



Cootes Paradise Heritage Lands MANAGEMENT PLAN

Final Report

Prepared for Cootes to Escarpment EcoPark System

October 2018

Cootes to Escarpment EcoPark System Partners



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Halton



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EXECUTIVE SUMMARY

The purpose of this Management Plan is to develop a set of management directions for the Cootes Paradise Heritage Lands, which is one of six Heritage Lands within the Cootes to Escarpment EcoPark System. The Heritage Lands are owned by Royal Botanical Gardens, City of Hamilton and the Hamilton Conservation Authority. This Management Plan will inform the protection, enhancement and communication of the important natural and cultural features within the Cootes Paradise Heritage Lands. This Management Plan is a compilation of detailed information about the Cootes Paradise Heritage Lands and the articulation of the partner agencies' joint vision for the holistic management of their lands. It provides a framework for future planning and implementation actions at the individual site level.

Development of this Management Plan involved community consultation to identify management issues and concerns as well as compilation of information on the recreational, natural and cultural resources of the Heritage Lands (detailed in the Inventory, Issues and Opportunities report for the Cootes Paradise Heritage Lands, North-South Environmental Inc. et al. 2018). This Management Plan also applied the Niagara Escarpment Parks and Open Space System planning framework to identify classifications and zones (detailed in the Classification and Zoning report for the Cootes Paradise Heritage Lands, Appendix 1).

This Management Plan contains a summary of the background and context of the Cootes Paradise Heritage Lands area followed by a summary of significance. Further detailed information can be found in the Inventory, Issues and Opportunities Report (North-South Environmental Inc. et al. 2018). Section 3.0 discusses issues and opportunities. Section 4.0 summarizes the management recommendations for the Heritage Lands, including the classification and zoning of the Heritage Lands, followed by implementation recommendations in Section 5.0 and monitoring recommendations in Section 6.0.

This Management Plan recommends several actions for future management of the Cootes Paradise Heritage Lands. The recommendations are organized into three categories:

- Approach to Management Recommendations;
- Overarching Management Recommendations; and
- Cootes Paradise Heritage Lands Management Recommendations.

An outline for implementing the recommended management actions is provided in Section 5.0 after which monitoring, and evaluation are identified in Section 6.0.

1.0 Introduction

1.1 Study Background

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 (BTC), Hamilton Naturalists' Club, and Hamilton Harbour Remedial Action Plan (RAP), undertook an initiative to develop a strategy to protect, connect and restore natural lands and open space between the Niagara Escarpment and Cootes Paradise. 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):

- Burlington Heights Heritage Lands;
- Clappison-Grindstone Heritage Lands;
- Waterdown-Sassafras Woods Heritage Lands
- Cootes Paradise Heritage Lands;
- Borer's Falls-Rock Chapel Heritage Lands; and
- Lower Grindstone 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 unauthorized use and access. These stressors often 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 that a Management Plan is prepared for each of the Heritage Lands. Each Management Plan is to:

- 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";
- 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; and
- provide guidance to the partner agencies such that they can implement their respective mandates while providing consistency throughout the EcoPark System.

This report is the Management Plan for the Cootes Paradise Heritage Lands. The Current EcoPark System Lands in the Cootes Paradise Heritage Lands are owned and managed by three partner agencies: Royal Botanical Gardens, Hamilton Conservation Authority, and the City of Hamilton (Figure 2).

The Heritage Lands include both publicly- and privately-owned lands. The Management Plan only addresses the publicly-owned lands and the Royal Botanical Gardens lands, which are referred to as the Current EcoPark System Lands. Privately-owned lands located within the Heritage Lands are referred to

Cootes to Escarpment EcoPark System Vision Map



- EcoPark Land Boundaries
- Privately Owned Outreach Area
- Hydro Corridors
- Water Bodies
- Roads
- Rail Lines
- Hiking Trails



