION	ZONING
Berry Tract 1	Royal Botanical Gardens	forest	27.2	Conservation Halton	NEP (Escarpment Natural Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Berry Tract 2	Royal Botanical Gardens	forest	4.4	Conservation Halton	NEP (Escarpment Natural Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Berry Tract South	Royal Botanical Gardens	agriculture, field, forest, watercourse	17.2	Conservation Halton	NEP (Escarpment Rural Area)	n/a	City of Hamilton Rural OP	Rural Area	Rural RU zone and Open Space OS zone
Borer's Falls Conservation Area 1	Hamilton Conservation Authority	forest, watercourse, field, parking lot	97.9	Hamilton Conservation Authority	NEP (Escarpment Natural Area, Escarpment Protection Area)	yes	City of Hamilton Urban OP	Open Space, Rural Area	n/a
Borer's Falls Conservation Area 2	Hamilton Conservation Authority	forest, field, watercourse	21.0	Conservation Halton	NEP (Escarpment Rural Area, Escarpment Natural Area)	n/a	City of Hamilton Rural OP	Open Space, Rural Area	Rural RU zone, Open Space OS zone and Public Utilities U zone Exception 57
Borer's Falls Conservation Area 3	Hamilton Conservation Authority	forest, field	8.6	Conservation Halton, Hamilton Conservation Authority	NEP (Escarpment Protection Area, Escarpment Rural Area)	n/a	City of Hamilton Rural OP	Open Space, Rural Area	Rural RU zone and Open Space OS zone
Cartwright Tract	Conservation Halton	forest, watercourse	18.6	Conservation Halton	NEP (Escarpment Natural Area)	n/a	City of Hamilton Rural OP	Open Space	Open Space OS zone and Public Utilities U zone Exception 57
Hopkins Tract	Conservation Halton	field, forest, agriculture	21.9	Conservation Halton	NEP (Escarpment Natural Area, Escarpment Rural Area)	n/a	City of Hamilton Rural OP	Rural Area, Open Space	Rural RU zone, Open Space OS zone and Public Utilities U zone Exception 57
Innovation Park	City of Hamilton	field, forest, recreational	9.6	Conservation Halton	NEP (Escarpment Natural Area, Escarpment Protection Area, Urban Area)	yes (in part-open and wooded areas adjacent to Escarpment brow)	City of Hamilton Urban OP, City of Hamilton Rural OP	Open Space, Business Park	Hamilton Technology Centre zoned Prestige Business Park M3 zone, Watercourse between Innovation Drive and Highway 6 zoned Conservation Hazard Lands P5 zone
John Prentice Park	City of Hamilton	manicured grass, field, recreational	0.4	Conservation Halton	NEP (Urban Area)	n/a	City of Hamilton Urban OP	Neighbourhoods	Neighborhood Park P1 zone

PROPERTY NAME	OWNERSHIP	CURRENT LANDUSE	AREA (ha)	Conservation Authority	PROVINCIAL		CITY OF HAMILTON OFFICIAL PLAN		
					NEP/GREENBELT	NEC DEV CONTROL REG	PLAN	LANDUSE DESIGNATION	ZONING
Nicholson Tract 1	Conservation Halton	forest, watercourse	11.0	Conservation Halton	NEP (Escarpment Natural Area)	n/a	City of Hamilton Rural OP	Open Space	Rural RU zone, Rural RU zone Exception 58, Open Space OS zone and Public Utilities U zone Exception 57
Nicholson Tract 2	Conservation Halton	forest, watercourse	4.6	Conservation Halton	NEP (Escarpment Natural Area)	n/a	City of Hamilton Rural OP	Open Space	Rural RU zone, Rural RU zone Exception 58, Open Space OS zone and Public Utilities U zone Exception 57
Nicholson Tract 3	Conservation Halton	forest	1.2	Conservation Halton	NEP (Escarpment Natural Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Nicholson Tract 4	Conservation Halton	forest, field	0.2	Conservation Halton	NEP (Escarpment Natural Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Rock Chapel 1	Royal Botanical Gardens	forest, utility	41.8	Hamilton Conservation Authority	NEP (Escarpment Natural Area, Escarpment Protection Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Rock Chapel 2	Royal Botanical Gardens	agriculture, utility, hedgerow	9.7	Hamilton Conservation Authority	NEP (Escarpment Protection Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Rock Chapel 3	Royal Botanical Gardens	agriculture, field, forest	13.9	Hamilton Conservation Authority	NEP (Escarpment Protection Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Rock Chapel 4	Royal Botanical Gardens	agriculture, forest	8.2	Hamilton Conservation Authority	NEP (Escarpment Natural Area, Escarpment Protection Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Rock Chapel 5	Royal Botanical Gardens	field, forest	2.1	Hamilton Conservation Authority	NEP (Escarpment Natural Area)	yes	City of Hamilton Rural OP	Open Space	n/a
Valley Community Centre Park	City of Hamilton	manicured grass, recreational forest	4.0	Conservation Halton	NEP (Escarpment Protection Area)	n/a	City of Hamilton Rural OP	Open Space	Park and Recreation PR1 zone and Public Utilities U zone Exception 57 zone

Appendix 2. Detailed Planning Policy and Regulatory Framework

1. Planning Policy

Within the Greater Golden Horseshoe, the Provincial Policy Statement and several Provincial Plans work together to manage growth, protect the environment and support economic development.

Provincial Policy Statement 2014

The Provincial Policy Statement came into effect on April 30, 2014 and applies Province-wide. The Policy Statement provides direction on matters of Provincial interest related to land use planning and development, and is a key part of the Provincial policy-led planning system. All land use decisions must be consistent with the Policy Statement. Provincial plans build upon the policy foundation provided by the Policy Statement in order to address issues in the specific geographic areas. Provincial plans are to be read together with the Policy Statement but where they apply, take precedence over the Policy Statement to the extent of any conflict. Where Provincial Plans apply, all land use decisions must conform to or at least not conflict with the Plans.

The Policy Statement is divided into three broad categories of guidance: Building Strong (and) Healthy Communities; Wise Use and Management of Resources; and Protecting Public Health and Safety. The Policy Statement focuses growth and development into urban and rural settlement areas while supporting the viability of rural areas. The Policy Statement recognizes that land use must be carefully managed to achieve appropriate and efficient development while avoiding and protecting significant or sensitive resources, and areas which may pose risk to public health and safety.

As Management Plans are prepared and implemented for the Heritage Lands, it is important to ensure that the plans are consistent with the Policy Statement.

Greenbelt Plan 2017

As amended through the Coordinated Provincial Plan Review, the updated Greenbelt Plan became effective on July 1, 2017. The Greenbelt Plan complements the Growth Plan for the Greater Golden Horseshoe 2017 which manages and guides urban growth. The Greenbelt Plan provides permanent agricultural and environmental protection in areas where urban growth is not intended to occur.

The Niagara Escarpment Plan 2017 and the Parkway Belt West Plan 1978 both form part of the Greenbelt Plan, and continue to apply where they exist. The Borer's Falls-Rock Chapel Heritage Lands are entirely within the jurisdiction of the Niagara Escarpment Plan 2017 due to jurisdictional transfer from the Parkway Belt West Plan to the Niagara Escarpment Plan which was completed before the Coordinated Provincial Plan Review. Where the Niagara Escarpment Plan jurisdiction exists, the policies of the Plan apply and the Protected Countryside policies of the Greenbelt Plan do not apply except section 3.3.

The Greenbelt Plan, section 3.3 outlines policies for Parkland, Open Space and Trails in order to provide opportunities for recreation, tourism and natural, and cultural heritage appreciation. In partnership with land-owning agencies and other parties, the intent is to encourage a system of publicly accessible open space, to promote a coordinated approach to the trail planning and to promote good stewardship practices for public lands and publicly accessible private lands in the

Greenbelt system of open space. The policies speak to the municipal role in providing a full range of built and natural settings for public recreation, and considerations for municipal park planning, open space and trail strategies. These policies also recognize Provincial and Conservation Authority lands as important components of the system of open space and park lands.

Niagara Escarpment Plan 2017

As amended through the Coordinated Provincial Plans Review, the updated Niagara Escarpment Plan became effective June 1, 2017. The essential purpose of the Niagara Escarpment Plan is to maintain the Niagara Escarpment and land in the vicinity substantially as a continuous natural environment, and to ensure that only such development occurs as is compatible with that natural environment.

The Niagara Escarpment Plan sets out seven land use designations which define how land shall be used including permitted land uses and lot creation. Development criteria applicable to all land use designations determine how a proposed use of land or development shall be carried out. The Plan also sets out policies for the system of parks and open space within the Plan area.

The Borer's Falls-Rock Chapel Heritage Lands are entirely within the Niagara Escarpment Plan and are designated as follows:

- Urban Area
  - John Prentice Park
  - Innovation Park (consisting of the Hamilton Technology Centre and watercourse between Innovation Drive and Highway #6)

- Escarpment Rural Area
  - Hopkins Tract
  - Borer's Falls Conservation Area 2 and 3
  - Berry Tract South

- Escarpment Protection Area
  - Valley Community Centre Park
  - Borer's Falls Conservation Area 3
  - Innovation Park (open area adjacent to Escarpment brow)
  - Rock Chapel 2, 3 and 4
  - Borer's Falls Conservation Area 3 and 1 (small tableland areas adjacent to York Road)

- Escarpment Natural Area
  - Hopkins Tract
  - Innovation Park (wooded area adjacent to Escarpment brow)
  - Nicholson Tract 1, 2, 3 and 4
  - Cartwright Tract
  - Berry Tract 1 and 2
  - Rock Chapel 1, 4 and 5
  - Borer's Falls Conservation Area 1

Escarpment Natural Area is the most restrictive designation, followed by Escarpment Protection Area, Escarpment Rural Area and Urban Area which is the least restrictive. Some properties within the Heritage Lands bear more than one land use designation depending on the physical conditions and property context.

Generally, Escarpment Natural Areas consist of Escarpment features in a relatively natural state, related woodlands, valleylands and wetlands that are relatively undisturbed, and Provincially Significant Areas of Natural and Scientific Interest. Escarpment Protection Areas are similar slopes, landforms and features but where existing land uses have altered the natural environment, areas in proximity to and needed to buffer Escarpment Natural Areas, and natural areas of Regional significance. Escarpment Rural Areas are generally open areas in the Escarpment vicinity needed to buffer more ecologically sensitive areas and complete the Escarpment corridor. Urban Areas are designated municipally for urban serviced uses where Escarpment and closely related lands are located.

Land use permissions in these land use designations are progressive in structure, that is, uses permitted in the most restrictive designation are permitted in the next least restrictive plus other uses. All permitted land uses and lot creation are subject to the applicable Development Criteria of the Plan.

A partial list of permitted uses in the Escarpment Natural Area designation includes existing uses, non-motorized trail uses, forestry, fish and wildlife management, flood and erosion control carried out or supervised by public authority, licensed archaeology, infrastructure, accessory uses except ponds, unserviced camping on public or institutional land, the Bruce Trail including overnight rest areas and access points, uses permitted in parks and open space master/management plans not in conflict with the Niagara Escarpment Plan and nature preserves owned, and managed by a conservation organization. In the Escarpment Protection Area designation, these same Escarpment Natural Area uses are permitted plus agricultural uses and agricultural-related uses, institutional uses and non-motorized trail activities, and snowmobiling. Similarly, in the Escarpment Rural Area designation, the Escarpment Protection Area uses are permitted plus recreational uses. Finally, in Urban Areas, permitted uses are subject to the Development Objectives (for the Urban Area land use designation), the Development Criteria and where applicable, Zoning Bylaws not in conflict with the Niagara Escarpment Plan.

The Development Criteria set out performance standards to be implemented with all permitted uses depending on the site conditions. Since the criteria deal with a variety of conditions, all criteria will not apply to every circumstance. The criteria address matters of site capacity, servicing and design, and specific matters of steep slopes and ravines, wooded areas, water resources, wildlife habitat, forestry, cultural heritage, recreation, Areas of Natural and Scientific Interest and the Bruce Trail.

Amendment 179 to the Niagara Escarpment Plan incorporated special provisions for the Pleasant View Area, consistent with a 1995 Ontario Municipal Board decision for the area. These provisions are implemented in the City of Hamilton Official Plan and Zoning By-law which pre-date Niagara Escarpment Plan jurisdiction in Pleasant View. The following is a summary of the provisions:

- only uses, except single dwellings, that existed on or before February 16, 1993 are recognized;

- only single dwellings that existed on or before August 14, 1998 are permitted and may be replaced;
- accessory uses to an existing uses or existing single dwelling are permitted;
- notwithstanding the above, a single dwelling may be permitted on a lot with a minimum size of 10 ha;
- site specific existing uses are recognized and permitted, which are candle manufacturing/mini-storage facility/ light manufacturing at 325 Old Guelph Road, the Sisters of the Precious Blood institutional use in the existing buildings at 154 Northcliffe Avenue and the Sisters of St. Joseph institutional use in the existing buildings at 574 Northcliffe Avenue;
- nothing prevents the use of land for forest, wildlife, fisheries management, archaeological activities, public park and open space uses, trails, nature preserves and non-intensive recreation, and essential transportation and utility facilities; and
- all of the above are subject to the Development Criteria of the Plan.

The Niagara Escarpment Plan sets out a policy framework for the Niagara Escarpment Parks and Open Space System (NEPOSS) including the overall park system concept, a system of park and open space classification and a park zoning, and master/management planning policy. The Borer's Falls-Rock Chapel Heritage Lands are located within the Halton Escarpment/Caledon Hills Segment of NEPOSS with the following classified properties:

- Pleasant View Conservation Sanctuary (Natural Environment Park 129)
  - Nicholson Tracts 1, 2 and 3

- York Road Access (Escarpment Access Park 130)
  - Borer's Falls Conservation Area 2

- Berry Tract (Natural Environment Park 133)
  - Berry Tract 1 and 2, and Cartwright Tract

- Rock Chapel (Natural Environment Park 134)
  - Rock Chapel 1, 2, 3, 4 and 5

- Borer's Falls Conservation Area (Nature Reserve Park 135)
  - Borer's Falls Conservation Area 1

- Clappison Woods (Natural Environment Park 127)
  - Nicholson Tract 3 and 4

Although not included in the classified parks at this time, for planning purposes, it is anticipated that the Berry Tract South could be included in the Berry Tract NEPOSS park and Borer's Falls Conservation Area 3 could be included in the York Road Access NEPOSS park. Lands acquired and to be managed as part of an existing park in the NEPOSS system can be added to the Niagara Escarpment Plan maps without a Plan amendment.

Nature Reserve parks protect the most sensitive natural heritage features and landforms such as provincially significant wetlands, and Areas of Natural and Scientific Interest. Management practices and uses are to protect the features and values for which the reserve was established. Access and activities are to be limited to scientific research, nature appreciation and trails with a minimal amount of facilities necessary to support these activities.

Natural Environment parks are characterized by a variety of natural heritage resources, cultural heritage resources and scenic landscapes. Activities range from trail uses to car camping and day use activities in more developed or accessible areas.

Escarpment Access parks are generally small areas which complement larger of more developed parks by providing opportunities for public access with modest facilities for day use, for example, trail access and picnic areas, etc.

City of Hamilton Official Plan (Rural March 2012) (Urban August 2013)

On these Heritage Lands, the general intent of the City Official Plan is to implement the requirements of the Niagara Escarpment Plan, the Provincial Policy Statement and local land use objectives. Most of the Borer's Falls-Rock Chapel Heritage Lands are located within the Rural Planning Area of the City Official Plan. Borer's Falls Conservation Area 1 south of the Canadian National railway, the adjacent John Prentice Park and the north section of Innovation Park are within the Urban Planning Area of the City Official Plan (Hamilton Technology Centre and the watercourse between Innovation Drive and Highway #6).

For those Heritage Lands within the Rural Planning Area, Schedule A – Provincial Plans to the Rural Official Plan identifies the former Parkway Belt West Plan Area jurisdiction. As noted previously, the jurisdictional transfer of these lands from the Parkway Belt West Plan Area to the Niagara Escarpment Plan Area was completed before the recent Coordinated Provincial Plan Review. At the appropriate time, the City Official Plan – Schedule A will be amended to reflect the updated Niagara Escarpment Plan jurisdiction and land use designations.

In addition to Provincial Plan designations on Schedule A, the Heritage Lands are variously designated in the City Official Plan on Schedules D (Rural Plan) and E-1 (Urban Plan) for land use as follows:

- Open Space (Rural Plan and Urban Plan)
  - Innovation Park (open and wooded areas adjacent to Escarpment brow and watercourse between Innovation Drive and Highway #6)
  - Valley Community Centre Park
  - Hopkins Tract (valley lands)
  - Nicholson Tracts 1, 2, 3 and 4
  - Cartwright Tract
  - Berry Tract 1 and 2
  - Borer's Falls Conservation Area 1 and parts of 2, and 3
  - Rock Chapel 1, 2, 3, 4 and 5

- Rural Area (Rural Plan)
  - Hopkins Tract (table lands)

  - Borer's Falls Conservation Area 1 (table lands adjacent to York Road) and parts of Areas 2 and 3
  - Berry Tract South

- Business Park (Urban Plan)
  - Innovation Park (Hamilton Technology Centre)

- Neighbourhoods (Urban Plan)
  - John Prentice Park

The Open Space System as designated in the City Official Plan includes the natural and open space features that form part of the Niagara Escarpment. The predominant use or function of these areas is recreation, conservation and other appropriate open space uses including passive recreation, resource-based tourism and recreation, trails, bikeways and walkways, forestry, fish and wildlife management, hazard lands and limited ancillary uses, subject among other things, to the Natural Heritage System policies.

Lands designated as Open Space and included in the NEPOSS system are required to comply with the policies of the Niagara Escarpment Plan.

Lands within Rural Area designation are not prime agricultural areas and are not natural in state. The permitted uses in the Rural Area designation are limited to agriculture, agriculture-related commercial and industrial uses, on-farm secondary uses, other resource-based rural uses and institutional uses servicing the rural community, all subject to specific requirements.

Lands within the Business Park designation of the Urban Plan are intended for prestige employment uses compatible with the high level of design required for these areas. The permitted uses include manufacturing, warehousing, office, research and development, and similar uses, activities which support industry such as trade schools, conference and convention centres, hotels, and limited accessory uses such as retail, all subject to specific requirements.

The Neighbourhood designation applies to the urban residential environment of the City. Permitted uses include residential dwellings and support uses such as open space and parks, local commercial uses, and local community facilities. John Prentice Park is a neighbourhood-level park.

The City Official Plan sets out a Natural Heritage System which consists of the Greenbelt Natural Heritage System, the Niagara Escarpment Plan and the City Natural Heritage System Core Areas, and Linkages as identified by the City based on Provincial Plans, and the Provincial Policy Statement. The general intent is to protect and enhance these areas, and to provide opportunities for recreation and use where they do not impact on natural heritage features. Where two or more natural features of differing significance overlap in the Natural Heritage System, the more restrictive policies pertaining to those features shall apply.