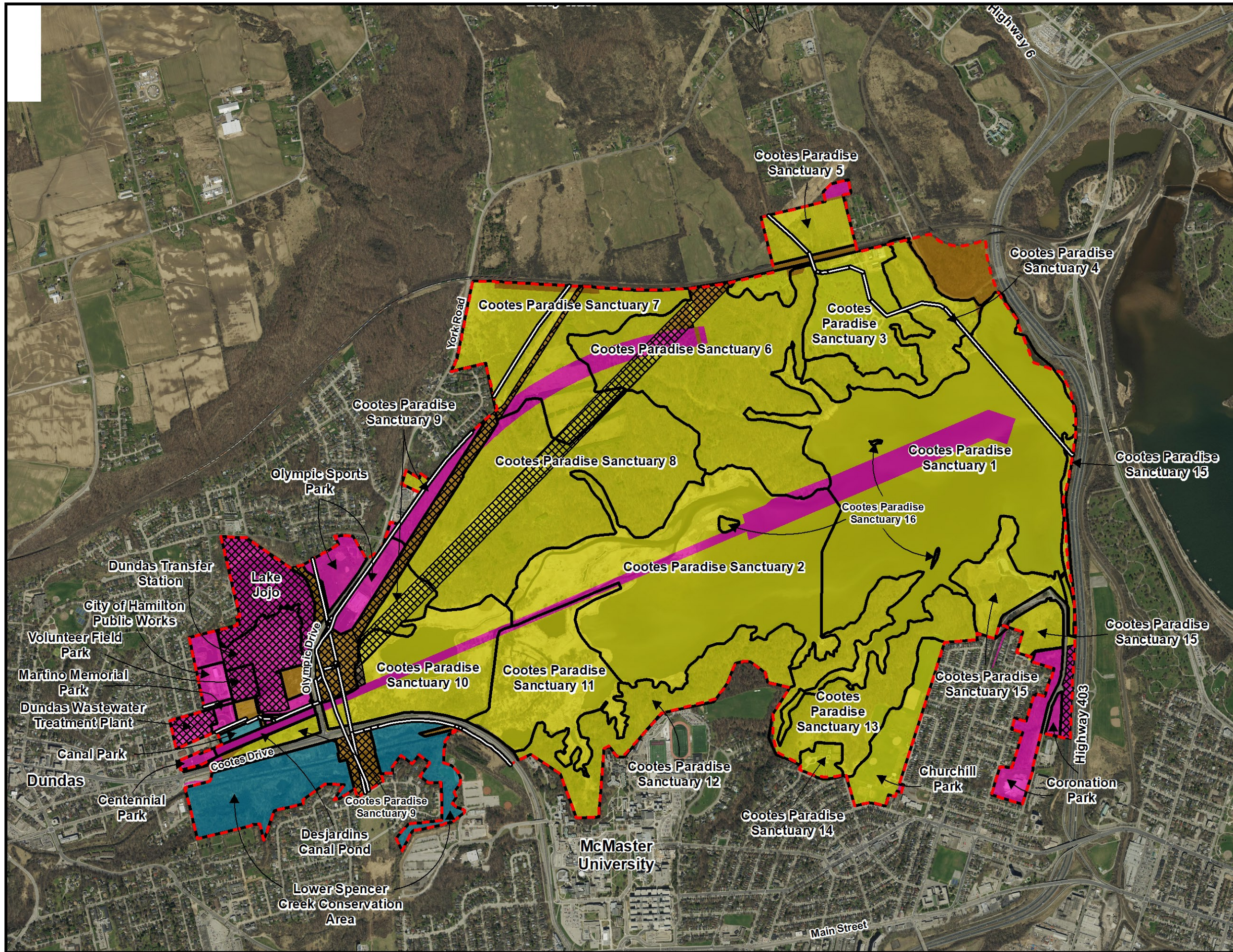
Vision

Our vision for the Cootes to Escarpment EcoPark System is that it will be known internationally 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.



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



Cootes to Escarpment EcoPark System

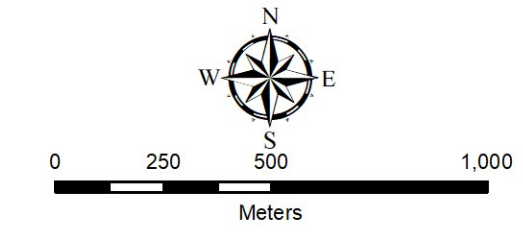
Figure 2: Cootes Paradise Heritage Lands Management Units

Legend

-  Heritage Lands Boundary
-  Gas Pipeline
-  Study Area
-  Privately Owned Outreach Area
-  Utilities
- Current EcoPark System Lands**
-  City of Hamilton
-  Hamilton Conservation Authority
-  Royal Botanical Gardens

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

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as Privately Owned Outreach Areas, and lands outside the Heritage Lands but within the Cootes to Escarpment EcoPark System are referred to as Adjacent Lands (Figure 1).

1.2 Management Plan Purpose and Process

The purpose of this Management Plan is to 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, wildlife crossing 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.

The preparation of this Management Plan occurred in several phases. The first phase involved the development of a Project Charter to establish the purpose, context and rationale for the project, to provide necessary background information, and to introduce the planning process and team that would be formed to generate the Management Plan. During this phase, a Steering Committee and Stakeholder Advisory Committee for the project were formed, and North-South Environmental Inc. (NSE) was retained to develop the Management Plan.

The second phase of the project culminated in the preparation of the Cootes Paradise Heritage Lands Inventory, Opportunities and Issues Report (North-South Environmental Inc. et al. 2018). It identified the significant natural and cultural heritage resources in the Heritage Lands, presented opportunities and issues, and provided preliminary management recommendations. The Inventory, Opportunities and Issues Report was reviewed by the Steering Committee, Stakeholder Advisory Committee and through public and Indigenous communities' consultation.

During the third phase of the project, land classifications and zones for the Cootes Paradise Heritage Lands were established and presented the Land Classification and Zoning Report (May 2018, Appendix 1), based on the Niagara Escarpment Parks and Open Space System (NEPOSS) Planning Manual (MNR 2012). Not all of the Cootes Paradise Heritage Lands are located within the Niagara Escarpment Plan (NEP) area. Therefore approval under NEPOSS is not required for these lands, but the intent is to use the NEPOSS planning approach as a planning tool for all the Heritage Lands, as most of the Cootes to Escarpment EcoPark System is within the NEP area and using one guiding framework for all the Heritage Lands will assist with maintaining consistency in the management approach. The application of NEPOSS provides a framework for identifying appropriate uses that coincide with the natural and cultural heritage resources in the various park and open space areas of the Cootes Paradise Heritage Lands. The

classifications and zones were reviewed by the Steering Committee and Stakeholder Advisory Committee.

This Management Plan is the culmination of information and input generated in the preceding phases of the project. The Management Plan summarizes key information from the Inventory, Opportunities and Issues Report, and presents final management recommendations that strive to balance the protection of the natural and cultural attributes with appropriate uses, education and research opportunities. The land classifications and zones identified in the Land Classification and Zoning Report (Appendix 1) provide defined areas through which management goals and policies can be directed and achieved, including directions for permitted uses.

1.3 Project Governance and Project Team

Each agency and organization that is a Party to the *Memorandum of Understanding Regarding the Cootes to Escarpment EcoPark System* appoints one regular member to a Management Committee. The Management Committee provides tactical leadership for implementing the Cootes to Escarpment EcoPark System and related initiatives. It has authority for decisions concerning specific projects and initiatives and provides direction to Cootes to Escarpment EcoPark System staff.

The Management Committee provides leadership and decision-making to, among other things:

- protect natural and cultural heritage features within the Cootes to Escarpment EcoPark System;
- support the growth of the Cootes to Escarpment EcoPark System through land securement initiatives;
- develop a centralized strategic marketing and communication process;
- develop, promote and implement stewardship programs appropriate to all landowners within the region to provide additional protection for Cootes to Escarpment EcoPark System lands;
- build strong relationships with key stakeholders and communities to address common park and open space issues and interests; and
- work together to provide an interconnected system of trails and educational, research and recreational opportunities.

The Cootes Paradise Heritage Lands Management Plan project is directed by a Steering Committee consisting of representatives from Conservation Halton, City of Hamilton, Hamilton Conservation Authority, Royal Botanical Gardens, and the BTC, as well as the Cootes to Escarpment EcoPark System Coordinator. Input and comment have also been received from a Stakeholder Advisory Committee comprised of thirteen representatives from key stakeholder organizations with a broad geographic interest in the area (Appendix 2). Meetings were also held to gather input from the public and Indigenous communities.

The Project Team is led by North-South Environmental Inc. (project management and natural heritage expertise) and consists of Lura Consulting (public and Indigenous engagement expertise), Schollen & Company Inc. (recreation expertise), Cecelia Paine (cultural expertise), and Andlyn Ltd (planning expertise).

2.0 Characterization of the Cootes Paradise Heritage Lands

The general character of the Cootes Paradise Heritage Lands is provided below. A more detailed characterization was provided in the Inventory, Opportunities and Issues report (North-South Environmental Inc. et al. 2018).

2.1 General Overview

The Cootes Paradise Heritage Lands comprise 762 ha of land and marsh located at the north end of the City of Hamilton. Cootes Paradise Heritage Lands includes an area generally extending between Olympic Drive east to Highway 403 and from Cootes Drive/McMaster University campus and Westdale neighbourhood in Hamilton north to York Road (including all of Cootes Paradise and adjacent lands). Of the 762 ha within the Heritage Lands, 711 ha (93%) 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 the RBG (582 ha), with smaller areas owned by the City of Hamilton (98 ha) and Hamilton Conservation Authority (30 ha). The lands to the south, west, and northwest of Cootes Paradise Heritage Lands are largely urban, including McMaster University. North of York Road, the Cootes Paradise Heritage Lands is bordered by privately-owned lands, some of which is open space, as well as rural residential areas. Cootes Paradise Heritage Lands is adjacent to the Burlington Heights Heritage Lands (on the east) and the Borer's Falls-Rock Chapel Heritage Lands (on the northwest).