Within the Natural Heritage System, the Heritage Lands are variously identified on Schedule B to the City Official Plan as follows:

- Core Areas (Rural Plan and Urban Plan)

  - Innovation Park (open and wooded areas adjacent to Escarpment brow)
  - Hopkins Tract (valley lands)
  - Nicholson Tracts 1, 2, 3 and 4
  - Cartwright Tract
  - Berry Tract 1 and 2
  - Borer's Falls Conservation Area 1
  - Rock Chapel 1, 4 and 5

- Linkages (Rural Plan)
  - Hopkins Tract (some table land areas)

- Parks & General Open Space (Urban Plan)
  - Innovation Park (watercourse between Innovation Drive and Highway #6)
  - John Prentice Park

- Streams (Urban Plan)
  - Borer's Falls Conservation Area 1

Schedule B currently identifies some of the Heritage Lands within the Greenbelt Protected Countryside; these are the Valley Community Centre Park, portions of the Hopkins Tract, Borer's Falls Conservation Area 2 and 3, and the Berry Tract South. Schedule B also shows the Greenbelt Natural Heritage System on some of the Heritage Lands. At the appropriate time, these designations will change when the City Official Plan is updated to reflect the Niagara Escarpment Plan jurisdiction.

Within the Natural Heritage System policy framework, key natural heritage features are identified in the City Official Plan as follows:

- Life Science ANSI (Rural Plan and Urban Plan)
  - Borer's Falls Conservation Area 1 (north of Canadian National railway)
  - Rock Chapel 1 and part of 4

- Significant Woodlands (Rural Plan and Urban Plan)
  - Innovation Park (wooded areas adjacent to Escarpment brow)
  - Hopkins Tract (valley lands)
  - Nicholson Tract 1, 2, 3 and 4
  - Berry Tract 2 and parts of 1
  - Borer's Falls Conservation Area 1
  - Rock Chapel 1 and parts of 4, and 5

- Alvar and Tall Grass Prairie (Rural Plan)
  - Borer's Falls Conservation Area 1 (north of Canadian National railway)

- Wetlands (Rural Plan And Urban Plan)
  - Borer's Falls Conservation 1

- Lakes and Littoral Zones (Rural Plan)
  - Berry Tract 1
  - Berry Tract South

- Streams (Rural Plan and Urban Plan)
  - Hopkins Tract (valley lands)
  - Nicholson Tracts 1, 2, 3 and 4
  - Cartwright TractBerry Tract 1
  - Berry South Tract
  - Borer's Falls Conservation Area 1, 2 and 3
  - Rock Chapel 1 and 4

- Environmentally Significant Areas (Rural Plan and Urban Plan)
  - Innovation Park (wooded areas adjacent to Escarpment brow)
  - Hopkins Tract (valley lands)
  - Nicholson Tracts 1, 2, 3 and 4
  - Cartwright Tract
  - Berry Tract 1 and 2
  - Berry Tract South (in part)
  - Borer's Falls Conservation Area 1
  - Rock Chapel 1, 5 and 4 (in parts)

For lands outside of the Greenbelt Natural Heritage System (i.e., within the Niagara Escarpment Plan and City Official Plan Urban Area), permitted uses within Core Areas, including associated vegetation protection zones, are existing uses including agricultural uses, forest, fish and wildlife management, conservation and flood, and erosion control by public authority, passive recreation, and infrastructure projects. New development is not permitted within or adjacent to a key natural heritage feature unless evaluated through an Environmental Impact Statement (EIS) and demonstrated that there will be no negative impacts to natural features, and ecological functions, that connectivity between Core Areas is maintained or where possible, enhanced and removal of other natural features is avoided or minimized.

The EIS shall propose vegetation protection zones of sufficient width to protect the Core Area and achieve natural self-sustaining vegetation. Where vegetation protection zones have not been specified the following minimum zone objectives are to be considered by the EIS:

- Permanent or intermittent stream – 30 m, both sides, measured from stable top of bank
- Wetlands – 30 m
- Fish habitat – 30 m from top of bank or meander belt allowance
- Woodlands – 15 m from dripline
- Significant woodlands – 30 m from dripline
- ANSI – 30 m
- Designated valleylands – 15 m from top of bank
  - Berry Tract 1 and 2
  - Berry Tract South (in part)
  - Borer's Falls Conservation Area 1
  - Rock Chapel 1, 5 and 4 (in parts)

Linkages are remnant natural features within the landscape that connect core areas. On Schedule B, Linkages are shown on the Hopkins Tract and adjacent to the Valley Community Centre Park, and the Nicholson Tract 2. The intent is that Linkages be protected and enhanced in order to sustain the Natural Heritage System, wherever possible.

Where new development is proposed within an identified Linkage, a Linkage Assessment is required. Linkages typically include woodlands, other features such as meadows and streams, and watercourses. The City Official Plan sets out the basic information requirements for Linkage Assessments. The City Council has adopted guidelines for EIS and Linkage Assessment Reports.

In addition to Linkages, the City Official Plan acknowledges that there are hedgerows that are worthy of protection as they function similarly to linkages or represent a feature that contributes to the landscape.

The City Official Plan sets out special policy areas where additional studies are required to determine ultimate land use and establish policies to address unique local conditions. Map A to Volume 3 of the Rural Official Plan identifies Special Policy Area A on the Pleasant View Area of Dundas, generally located between the Dundas urban area, Highway #6, Old Guelph Road and the Canadian National Railway. Excluded are the Heritage Lands west and north of York Road/Valley Road and Patterson Road.

The intent of the Special Policy Area is that the affected lands in Pleasant View will remain subject to the provisions of the Official Plan for the former Town of Dundas as set out in the Ontario Municipal Board decision dated June 28 1995 in respect of servicing and development. Following the approval of the City-wide Growth Related Integrated Development Strategy, the City established Special Policy Area A to remain as part of the designated Rural Area with the intent of undertaking future studies and secondary planning to ensure conformity for the future development of the area with the, then applicable, Parkway Belt West Plan and the Greenbelt Plan. It is noteworthy that before the Provincial Plans Coordinated Review, these lands were transferred to the jurisdiction of the Niagara Escarpment Plan. At the appropriate time, the City will update the City Official Plan to reflect the Niagara Escarpment Plan jurisdiction on the Pleasant View Area.

2. Planning Regulation

<u>Niagara Escarpment Development Control</u>

Niagara Escarpment Development Control Regulation 828/90 regulates development within the designated area of Development Control as defined by Regulation 826/90. Within the designated area of Development Control, all local Zoning Bylaws and Minister's Zoning Orders have no effect. The designated area of Development Control is not the same as the Niagara Escarpment Plan area. Some sections of the Plan Area have been removed from Development Control, thus allowing local Zoning Bylaws to take sole effect. Some sections of the Plan Area have not been included in the area of Development Control so that local Zoning Bylaws maintain sole effect. An example of the latter is the entire Pleasant View Area which was transferred from the Parkway Belt West Plan to the Niagara Escarpment Plan jurisdiction before the Coordinated Provincial Plan Review.

Current areas of Development Control are shown schematically on maps available from the Niagara Escarpment Commission. At the time of any proposed development on the Heritage Lands, it is important to confirm whether Development Control or local Zoning Bylaws apply.

Generally, Development Control applies to the following Heritage Lands:

- Innovation Park (open and wooded areas adjacent to Escarpment brow)
- Nicholson Tracts 3 and 4
- Berry Tract 1 and 2
- Borer's Falls Conservation Area 1
- Rock Chapel 1, 2, 3, 4 and 5

All other Borer's Falls-Rock Chapel Heritage Lands are subject to City of Hamilton Zoning Bylaws which are outlined in the report section which follows.

Under the Niagara Escarpment Planning and Development Act, any development in the form of the change of use of land, building or structure requires a development permit prior to the issuance of any other approval unless exempt. Change of use of land includes site alteration.

Under Regulation 828/90, certain classes of development are exempt from the requirement to obtain a development permit if the development is included as a permitted use in the Niagara Escarpment Plan and not in conflict with any development permit issued. The list of exemptions is numerous and, by way of example, includes:

- The maintenance of lands, buildings and structures under the jurisdiction of a conservation authority, the establishment of hiking or cross-country ski trails and the erection of signs for the purposes of property identification or interpretive, or recreational information on lands owned by a conservation authority.
- The maintenance of land, buildings and structures for The Bruce Trail by the Bruce Trail Conservancy and the establishment of The Bruce Trail by the Bruce Trail Conservancy on land owned or managed by agreement with the Bruce Trail Conservancy.

Other exemptions deal with public maintenance matters, forestry, agriculture, etc. Any proposed development on the Heritage Lands should be reviewed against the exemption list.

<u>City of Hamilton Zoning Bylaws</u>

The City of Hamilton is preparing one comprehensive Zoning Bylaw to implement the City Urban Official Plan and Rural Official Plan in stages by replacing six existing former area municipal Zoning Bylaws. At this time, comprehensive Zoning Bylaw 05-200 includes zones for the downtown, open space and parks, rural, institutional and industrial zones. New residential, mixed use and commercial zones will follow.

The Borer's Falls-Rock Chapel Heritage Lands not subject to Niagara Escarpment Development Control are subject to Zoning Bylaw 05-200 of the City of Hamilton and Zoning Bylaw 3581-86 of the former Town of Dundas. With the jurisdictional transfer of the Pleasant View Area from the Parkway Belt West Plan to the Niagara Escarpment Plan, Development Control regulation of the affected lands has not been established and as such, Zoning Bylaw 3581-86 of the former Town of Dundas has effect. Where Development Control operates, the underlying zoning has no effect and

is not reported here. Reference can be made to Zoning Bylaw 05-200 should the non-operative zoning be of interest.

Under Zoning Bylaw 05-200, the affected Heritage Lands are zoned as follows:

- Innovation Park – Hamilton Technology Centre zoned Prestige Business Park M3 zone, watercourse between Innovation Drive and Highway #6 zoned Conservation Hazard Lands P5 zone; and
- John Prentice Park – zoned Neighbourhood Park P1 zone.

Under Zoning Bylaw 3581-86, the affected Heritage Lands are zoned as follows:

- Valley Community Centre Park – zoned Park and Recreation PR1 zone, and Public Utilities U zone Exception 57
- Hopkins Tract – zoned Rural RU zone, Open Space 0S zone and Public Utilities U zone Exception 57
- Nicholson Tracts 1 and 2 – zoned Rural RU zone, Rural RU zone Exception 58, Open Space OS zone and Public Utilities U zone Exception 57
- Cartwright Tract – zoned Open Space OS zone, Rural RU zone and Public Utilities U zone Exception 57
- Berry Tract South – zoned Rural RU zone and Open Space OS zone
- Borer's Falls Conservation Area 2 – zoned Rural RU zone, Open Space OS zone and Public Utilities U zone Exception 57
- Borer's Falls Conservation Area 3 – zoned Rural RU zone and Open Space OS zone

Most of these zone designations and regulations were established pursuant to the June 28, 1995 Ontario Municipal Board decision affecting the Pleasant View Area.

These zones reflect the context of constraints to development, limitations on servicing these lands and the, then applicable, jurisdiction of the Parkway Belt West Plan 1978.

Several of the Heritage Lands properties are zoned in part as Public Utilities U zone due to utilities in the form of hydro-electric transmission corridors and natural gas pipelines which extend through the Pleasant View Area. The permitted uses in the Public Utilities zone include government and utility installations, public works yards, and waste transfer stations. Exception 57 prohibits public waste treatment facilities on these lands.

The permitted uses in the Rural RU zone are restricted to agricultural uses limited to field crops, fruit and vegetable farms, and an accessory residence and farm buildings. Residential uses existing at the time of the Zoning Bylaw passage are permitted. New non-farm residential dwellings are also permitted on lots having a minimum 10 ha land area.

Exception 58 to the Rural zone permits only single-detached dwellings existing as of August 14, 1998 and new single-detached dwellings where a building permit has been issued, a site plan approval has been granted or an amendment to the, then applicable, Parkway Belt land use regulations 484/73 and 486/73 has been granted, all before the same date. Essentially, this is a grandfathering provision established on certain lands at the time of the Ontario Municipal Board decision referenced previously.

The uses permitted in the Open Space OS zone are botanical gardens, outdoor recreation uses, nature and interpretive centres, and wildlife sanctuaries, all operated by public authority, and agriculture uses limited to field crops, fruit and vegetable farms.

Permitted uses in the Park and Recreation PR1 zone include parks, playgrounds, picnic areas, camp grounds, golf courses, park maintenance storage and administration facilities, and other recreation uses including but not limited to structured forms such as arenas, curling clubs, stadium, swimming pools and tennis clubs.

Permitted in all zones are flood control works, parks and public thoroughfares, public utilities, memorials, and ornamental structures.

Conservation Authority Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulations

The Heritage Lands straddle the watershed jurisdictions of two Conservation Authorities: the Hamilton Conservation Authority and Conservation Halton. As it affects the Heritage Lands, the jurisdictional boundary between the two Conservation Authorities is defined by the watershed limits of Borer's Creek.

The Heritage Lands within the watershed limits of the Hamilton Conservation Authority are as follows:

- Borer's Falls Conservation Area 1
- Part of Borer's Falls Conservation Area 3
- Rock Chapel 1, 2, 3, 4 and 5

All other Borer's Falls-Rock Chapel Heritage Lands are located within the watershed jurisdiction of Conservation Halton.

On portions of the Heritage Lands within their watershed jurisdictions, each Conservation Authority administers Development, Interference with Wetland and Alteration to Shorelines, and Watercourses regulations made under the Conservation Authorities Act s.28, specifically Ontario Regulation 161/06 and Ontario Regulation 162/06 for the Hamilton Conservation Authority and Conservation Halton respectively. Generally, the regulation area to which the regulations apply are defined as follows:

- The regulatory storm floodplain plus 15 m;
- On confined watercourses, the stable top of bank plus 15 m;
- On unconfined watercourses, the predicted meander belt plus 15 m;
- Provincially Significant Wetlands plus 120 m; and
- All other wetlands plus 30 m.

The regulations of each Conservation Authority are administered based on guidelines which reflect local watershed conditions and objectives, and account for circumstances such as existing land uses and development, additions and accessory structures, and public uses. Permits are required for any building, structure or site alteration within all regulated areas, unless exempted.

3. Additional Natural Heritage Legislation and Policy

Federal Legislation

Federal Fisheries Act
The Federal Fisheries Act contains two key provisions on conservation and protection of fish habitat essential to sustaining freshwater and marine fish species. The Department of Fisheries and Oceans administers section 35, the key habitat protection provision, prohibiting any work or undertaking that would cause the harmful alteration, disruption or destruction of fish habitat. Environment and Climate Change Canada administers section 36, the key pollution prevention provision, prohibiting the deposit of deleterious substances into waters frequented by fish, unless authorized by regulations under the Fisheries Act or other federal legislation. A deleterious substance can be any substance that, if added to any water, would degrade or alter its quality such that it could be harmful to fish, fish habitat or the use of fish by people.

Aquatic Invasive Species Act
Under the Fisheries Act, the Aquatic Invasive Species Act prohibits the import, transport, possession and/or release of priority invasive species, including Asian carps and Zebra Mussels.

Federal Canadian Environmental Assessment Act
The Canadian Environmental Assessment Act, S.C. 1992, c. 37 (CEAA) is an Act of Parliament that was passed by the Government of Canada in 1992. The Act requires federal departments, including Environment Canada, agencies, and Crown corporations to conduct environmental assessments for proposed projects where the federal government is the proponent or where the project involves federal funding, permits, or licensing. The purposes of the Act were set out as follows: (1) to achieve sustainable development that conserves environmental quality by integrating environmental factors into the planning and decision-making process; (2) exercise leadership within Canada and internationally; and (3) to provide access to information and to facilitate public participation.

Migratory Birds Convention Act (1994)
Most species of birds in Canada are protected under the Migratory Birds Convention Act through the Migratory Birds Regulations and the Migratory Birds Sanctuary Guidelines. These policies and regulations ensure the protection of listed migratory bird species, their nests, eggs and offspring.

Species at Risk Act (2002)
Enacted in 2002, the Species at Risk Act (SARA) provides legal protection for federally-listed species at risk (i.e., listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)) on federal lands. The Act helps to protect sensitive species from becoming extinct by securing actions for their recovery.

Provincial Legislation

Ontario Endangered Species Act (2007)
This legislation provides science-based assessment whereby species are assessed by an independent body based on the best-available science and Aboriginal Traditional Knowledge. Species classified as endangered or threatened automatically receive legal protection.

Furthermore, when a species is classified as endangered or threatened, its habitat is also protected. This legislation sets out timelines in the law for producing strategies and plans to recover at-risk species, tools to help reduce the impact of human activity on species and their habitats, and tools to encourage protection and recovery activities.

Ontario Invasive Species Act (2015)
The Ontario Invasive Species Act aims to prevent invasive species (defined as species that are non-native to Ontario and is harming the natural environment or is likely to harm the natural environment) from entering or spreading withing the province. Prohibited and restricted species include those that have not yet been established in Ontario but are predicted to have a strong negative influence if they are introduced or species which are already established in Ontario.

Ontario Fisheries Regulation (2007)
The Ontario Fisheries Regulation prohibits the possession, transport or release of invasive species.

Ontario Environmental Assessment Act (1990)
The Environmental Assessment Act (and amendments and regulations thereto) is a provincial statute that sets out a planning and decision-making process to evaluate the potential environmental effects of a proposed undertaking. Proponents wishing to proceed with an undertaking must document their planning and decision-making process and submit the results from their environmental assessment to the Minister for approval.

Ontario Conservation Authorities Act (1990)
The Conservation Authorities Act was created by the Ontario Provincial Legislature in 1946 to ensure the conservation, restoration and responsible management of hydrological features through programs that balance human, environmental and economic needs. The Act authorizes the formation of conservation authorities. The Conservation Authorities implement regulations associated with some natural heritage features as described in section 3.2.3 above.

Ontario Lakes and Rivers Improvement Act (1990)
The purposes of the Lakes and Rivers Improvement Act are to provide for: (a) the management, protection, preservation and use of the waters of the lakes and rivers of Ontario and the land under them; (b) the protection and equitable exercise of public rights in or over the waters of the lakes and rivers of Ontario; (c) the protection of the interests of riparian owners; (d) the management, perpetuation and use of the fish, wildlife, and other natural resources dependent on the lakes and rivers; (e) the protection of the natural amenities of the lakes and rivers and their shores and banks; and (f) the protection of persons and of property by ensuring that dams are suitably located, constructed, operated and maintained and are of an appropriate nature.

Ontario Clean Water Act (2006)
The Ontario government passed the Clean Water Act in 2006 to implement some of the recommendations of the Walkerton Inquiry. The Clean Water Act ensures communities protect their drinking water supplies through prevention by developing collaborative, watershed-based source protection plans that are locally driven and based on science. The Act established source protection areas and source protection regions. It also created a local multi-stakeholder source protection committee for each area. The committees identify significant existing and future risks to their municipal drinking water sources and develop plans to address these risks.

Provincial Plans and Strategies

Ontario Biodiversity Strategy (2005)
This strategy was developed to protect and conserve Ontario's biodiversity. This goal is achieved through a variety of measureable, time-bound targets. Partnerships between government, private landowners, academic institutions, non-governmental agencies, industrial sectors, urban and rural communities, and Aboriginal communities is key to the success of the protection and sustainable use of biological assets. To ensure sustainable use, the Ontario Biodiversity Strategy uses the concept of "sustainable use: the use of components of biodiversity in a way and at a rate that does not lead to their long-term decline, thereby maintaining the potential for future generations to meet their needs and aspirations" (OMNR 2005).

Ontario Invasive Species Strategic Plan (2012)
Invasive species are a growing threat to the economy and environment in Ontario. This plan details the current threats posed by invasive species and highlights work that has been undertaken, identifies gaps in current programs/policies and outlines necessary future actions to meet objectives. This plan also identifies a need for collaboration with other jurisdictions (nationally and internationally) to expand research, monitoring and enforcement.