Cootes Paradise Heritage Lands includes several recognized environmental designations including Environmentally Significant Areas (ESA), Areas of Natural and Scientific Interest (ANSI), Important Amphibian and Reptile Area (IMPARA) and a Provincially Significant Wetland (PSW) which comprises the largest river mouth wetland on Lake Ontario. Cootes Paradise Heritage Lands is generally classified as a deciduous forest and wetland area. This area contains multiple small watersheds and floodplains, including Spencer Creek, Chedoke Creek and Ancaster Creek. Cootes Paradise Heritage Lands include over 320 ha of marshland known as Cootes Paradise Marsh, the largest in western Lake Ontario, and approximately 25 km of shoreline.

The Heritage Lands include a diverse network of trails, which is connected to the escarpment via a Bruce Trail side trail and the Hamilton Waterfront/Desjardins Trail with a rapidly increasing level of usage. The Heritage Lands also contain traditional urban parks with sports fields and playgrounds (Olympic Sports Park, Coronation Park, Volunteer Field Park, Martino Memorial Park and Churchill Park). The north shore of Cootes Paradise itself is wholly within the RBG and includes an arboretum and interpretive centre. Cootes Paradise Heritage Lands are used extensively by hikers, dog-walkers, birdwatchers, nature enthusiasts and the surrounding community due to their aesthetic, recreational, and natural value. The area provides spectacular views of Hamilton, Hamilton Harbour, deciduous forest and marshland.

Some of the Current EcoPark System Lands support existing infrastructure. Hydro and gas lines intersect the site. Several utilities border the site including a railway across the northern edge. The Dundas Transfer Station, City of Hamilton Public Works, and Dundas Water Treatment occur on the western border of the Heritage Lands. The Desjardins Canal opened in 1837 and contributed to the development

of the Hamilton area. The Great Western Railway was completed in 1853, including a rail bridge over the Desjardins Canal.

2.2 Planning Policy and Regulatory Framework

For the Cootes Paradise Heritage Lands, the current planning policy and regulatory framework reflect the jurisdiction of the Niagara Escarpment Plan, the City of Hamilton Official Plan and Zoning Bylaws, and a small area which remains under the Parkway Belt West Plan at Coronation Park.

Relevant policy documents and regulations include:

- Niagara Escarpment Plan, 2017;
- Niagara Escarpment Development Control Regulation;
- Greenbelt Plan, 2017;
- Provincial Policy Statement, 2014;
- Parkway Belt West Plan, as amended;
- City of Hamilton Official Plan, Rural March 2012, Urban August 2013;
- City of Hamilton Secondary Plans, Ainslie Wood Westdale;
- City of Hamilton Zoning Bylaw (City of Hamilton Zoning Bylaw 05-200, former City of Hamilton Bylaw 6593, former Town of Dundas Zoning Bylaw 3581-86 and 1964); and
- Conservation Authority Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (O. Reg. 161/06 and O. Reg. 162/06).

The current City Official Plan reflects the Provincial Plans in-place at the time of the Official Plan approval. Permitted uses on the Heritage Lands are typically limited to non-intensive recreational uses, trail uses and ancillary facilities like parking and access. Generally, these ancillary facilities are intended to be small in scale with the least impact on the environment and landscape. Given the extent of the Natural Heritage System under the City Official Plan, individual permitted uses may require Environmental Impact Studies depending on the location, conditions and applicable policy and regulation. Development in proximity to natural heritage features may be subject to greater separation distances to maintain the integrity of features. In the area of Niagara Escarpment Development Control, development permits may be required for individual projects on the Cootes Paradise Heritage Lands unless the nature of the project falls under the development control exemptions. For the Cootes Paradise Sanctuary (a named park within NEPOSS), preparation of a master plan or management plan in accordance with the NEPOSS planning framework will help to facilitate projects which are not minor. Churchill Park is located within NEPOSS and a management plan was created in 2014 (City of Hamilton 2014) to establish direction for the long-term protection, development and management of the park.

Large portions of the Heritage Lands are located within areas regulated by Conservation Authorities (Hamilton Conservation Authority and Conservation Halton) and development may require a permit. Further, if proposed works have the potential to affect shoreline habitat (e.g., shoreline restoration projects, mooring facilities) additional permits may be required by Provincial (e.g., Ministry of the Environment, Conservation and Parks, Ministry of Natural Resources and Forestry) and Federal (e.g., Department of Fisheries and Oceans, Ministry of Environment and Climate Change) departments of works are to occur within the high-water mark. Well in advance of any development, site alteration or

activity on the Heritage Lands, it will be important to review applicable policies and regulations in order to determine conformity of any application, and approval requirements or exemptions.

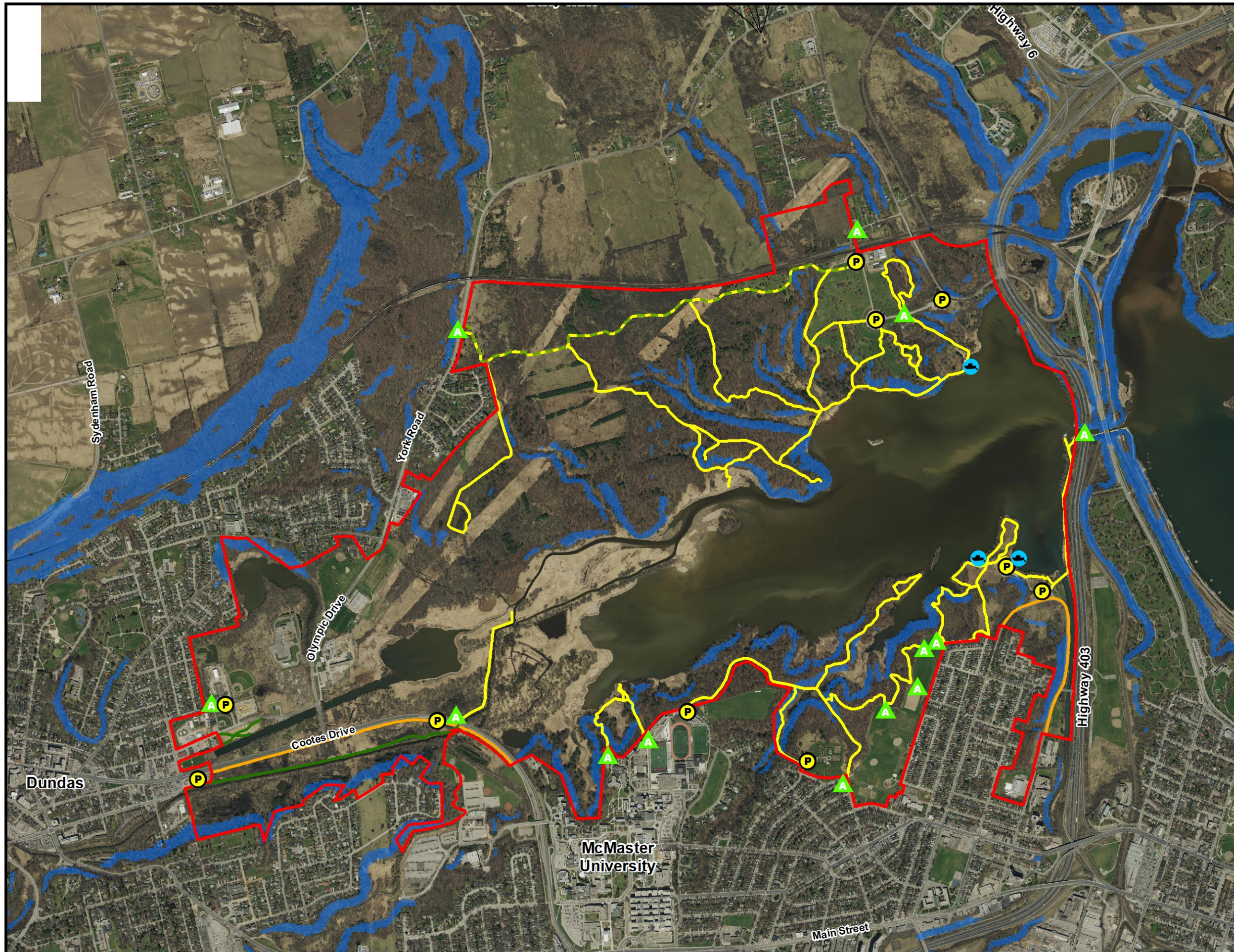
2.3 Recreation

The Cootes Paradise Heritage Lands are highly aesthetic and scenic, and are valued by hikers, dog-walkers, birdwatchers, nature enthusiasts and the surrounding community, and are thus primarily used for conservation and passive recreation. The area provides spectacular views of Hamilton, Hamilton Harbour, deciduous forests and marshlands.