A Wetland Conservation Strategy for Ontario 2017-2030 (2017)
This Strategy outlines a framework to guide the future of wetland conservation across the province. The intent of the Strategy is to establish a common focus to protect wetlands. Providing both a primer on applicable legislation, regulations, policies, guidelines, programs, and partnerships as well as a clear vision, goals, desired outcomes, and actions that the Ontario governemnt will undertake that will ultimately lead to halting loss and restoring wetlands across the province.

Appendix 3: Natural Heritage Data Gap Analysis

Appendix 3. Borer's Falls-Rock Chapel Heritage Lands Natural Heritage Data Gap Analysis

PROPERTY NAME	ANSI	Environmentally Significant Area	Wetland	Landcover	ELC	Plants	Birds	Amphibians	Reptiles	Mammals	Fish
Berry Tract 1	No	Borer's Falls – Rock Chapel		Forest	Complete (RBG)	Yes (C2E Species List DUND_16, Checklist of the spontaneous flora of RBG's nature sanctuaries (2003))	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	
Berry Tract 2	No	Borer's Falls – Rock Chapel		Forest	Complete (RBG)	Yes (C2E Species List DUND_16, Checklist of the spontaneous flora of RBG's nature sanctuaries (2003))	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	
Berry Tract South	No	No		Agriculture, field, forest, watercourse	Complete (RBG)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	
Borer's Falls Conservation Area 1	Rock Chapel Escarpment Regional Life Science Candidate ANSI, Rock Chapel Regional Earth Science ANSI	Borer's Falls – Rock Chapel		Forest, watercourse, field, parking lot	Complete (Hamilton Conservation)	Yes (BCFA Management Plan 2002, C2E Species List DUND_16)	Yes (BCFA Management Plan 2002, C2E Species List DUND_16)	Yes (BCFA Management Plan 2002, C2E Species List DUND_16)	Yes (BCFA Management Plan 2002, C2E Species List DUND_16)	Yes (BCFA Management Plan 2002, C2E Species List DUND_16)	Yes (HC Fisheries data)
Borer's Falls Conservation Area 2	No	No		Forest, field, watercourse	Complete (Nolan Property Conservation Easement Agreement, 2013)	Yes (Nolan Property Conservation Easement Agreement, 2013)	Yes (Nolan Property Conservation Easement Agreement, 2013)			Yes (Nolan Property Conservation Easement Agreement, 2013)	
Borer's Falls Conservation Area 3	No	No		Forest, field	Partial (Conservation Halton)						
Cartwright Tract	No	No		Forest, watercourse	Complete (Conservation Halton)						
Hopkins Tract	No	No		Field, forest, agriculture	Partial (Conservation Halton)						
Innovation Park	No	No		Field, forest, recreational	Partial (Conservation Halton)						

PROPERTY NAME	ANSI	Environmentally Significant Area	Wetland	Landcover	ELC	Plants	Birds	Amphibians	Reptiles	Mammals	Fish
John Prentice Park	No	Borer's Falls – Rock Chapel		Manicured grass, field, recreational							
Nicholson Tract 1	No	No		Forest, watercourse	Complete (Conservation Halton)						
Nicholson Tract 2	No	No		Forest, watercourse	Complete (Conservation Halton)						
Nicholson Tract 3	No	No		Forest	Complete (Conservation Halton)						
Nicholson Tract 4	No	No		Forest, field	Complete (Conservation Halton)						
Rock Chapel 1	Rock Chapel Escarpment Regional Life Science Candidate ANSI	Borer's Falls – Rock Chapel		Forest, utility	Complete (RBG)	Yes (**REDACTED**, 2014 Floristic Inventory of RC Nature Sanctuary, C2E Species List DUND_16, RBG ELC Report 2014, Checklist of the spontaneous flora of RBG's nature sanctuaries (2003))	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (C2E Species List DUND_16)	Yes (HC Fisheries data)
Rock Chapel 2	No	Borer's Falls – Rock Chapel		Agriculture, utility, hedgerow	Complete (RBG)	Yes (**REDACTED**, C2E Species List DUND_16, RBG ELC Report 2014, Checklist of the spontaneous flora of RBG's nature sanctuaries (2003))					

PROPERTY NAME	ANSI	Environmentally Significant Area	Wetland	Landcover	ELC	Plants	Birds	Amphibians	Reptiles	Mammals	Fish
Rock Chapel 3	No	No		Agriculture, field, forest	Complete (RBG)	**REDACTED,** Checklist of the spontaneous flora of RBG's nature sanctuaries (2003))					
Rock Chapel 4	No	Borer's Falls – Rock Chapel		Agriculture, forest	Complete (RBG)	**REDACTED**, Checklist of the spontaneous flora of RBG's nature sanctuaries (2003))					
Rock Chapel 5	No	Borer's Falls – Rock Chapel		Field, forest	Complete (RBG)	**REDACTED**, Checklist of the spontaneous flora of RBG's nature sanctuaries (2003))					
Valley Community Centre Park	No	No		Manicured grass, recreational forest	Complete (Conservation Halton)						

Appendix 4: Information Gathering Session Participants

Appendix 4. List of Individuals and/or Agencies Consulted in the preparation of the Borer's Falls-Rock Chapel Heritage Lands Inventory, Issues and Opportunities Report (to date).

Information Gathering Sessions

Group A: Environmental, Recreation and Education – 12 July 2017, 9:30am – 12:00pm

- Bryan Czerneda, Hamilton Burlington Mountain Biking Association/Hamilton Burlington Trails Council
- Kristin O'Conner, Hamilton Harbour Remedial Action Plan (RAP)
- Lesley McDonnell, Hamilton Conservation Authority
- Lisa Grbinicek, Ministry or Natural Resources and Forestry/Niagara Escarpment Commission
- Terry Henderson, City of Hamilton Parks and Recreation
- Dr. David Galbraith, Royal Botanical Gardens
- Peter Kelly, Cootes to Escarpment EcoPark System
- Felicia Radassao, Royal Botanical Gardens
- Barb McKean, Royal Botanical Gardens
- Lindsay Barr, Royal Botanical Gardens
- Mirek Sharp, North-South Environmental Inc.
- Holly Dodds, North-South Environmental Inc.
- Markus Hillar, Schollen & Company Inc.
- Lily D'Souza, Lura Consulting

Group B: Utilities – 12 July 2017, 1:00pm – 3:00pm

- Isabel Vautour-Larabee, Union Gas
- Mirek Sharp, North-South Environmental Inc.
- Holly Dodds, North-South Environmental Inc.
- Markus Hillar, Schollen & Company Inc.
- Lily D'Souza, Lura Consulting

Group C: Cultural Heritage – 12 July 2017, 3:30pm – 5:00 pm

- Alissa Golden, City of Hamilton
- Chelsey Tyers, City of Hamilton
- Olivia Falcone, City of Hamilton
- Sandra Kiemele, Dundas Historical Society/Dundas Museum
- Dr. David Galbraith, Royal Botanical Gardens
- Peter Kelly, Cootes to Escarpment EcoPark System
- Mirek Sharp, North-South Environmental Inc.
- Holly Dodds, North-South Environmental Inc.
- Cecelia Paine
- Lily D'Souza, Lura Consulting

Group D: Community Groups – 12 July 2017, 7:00pm – 9:00pm

- Rosemary Horsewood, Dundas Turtle Watch
- Bill Nanskeville, Dundas Turtle Watch
- Janet Nanskeville, Dundas Turtle Watch

- Chris Boothe, Stewards of Cootes Watershed
- Alan Hansell, Stewards of Cootes Watershed
- Mary Lyn Brown, RBG Auxiliary
- Mirek Sharp, North-South Environmental Inc.
- Holly Dodds, North-South Environmental Inc.
- Lily D'Souza, Lura Consulting

One-on-one meetings with Partner Agencies

Hamilton Conservation Authority
12 October 2017, 1:00pm – 3:30pm

Royal Botanical Gardens
17 October 2017, 9:00am – 11:30am
24 October 2017, 1:30pm – 3:30pm

Appendix 5: Flora Species at Borer's Falls-Rock Chapel Heritage Lands

Appendix 5. Flora species at Borer's Falls-Rock Chapel Heritage Lands.