Figure 3 illustrates the existing trail network, access points and parking areas in the Current EcoPark System Lands. The existing trail network consists of trails maintained by the RBG, HCA and the City of Hamilton. Within their holdings in the Cootes Paradise Heritage Lands, RBG maintains the majority of trail networks (18 km total), which is organized into two categories: trails that occur on the north shore and trails that occur on the south shore of Cootes Paradise. Hamilton Conservation Authority maintains two small trails: the Spencer Creek Rail Trail which is a 1.3km gravel trail constructed along an abandoned railway on the north bank of Spencer Creek through the Lower Spencer Creek Conservation Area, and the Canal Park Trail which is a small gravel trail (0.5km) that criss-crosses Canal Park and outlets onto King Street East. The City of Hamilton also maintains a variety of multi-user trails including the Centennial Park Trail, the Desjardins Trail, Cootes Drive Path, and an unnamed multi-use trail along the eastern edge of Macklin Avenue, on the west bank of Chedoke Creek. In addition, a proliferation of unsanctioned trails occur in many locations (Figure 3), and extending beyond the Current EcoPark System Lands onto neighbouring private property. RBG has closed approximately 15 km of unsanctioned trails, and an additional eight km of old RBG trails, to reduce impacts brought on with the rapidly increasing population and usage to the natural environment, minimize maintenance requirements, and simplify the trail network to avoid redundancy and duplication.

There are a number of access points to the current trail system (Figure 3). Three access points currently provide formal parking: (1) at the Arboretum for 108 vehicles; (2) at Princess Point for 88 vehicles; and (3) at Westdale for 22 vehicles. Other access points do not formally provide parking, although at certain locations, paid parking is available close by. For example, the McMaster University Stadium Parking Area H and underground parking north of the Ron Joyce Stadium are located adjacent to access points to the Chegwin Trail and the west end of the Westdale Ravine Trail. At other locations, parking occurs on roadside edges, which is not desirable. In several locations, trails from private lands that back onto Cootes Paradise Heritage Lands were found. These trail connections into the Heritage lands are unauthor, connect to the sanctioned trail system maintained by the RBG. These trail networks are unauthorized, and therefore access points are not shown in Figure 3 as to not encourage trespassing.

Trail use within the Heritage Lands primarily consists of walking, jogging, hiking (ranging from casual outings by local residents, and McMaster staff and students, to more serious day-hikers), cycling and dog walking. In addition, motorized vehicles (e.g., ATVs, dirt bikes, e-bikes and snowmobiles) are used on some of the north shore nature trails and utility corridors. These same trails are also used by cyclists and other recreationalists. Fishing also occurs at various locations along the shores of Cootes Paradise Marsh, Spencer Creek and Lake Jojo. Other known uses include canoeing and kayaking, skating, geocaching and nature photography.



Cootes to Escarpment EcoPark System

Figure 3: Trails, Parking and Access Locations at Cootes Paradise Heritage Lands

Legend

Trails

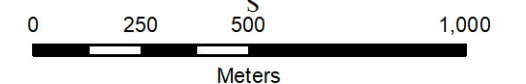
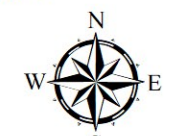
- Bruce Side Trail
- RBG Trails
- Hamilton Conservation Authority Trail
- City of Hamilton Trails

Parking and Access Locations

- Access Locations
- Parking and Access Locations
- Boat Launch
- Slopes > 25%
- Heritage Lands Boundary

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

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There are limited resources available for the partner agencies to oversee the use of their lands and enforce the rules that apply. Unsanctioned trails between private property and the Heritage Lands were observed. It is important to note that unsanctioned trail and structure development is prohibited within Heritage Lands. The partner agencies need to consider with the neighbouring land owners how to address trespassing issues in the ongoing management of these lands.

The increasing use of trails by a variety of users is expected to increase pressure on the natural and existing recreational resources. An increased commitment to management to prevent and/or mitigate recreational impacts will be necessary. In addition, current access to the Heritage Lands is inadequate, and parking at unsanctioned access points is undesirable. Issues related to access and parking will be exacerbated by the continued increase in the use of the Heritage Lands.