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
Lardizabalaceae	*Akebia quinata (Houtt.) Dcne.*	Five-leaf Akebia	Yes	GNR	SE1						
Equisetaceae	*Equisetum arvense L.*	Field Horsetail	No	G5	S5						
Ophioglossaceae	*Botrypus virginianus (L.) Michx.*	Rattlesnake Fern	No	G5	S5						
Dennstaedtiaceae	*Pteridium aquilinum var. latiusculum (Desv.) Underw. ex A. Heller*	Bracken Fern	No	G5T5	S5						
Pteridaceae	*Adiantum pedatum L.*	Northern Maidenhair Fern	No	G5	S5						
Cystopteridaceae	*Cystopteris bulbifera (L.) Bernh.*	Bulblet Bladder Fern	No	G5	S5						
	Cystopteris sp.	Fragile Fern	No	G?	S?						
Aspleniaceae	*Asplenium platyneuron (L.) Britton, Sterns & Poggenb.*	Ebony Spleenwort	No	G5	S4				h		
	Asplenium rhizophyllum L.	Walking-Fern	No	G5	S4				h		
Onocleaceae	*Onoclea sensibilis L.*	Sensitive Fern	No	G5	S5						
Athyriaceae	*Athyrium filix-femina (L.) Roth ex Mert.*	Common Lady Fern	No	G5	S5						
Dryopteridaceae	*Dryopteris carthusiana (Vill.) H.P. Fuchs*	Spinulose Wood Fern	No	G5	S5						
	Dryopteris filix-mas subsp. brittonii Fraser-Jenkins & Widen	Britton's Male Fern	No	G5T4?	S4				H		
	Dryopteris intermedia (Muhlenb. ex Willd.) A.Gray	Evergreen Wood Fern	No	G5	S5						
	Dryopteris marginalis (L.) A.Gray	Marginal Wood Fern	No	G5	S5						
	Dryopteris sp.	Wood Fern	No	G?	S?						
	Polystichum acrostichoides (Michx.) Schott	Christmas Fern	No	G5	S5						
Polypodiaceae	*Polypodium virginianum L.*	Rock Polypody	No	G5	S5				h		
Pinaceae	*Larix sp.*	Larch	?	G?	S?						
	Picea sp.	Spruce	?	G?	S?						
	Pinus resinosa Aiton	Red Pine	No	G5	S5				I/N		
	Pinus strobus L.	Eastern White Pine	No	G5	S5						
	Tsuga canadensis (L.) Carrière	Eastern Hemlock	No	G5	S5						
Cupressaceae	*Juniperus virginiana L. var. virginiana*	Eastern Red Cedar	No	G5T5	S5						
	Thuja occidentalis L.	Eastern White Cedar	No	G5	S5						
Taxaceae	*Taxus canadensis Marsh.*	Canadian Yew	No	G5	S4						
Aristolochiaceae	*Asarum canadense L.*	Canada Wild Ginger	No	G5	S5						
Lauraceae	*Lindera benzoin (L.) Blume*	Northern Spicebush	No	G5	S4						
	Sassafras albidum (Nutt.) Nees	Sassafras	No	G5	S4						
Araceae	*Arisaema triphyllum (L.) Schott subsp. triphyllum*	Jack-in-the-pulpit	No	G5T5	S5						
Potamogetonaceae	*Potamogeton crispus L.*	Curly-leaved Pondweed	Yes	G5	SE5				I		
Dioscoreaceae	*Dioscorea villosa L.*	Wild Yam	No	G4G5	S4						
Melanthiaceae	*Trillium erectum L.*	Red Trillium	No	G5	S5						
	Trillium grandiflorum (Michx.) Salisb.	White Trillium	No	G5	S5						
Colchicaceae	*Uvularia grandiflora Sm.*	Large-flowered Bellwort	No	G5	S5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
Smilacaceae	*Smilax herbacea L.*	Herbaceous Carrionflower	No	G5	S4?						
Liliaceae	*Erythronium americanum Ker Gawl. subsp. americanum*	Yellow Trout Lily	No	G5T5	S5						
	Lilium michiganense Farw.	Michigan Lily	No	G5	S4						
	Lilium philadelphicum L.	Wood Lily	No	G5	S5				H		
	Prosartes lanuginosa (Michx.) D.Don	Yellow Fairybells	No	G5	S4						
Orchidaceae	*Corallorhiza maculata (Raf.) Raf.*	Spotted Coralroot	No	G5	S5						
	Epipactis helleborine (L.) Crantz	Braod-leaved Helleborine	Yes	GNR	SE5				I		
	Spiranthes cernua (L.) Rich.	Nodding Ladies'-tresses	No	G5	S5				h		
Iridaceae	*Sisyrinchium montanum Greene*	Strict Blue-eyed Grass	No	G5	S5						
Xanthorrhoeaceae	*Hemerocallis fulva L. L.*	Orange Daylily	Yes	GNA	SE5				I		
Asparagaceae	*Asparagus officinalis L.*	Garden Asparagus	Yes	G5?	SE5				I		
	Convallaria majalis L. var majalis	European Lily-of-the-valley	Yes	G5T5	SE5				I		
	Maianthemum canadense Desf.	Wild Lily-of-the-valley	No	G5	S5						
	Maianthemum racemosum (L.) Link	Large False Solomon's Seal	No	G5	S5						
	Maianthemum stellatum (L.) Link	Star-flowered False Solomon's-seal	No	G5	S5						
	Ornithogalum umbellatum L.	Common Star-of-Bethlehem	Yes	G3G5	SE3				I		
	Polygonatum multiflorum (L.) All.	Eurasian Soloman's Seal	Yes	GNR	SE1				I		
	Polygonatum pubescens (Willd.) Pursh	Hairy Solomon's Seal	No	G5	S5						
Commelinaceae	*Commelina communis L.*	Asiatic Dayflower	Yes	G5	SE3						
	Tradescantia virginiana L.	Virginia Spiderwort	Yes	G5	SE1				I		
Typhaceae	*Sparganium sp.*	Burreed	?	GNR	SNA						
	Typha angustifolia L.	Narrow-leaved Cattail	Yes	G5	SE5						
	Typha latifolia L.	Broad-leaved Cattail	No	G5	S5						
	Typha sp.	Cattail	?	GNA	SNA						
Juncaceae	*Juncus bufonius L.*	Toad Rush	No	G5	S5						
	Juncus dudleyi Wiegand	Dudley's Rush	No	G5	S5						
	Juncus gerardii Loisel. subsp. gerardii	Blackgrass Rush	Yes	G5TNR	SE3				I		
	Juncus tenuis Willd.	Path Rush	No	G5	S5						
	Juncus torreyi Coville	Torrey's Rush	No	G5	S5						
	Luzula acuminata Raf. subsp. acuminata	Hairy Woodrush	No	G5T5	S5						
	Luzula multiflora (Ehrh.) Lej. subsp. multiflora	Many-flowered Woodrush	No	G5T5	S5						
Cyperaceae	*Carex albursina E.Sheld.*	White Bear Sedge	No	G5	S5						
	Carex aurea Nutt.	Golden Sedge	No	G5	S5						
	Carex blanda Dewey	Woodland Sedge	No	G5	S5						
	Carex cephalophora Muhlenb. ex Willd.	Oval-headed Sedge	No	G5	S5						
	Carex crinita Lam. var. crinata	Fringed Sedge	No	G5T5	S5						
	Carex cristatella Britton	Crested Sedge	No	G5	S5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Carex digitalis Willd. var. digitalis	Slender Woodland Sedge	No	G5T5	S4S5						
	Carex granularis Muhlenb. ex Willd.	Limestone Meadow Sedge	No	G5	S5						
	Carex hirtifolia Mack.	Pubescent Sedge	No	G5	S4S5						
	Carex hitchcockiana Dewey	Hitchcock's Sedge	No	G5	S4S5						
	Carex jamesii Schwein.	James' Sedge	No	G5	S4				H		
	Carex laxiflora Lam.	Loose-flowered Sedge	No	G5	S5						
	Carex lupulina Muhlenb. ex Willd.	Hop Sedge	No	G5	S5						
	Carex molesta Mack.	Troublesome Sedge	No	G4	S4S5						
	Carex oligocarpa Schkuhr ex Willd.	Eastern Few-fruited Sedge	No	G4G5	S3				H		
	Carex oligosperma Michx.	Few-seeded Sedge	No	G5	S5				H		
	Carex pensylvanica Lam.	Pennsylvania Sedge	No	G5	S5						
	Carex platyphylla J. Carey	Broad-leaved Sedge	No	G5	S4S5						
	Carex prasina Wahlenb.	Drooping Sedge	No	G4	S4				h		
	Carex radiata (Wahlenb.) Small	Eastern Star Sedge	No	G5	S5						
	Carex rosea Schkuhr ex Willd.	Rosy Sedge	No	G5	S5						
	Carex sp.	Sedge	?	GNR	S?						
	Carex sparganioides Muhlenb. ex Willd.	Burreed Sedge	No	G5	S4S5						
	Carex spicata Hudson	Spiked Sedge	Yes	GNR	SE5				I		
	Carex sprengelii Dewey ex Spreng.	Sprengel's Sedge	No	G5	S5				H		
	Carex tenera Dewey	Tender Sedge	No	G5	S5						
	Carex vulpinoidea Michx.	Fox Sedge	No	G5	S5						
	Cyperus bipartitus Torr.	Shining Flatsedge	No	G5	S5				H		
	Cyperus lupulinus (Spreng.) Marcks subsp. macilentus (Fern.) Marcks	Slender Flatsedge	No	G5T5?	S4				H		
	Eleocharis erythropoda Steud.	Red-stemmed Spikerush	No	G5	S5						
	Eleocharis palustris (L.) Roemer & Schultes	Creeping Spikerush	No	G5?	S5				H		
	Schoenoplectus tabernaemontani (C.C. Gmelin) Pall.	Soft-stemmed Bulrush	No	G5	S5						
	Scirpus atrovirens Willd.	Dark-green Bulrush	No	G5	S5						
	Scirpus cyperinus (L.) Kunth	Common Wooly Bulrush	No	G5	S5						
	Scirpus pendulus Muhlenb. ex Willd.	Hanging Bulrush	No	G5	S5						
Poaceae	*Agropyron cristatum subsp. pectinatum (M. Bieb.) Tzvelev*	Crested Wheatgrass	Yes	G5	SE2				I		
	Agrostis gigantea Roth	Redtop	Yes	G4G5	SE5				I		
	Agrostis perennans (Walter) Tuckerm.	Upland Bentgrass	No	G5	S4?						
	Agrostis sp.	Bentgrass	?	GNR	SNR						
	Andropogon gerardi Vitman	Big Bluestem	No	G5	S4				h		
	Arrhenatherum elatius (L.) P.Beauv. ex J.Presl & C.Presl subsp. Elatius	Tall Oatgrass	Yes	GNRTNR	SE4				I		
	Bromus arvensis L.	Field Brome	Yes	GNR	SE1				I		
	Bromus commutatus Schrad.	Hairy Brome	Yes	GNR	SE4				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Bromus hordeaceus L. subsp. hordeaceus	Soft Brome	Yes	GNRTNR	SE2?				I		
	Bromus inermis Leyss.	Smooth Brome	Yes	G5	SE5				I		
	Bromus japonicus Houtt.	Japanese Brome	Yes	GNR	SE4				I		
	Bromus kalmii A.Gray	Kalm's Brome	No	G5	S4				H		
	Bromus latiglumis (Schibner ex Shear) Hitchc.	Broad-glumed Brome	No	G5	S4				H		
	Bromus pubescens Spreng.	Hairy Woodland Brome	No	G5	S4				h		
	Bromus secalinus L.	Rye Brome	Yes	GNR	SE4				I		
	Bromus sp.	Brome	?	GNR	SNR						
	Bromus tectorum L.	Downy Brome	Yes	GNR	SE5				I		
	Calamagrostis canadensis (Michx.) P.Beauv.	Bluejoint Reedgrass	No	G5	S5						
	Calamagrostis epigejos (L.) Roth	Chee Reedgrass	Yes	G5	SE2				I		
	Cenchrus longispinus (Hack.) Fernald	Long-spined Sandbur	No	G5	S4				I		
	Dactylis glomerata L.	Orchard Grass	Yes	GNR	SE5				I		
	Danthonia spicata (L.) P.Beauv. ex Roem. & Schult.	Poverty Oatgrass	No	G5	S5						
	Dichanthelium acuminatum (Swartz) Gould & C.A. Clark	Tapered Panicgrass	No	G5T5	S5						
	Dichanthelium lanuginosum (Elliott) Gould	Wooly Panicgrass	No	G5	S5						
	Digitaria ischaemum (Schreb.) Muhlenb.	Smooth Crabgrass	Yes	GNR	SE5						
	Digitaria sanguinalis (L.) Scop.	Hairy Crabgrass	Yes	G5	SE5				I		
	Echinochloa crus-galli (L.) P.Beauv.	Large Barnyard Grass	Yes	GNR	SE5				I		
	Elymus canadensis L. var. canadensis	Canada Wildrye	No	G5T5	S5				H		
	Elymus hystrix L.	Bottlebrush Grass	No	G5	S5						
	Elymus repens (L.) Gould	Quackgrass	Yes	GNR	SE5				I		
	Elymus villosus Muhlenb. ex Willd.	Downy Wildrye	No	G5	S4				H		
	Elymus virginicus L.	Virginia Wildrye	No	G5	S5						
	Eragrostis cilianensis (All.) Vignolo ex Janchen	Stinkgrass	Yes	GNR	SE5				I		
	Eragrostis minor Host	Little Lovegrass	Yes	GNR	SE5				I		
	Eragrostis pectinacea (Michx.) Nees var. pectinacea	Tufted Lovegrass	No	G5T5	S5				h		
	Festuca rubra L. subsp. rubra	Red Fescue	Yes	G5T5	SE5				I		
	Festuca subverticillata (Pers.) Alexeev	Nodding Fescue	No	G5	S4				h		
	Festuca trachyphylla (Hackel) Krajina	Hard Fescue	Yes	GNR	SE4				I		
	Glyceria maxima (Hartm.) Holmb.	Rough Mannagrass	Yes	GNR	SE4				I		
	Glyceria striata (Lam.) Hitchc. var. striata	Fowl Mannagrass	No	G5	S5						
	Hordeum jubatum L. subsp. jubatum	Foxtail Barley	No	G5T5	S5?				I		
	Hordeum vulgare L. subsp. vulgare	Common Barley	Yes	GNRTNR	SE2						
	Leersia virginica Willd.	White Cutgrass	No	G5	S4						
	Lolium arundinaceum (Schreb.) Darbyshire	Tall Ryegrass	Yes	GNR	SE5				I		
	Lolium pratense (Huds.) Darbyshire	Meadow Ryegrass	Yes	G5	SE5				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Muhlenbergia mexicana var. filiformis (Torr.) Scribn.	Slim-stemmed Mexican Muhly	No	G5T4T5	S4				H		
	Muhlenbergia schreberi J.F.Gmel.	Schreber's Muhly	No	G5	S4				H		
	Oryzopsis asperifolia Michx.	Rough-leaved Mountain Rice	No	G5	S5						
	Panicum capillare L.	Common Panicgrass	No	G5	S5						
	Panicum dichotomiflorum Michx. subsp. dichotomiflorum	Fall Panicgrass	Yes	G5T5	SE5				I		
	Patis racemosa (Sm.) Romaschenko, P.M. Peterson & Soreng	Black-seeded Ricegrass	No	G5	S4				h		
	Phalaris arundinacea L.	Reed Canarygrass	P	G5	S5						
	Phalaris arundinacea L. var. arundinacea	Reed Canarygrass	No	G5TNR	S5						
	Phleum pratense L. subsp. pratense	Common Timothy	Yes	GNRTNR	SE5				I		
	Phragmites australis (Cav.) Trin. ex Steud. subsp. australis	European Reed	Yes	G5T5	SE5				I		
	Poa annua L.	Annual Bluegrass	Yes	GNR	SE5				I		
	Poa bulbosa subsp. vivipara (Koeler) Arcang.	Viviparous Bulbous Bluegrass	Yes	GNRTNR	SE4				I		
	Poa compressa L.	Canada Bluegrass	Yes	GNR	SE5						
	Poa nemoralis L.	Eurasian Woodland Bluegrass	Yes	G5	SE4				I		
	Poa pratensis L. subsp. pratensis	Kentucky Bluegrass	Yes	G5T5	SE5				I		
	Poa sp.	Bluegrass	?	GNR	S?						
	Schizachne purpurascens (Torr.) Swallen subsp. purpurascens	Purple False Melic	No	G5T5	S5						
	Schizachyrium scoparium (Michx.) Nash var. scoparium	Little Bluestem	No	G5T5	S4				H		
	Secale cereale L.	Cultivated Rye	Yes	GNR	SE3				I		
	Setaria faberi R.A.W. Herrm.	Giant Foxtail	Yes	GNR	SE4				I		
	Setaria pumila (Poir.) Roem. & Schult. subsp. pumila	Yellow Foxtail	Yes	GNRTNR	SE5				I		
	Setaria sp.	Foxtail	Yes	G?	SE?						
	Setaria verticillata (L.) P.Beauv.	Bristly Foxtail	Yes	GNR	SE4				I		
	Setaria viridis (L.) P.Beauv. var. viridis	Green Foxtail	Yes	GNRTNR	SE5				I		
	Sorghastrum nutans (L.) Nash	Yellow Indiangrass	No	G5	S4				H		
	Sorghum bicolor (L.) Moench subsp. bicolor	Sorghum	Yes	GNRTNR	SE1				I		
	Sphenopholis intermedia (Rydb.) Rydb.	Slender Wedgegrass	No	G5	S4S5						
	Sporobolus cryptandrus (Torr.) A.Gray	Sand Dropseed	No	G5	S4				H		
	Sporobolus michauxianus (Hitchc.) P.M. Peterson & Saarela	Pairie Cordgrass	No	G5	S4				H		
	Sporobolus neglectus Nash	Small Dropseed	No	G5	S4						
	Sporobolus vaginiflorus (Torr. ex A.Gray) Alph.Wood	Sheathed Dropseed	No	G5	S2S3						
	Triticum aestivum L.	Common Wheat	Yes	GNR	SE1				I		
Ceratophyllaceae	*Ceratophyllum demersum L.*	Common Hornwort	No	G5	S5				h		
Papaveraceae	*Chelidonium majus L.*	Greater Celadine	Yes	GNR	SE5				I		
	Papaver rhoeas L.	Corn Poppy	Yes	GNR	SE1				I		
	Papaver somniferum L.	Opium Poppy	Yes	GNR	SE1				I		
	Sanguinaria canadensis L.	Bloodroot	No	G5	S5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
Menispermaceae	*Menispermum canadense L.*	Canada Moonseed	No	G5	S4						
Berberidaceae	*Berberis aquifolium Pursh*	Holly-leaved Oregon-grape	Yes	GNR	SE2				I		
	Berberis sp.	Barberry	Yes	G?	S?						
	Berberis vulgaris L.	European Barberry	Yes	GNR	SE5				I		
	Caulophyllum giganteum (Farw.) Leconte & Blackwell	Giant Blue Cohosh	No	G4G5	S5						
	Caulophyllum thalictroides L. Michx.	Blue Cohosh	No	G5	S5						
	Podophyllum peltatum L.	May-apple	No	G5	S5						
Ranunculaceae	*Actaea pachypoda Elliott*	White Baneberry	No	G5	S5						
	Actaea rubra (Aiton) Willd. subsp. rubra	Red Baneberry	No	G5T5	S5						
	Actaea sp.	Baneberry	?	G?	S?						
	Anemone cylindrica A.Gray	Long-headed Anemone	No	G5	S4				h		
	Anemone quinquefolia L. var. quinquefolia	Wood Anemone	No	G5T5	S5						
	Anemone virginiana L.	Tall Anemone	No	G5	S5						
	Anemone virginiana L. var. virginiana	Tall Anemone	No	G5T5	S5?						
	Aquilegia canadensis L.	Red Columbine	No	G5	S5						
	Caltha palustris L.	Yellow Marsh Marigold	No	G5	S5						
	Clematis occidentalis (Hornem.) DC. var. occidentalis	Purple Clematis	No	G5T5	S4				h		
	Clematis virginiana L.	Virginia Clematis	No	G5	S5						
	Hepatica acutiloba DC.	Sharp-lobed Hepatica	No	G5	S5						
	Hepatica americana (DC.) Ker Gawler	Round-lobed Hepatica	No	G5	S5						
	Ranunculus abortivus L.	Kidney-leaved Buttercup	No	G5	S5						
	Ranunculus acris L.	Tall Buttercup	Yes	G5	SE5				I		
	Ranunculus hispidus Michx. var. hispidus	Bristly Buttercup	No	G5T5	S3				H		
	Ranunculus hispidus var. caricetorum (Greene) T.Duncan	Northern Swamp Buttercup	No	G5T5	S5						
	Ranunculus recurvatus Poir. var. recurvatus	Hooked Buttercup	No	G5T5	S5						
	Ranunculus sceleratus L.	Cursed Buttercup	P	G5	S5						
	Ranunculus sceleratus L. var. sceleratus	Cursed Buttercup	Yes	G5T5	SE						
	Ranunculus sp.	Buttercup	?	G?	S?						
	Thalictrum dioicum L.	Early Meadow-rue	No	G5	S5						
	Thalictrum thalictroides (L.) A.J.Eames & B.Boivin	Rue-anemone	No	G5	S3				H		
Hamamelidaceae	*Hamamelis virginiana L.*	American Witch-hazel	No	G5	S4S5						
Grossulariaceae	*Ribes americanum Mill.*	American Black Currant	No	G5	S5						
	Ribes aureum var. villosum DC.	Buffalo Currant	Yes	G5T4T5	SE3				I		
	Ribes cynosbati L.	Eastern Prickly Gooseberry	No	G5	S5						
	Ribes nigrum L.	European Black Currant	Yes	GNR	SE2						
	Ribes sp.	Gooseberry/Currant	?	GNR	S?						
Saxifragaceae	*Micranthes virginiensis (Michx) Small*	Early Saxifrage	No	G5	S5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
Crassulaceae	*Sedum acre L.*	Mossy Stonecrop	Yes	GNR	SE5				I		
	Sedum sarmentosum Bunge	Stringy Stonecrop	Yes	GNR	SE1				I		
Vitaceae	*Parthenocissus quinquefolia (L.) Planch. ex DC.*	Virginia Creeper	No	G5	S4?						
	Parthenocissus sp.	Creeper	?	GNR	SNA						
	Parthenocissus vitacea (Knerr) Hitchc.	Thicket Creeper	No	G5	S5						
	Vitis aestivalis Michx.	Summer Grape	No	G5	S4						
	Vitis riparia Michx.	Riverbank Grape	No	G5	S5						
Fabaceae	*Amphicarpaea bracteata (L.) Fernald*	American Hog Peanut	No	G5	S5						
	Colutea arborescens L.	Bladder Senna	Yes	GNR	SE1				I		
	Desmodium canadense (L.) DC.	Canada Tick-trefoil	No	G5	S4						
	Desmodium cuspidatum (Muhlenb. ex Willd.) DC. ex G.Don	Largebract Tick-trefoil	No	G5	S3				H		
	Desmodium paniculatum (L.) DC var. paniculatum	Panicled Tick-trefoil	No	G5	S4				H		
	Gleditsia triacanthos L. var. inermis (L.) C.K.Schneid.	Thornless Honey Locust	Yes	GNA	SNA						
	Hylodesmum glutinosum (Muhlenb. ex Willd.) H. Ohashi & R.R. Mill	Large Tick-trefoil	No	G5	S4						
	Lespedeza hirta (L.) Hornem. subsp. hirta	Hairy Bush-clover	No	G5T5?	S4				h		
	Lotus corniculatus L.	Garden Bird's-foot Trefoil	Yes	GNR	SE5				I		
	Medicago lupulina L.	Black Medick	Yes	GNR	SE5				I		
	Medicago sativa L. subsp. sativa	Alfalfa	Yes	GNRTNR	SE5				I		
	Melilotus albus Medik.	White Sweet-clover	Yes	G5	SE5				I		
	Melilotus officinalis (L.) Lam.	Yellow Sweet Clover	Yes	GNR	SE5				I		
	Robinia pseudoacacia L.	Black Locust	Yes	G5	SE5				I		
	Robinia viscosa Vent.	Clammy Locust	Yes	G3	SE3						
	Securigera varia (L.) Lassen	Purple Crown-vetch	Yes	GNR	SE5				I		
	Trifolium aureum Pollich	Yellow Clover	Yes	GNR	SE5				I		
	Trifolium campestre Schreb.	Low Hop Clover	Yes	GNR	SE5				I		
	Trifolium hybridum L.	Alsike Clover	Yes	GNR	SE5				I		
	Trifolium pratense L.	Red Clover	Yes	GNR	SE5				I		
	Trifolium repens L.	White Clover	Yes	GNR	SE5				I		
	Trifolium sp.	Clover	Yes	G?	SE?						
	Vicia cracca L.	Tufted Vetch	Yes	GNR	SE5				I		
	Vicia sativa L.	Common Vetch	Yes	GNR	SE5				I		
	Vicia sativa var. angustifolia (L.) Wahlenb.	Narrow-leaved Vetch	Yes	GNR	SE5						
	Vicia sp.	Vetch	?	GNR	SNA						
	Vicia tetrasperma (L.) Schreb.	Four-seed Vetch	Yes	GNR	SE5				I		
	Vicia villosa Roth var. villosa	Hairy Vetch	Yes	G5TNR	SE5				I		
Polygalaceae	*Polygala senega L.*	Seneca Snakeroot	No	G4G5	S4				h		
	Polygala verticillata L.	Whorled Milkwort	No	G5	S3?				H		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Agrimonia gryposepala Wallr.	Hooked Agrimony	No	G5	S5						
	Agrimonia parviflora Aiton	Swamp Agrimony	No	G5	S4				H		
	Agrimonia pubescens Wallr.	Soft Agrimony	No	G5	S4				h		
	Agrimonia sp.	Agrimony	?	G?	S?						
	Agrimonia striata Michx.	Woodland Agrimony	No	G5	S4						
	Amelanchier alnifolia (Nutt.) Nutt. ex M.Roem. var. alnifolia	Saskatoon	No	G5T5	S4?				H		
	Amelanchier arborea (F.Michx.) Fernald	Downy Serviceberry	No	G5	S5						
	Amelanchier interior E.L. Nielsen	Inland Serviceberry	No	GNA	SU						
	Amelanchier laevis Wiegand	Smooth Serviceberry	No	G5	S5						
	Amelanchier sanguinea (Pursh) DC.	Round-leaved Serviceberry	No	G5	S5				h		
	Amelanchier sp.	Serviceberry	?	G?	S?						
	Crataegus calpodendron (Ehrh.) Medik.	Pear Hawthorn	No	G5	S4				h		
	Crataegus chrysocarpa Ashe	Fireberry Hawthorn	No	G5	S5				h		
	Crataegus coccinea L. var. coccinea	Scarlet Hawthorn	No	G5T5	S4				H		
	Crataegus flabellata (Bosc ex Spach) K.Koch	Fan-leaved Hawthorn	No	G4G5	S4						
	Crataegus macracantha Lodd. ex Loudon	Large-thorned Hawthorn	No	G5	S5				h		
	Crataegus macrosperma Ashe	Big-fruited Hawthorn	No	G5	S5						
	Crataegus pruinosa (H.L.Wendl.) K.Koch	Frosted Hawthorn	No	G5	S5				h		
Rosaceae	*Crataegus punctata Jacq.*	Dotted Hawthorn	No	G5	S5						
	Crataegus sp.	Hawthorn	?	GNR	S?						
	Crataegus succulenta Schrad. ex Link	Fleshy Hawthorn	No	G5	S5						
	Fragaria sp.	Strawberry	?	GNR	SNA						
	Fragaria vesca subsp. americana (Porter) Staudt	American Woodland Strawberry	No	G5T5	S5						
	Fragaria virginiana Mill.	Wild Strawberry	No	G5	S5						
	Fragaria virginiana Mill. subsp. virginiana	Wild Strawberry	No	G5T5	S5						
	Geum aleppicum Jacq.	Yellow Avens	No	G5	S5						
	Geum canadense Jacq.	Canada Avens	No	G5	S5						
	Geum fragarioides (Michx.) Smedmark	Barren Strawberry	No	G5	S5						
	Geum laciniatum Murray	Rough Avens	No	G5	S4						
	Geum sp.	Geum	?	GNR	S?						
	Geum urbanum L.	Wood Avens	Yes	G5	SE3				I		
	Geum x catlingii J.-P. Bernard & R. Gautier	Catling's Avens	Yes	GNA	SNA				I		
	Malus coronaria (L.) Mill.	Sweet Crabapple	No	G5	S4						
	Malus pumila Mill.	Common Apple	Yes	G5	SE4				I		
	Malus sp.	Apple	Yes	GNR	SE?						
	Potentilla argentea L.	Silvery Cinquefoil	Yes	GNR	SE5				I		
	Potentilla canadensis L.	Canada Cinquefoil	No	G5	S2?						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Potentilla inclinata Vill.	Ashy Cinquefoil	Yes	GNR	SE4						
	Potentilla norvegica L.	Rough Cinquefoil	No	G5	S5				I		
	Potentilla recta L.	Sulphur Cinquefoil	Yes	GNR	SE5				I		
	Potentilla simplex Michx.	Old Field Cinquefoil	No	G5	S5						
	Potentilla sp.	Cinquefoil	?	GNR	SNA						
	Prunus americana Marshall	American Plum	No	G5	S4				h		
	Prunus avium (L.) L.	Sweet Cherry	Yes	GNR	SE4				I		
	Prunus cerasus L.	Sour Cherry	Yes	GNR	SE1				I		
	Prunus domestica L.	Damson Plum	Yes	GNR	SE2				I		
	Prunus nigra Aiton	Canada Plum	No	G4G5	S4						
	Prunus serotina Ehrh. var. serotina	Black Cherry	No	G5T5	S5						
	Prunus sp.	Cherry	?	G?	S?						
	Prunus spinosa L.	Blackthorn	Yes	G5	SE1				I		
	Prunus virginiana L. var. virginiana	Chokecherry	No	G5T5	S5						
	Pyrus communis L.	Common Pear	Yes	G5	SE4				I		
	Pyrus sp.	Pear	Yes	G?	SE?						
	Rosa blanda Aiton	Smooth Rose	No	G5	S5						
	Rosa canina L.	Dog Rose	Yes	GNR	SE2				I		
	Rosa carolina L.	Carolina Rose	No	G5	S4						
	Rosa multiflora Thunb.	Multiflora Rose	Yes	GNR	SE5				I		
	Rosa palustris Marshall	Swamp Rose	No	G5	S5						
	Rosa rubiginosa L.	Sweetbrier Rose	Yes	GNR	SE4				I		
	Rosa sp.	Rose	?	GNR	S?						
	Rubus allegheniensis Porter	Allegheny Blackberry	No	G5	S5						
	Rubus idaeus L.	Red Raspberry	P	G5	S5						
	Rubus idaeus L. subsp. idaeus	European Red Raspberry	Yes	G5T5	SE1				I		
	Rubus idaeus subsp. strigosus (Michx.) Focke	North American Red Raspberry	No	G5T5	S5						
	Rubus occidentalis L.	Black Raspberry	No	G5	S5						
	Rubus odoratus L.	Purple-flowering Raspberry	No	G5	S5						
	Spiraea x vanhouttei (Briot) Carriere	Van Houtte's Meadowsweet	Yes	GNA	SNA						
Elaeagnaceae	*Elaeagnus umbellata Thunb.*	Autum Olive	Yes	GNR	SE3				I		
Rhamnaceae	*Ceanothus americanus L.*	New Jersey Tea	No	G5	S4				h		
	Rhamnus cathartica L.	European Buckthorn	Yes	GNR	SE5				I		
Ulmaceae	*Ulmus americana L.*	White Elm	No	G5	S5						
	Ulmus rubra Muhlenb.	Slippery Elm	No	G5	S5						
Cannabaceae	*Cannabis sativa L.*	Hemp	Yes	GNR	SE1						
	Celtis occidentalis L.	Common Hackberry	No	G5	S4				h		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Humulus japonicus Siebold & Zucc.	Japanese Hop	Yes	GNR	SE3				I		
Moraceae	*Morus alba L.*	White Mulberry	Yes	GNR	SE5				I		
	Morus alba x Morus rubra	Hybrid Mulberry	Yes	GNA	SNA						
	Morus rubra L.	Red Mulberry	No	G5	S2	END	END	END	H		
Urticaceae	*Pilea pumila (L.) A.Gray*	Canada Clearweed	No	G5	S5						
	Urtica dioica L.	Stinging Nettle	P	G5	S5						
	Urtica dioica L. subsp. dioica	European Stinging Nettle	Yes	G5T5?	SE2				I		
	Urtica dioica subsp. gracilis (Aiton) Selander	Slender Stinging Nettle	No	G5T5	S5						
Fagaceae	*Fagus grandifolia Ehrh.*	American Beech	No	G5	S4						
	Quercus alba L.	White Oak	No	G5	S5						
	Quercus macrocarpa Michx.	Bur Oak	No	G5	S5						
	Quercus muehlenbergii Engelm.	Chinquapin Oak	No	G5	S4						
	Quercus rubra L.	Northern Red Oak	No	G5	S5						
	Quercus velutina Lam.	Black Oak	No	G5	S4						
Juglandaceae	*Carya cordiformis (Wangenh.) K.Koch*	Bitternut Hickory	No	G5	S5						
	Carya glabra (Mill.) Sweet	Pignut Hickory	No	G5	S3				H		
	Carya ovata (Mill.) K.Koch var. ovata	Shagbark Hickory	No	G5T5	S5						
	Carya sp.	Hickory	?	GNR	SNA						
	Juglans cinerea L.	Butternut	No	G4	S2?	END	END	END			
	Juglans nigra L.	Black Walnut	No	G5	S4?						
Betulaceae	*Alnus glutinosa (L.) Gaertn.*	European Black Alder	Yes	GNR	SE4				I		
	Betula papyrifera Marshall	Paper Birch	No	G5	S5						
	Betula pendula Roth	Weeping Birch	Yes	GNR	SE4				I		
	Carpinus caroliniana subsp. virginiana (Marshall) Furlow	Blue-beech	No	G5T5	S5				H		
	Ostrya virginiana (Mill.) K.Koch	Eastern Hop-hornbeam	No	G5	S5						
Cucurbitaceae	*Cucurbita pepo L. subsp. pepo*	Field Pumpkin	Yes	G4G5TNR	SE1						
	Echinocystis lobata (Michx.) Torr. & A.Gray	Wild Cucumber	No	G5	S5						
Celastraceae	*Celastrus orbiculatus Thunb.*	Oriental Bittersweet	Yes	GNR	SE2				I		
	Celastrus scandens L.	Climbing Bittersweet	No	G5	S5						
	Euonymus atropurpureus Jacq.	Eastern Burning-bush	No	G5	S3				H		
	Euonymus obovatus Nutt.	Running Strawberry-bush	No	G5	S4						
Oxalidaceae	*Oxalis corniculata L.*	Creeping Wood-sorrel	Yes	GNR	SE1				I		
	Oxalis dillenii Jacq.	Slender Yellow Wood-sorrel	No	G5	S5?						
	Oxalis sp.	Wood-sorrel	?	GNR	SNA						
	Oxalis stricta L.	European Wood-sorrel	No	G5	S5						
Hypericeae	*Hypericum perforatum L. subsp. perforatum*	Common St. John's-wort	Yes	GNR	SE5				I		
	Hypericum punctatum Lam.	Spotted St. John's-wort	No	G5	S5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
Violaceae	*Hybanthus concolor (T.F.Forst.) Spreng.*	Eastern Green-violet	No	G5	S2				h		
	Viola arvensis Murray	European Field Pansy	Yes	GNR	SE4				I		
	Viola canadensis L.	Canada Violet	No	G5	S5						
	Viola pubescens Aiton	Downy Yellow Violet	No	G5	S5						
	Viola rostrata Pursh	Long-spur Violet	No	G5	S5						
	Viola sororia Willd.	Woolly Blue Violet	No	G5	S5				H		
	Viola sp.	Violet	?	GNR	S?						
	Viola striata Aiton	Striped Cream Violet	No	G5	S3						
	Viola tricolor L. var. tricolor	Johnny-jump-up	Yes	GNR	SE2				I		
Salicaceae	*Populus alba L.*	White Poplar	Yes	G5	SE5				I		
	Populus balsamifera L.	Balsam Poplar	No	G5	S5						
	Populus deltoides W.Bartram ex Marshall subsp. deltoides	Eastern Cottonwood	No	G5T5	S5						
	Populus grandidentata Michx.	Large-tooth Aspen	No	G5	S5						
	Populus nigra var. italica Du Roi	Lombardy Poplar	Yes	G5T1Q	SE3				I		
	Populus tremuloides Michx.	Trembling Aspen	No	G5	S5						
	Populus x canescens (Aiton) Sm.	Grey Poplar	Yes	GNA	SNA						
	Salix alba L.	White Willow	Yes	G5	SE4				I		
	Salix discolor Muhlenb.	Pussy Willow	No	G5	S5						
	Salix eriocephala Michx.	Cottony Willow	No	G5	S5						
	Salix euxina I.V. Belyaeva	Crack Willow	Yes	GNR	SE						
	Salix interior Rowlee	Sandbar Willow	No	GNR	S5						
	Salix lucida Muhlenb.	Shining Willow	No	G5	S5						
	Salix nigra Marshall	Black Willow	No	G5	S4						
	Salix sp.	Willow	?	GNR	S?						
	Salix x fragilis L.	Hybrid White Willow	Yes	GNA	SNA				I		
Euphorbiaceae	*Acalypha rhomboidea Raf.*	Common Three-seed Mercury	No	G5	S5						
	Euphorbia dentata Michx.	Toothed Spurge	Yes	G5	SE1				I		
	Euphorbia glyptosperma Engelm.	Ridge-seeded Spurge	Yes	G5	SE5				I		
	Euphorbia helioscopia L.	Sun Spurge	Yes	G5	SE3				I		
	Euphorbia maculata L.	Spotted Spurge	Yes	G5?	SE5				I		
	Euphorbia marginata Pursh	Snow-on-the-mountain	Yes	G5	SE2				I		
	Euphorbia nutans Lag.	Nodding Spurge	No	G5	S4				h		
	Euphorbia peplus L.	Petty Spurge	Yes	GNR	SE4				I		
	Euphorbia platyphyllos L.	Broad-leaved Spurge	Yes	GNR	SE2?				I		
	Euphorbia vermiculata Raf.	Wormseed Spurge	No	G5	S5				H		
	Mercurialis annua L.	Annual Mercury	Yes	GNR	SE1				I		
	Ricinus communis L.	Castor Bean	Yes	GNR	SE1						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
Linaceae	*Linum usitatissimum L.*	Common Flax	Yes	GNR	SE3				I		
Geraniaceae	*Erodium cicutarium (L.) L'Hér. Ex Aiton subsp. cicutarium*	Common Storksbill	Yes	GNRTNR	SE3				I		
	Geranium maculatum L.	Spotted Geranium	No	G5	S5						
	Geranium pusillum L.	Small-flowered Geranium	Yes	GNR	SE4				I		
	Geranium robertianum L.	Herb-Robert	No	G5	S5				I		
Lythraceae	*Lythrum alatum Pursh var. alatum*	Winged Loosestrife	No	G5T5	S3				H		
	Lythrum salicaria L.	Purple Loosestrife	Yes	G5	SE5				I		
Onagraceae	*Circaea canadensis (L.) Hill subsp. canadensis*	Canada Enchanter's Nightshade	No	G5TNR	S5						
	Epilobium ciliatum Raf. subsp. ciliatum var. ciliatum	Northern Willowherb	No	G5T5	S5						
	Epilobium coloratum Biehler	Purple-veined Willowherb	No	G5	S5						
	Epilobium hirsutum L.	Hairy Willowherb	Yes	GNR	SE5				I		
	Epilobium parviflorum Schreb.	Small-flowered Hairy Willowherb	Yes	GNR	SE4				I		
	Oenothera biennis L.	Common Evening Primrose	No	G5	S5						
	Oenothera filiformis (Small) W.L. Wagner & Hoch	Long-flowered Gaura	Yes	G4G5	SE1				I		
	Oenothera parviflora L.	Small-flowered Evening Primrose	No	G5	S5						
Staphyleaceae	*Staphylea trifolia L.*	American Bladdernut	No	G5	S4						
Anacardiaceae	*Rhus typhina L.*	Staghorn Sumac	No	G5	S5						
	Toxicodendron radicans (L.) Kuntze var. radicans	Eastern Poison Ivy	No	G5T5	S5						
	Toxicodendron radicans var. rydbergii (Small ex Rydb.) Erskine	Western Poison Ivy	No	G5T5	S5						
Sapindaceae	*Acer campestre L.*	Hedge Maple	Yes	GNR	SE1						
	Acer negundo L.	Manitoba Maple	No	G5	S5						
	Acer platanoides L.	Norway Maple	Yes	GNR	SE5				I		
	Acer rubrum L.	Red Maple	No	G5	S5						
	Acer saccharinum L.	Silver Maple	No	G5	S5						
	Acer saccharum Marshall	Sugar Maple	No	G5	S5						
	Acer sp.	Maple	?	G?	S?						
	Acer spicatum Lam.	Mountain Maple	No	G5	S5						
	Acer tataricum subsp. ginnala (Maxim.) Wesmael	Amur maple	Yes	GNRTNR	SE1						
Rutaceae	*Phellodendron amurense Rupr.*	Amur Corktree	Yes	GNR	SE1						
	Zanthoxylum americanum Mill.	Northern Prickly Ash	No	G5	S5						
Simaroubaceae	*Ailanthus altissima (Mill.) Swingle*	Tree-of-heaven	Yes	GNR	SE5				I		
Malvaceae	*Abutilon theophrasti Medik.*	Velvetleaf	Yes	GNR	SE5				I		
	Alcea rosea L.	Hollyhock	Yes	GU	SE4				I		
	Hibiscus trionum L.	Flower-of-an-hour	Yes	GNR	SE4				I		
	Malva moschata L.	Musk mallow	Yes	GNR	SE5				I		
	Malva neglecta Wallr.	Common Mallow	Yes	GNR	SE5				I		
	Tilia americana L.	American Basswood	No	G5	S5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Tilia sp.	Linden	?	GNR	SNA						
Cleomaceae	*Polanisia dodecandra (L.) DC.*	Common Clammyweed	P	G5	S4				H		
	Tarenaya hassleriana (Chodat) Iltis	Pink-queen	Yes	GNR	SE1				I		
Brassicaceae	*Alliaria petiolata (M.Bieb.) Cavara & Grande*	Garlic Mustard	Yes	GNR	SE5				I		
	Alyssum alyssoides (L.) L.	Small Alyssum	Yes	GNR	SE5				I		
	Arabidopsis thaliana (L.) Heynh.	Mouse-ear cress	Yes	GNR	SE5				I		
	Arabis pycnocarpa M. Hopkins var. pycnocarpa	Cream-flowered Rockcress	No	G5T5	S5				H		
	Arabis pycnocarpa var. adpressipilis M. Hopkins	Soft-haired Rockcress	No	G5T4Q	S1				H		
	Armoracia rusticana P.G. Gaertner, B.Meyer & Scherb.	Horseradish	Yes	GNR	SE4						
	Barbarea vulgaris W.T.Aiton	Bitter Wintercress	Yes	GNR	SE5				I		
	Berteroa incana (L.) DC.	Hoary Alyssum	Yes	GNR	SE5				I		
	Boechera grahamii (Lehm.) Windham & Al-Shehbaz	Graham's Rockcress	No	G5	S5						
	Borodinia canadensis (L.) P.J. Alexander & Windham	Canada Rockcress	No	G5	S4?				h		
	Brassica juncea (L.) Czern.	Chinese Mustard	Yes	GNR	SE5				I		
	Brassica napus L.	Rapeseed	Yes	GNR	SE1				I		
	Brassica rapa L.	Field Mustard	Yes	GNR	SE5				I		
	Camelina microcarpa Andrz. ex DC.	Small-seed False-flax	Yes	GNR	SE5				I		
	Capsella bursa-pastoris (L.) Medik.	Common Shepherd's Purse	Yes	GNR	SE5						
	Cardamine concatenata (Michx.) O.Schwarz	Cut-leaved Toothwort	No	G5	S5						
	Cardamine hirsuta L.	Hairy Bittercress	Yes	GNR	SE4				I		
	Cardamine impatiens L.	Narrow-leaved Bittercress	Yes	GNR	SE1				I		
	Descurainia sophia (L.) Webb ex Prantl	Flixweed	Yes	GNR	SE5				I		
	Diplotaxis muralis (L.) DC.	Annual Wallrocket	Yes	GNR	SE3				I		
	Diplotaxis tenuifolia (L.) DC.	Perennial Wallrocket	Yes	GNR	SE5				I		
	Draba verna L.	Spring Draba	Yes	GNR	SE5				I		
	Eruca vesicaria subsp. sativa (Mill.) Thelung	Garden Rocket	Yes	GNRTNR	SE1				I		
	Erucastrum gallicum (Willd.) O.E.Schulz	Common Dog Mustard	Yes	G5	SE5				I		
	Erysimum cheiranthoides L.	Wormseed Wallflower	No	G5	S5				I		
	Hesperis matronalis L.	Dame's Rocket	Yes	G4G5	SE5				I		
	Lepidium campestre (L.) W.T.Aiton	Field Peppergrass	Yes	GNR	SE5				I		
	Lepidium densiflorum Schrad.	Common Peppergrass	Yes	G5	SE5				I		
	Lepidium didymum L.	Lesser Swinecress	Yes	GNR	SEH				I		
	Lepidium ruderale L.	Roadside Peppergrass	Yes	GNR	SE3				I		
	Lepidium virginicum L. subsp. virginicum	Poor-man's Peppergrass	No	G5T5	S5				h		
	Nasturtium microphyllum (Boenn.) Reichb.	Small-leaved Watercress	Yes	GNR	SE5				I		
	Sinapis arvensis L.	Corn Mustard	Yes	GNR	SE5				I		
	Sisymbrium altissimum L.	Tall Tumble Mustard	Yes	GNR	SE5				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Sisymbrium loeselii L.	Loesel's Tumble Mustard	Yes	GNR	SE2				I		
	Sisymbrium officinale (L.) Scop.	Common Tumble Mustard	Yes	GNR	SE5				I		
	Thlaspi arvense L.	Field Pennycress	Yes	GNR	SE5				I		
Santalaceae	*Comandra umbellata (L.) Nutt. subsp. umbellata*	Eastern Bastard Toad-flax	No	G5T5	S5						
Polygonaceae	*Fallopia convolvulus (L.) A.Löve*	Eurasian Black Bindweed	Yes	GNR	SE5				I		
	Persicaria hydropiper (L.) Delarbre	Marshpepper Smartweed	Yes	GNR	SE5				I		
	Persicaria hydropiperoides (Michx.) Small	False Waterpepper	No	G5	S5						
	Persicaria lapathifolia (L.) Delarbre	Pale Smartweed	No	G5	S5				I		
	Persicaria maculosa Gray	Spotted Lady's Thumb	Yes	G3G5	SE5				I		
	Persicaria sp.	Smartweed	?	G?	S?						
	Persicaria virginiana (L.) Gaertner	Virginia Smartweed	No	G5	S4						
	Polygonum achoreum S.F.Blake	Leathery Knotweed	No	G5	S5				H		
	Polygonum aviculare L.	Prostrate Knotweed	P	G5	S4?						
	Polygonum ramosissimum Michx.	Bushy Knotweed	No	G5	S4						
	Rumex acetosella L.	Sheep Sorrel	Yes	GNR	SE5				I		
	Rumex crispus L.	Curled Dock	Yes	GNR	SE5				I		
	Rumex obtusifolius L.	Bitter Dock	Yes	GNR	SE5				I		
	Rumex sp.	Sorrel	?	GNR	SNR						
Caryophyllaceae	*Arenaria serpyllifolia L. var. serpyllifolia*	Thyme-leaf Sandwort	Yes	GNRTNR	SE5				I		
	Cerastium arvense subsp. strictum Gaudin	Matted Field Chickweed	No	G5T5	S4						
	Cerastium fontanum subsp. vulgare (Hartm.) Greuter & Burdet	Common Mouse-ear Chickweed	Yes	GNRTNR	SE5				I		
	Cerastium nutans Raf. var. nutans	Nodding Chickweed	No	G5	S4				H		
	Cerastium pumilum Curtis	European Chickweed	Yes	GNR	SE2				I		
	Cerastium semidecandrum L.	Five-stamen Chickweed	Yes	GNR	SE5				I		
	Cerastium tomentosum L.	Snow-in-summer	Yes	GNR	SE2				I		
	Dianthus armeria L. subsp. armeria	Deptford Pink	Yes	GNRTNR	SE5				I		
	Moehringia lateriflora (L.) Fenzl	Grove Sandwort	No	G5	S5				h		
	Sagina procumbens L.	Procumbent Pearlwort	Yes	G5	SE4				I		
	Saponaria officinalis L.	Bouncing-bet	Yes	GNR	SE5				I		
	Silene antirrhina L.	Sleepy Catchfly	No	G5	S5				H		
	Silene latifolia Poir.	White Campion	Yes	GNR	SE5				I		
	Silene noctiflora L.	Night-flowering Catchfly	Yes	GNR	SE5				I		
	Silene vulgaris (Moench) Garcke	Bladder Campion	Yes	GNR	SE5				I		
	Spergularia rubra (L.) J.Presl & C.Presl	Red Sand-spurrey	Yes	G5	SE3?				I		
	Stellaria graminea L.	Grass-leaved Starwort	Yes	GNR	SE5				I		
	Stellaria media (L.) Vill.	Common Chickweed	Yes	GNR	SE5				I		
Amaranthaceae	*Amaranthus albus L.*	White Amaranth	Yes	GNR	SE5				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Amaranthus blitoides S.Watson	Prostrate Amaranth	Yes	GNR	SE4?				I		
	Amaranthus blitum L. subsp. blitum	Livid Amaranth	Yes	GNRTNR	SE1						
	Amaranthus powellii S.Watson	Powell's Amaranth	Yes	G5T5	SE5				I		
	Amaranthus retroflexus L.	Redroot Amaranth	Yes	G5	SE5				I		
	Atriplex patula L.	Spear Saltbush	Yes	G5	SE5				h		
	Atriplex prostrata Boucher ex DC.	Creeping Saltbush	Yes	G5	SE5				H		
	Bassia scoparia (L.) Voss	Common Kochia	Yes	GNR	SE5				I		
	Chenopodiastrum simplex (Torr.) S.Fuentes, Uotila & Borsch	Maple-leaved Goosefoot	No	G5	S5				h		
	Chenopodium album L.	Common Lamb's-quarters	Yes	G5	SE5				I		
	Dysphania botrys (L.) Mosyakin & Clemants	Jerusalem-oak Goosefoot	Yes	GNR	SE5				I		
	Lipandra polysperma (L.) S.Fuentes, Uotila & Borsch var. polysperma	Many-seed Goosefoot	Yes	GNRTNR	SE1				I		
	Oxybasis glauca (L.) S.Fuentes, Uotila & Borsch subsp. glauca	Oak-leaved Goosefoot	Yes	G5T5	SE5				I		
	Salsola tragus L.	Prickly Russian Thistle	Yes	GNRTNR	SE5				I		
Phytolaccaceae	*Phytolacca americana L. var. americana*	Common Pokeweed	No	G5T5	S4				h		
Nyctaginaceae	*Mirabilis nyctaginea (Michx.) MacMill.*	Heart-leaved Four-o'clock	No	G5	S2				I		
Montiaceae	*Claytonia virginica L.*	Eastern Spring Beauty	No	G5	S5						
Portulacaceae	*Portulaca oleracea L.*	Common Purslane	Yes	GU	SE5				I		
Hydrangeaceae	*Philadelphus coronarius L.*	European Mock-orange	Yes	GNR	SE1				I		
Cornaceae	*Cornus alternifolia L.f.*	Alternate-leaved Dogwood	No	G5	S5						
	Cornus racemosa Lam.	Grey Dogwood	No	G5	S5						
	Cornus rugosa Lam.	Round-leaved Dogwood	No	G5	S5						
	Cornus sericea L.	Red-osier Dogwood	No	G5	S5						
Balsaminaceae	*Impatiens capensis Meerb.*	Spotted Jewelweed	No	G5	S5						
	Impatiens pallida Nutt.	Pale Jewelweed	No	G5	S4						
	Impatiens sp.	Jewelweed	?	G?	S?						
Polemoniaceae	*Phlox divaricata L.*	Wild Blue Phlox	No	G5	S4						
	Phlox subulata L. subsp. subulata	Moss Phlox	No	G5T5	S1?				I		
Primulaceae	*Lysimachia ciliata L.*	Fringed Yellow Loosestrife	No	G5	S5						
Ericaceae	*Gaultheria procumbens L.*	Eastern Teaberry	No	G5	S5						
	Gaylussacia baccata (Wangenh.) K. Koch	Black Huckleberry	No	G5	S4				h		
	Monotropa uniflora L.	Indian Pipe	No	G5	S5						
	Vaccinium angustifolium Aiton	Early Lowbush Blueberry	No	G5	S5						
	Vaccinium pallidum Aiton	Pale Blueberry	No	G5	S4						
Rubiaceae	*Cephalanthus occidentalis L.*	Eastern Buttonbush	No	G5	S5						
	Galium aparine L.	Common Bedstraw	No	G5	S5						
	Galium circaezans Michx.	Licorice Bedstraw	No	G5	S5						
	Galium mollugo L.	Smooth Bedstraw	Yes	GNR	SE5				I		

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	Galium sp.	Bedstraw	?	GNR	S?						
	Galium triflorum Michx.	Three-flowered Bedstraw	No	G5	S5						
Gentianaceae	*Frasera caroliniensis Walter*	American Columbo	No	G5	S2	END	END	END	H		
Apocynaceae	*Apocynum androsaemifolium L. subsp. androsaemifolium*	Spreading Dogbane	No	G5	S5						
	Apocynum cannabinum L.	Hemp Dogbane	No	G5	S5						
	Apocynum cannabinum var. hypericifolium (Aiton) A.Gray	Hemp Dogbane	No	G5T5?	S5						
	Asclepias exaltata L.	Poke Milkweed	No	G5	S4						
	Asclepias syriaca L.	Common Milkweed	No	G5	S5						
	Asclepias tuberosa var. interior (Woodson) Shinners	Butterfly Milkweed	No	G5T5?	S4				h		
	Vinca minor L.	Lesser Periwinkle	Yes	GNR	SE5				I		
	Vincetoxicum nigrum (L.) Moench	Black Swallowwort	Yes	GNR	SE3?				I		
	Vincetoxicum rossicum (Kleopow) Barbaricz	European Swallowwort	Yes	GNR	SE5				I		
	Vincetoxicum sp.	Swallow-wort	Yes	GNR	SNA						
Boraginaceae	*Anchusa arvensis (L.) M.Bieb.*	Small Bugloss	Yes	GNR	SE3				I		
	Anchusa azurea Mill.	Italian Bugloss	Yes	GNR	SE1						
	Anchusa officinalis L.	Common Bugloss	Yes	GNR	SE1						
	Buglossoides arvensis (L.) I.M.Johnst.	Corn Gromwell	Yes	GNR	SE5				I		
	Cynoglossum officinale L.	Common Hound's-tongue	Yes	GNR	SE5				I		
	Echium vulgare L.	Common Viper's Bugloss	Yes	GNR	SE5				I		
	Hackelia virginiana (L.) I.M.Johnst.	Virginia Stickseed	No	G5	S5						
	Hydrophyllum virginianum L. var. virginianum	Virginia Waterleaf	No	G5T5	S5						
	Myosotis arvensis (L.) Hill	Field Forget-me-not	Yes	GNR	SE4				I		
	Myosotis stricta Link ex Roem. & Schult.	Upright Forget-me-not	Yes	GNR	SE4				I		
	Myosotis sylvatica Hoffm.	Woodland Forget-me-not	Yes	G5	SE4				I		
Convolvulaceae	*Calystegia sepium subsp. americana (Sims) Brummit*	American Bindweed	No	G5T5	S5						
	Convolvulus arvensis L.	Field Bindweed	Yes	GNR	SE5				I		
	Ipomoea purpurea (L.) Roth	Common Morning Glory	Yes	GNR	SE2				I		
Solanaceae	*Datura innoxia Mill.*	Angel's Trumpet	Yes	G5	SE1				I		
	Datura stramonium L.	Jimsonweed	Yes	GU	SE5				I		
	Hyoscyamus albus L.	White Henbane	Yes	GNR	SE1						
	Nicandra physalodes (L.) Gaertn.	Apple-of-Peru	Yes	GNR	SE1				I		
	Nicotiana rustica L.	Wild Tobacco	Yes	GU	SE1						
	Petunia x atkinsiana (Sweet) D.Don ex W.H. Baxter	Garden Petunia	Yes	GNA	SNA						
	Physalis heterophylla Nees	Clammy Ground-cherry	No	G5	S4						
	Solanum dulcamara L.	Bittersweet Nightshade	Yes	GNR	SE5				I		
	Solanum lycopersicum L.	Garden Tomato	Yes	GNR	SE2						
	Solanum ptychanthum Dunal ex DC.	Eastern Black Nightshade	No	G5	S5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Solanum rostratum Dunal	Horned Nightshade	Yes	G5?	SE1						
Oleaceae	*Fraxinus americana L.*	White Ash	No	G5	S4						
	Fraxinus pennsylvanica Marshall	Red Ash	No	G5	S4						
	Ligustrum vulgare L.	European Privet	Yes	GNR	SE5				I		
	Syringa sp.	Lilac	Yes	G?	SE?						
	Syringa vulgaris L.	Common Lilac	Yes	GNR	SE5				I		
Plantaginaceae	*Antirrhinum majus L.*	Common Snapdragon	Yes	GNR	SEH				I		
	Chaenorrhinum minus (L.) Lange subsp. minus	Dwarf Snapdragon	Yes	GNR	SE5				I		
	Chelone glabra L.	White Turtlehead	No	G5	S5						
	Kickxia spuria (L.) Dumort.	Round-leaved Cancerwort	Yes	GNR	SE1				I		
	Linaria dalmatica (L.) Mill. subsp. dalmatica	Dalmatian Toadflax	Yes	G5T5?	SE3				I		
	Linaria vulgaris Mill.	Butter-and-eggs	Yes	GNR	SE5				I		
	Penstemon digitalis Nutt. ex Sims	Foxglove Beardtongue	No	G5	S4						
	Penstemon hirsutus (L.) Willd.	Hairy Beardtongue	No	G4	S4						
	Plantago lanceolata L.	English Plantain	Yes	G5	SE5				I		
	Plantago major L.	Common Plantain	Yes	G5	SE5				I		
	Veronica arvensis L.	Corn Speedwell	Yes	GNR	SE5				I		
	Veronica officinalis L.	Common Speedwell	Yes	G5	SE5				I		
	Veronica peregrina L. subsp. peregrina	Purslane Speedwell	No	G5T5	S5				h		
	Veronica persica Poir.	Bird's-eye Speedwell	Yes	GNR	SE4				I		
	Veronica polita Fr.	Wayside Speedwell	Yes	GNR	SE4				I		
	Veronica serpyllifolia L.	Thyme-leaved Speedwell	Yes	G5	SE5?				I		
	Veronica teucrium L.	Broad-leaved Speedwell	Yes	G3G5	SE1						
Scrophulariaceae	*Scrophularia lanceolata Pursh*	Lance-leaved Figwort	No	G5	S4						
	Scrophularia marilandica L.	Carpenter's Figwort	No	G5	S4				h		
	Verbascum blattaria L.	Moth Mullein	Yes	GNR	SE5				I		
	Verbascum phlomoides L.	Clasping Mullein	Yes	GNR	SE1						
	Verbascum thapsus L. subsp. thapsus	Great Mullein	Yes	GNR	SE5				I		
Bignoniaceae	*Catalpa speciosa Teas*	Northern Catalpa	Yes	G4?	SE1				I		
Verbenaceae	*Verbena hastata L.*	Blue Vervain	No	G5	S5						
	Verbena incompta P.W. Michael	Common Clasping Vervain	Yes	GNR	SE1						
	Verbena urticifolia L.	White Vervain	No	G5	S5						
Lamiaceae	*Agastache nepetoides (L.) Kuntze*	Yellow Giant Hyssop	No	G5	S4				H		
	Clinopodium vulgare L.	Wild Basil	No	G5	S5						
	Collinsonia canadensis L.	Canada Horsebalm	No	G5	S4						
	Glechoma hederacea L.	Ground-ivy	Yes	GNR	SE5				I		
	Lamium amplexicaule L.	Common Dead-nettle	Yes	GNR	SE3				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Leonurus cardiaca L. subsp. cardiaca	Common Motherwort	Yes	GNRTNR	SE5				I		
	Lycopus uniflorus Michx.	Northern Water-horehound	No	G5	S5						
	Mentha canadensis L.	Canada Mint	No	G5	S5						
	Monarda fistulosa L.	Wild Bergamot	No	G5	S5						
	Nepeta cataria L.	Catnip	Yes	GNR	SE5				I		
	Prunella vulgaris L.	Common Self-heal	P	G5	S5						
	Prunella vulgaris L. subsp. vulgaris	Common Self-heal	Yes	G5TU	SE3				I		
	Prunella vulgaris subsp. lanceolata (W.P.C.Barton) Piper & Beattie	Lance-leaved Self-heal	No	G5T5	S5						
	Pycnanthemum incanum (L.) Michx. var. incanum	Hoary Mountain-mint	No	G5T5	S1	END	END	END	H	1999	2017
	Salvia pratensis L.	Meadow Sage	Yes	GNR	SE2				I		
	Salvia reflexa Hornem.	Lance-leaved Sage	Yes	G5	SE1				I		
	Stachys palustris L.	Marsh Hedge-nettle	Yes	G5	SE5				I		
Phrymaceae	*Mimulus ringens L. var. ringens*	Square-stemmed Monkeyflower	No	G5T5	S5						
	Phryma leptostachya L. var. leptostachya	Lopseed	No	G5T5	S4S5						
Orobanchaceae	*Orobanche uniflora L. subsp. uniflora*	One-flowered Broomrape	No	G5	S4				H		
	Pedicularis canadensis L.	Canada Lousewort	No	G5	S5				h		
Campanulaceae	*Campanula gieseckeana Vest*	Giesecke's Bellflower	No	G5	S5				h		
	Campanulastrum americanum (L.) Small	American Bellflower	No	G5	S4				h		
	Lobelia inflata L.	Indian Tobacco	No	G5	S5						
Asteraceae	*Achillea borealis Bong. var. borealis*	Woolly Yarrow	No	GNRT5	S5						
	Achillea millefolium L.	Common Yarrow	Yes	G5	SE				I		
	Ageratina altissima (L.) R.M.King & H.Rob. var. altissima	Common White Snakeroot	No	G5T5	S5						
	Ambrosia artemisiifolia L.	Common Ragweed	No	G5	S5						
	Ambrosia trifida L.	Great Ragweed	No	G5	S5				h		
	Antennaria howellii subsp. canadensis (Greene) R.J.Bayer	Canadian Pussytoes	No	G5T5?	S4S5				H		
	Antennaria howellii subsp. neoindica (Greene) R.J.Bayer	Northern Pussytoes	No	G5T5	S5?				H		
	Antennaria neglecta Greene	Field Pussytoes	No	G5	S5						
	Antennaria parlinii Fernald subsp. parlinii	Parlin's Pussytoes	No	G5T5?	SU						
	Antennaria parlinii subsp. fallax (Greene) R.J.Bayer & Stebbins	Deceitful Pussytoes	No	G5T5	S5						
	Anthemis arvensis L.	Corn Camomile	Yes	GNR	SE5				I		
	Anthemis cotula L.	Stinking Chamomile	Yes	G5	SE5				I		
	Arctium lappa L.	Great Burdock	Yes	GNR	SE5				I		
	Arctium minus (Hill) Bernh.	Common Burdock	Yes	GNR	SE5				I		
	Arctium tomentosum Mill.	Woolly Burdock	Yes	GNR	SE1						
	Artemisia absinthium L.	Absinthe Wormwood	Yes	GNR	SE5?				I		
	Artemisia annua L.	Annual Wormwood	Yes	GNR	SE1						
	Artemisia biennis Willd.	Biennial Wormwood	Yes	G5	SE5				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Artemisia ludoviciana Nutt. subsp. ludoviciana	Silver Wormwood	No	G5T5	SU						
	Artemisia vulgaris L.	Common Wormwood	Yes	GU	SE5				I		
	Bellis perennis L.	English Daisy	Yes	GNR	SE5				I		
	Bidens cernua L.	Nodding Beggarticks	No	G5	S5						
	Bidens frondosa L.	Devil's Beggarticks	No	G5	S5						
	Bidens sp.	Beggarticks	?	G?	S?						
	Bidens vulgata Greene	Tall Beggarticks	No	G5	S5						
	Centaurea cyanus L.	Bachelor's Button	Yes	GNR	SE1				I		
	Centaurea jacea L.	Brown Knapweed	Yes	GNR	SE5				I		
	Centaurea macrocephala Mussin-Puschkin ex Willd.	Globe Knapweed	Yes	GNR	SE1						
	Centaurea nigra L.	Black Knapweed	Yes	GNR	SE5?				I		
	Centaurea nigrescens Willd.	Short-fringed Knapweed	Yes	GNR	SE5				I		
	Cichorium intybus L.	Wild Chicory	Yes	GNR	SE5				I		
	Cirsium arvense (L.) Scop.	Canada Thistle	Yes	GNR	SE5				I		
	Cirsium sp.	Thistle	?	GNR	S?						
	Cirsium vulgare (Savi) Ten.	Bull Thistle	Yes	GNR	SE5				I		
	Cosmos bipinnatus Cav.	Garden Cosmos	Yes	GNR	SE1				I		
	Cota tinctoria (L.) J.Gay	Golden Chamomile	Yes	GNR	SE1				I		
	Crepis tectorum L.	Narrow-leaved Hawksbeard	Yes	GNR	SE5				I		
	Cyclachaena xanthiifolia (Nutt.) Fresen.	False Ragweed	Yes	G5	SE1				I		
	Erigeron annuus (L.) Pers.	Annual Fleabane	No	G5	S5						
	Erigeron canadensis L.	Canada Horseweed	No	G5	S5						
	Erigeron philadelphicus L. var. philadelphicus	Philadelphia Fleabane	No	G5T5	S5						
	Erigeron pulchellus Michx. var. pulchellus	Robin's-plantain Fleabane	No	G5T5	S5						
	Erigeron strigosus Muhlenb. ex Willd.	Rough Fleabane	No	G5	S5						
	Eupatorium perfoliatum L.	Common Boneset	No	G5	S5						
	Eurybia macrophylla (L.) Cass.	Large-leaved Aster	No	G5	S5						
	Euthamia graminifolia (L.) Nutt.	Grass-leaved Goldenrod	No	G5	S5						
	Eutrochium maculatum (L.) E.E.Lamont var. maculatum	Spotted Joe Pye Weed	No	G5T5	S5						
	Eutrochium purpureum (L.) E.E.Lamont var. purpureum	Purple Joe Pye Weed	No	G5T5?	S4				H		
	Gaillardia aristata Pursh	Great Blanketflower	Yes	G5	SE1				I		
	Galinsoga quadriradiata Rúiz & Pavón	Hairy Galinsoga	Yes	GNR	SE5				I		
	Helianthus divaricatus L.	Woodland Sunflower	No	G5	S5				h		
	Helianthus giganteus L.	Tall Sunflower	No	G5	S5				H		
	Helianthus strumosus L.	Pale-leaved Sunflower	No	G5	S5				h		
	Helianthus tuberosus L.	Jerusalem Artichoke	No	G5	SU				I		
	Hieracium murorum L.	Wall Hawkweed	Yes	GNR	SE1				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Hieracium umbellatum L.	Umbellate Hawkweed	No	G5	S5				H		
	Inula helenium L.	Elecampane	Yes	GNR	SE5				I		
	Jacobaea vulgaris Gaertn.	Tansy Ragwort	Yes	GNR	SE1				I		
	Lactuca canadensis L.	Canada Lettuce	No	G5	S5						
	Lactuca serriola L.	Prickly Lettuce	Yes	GNR	SE5				I		
	Lapsana communis L.	Common Nipplewort	Yes	GNR	SE5				I		
	Leucanthemum vulgare Lam.	Oxeye Daisy	Yes	GNR	SE5				I		
	Matricaria chamomilla L.	Wild Chamomile	Yes	GNR	SE3				I		
	Matricaria discoidea DC.	Pineappleweed	Yes	G5	SE5				I		
	Nabalus albus (L.) Hook.	White Rattlesnakeroot	No	G5	S5						
	Nabalus altissimus (L.) Hook.	Tall Rattlesnakeroot	No	G5	S5						
	Nabalus sp.	Rattlesnakeroot	?	GNR	SNA						
	Onopordum acanthium L. subsp. Acanthium	Scotch Thistle	Yes	GNRTNR	SE4				I		
	Picris hieracioides L.	Hawkweed Oxtongue	Yes	G5	SE5				I		
	Pilosella aurantiaca (L.) F.W. Shultz & Sch.Bip.	Orange Hawkweed	Yes	GNR	SE5				I		
	Pilosella caespitosa (Dumort.) P.D. Sell & C. West	Meadow Hawkweed	Yes	GNR	SE5				I		
	Pilosella piloselloides (Vill.) Soják ssp. Piloselloides	Tall Hawkweed	Yes	GNRTNR	SE5				I		
	Pilosella piloselloides subsp. praealta (Gochnat) S. Bräutigam & Greuter	King Devil Hawkweed	Yes	GNRTNR	SE1				I		
	Pilosella x floribunda (Wimmer & Grabowski) Fr.	King Devil Hawkweed	Yes	GNA	SNA						
	Polymnia canadensis L.	White-flowered Leafcup	No	G5	S4				h		
	Rudbeckia hirta var. pulcherrima Farw.	Black-eyed Susan	No	G5T5	S5						
	Rudbeckia laciniata L. var. laciniata	Cut-leaved Coneflower	No	G5T5	S5				h		
	Rudbeckia triloba L. var. triloba	Brown-eyed Susan	Yes	G5T4T5	SE4				I		
	Scorzoneroides autumnalis (L.) Moench	Autumn Hawkbit	Yes	GNR	SE5						
	Senecio vulgaris L.	Common Ragwort	Yes	GNR	SE5				I		
	Solidago altissima L. var. altissima	Tall Goldenrod	No	G5T5	S5						
	Solidago caesia L. var. caesia	Blue-stemmed Goldenrod	No	G5T5	S5						
	Solidago caesia L. x Solidago canadensis L.	Hybrid Goldenrod	No	GNR	SNA						
	Solidago canadensis L.	Canada Goldenrod	No	G5	S5						
	Solidago canadensis L. var. canadensis	Canada Goldenrod	No	G5T5	S5						
	Solidago flexicaulis L.	Zigzag Goldenrod	No	G5	S5						
	Solidago gigantea Aiton	Giant Goldenrod	No	G5	S5						
	Solidago juncea Aiton	Early Goldenrod	No	G5	S5						
	Solidago nemoralis Aiton subsp. nemoralis	Grey-stemmed Goldenrod	No	G5T5	S5						
	Solidago rigida L. subsp. rigida	Stiff Goldenrod	No	G5T5	S3				H		
	Solidago sp.	Goldenrod	?	GNR	S?						
	Sonchus arvensis L.	Field Sow-thistle	Yes	GNR	SE5						