2.4 Natural Heritage

2.4.1 Physiography and Surface Geology

The defining physiographic feature of the Cootes Paradise Heritage Lands is an 18km-long Dundas re-entrant valley forming from the Niagara Escarpment, which was shaped as a result of a deep pre-glacial river valley in the bedrock (Chapman and Putnam 1984). The Heritage Lands are dominated by a large, shallow water lagoon known as Cootes Paradise. Areas surrounding the Cootes Paradise lagoon are overlain by sand and gravel lacustrine deposits that have since been eroded to produce a landscape of rolling hills and ravines (Schwetz 2014). The surficial deposits in the Cootes Paradise Heritage Lands are underlain by the Queenston Bedrock Formation, which is exposed only along some ravines and occasional shoreline bluffs. Overlain on the Queenston Bedrock Formation is a plain of Halton Till, which is subsequently overlain by the aforementioned lacustrine sediment deposits. Several of the peninsulas that jut into the marsh is a function of underlying sandstone and conglomerate rock. The soils of the areas surrounding the Cootes Paradise lagoon are characterized as Grimsby sandy loam and Springdale sandy loam. This has substantial consequences for the sensitivity of soils and vegetation to disturbance.

2.4.2 Surface Water

Cootes Paradise Marsh is the central water feature in the Cootes Paradise Heritage Lands. It is the largest coastal wetland on the western end of Lake Ontario, and it is considered to be one of the most important staging areas for migratory waterfowl and the largest nursery habitat for fish in the region.

The Cootes Paradise Heritage Lands are located within the Spencer Creek Watershed (Hamilton Conservation Authority) and the North Cootes Paradise Watershed Area (Conservation Halton). The subwatersheds that occur within the Cootes Paradise Heritage Lands are Lower Spencer Creek, Borer's Creek and Chedoke Creek. Within the Heritage Lands, several additional small tributaries drain to the Spencer Creek watershed (Delsey Creek, Ancaster Creek, Chegwin Creek, Double Marsh Springs, and Westdale Creek). A number of tributaries drain from the north into Cootes Paradise Marsh including: Mink Brook, Spring Brook, Long Valley Brook, Hickory Brook, Highland Creek, Corner Brook and Mercer Spring.

Watercourses draining into the west end of Cootes Paradise have been altered substantially. Several urban storm drains empty directly into Cootes Paradise Marsh, some of which enter into an extremely

environmentally sensitive area of the marsh (Spencer Creek Special Protection Area). Figure 4 illustrates the watercourses that drain into the Cootes Paradise Heritage Lands.