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Sonchus arvensis L. subsp. arvensis	Field Sow-thistle	Yes	GNRTNR	SE5				I		
	Sonchus asper (L.) Hill	Prickly Sow-thistle	Yes	GNR	SE5				I		
	Sonchus oleraceus L.	Common Sow-thistle	Yes	GNR	SE5				I		
	Symphyotrichum cordifolium (L.) G.L.Nesom	Heart-leaved Aster	No	G5	S5						
	Symphyotrichum ericoides (L.) G.L.Nesom var. ericoides	White Heath Aster	No	G5T5	S5						
	Symphyotrichum laeve (L.) Á.Löve & D.Löve var. laeve	Smooth Aster	No	G5T5	S5						
	Symphyotrichum lanceolatum (Willd.) G.L.Nesom	White Panicled Aster	No	G5	S5						
	Symphyotrichum lanceolatum (Willd.) G.L.Nesom subsp. lanceolatum	Panicled Aster	No	G5T5	S4?						
	Symphyotrichum lateriflorum (L.) Á.Löve & D.Löve	Calico Aster	No	G5	S5						
	Symphyotrichum novae-angliae (L.) G.L.Nesom	New England Aster	No	G5	S5						
	Symphyotrichum oolentangiense (Riddell) G.L.Nesom	Sky Blue Aster	No	G5	S4						
	Symphyotrichum pilosum (Willd.) G.L.Nesom var. pilosum	Old Field Aster	No	G5T5	S5						
	Symphyotrichum sp.	Aster	?	GNR	SNA						
	Symphyotrichum urophyllum (Lindl. ex DC.) G.L.Nesom	Arrow-leaved Aster	No	G4G5	S4						
	Symphyotrichum x amethystinum (Nutt.) G.L.Nesom	Amethyst Aster	No	GNA	SNA						
	Tanacetum vulgare L.	Common Tansy	Yes	GNR	SE5				I		
	Taraxacum erythrospermum Andrz.	Red-seeded Dandelion	Yes	GNR	SE5				I		
	Taraxacum officinale F.H.Wigg.	Common Dandelion	Yes	G5	SE5						
	Taraxacum palustre (Lyons) Symons	Marsh Dandelion	Yes	GNR	SE5				I		
	Tragopogon dubius Scop.	Yellow Goatsbeard	Yes	GNR	SE5				I		
	Tragopogon porrifolius L.	Purple Goatsbeard	Yes	GNR	SE4?				I		
	Tragopogon pratensis L.	Meadow Goatsbeard	Yes	GNR	SE5				I		
	Tripleurospermum inodorum (L.) Sch.-Bip.	Scentless Chamomile	Yes	GNR	SE				I		
	Tussilago farfara L.	Coltsfoot	Yes	GNR	SE5				I		
Adoxaceae	*Sambucus canadensis L.*	Common Elderberry	No	G5	S5						
	Sambucus racemosa subsp. pubens var. pubens (Michx.) Trautv. & C.A.Mey.	Red Elderberry	No	G5T5	S5						
	Sambucus sp.	Elderberry	?	GNR	SNA						
	Viburnum acerifolium L.	Maple-leaved Viburnum	No	G5	S5						
	Viburnum lentago L.	Nannyberry	No	G5	S5						
	Viburnum opulus L.	Cranberry Viburnum	P	G5	S5						
	Viburnum opulus L. subsp. opulus	Cranberry Viburnum	Yes	G5TNR	SE3?				I		
	Viburnum opulus subsp. trilobum var. americanum Aiton	Highbush Cranberry	No	G5T5	S5						
	Viburnum rafinesquianum Schult.	Downy Arrowwood	No	G5	S5						
Caprifoliaceae	*Diervilla lonicera Mill.*	Northern Bush-honeysuckle	No	G5	S5						
	Dipsacus fullonum L.	Common Teasel	Yes	GNR	SE5				I		
	Lonicera dioica L.	Limber Honeysuckle	No	G5	S5						
	Lonicera maackii (Rupr.) Herder	Maack's Honeysuckle	Yes	GNR	SE2				I		

Family	Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Historical Record	Planted
	Lonicera morrowii A.Gray	Morrow's Honeysuckle	Yes	GNR	SE3				I		
	Lonicera sp.	Honeysuckle	?	GNR	S?						
	Lonicera tatarica L.	Tartarian Honeysuckle	Yes	GNR	SE5				I		
	Lonicera x bella Zabel	Bell's Honeysuckle	Yes	GNA	SNA				I		
	Lonicera xylosteum L.	Dwarf Honeysuckle	Yes	GNR	SE2				I		
	Symphoricarpos albus (L.) S.F. Blake	Thin-leaved Snowberry	P	G5	S5						
	Symphoricarpos albus (L.) S.F. Blake var. albus	Thin-leaved Snowberry	No	G5T5	S5						
	Triosteum aurantiacum E.P. Bicknell var. aurantiacum	Orange-fruit Horse-gentian	No	G5T5	S4S5						
Araliaceae	*Aralia nudicaulis L.*	Wild Sarsaparilla	No	G5	S5						
Apiaceae	*Anethum graveolens L.*	Dill	Yes	GNR	SE1				I		
	Anthriscus caucalis Bieb.	Burr Chervil	Yes	GNR	SE1						
	Cicuta bulbifera L.	Bulbous Water-hemlock	No	G5	S5						
	Cicuta maculata L.	Spotted Water-hemlock	No	G5	S5						
	Conium maculatum L.	Poison-hemlock	Yes	G5	SE2?				I		
	Cryptotaenia canadensis (L.) DC.	Canada Honewort	No	G5	S5						
	Daucus carota L.	Wild Carrot	Yes	GNR	SE5				I		
	Myrrhis odorata (L.) Scop.	Anise	Yes	GNR	SE1						
	Osmorhiza claytonii (Michx.) C.B. Clarke	Hairy Sweet Cicely	No	G5	S5						
	Osmorhiza longistylis (Torr.) DC.	Smooth Sweet Cicely	No	G5	S5				h		
	Pastinaca sativa L.	Wild Parsnip	Yes	GNR	SE5						
	Sanicula canadensis L. var. canadensis	Short-styled Canada Sanicle	No	G5T5	S4						
	Taenidia integerrima (L.) Drude	Yellow Pimpernel	No	G5	S4				h		
	Torilis japonica (Houtt.) DC.	Erect Hedge-parsley	Yes	GNR	SE4				I		

Hamilton NAI (2014):
H – Rare in the City of Hamilton
h – Uncommon in the City of Hamilton
I – Introduced, not native to the City of Hamilton
I/N – Native status in Hamilton in unclear
N/I? – Likely planted

Appendix 6: Carolinian, Prairie and Savannah Indicators at Borer's Falls-Rock Chapel Heritage Lands

Appendix 6. Carolinian, Prairie and Savannah Indicator species at Borer's Falls-Rock Chapel Heritage Lands.

Scientific Name	Common Name	Carolinian Zone	Prairie/ Savannah
Desmodium cuspidatum (Muhlenb. ex Willd.) DC. ex G.Don	Largebract Tick-trefoil	Yes	Yes
Pycnanthemum incanum (L.) Michx. var. incanum	Hoary Mountain-mint	Yes	Yes
Lespedeza hirta (L.) Hornem. subsp. hirta	Hairy Bush-clover	Yes	Yes
Schizachyrium scoparium (Michx.) Nash var. scoparium	Little Bluestem		Yes
Desmodium canadense (L.) DC.	Canada Tick-trefoil		Yes
Sporobolus vaginiflorus (Torr. ex A.Gray) Alph.Wood	Sheathed Dropseed		Yes
Sporobolus neglectus Nash	Small Dropseed		Yes
Sporobolus michauxianus (Hitchc.) P.M. Peterson & Saarela	Pairie Cordgrass		Yes
Sporobolus cryptandrus (Torr.) A.Gray	Sand Dropseed		Yes
Sorghastrum nutans (L.) Nash	Yellow Indiangrass		Yes
Symphyotrichum urophyllum (Lindl. ex DC.) G.L.Nesom	Arrow-leaved Aster		Yes
Comandra umbellata (L.) Nutt. subsp. umbellata	Eastern Bastard Toad-flax		Yes
Vaccinium pallidum Aiton	Pale Blueberry		Yes
Elymus canadensis L. var. canadensis	Canada Wildrye		Yes
Symphyotrichum laeve (L.) Á.Löve & D.Löve var. laeve	Smooth Aster		Yes
Rosa carolina L.	Carolina Rose		Yes
Amelanchier alnifolia (Nutt.) Nutt. ex M.Roem. var. alnifolia	Saskatoon		Yes
Bromus kalmii A.Gray	Kalm's Brome		Yes
Polygala verticillata L.	Whorled Milkwort		Yes
Polygala senega L.	Seneca Snakeroot		Yes
Ceanothus americanus L.	New Jersey Tea		Yes
Campanula gieseckeana Vest	Giesecke's Bellflower		Yes
Symphyotrichum oolentangiense (Riddell) G.L.Nesom	Sky Blue Aster		Yes
Erigeron pulchellus Michx. var. pulchellus	Robin's-plantain Fleabane		Yes
Anemone cylindrica A.Gray	Long-headed Anemone		Yes
Asclepias tuberosa var. interior (Woodson) Shinners	Butterfly Milkweed		Yes
Dichanthelium acuminatum (Swartz) Gould & C.A. Clark	Tapered Panicgrass		Yes
Andropogon gerardi Vitman	Big Bluestem		Yes

Scientific Name	Common Name	Carolinian Zone	Prairie/ Savannah
Helianthus strumosus L.	Pale-leaved Sunflower		Yes
Morus rubra L.	Red Mulberry	Yes	
Malus coronaria (L.) Mill.	Sweet Crabapple	Yes	
Collinsonia canadensis L.	Canada Horsebalm	Yes	
Carex jamesii Schwein.	James' Sedge	Yes	
Persicaria virginiana (L.) Gaertner	Virginia Smartweed	Yes	
Quercus velutina Lam.	Black Oak	Yes	
Frasera caroliniensis Walter	American Columbo	Yes	
Carya glabra (Mill.) Sweet	Pignut Hickory	Yes	
Agrimonia parviflora Aiton	Swamp Agrimony	Yes	
Sanicula canadensis L. var. canadensis	Short-styled Canada Sanicle	Yes	
Juglans nigra L.	Black Walnut	Yes	
Thalictrum thalictroides (L.) A.J.Eames & B.Boivin	Rue-anemone	Yes	
Prosartes lanuginosa (Michx.) D.Don	Yellow Fairybells	Yes	
Vitis aestivalis Michx.	Summer Grape	Yes	
Dioscorea villosa L.	Wild Yam	Yes	
Crataegus pruinosa (H.L.Wendl.) K.Koch	Frosted Hawthorn	Yes	
Euonymus atropurpureus Jacq.	Eastern Burning-bush	Yes	
Euonymus obovatus Nutt.	Running Strawberry-bush	Yes	

Appendix 7: Fauna species at Borer's Falls-Rock Chapel Heritage Lands

Appendix 7. Fauna species at Borer's Falls-Rock Chapel Heritage Lands.

Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Hamilton Breeding Status	Area Sensitive	Comments
BIRDS											
Branta canadensis	Canada Goose		G5	S5					Breeding		
Anas platyrhynchos	Mallard		G5	S5					Breeding		
Phasianus colchicus	Ring-necked Pheasant	Yes	G5	SNA					Breeding		
Bonasa umbellus	Ruffed Grouse		G5	S4				h	Breeding		
Meleagris gallopavo	Wild Turkey		G5	S5					Breeding		
Ardea herodias	Great Blue Heron		G5	S4				h	Breeding		
Cathartes aura	Turkey Vulture		G5	S5B				h	Breeding		
Haliaeetus leucocephalus	Bald Eagle		G5	S2N,S4B	NAR		SC		Breeding	Yes	
Buteo lineatus	Red-shouldered Hawk		G5	S4B	NAR	SC*	NAR	H	Breeding	Yes	
Buteo jamaicensis	Red-tailed Hawk		G5	S5	NAR		NAR		Breeding		
Falco sparverius	American Kestrel		G5	S4				h	Breeding		
Charadrius vociferus	Killdeer		G5	S5B,S5N					Breeding		
Actitis macularius	Spotted Sandpiper		G5	S5					Breeding		
Scolopax minor	American Woodcock		G5	S4B					Breeding		
Larus delawarensis	Ring-billed Gull		G5	S5B,S4N					Breeding		
Columba livia	Rock Pigeon	Yes	G5	SNA					Breeding		
Zenaida macroura	Mourning Dove		G5	S5				h	Breeding		
Coccyzus erythropthalmus	Black-billed Cuckoo		G5	S5B				H	Breeding		
Coccyzus americanus	Yellow-billed Cuckoo		G5	S4B				H	Breeding		
Megascops asio	Eastern Screech-owl		G5	S4	NAR		NAR	h	Breeding		
Bubo virginianus	Great Horned Owl		G5	S4				h	Breeding		
Chaetura pelagica	Chimney Swift		G4G5	S4B,S4N	THR	THR	THR	h	Breeding		
Archilochus colubris	Ruby-throated Hummingbird		G5	S5B				h	Breeding		
Melanerpes carolinus	Red-bellied Woodpecker		G5	S4				h	Breeding		
Picoides pubescens	Downy Woodpecker		G5	S5					Breeding		
Picoides villosus	Hairy Woodpecker		G5	S5				h	Breeding		
Colaptes auratus	Northern Flicker		G5	S4B					Breeding		
Dryocopus pileatus	Pileated Woodpecker		G5	S5				h	Breeding	Yes	
Contopus virens	Eastern Wood-pewee		G5	S4B	SC	SC	SC		Breeding		2017 (breeding)
Empidonax traillii	Willow Flycatcher		G5	S5B					Breeding		
Empidonax minimus	Least Flycatcher		G5	S4B				h	Breeding	Yes	
Sayornis phoebe	Eastern Phoebe		G5	S5B				h	Breeding		
Tyrannus tyrannus	Eastern Kingbird		G5	S4B					Breeding		
Myiarchus crinitus	Great Crested Flycatcher		G5	S4B					Breeding		

Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Hamilton Breeding Status	Area Sensitive	Comments
Lanius ludovicianus	Loggerhead Shrike		G4	S2B	END	END	END		Breeding/rare		1985 (historical)
Vireo gilvus	Warbling Vireo		G5	S5B					Breeding		
Vireo olivaceus	Red-eyed Vireo		G5	S5B					Breeding		
Cyanocitta cristata	Blue Jay		G5	S5					Breeding		
Corvus brachyrhynchos	American Crow		G5	S5B					Breeding		
Eremophila alpestris	Horned Lark		G5	S5B					Breeding		
Tachycineta bicolor	Tree Swallow		G5	S4B					Breeding		
Stelgidopteryx serripennis	Northern Rough-winged Swallow		G5	S4B					Breeding		
Riparia riparia	Bank Swallow		G5	S4B	THR	THR	THR	h	Breeding		
Hirundo rustica	Barn Swallow		G5	S4B	THR	THR	THR		Breeding		
Poecile atricapillus	Black-capped Chickadee		G5	S5					Breeding		
Sitta carolinensis	White-breasted Nuthatch		G5	S5					Breeding	Yes	
Certhia americana	Brown Creeper		G5	S5B				h	Breeding	Yes	
Thryothorus ludovicianus	Carolina Wren		G5	S4				H	Breeding		
Troglodytes aedon	House Wren		G5	S5B					Breeding		
Cistothorus platensis	Sedge Wren		G5	S4B	NAR		NAR	H	Breeding		
Polioptila caerulea	Blue-gray Gnatcatcher		G5	S4B				h	Breeding	Yes	
Sialia sialis	Eastern Bluebird		G5	S5B	NAR		NAR	h	Breeding		
Hylocichla mustelina	Wood Thrush		G4	S4B	THR	THR	SC		Breeding		2017 (breeding)
Turdus migratorius	American Robin		G5	S5B					Breeding		
Dumetella carolinensis	Gray Catbird		G5	S4B					Breeding		
Mimus polyglottos	Northern Mockingbird		G5	S4				h	Breeding		
Toxostoma rufum	Brown Thrasher		G5	S4B				h	Breeding		
Sturnus vulgaris	European Starling	Yes	G5	SNA					Breeding		
Bombycilla cedrorum	Cedar Waxwing		G5	S5B					Breeding		
Vermivora cyanoptera	Blue-winged Warbler		G5	S4B				h	Breeding		
Vermivora chrysoptera	Golden-winged Warbler		G4	S4B	THR	THR	SC	H	Breeding		2013
Vermivora spp.	Hybrid Warbler (Golden x Blue -winged)								---		
Setophaga petechia	Yellow Warbler		G5	S5B					Breeding		
Setophaga ruticilla	American Redstart		G5	S5B				h	Breeding	Yes	
Seiurus aurocapilla	Ovenbird		G5	S4B					Breeding	Yes	
Parkesia motacilla	Louisiana Waterthrush		G5	S3B	THR	SC	THR	H	Breeding		2003
Geothlypis philadelphia	Mourning Warbler		G5	S4B					Breeding		
Geothlypis trichas	Common Yellowthroat		G5	S5B					Breeding		
Setophaga citrina	Hooded Warbler		G5	S4B	NAR		NAR	H	Breeding		
Icteria virens	Yellow-breasted Chat		G5	S1B	END	END	END	H	Breeding/rare		2002 (migrant)
Piranga olivacea	Scarlet Tanager		G5	S4B				h	Breeding	Yes	

Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Hamilton Breeding Status	Area Sensitive	Comments
Pipilo erythrophthalmus	Eastern Towhee		G5	S4B				h	Breeding		
Spizella passerina	Chipping Sparrow		G5	S5B					Breeding		
Spizella pusilla	Field Sparrow		G5	S4B					Breeding		
Passerculus sandwichensis	Savannah Sparrow		G5	S4B					Breeding	Yes	
Melospiza melodia	Song Sparrow		G5	S5B					Breeding		
Cardinalis cardinalis	Northern Cardinal		G5	S5					Breeding		
Pheucticus ludovicianus	Rose-breasted Grosbeak		G5	S4B					Breeding		
Passerina cyanea	Indigo Bunting		G5	S4B					Breeding		
Dolichonyx oryzivorus	Bobolink		G5	S4B	THR	THR	THR		Breeding	Yes	2007; 2014 (migrant)
Agelaius phoeniceus	Red-winged Blackbird		G5	S4					Breeding		
Sturnella magna	Eastern Meadowlark		G5	S4B	THR	THR	THR		Breeding	Yes	2017
Quiscalus quiscula	Common Grackle		G5	S5B					Breeding		
Molothrus ater	Brown-headed Cowbird		G5	S4B					Breeding		
Icterus spurius	Orchard Oriole		G5	S4B				h	Breeding		
Icterus galbula	Baltimore Oriole		G5	S4B					Breeding		
Haemorhous mexicanus	House Finch	Yes	G5	SNA					Breeding		
Spinus tristis	American Goldfinch		G5	S5B					Breeding		
Passer domesticus	House Sparrow	Yes	G5	SNA					Breeding		
MAMMALS											
Didelphis virginiana	Virginia Opossum		G5	S4						No	
Blarina brevicauda	Northern Short-tailed Shrew		G5	S5						No	
Condylura cristata	Star-nosed Mole		G5	S5						No	
Sylvilagus floridanus	Eastern Cottontail		G5	S5						No	
Marmota monax	Groundhog (Woodchuck)		G5	S5						No	
Sciurus carolinensis	Eastern Gray Squirrel		G5	S5						No	
Tamias striatus	Eastern Chipmunk		G5	S5						No	
Tamiasciurus hudsonicus	Red Squirrel		G5	S5						No	
Microtus pennsylvanicus	Meadow Vole		G5	S5						No	
Peromyscus leucopus	White-footed Mouse		G5	S5						No	
Peromyscus maniculatus	Deer Mouse		G5	S5						No	
Vulpes vulpes	Red Fox		G5	S5						No	
Procyon lotor	Raccoon		G5	S5						No	
Mephitis mephitis	Striped Skunk		G5	S5						No	
Odocoileus virginianus	White-tailed Deer		G5	S5						No	
AMPHIBIANS											
Plethodon cinereus	Eastern Red-backed Salamander		G5	S5						No	
Anaxyrus americanus	American Toad		G5	S5						No	

Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Hamilton Breeding Status	Area Sensitive	Comments
Hyla versicolor	Gray Treefrog		G5	S5						No	
Lithobates clamitans	Green Frog		G5	S5						No	
Lithobates pipiens	Northern Leopard Frog		G5	S5	NAR	NAR				Yes	
REPTILES											
Chrysemys picta marginata	Midland Painted Turtle		G5T5	S4	SC					No	
Diadophis punctatus	Ring-necked Snake		G5	S4				H		No	
Lampropeltis triangulum	Eastern Milksnake		G5	S4	SC	SC	NAR			No	
Storeria dekayi	DeKay's Brownsnake		G5	S5	NAR		NAR			No	
Thamnophis sirtalis sirtalis	Eastern Gartersnake		G5T5	S5						No	
FISH											
Pimephales promelas	Fathead Minnow		G5	S5						No	
Rhinichthys atratulus	Blacknose Dace		G5	SNR						No	
Rhinichthys cataractae	Longnose Dace		G5	S5						No	
Semotilus atromaculatus	Creek Chub		G5	S5						No	
Catostomus commersoni	White Sucker		G5	S5						No	
Oncorhynchus mykiss	Rainbow Trout	Yes	G5	SNA						No	
Micropterus dolomieu	Smallmouth Bass		G5	S5						No	
Micropterus salmoides	Largemouth Bass		G5	S5						No	
Etheostoma caeruleum	Rainbow Darter		G5	S4						No	
Etheostoma flabellare	Fantail Darter		G5	S4						No	
Etheostoma nigrum	Johnny Darter		G5	S5						No	
ODONATES											
Aeshna constricta	Lance-tipped Darner		G5	S5						No	
Anax junius	Common Green Darner		G5	S5						No	
Epitheca cynosura	Common Baskettail		G5	S5						No	
Erythemis simplicicollis	Eastern Pondhawk		G5	S5						No	
Leucorrhinia intacta	Dot-tailed Whiteface		G5	S5						No	
Libellula luctuosa	Widow Skimmer		G5	S5						No	
Libellula pulchella	Twelve-spotted Skimmer		G5	S5						No	
Libellula quadrimaculata	Four-spotted Skimmer		G5	S5						No	
Libellula semifasciata	Painted Skimmer		G5	S2						No	
Pantala flavescens	Wandering Glider		G5	S4						No	
Plathemis lydia	Common Whitetail		G5	S5						No	
Sympetrum rubicundulum	Ruby Meadowhawk		G5	S5						No	
Sympetrum semicinctum	Band-winged Meadowhawk		G5	S4						No	
Tramea lacerata	Black Saddlebags		G5	S4						No	
Calopteryx maculata	Ebony Jewelwing		G5	S5						No	

Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Hamilton Breeding Status	Area Sensitive	Comments
Lestes dryas	Emerald Spreadwing		G5	S5						No	
Lestes rectangularis	Slender Spreadwing		G5	S5						No	
Enallagma annexum	Northern Bluet		G5	S4						No	
Enallagma aspersum	Azure Bluet		G5	S3						No	
Enallagma ebrium	Marsh Bluet		G5	S5						No	
Ischnura verticalis	Eastern Forktail		G5	S5						No	
Nehalennia irene	Sedge Sprite		G5	S5						No	
LEPIDOPTERA											
Anatrytone logan	Delaware Skipper		G5	S4						No	
Ancyloxypha numitor	Least Skipper		G5	S5						No	
Epargyreus clarus	Silver-spotted Skipper		G5	S4						No	
Erynnis juvenalis	Juvenal's Duskywing		G5	S5						No	
Euphyes vestris	Dun Skipper		G5	S5						No	
Poanes hobomok	Hobomok Skipper		G5	S5						No	
Polites mystic	Long Dash Skipper		G5	S5						No	
Polites origenes	Crossline Skipper		G4G5	S4						No	
Polites peckius	Peck's Skipper		G5	S5						No	
Polites themistocles	Tawny-edged Skipper		G5	S5						No	
Pompeius verna	Little Glassywing		G5	S4						No	
Thorybes pylades	Northern Cloudywing		G5	S5						No	
Thymelicus lineola	European Skipper	Yes	G5	SNA						No	
Wallengrenia egeremet	Northern Broken-Dash		G5	S5						No	
Papilio canadensis	Canadian Tiger Swallowtail		G5	S5						No	
Papilio cresphontes	Giant Swallowtail		G5	S4						No	
Papilio glaucus	Eastern Tiger Swallowtail		G5	S5						No	
Papilio polyxenes	Black Swallowtail		G5	S5						No	
Papilio troilus	Spicebush Swallowtail		G4?	S4						No	
Colias eurytheme	Orange Sulphur		G5	S5						No	
Colias philodice	Clouded Sulphur		G5	S5						No	
Pieris rapae	Cabbage White	Yes	G5	SNA						No	
Celastrina ladon	Spring Azure		G4G5	SU						No	
Cupido comyntas	Eastern Tailed Blue		G5	S5						No	
Lycaena hyllus	Bronze Copper		G5	S5						No	
Lycaena phlaeas	American Copper		G5	S5						No	
Satyrium calanus	Banded Hairstreak		G5	S4						No	
Satyrium caryaevorus	Hickory Hairstreak		G4	S4						No	
Satyrium liparops	Striped Hairstreak		G5	S5						No	

Scientific Name	Common Name	Introduced	G-Rank	S-Rank	COSEWIC	SARA	ESA	Hamilton NAI	Hamilton Breeding Status	Area Sensitive	Comments
Satyrium titus	Coral Hairstreak		G5	S5						No	
Cercyonis pegala	Common Wood-Nymph		G5	S5						No	
Coenonympha tullia	Common Ringlet		G5	S5						No	
Danaus plexippus	Monarch		G4	S2N,S4B	END	SC	SC			No	
Euphydryas phaeton	Baltimore Checkerspot		G4	S4						No	
Lethe anthedon	Northern Pearly-Eye		G5	S5						No	
Limenitis arthemis arthemis	White Admiral		G5T5	S5						No	
Limenitis arthemis astyanax	Red-spotted Purple		G5T5	S5						No	
Megisto cymela	Little Wood-Satyr		G5	S5						No	
Nymphalis antiopa	Mourning Cloak		G5	S5						No	
Nymphalis l-album	Compton Tortoiseshell		G5	S5						No	
Phyciodes cocyta	Northern Crescent		G5	S5						No	
Phyciodes tharos	Pearl Crescent		G5	S4						No	
Polygonia comma	Eastern Comma		G5	S5						No	
Polygonia interrogationis	Question Mark		G5	S5						No	
Speyeria cybele	Great Spangled Fritillary		G5	S5						No	
Vanessa atalanta	Red Admiral		G5	S5						No	
Vanessa cardui	Painted Lady		G5	S5						No	
Vanessa virginiensis	American Lady		G5	S5						No	
Pyrrharctia isabella	Woolly Bear (Isabella Tiger Moth)		G5	S5						No	
Bleptina caradrinalis	Bent-winged Owlet		G5	SNR						No	
Scopula limboundata	Large Lace-border		G5	SNR						No	

Appendix 8: Summary of Management Issues

Appendix 8. Inventory of management issues per management unit in the Borer's Falls-Rock Chapel Heritage Lands.

MANAGEMENT ISSUE	*RC1*	*RC2*	*RC3*	*RC4*	*RC5*	*BFCA1*	*BFCA2*	*BFCA3*	*BT1*	*JPP*	*BT2*	*BTS*	*CT*	*NT1*	*NT2*	*NT3*	*NT4*	*IP*	*VCCP*	*HT*
Overarching Cootes to Escarpment EcoPark System Management Issues																				
Awareness of Cootes to Escarpment EcoPark System	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Delineation of Current EcoPark System Lands	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lack of Uniform Set of Rules for EcoPark System	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Accommodating Stresses from Increased Use	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Funding	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Trail/Railway Crossings	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Critical Corridor for Connection of Cootes Paradise to the Niagara Escarpment	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Desire and Need for Trail Connections and Recreation Plan	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Access, Parking and Infrastructure Issues																				
Parking and Access Issues				x		x	x	x	x	x	x			x						x
Lack of Access to Lower Borer's Falls						x				x										
Lack of Access to Hopkins Tract South of Railway																				x
CNR Safety Issue						x				x										
Trespassing							x			x				x	x	x	x			x
Failing Trail Structures	x					x														
Recreation Issues																				
Trail Overuse and Erosion	x	x	x	x	x	x			x		x	x								

MANAGEMENT ISSUE	*RC1*	*RC2*	*RC3*	*RC4*	*RC5*	*BFCA1*	*BFCA2*	*BFCA3*	*BT1*	*JPP*	*BT2*	*BTS*	*CT*	*NT1*	*NT2*	*NT3*	*NT4*	*IP*	*VCCP*	*HT*
Trails Proximate to Escarpment Brow	x			x	x	x														
Bruce Trail along Rock Chapel Road				x		x														
Unsanctioned Cycling Use						x														
Cycling Route Connectivity							x	x					x	x	x					
Trail Connectivity							x	x	x				x	x	x					x
Nicholson Tract Transfer of Lots and Road Allowances														x						
Unsanctioned Trails	x	x	x	x	x	x	x	x	x			x	x	x						
Trail Proliferation				x																
Signage	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
User Conflicts	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Off-leash Dogs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Motorized Vehicle Use												x	x	x	x				x	x
Equestrian Use									x			x	x	x						
Hunting					x	x	x	x	x		x	x	x	x						x
Foraging	x					x														
Fire Pits and Party Spots	x					x														
Encroachment Issues																				
Private Unsanctioned Trails						x			x											
Structures and “Yard Extension”						x			x											
Dumping	x			x	x	x			x	x		x		x	x	x				x

MANAGEMENT ISSUE	*RC1*	*RC2*	*RC3*	*RC4*	*RC5*	*BFCA1*	*BFCA2*	*BFCA3*	*BT1*	*JPP*	*BT2*	*BTS*	*CT*	*NT1*	*NT2*	*NT3*	*NT4*	*IP*	*VCCP*	*HT*
Vegetation Removal/Trampling	x								x		x			x						
Septic Drainage														x	x	x				x
Cats/Domestic Pets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Hydrologic Impacts																				
High Run-off and Peak Flows	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Drainage and Erosion	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Water Quality															x			x		x
Polluting Spills				x		x									x			x		x
Ecosystem Management																				
Fragmentation and Edge Impacts	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Decline in Natural Feature Quality	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Forest Health Decline	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Urban-adapted Wildlife	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Loss of Open Woodland/Prairie/Savannah Habitat	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Conservation and Recovery of Species at Risk	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Stream Habitat Improvement															x			x		x
Invasive Species	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Noxious Plants	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Wildlife Crossing/Corridors						x		x					x							
Watershed/Sub-watershed Boundary Issues							x	x												

MANAGEMENT ISSUE	*RC1*	*RC2*	*RC3*	*RC4*	*RC5*	*BFCA1*	*BFCA2*	*BFCA3*	*BT1*	*JPP*	*BT2*	*BTS*	*CT*	*NT1*	*NT2*	*NT3*	*NT4*	*IP*	*VCCP*	*HT*
Cultural Heritage Issues																				
Cultural Heritage Importance of Borer's Mill				x		x														
Cultural Heritage Importance of Farming Remnants		x	x	x	x	x	x	x	x			x	x	x						x
Designation of Hopkins Cemetery																				x
Rotary Club Masonry Building	x																			

RC1 = Rock Chapel 1
RC2 = Rock Chapel 2
RC3 = Rock Chapel 3
RC4 = Rock Chapel 4
RC5 = Rock Chapel 5
JPP = John Prentice Park
BFCA1 = Borer's Falls Conservation Area 1
BFCA2 = Borer's Falls Conservation Area 2
BFCA3 = Borer's Falls Conservation Area 3
BT1 = Berry Tract 1
BT2 = Berry Tract 2
BTS = Berry Tract South
CT = Cartwright Tract
NT1 = Nicholson Tract 1
NT2 = Nicholson Tract 2
NT3 = Nicholson Tract 3
NT4 = Nicholson Tract 4
IP = Innovation Park
VCCP = Valley Community Centre Park
HT = Hopkins Tract

Appendix 9: Management Issue Photographs and Index

Appendix 9. Photographs of Borer's Falls-Rock Chapel Heritage Lands. Photograph numbers correspond to the numbers mapped on Figure Appendix 9. Photographs taken by Holly Dodds, Leah Lefler and Markus Hillar, 2017.

Photograph 1: Dog-strangling Vine along edges of Ray Lowes Side Trail.


Photograph 2: Failing/undersized bridge structure on Ray Lowes Side Trail.

Photograph 3: Trail erosion, unsanctioned cycling activity evidence and failing earthen staircase in Borer's Falls Conservation Area 1.

Photograph 4: Unofficial signage advertising unsanctioned trail that leads from the Bruce Trail to Valley Road in Borer's Falls Conservation Area 1.

Photograph 5: Unsanctioned trail with fallen tree in Borer's Falls Conservation Area 1.

Photograph 6: Unsanctioned trail in Borer's Falls Conservation Area 1.

Photograph 7: Unsanctioned access into Borer's Falls Conservation Area 1 from Valley Road.

Photograph 8: Perched outfall at edge of Borer's Falls Conservation Area 1, near Valley Road.

Photograph 9: Entrance to Bruce Trail on west side of Valley Road. Steep earthen staircase in poor repair. Parking pull-off on Valley Road.

Photograph 10: Cut down signpost is a tripping hazard.

Photograph 11: Creek erosion and bank failure at bridge located on Bruce Trail.

Photograph 11: Creek erosion and bank failure at bridge located on Bruce Trail.

Photograph 12: Trail erosion and tree root exposure.

Photograph 13: Series of staircases up the Niagara Escarpment cliff face in Rock Chapel 1.

Photograph 14: Trail proliferation and erosion.

Photograph 15: Wooden bench located at edge of Escarpment cliff in Rock Chapel 1.

Photograph 16: Unsanctioned trails and lookouts at Rock Chapel 4.

Photograph 17: Unsanctioned trail and lookout at Rock Chapel 4.

Photograph 18: Unsanctioned trail and lookout at Rock Chapel 4.

Photograph 19: Current sanctioned lookout at Borer's Falls located in Rock Chapel 4.

Photograph 20: Access to Bruce Trail from Rock Chapel Road into Rock Chapel 4. Hikers must hike along the road and cross the bridge to access the Bruce Trail. Unsanctioned trails leading to the creek.

Photograph 21: Bruce Trail along Rock Chapel Road passes through gaps in the guardrail. Hikers must walk off the road behind the guardrail for a section, and then on the road for a section. The section of trail behind the guardrail is along the top of a steep cliff.

Photograph 22: Access to Bruce Trail from Romar Drive, entering the west end of Rock Chapel 1.

Photograph 23: Wooden bridge along Bruce Trail in Rock Chapel 1.

Photograph 24: Wooden bench along Bruce Trail in Rock Chapel 1.

Photograph 25: Three-arched stone bridge along Bruce Trail in Rock Chapel 1.

Photograph 26: Steel staircase down Escarpment face in Rock Chapel 1. This staircase provides access to school groups for studying geology. It also provides access to the Armstrong Trail.

Photograph 27: Bruce Trail, pavilion and Rotary Club masonry building (previously used for maple syrup demonstrations) in Rock Chapel 1.

Photograph 28: Unsanctioned trail in Borer's Falls Conservation Area 1

Photograph 29: Unsanctioned trail structures and erosion along Borer's Creek.

Photograph 30: Northwest corner of Hopkins Tract, facing south from York Road.

Photograph 31: Erosional gully formed from tile drainage from agricultural field into Pleasant View Tributary at Hopkins Tract.

Photograph 32: Dumping down Escarpment cliff face at Sydenham lookout, and garbage cleanup.

Photograph 34: Unsanctioned access from unopened road allowance from Rock Chapel Rd.

Photograph 35: Motorized vehicle use on trail. Very wet trail conditions.

Photograph 36: Closed trail in Berry Tract 1.

Photograph 37: Sign post at junction of Thornapple Trail and Bruce W. Duncan Memorial Trail.

Photograph 38: Wooden bench and mowed path in Cartwright Sanctuary.

Photograph 39: Signage and fencing at Cartwright Nature Sanctuary.

Photograph 40: Wooden bridge in Cartwright Tract.

Photograph 41: Wooden boardwalk through wetland in Berry Tract 1.

Cootes to Escarpment EcoPark System

Appendix 9: Photograph Locations

Legend

(#) Photograph Locations

Trails

- Bruce Trail
- Bruce Side Trail
- RBG Trails
- Conservation Halton Trails
- Heritage Lands Boundary

Highway 5
Highway 6
Highway 403
Rock Chapel Road
Sydenham Road
Olympic Drive
Dundas

N
W
E
S

0 250 500 1,000
Meters

Sources of Information:
Royal Botanical Gardens
Conservation Halton
Hamilton Conservation Authority
City of Hamilton
Land Information Ontario

Data Disclaimer:
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Cootes to Escarpment EcoPark System

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