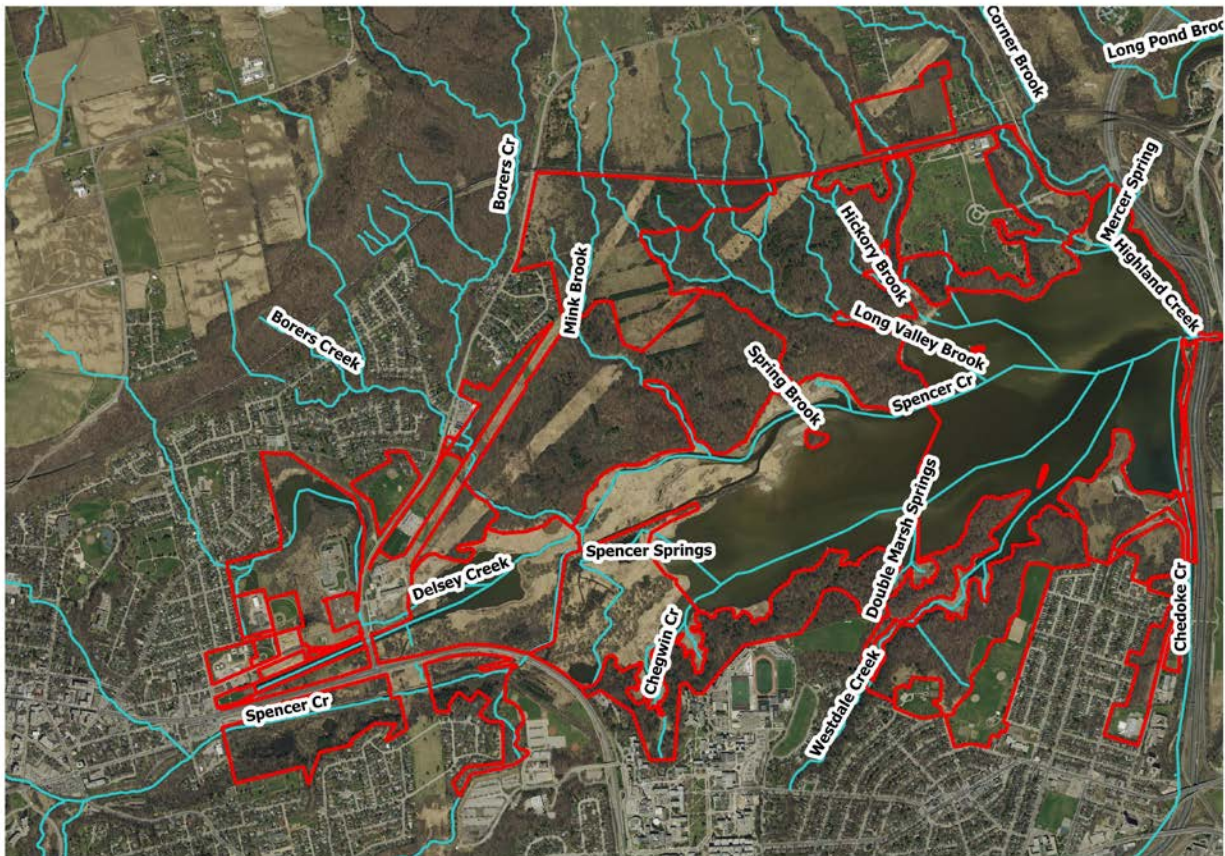


Figure 4: Watercourses of the Cootes Paradise Heritage Lands

Lake Jojo, located north of the Dundas Transfer Station (Figure 4), was historically a marsh (pre-1960s) fed by small streams at its southwestern and northern corners and a spring at its northwestern corner. After human influence altered the eastern and southern parts of the wetland, the drainage of the marsh changed, and the resulting lake formed (Duncan 1990). Lake Jojo is connected to Cootes Paradise by Delsey Creek (Figure 4), which flows to the south through a drainage ditch that runs to the east of the Dundas Transfer Station driveway and under King Street East through a culvert that drains into the Desjardins Canal.

2.4.3 Vegetation Communities

Approximately 72% (507 ha) of the Cootes Paradise Heritage Lands are characterized by natural vegetation communities, including deciduous forest, coniferous forest, mixed forest, open tallgrass prairie, beach/bar, deciduous swamp, thicket swamp, meadow marsh, shallow marsh, floating-leaved shallow aquatic, submerged shallow aquatic, and open water (Table 1 and Figure 5). These are the most ecologically sensitive areas, and they provide important habitat for many of the plant and animal species within the Cootes Paradise Heritage Lands. The remaining 28% (204 ha) of the Heritage Lands consists of anthropogenic and cultural vegetation communities, including cultural meadow, cultural thicket,

cultural savannah, cultural woodland, and cultural plantation (Table 1 and Figure 5). These areas have had a high degree of change as a result of human use and activity. Land classified as anthropogenic consists of mowed lands, parking lots, roads, etc.

Table 1. Vegetation Communities of Current EcoPark System Lands in the Cootes Paradise Heritage Lands

| Vegetation Community | % Current EcoPark System Lands | Area (ha) Current EcoPark System Lands |
|--|--------------------------------|--|
| Natural Vegetation Communities | | |
| Wetland | 39.9% | 283.5 |
| Forest | 30.3% | 215.8 |
| Prairie | 1.1% | 2.2 |
| Beach / Bar | 0.5% | 3.3 |
| Aquatic | 0.4% | 2.9 |
| Cultural Vegetation Communities | | |
| Meadow | 4.3% | 30.2 |
| Thicket | 4% | 28.4 |
| Plantation | 3.3% | 23.4 |
| Woodland | 0.4% | 2.6 |
| Savannah | 0.3% | 2.44 |
| Other | | |
| Anthropogenic | 5.8% | 41.0 |
| Unclassified | 10.1% | 716.4 |

Wetlands and forested communities dominate the Cootes Paradise area within the Heritage Lands. Wetlands, which consist of both swamp and marsh communities are interspersed whereas the north and south shores of Cootes Paradise support a diverse array of forested communities. The north shore of Cootes Paradise Heritage Lands consists largely of oak forests (*Quercus rubra*, *Q. velutina*, *Q. alba*, *Q. macrocarpa*) and Sugar Maple (*Acer saccharum*) with ash (*Fraxinus americanum*, *F. pennsylvanica*) and Black Cherry (*Prunus serotina*) co-dominating in the canopy. The south shore forests are typically composed of oak, Black Cherry, ash, Red Maple (*A. rubrum*), hickory (*Carya* spp.) and Eastern Hemlock (*Tsuga canadensis*). The Cootes Paradise Heritage Lands are covered in older forests of Red Oak, Sugar Maple and Eastern Hemlock with trees more than 100 years old. By some definitions, these forests would qualify as old growth.

There are six provincially significant vegetation communities present within the Cootes Paradise Heritage Lands (Figure 5).

- Spicebush Organic Thicket Swamp – S3
- Fresh-Moist Sassafras Deciduous Forest – S3

Cootes to Escarpment EcoPark System

Figure 5: Ecological Land Classification

Legend

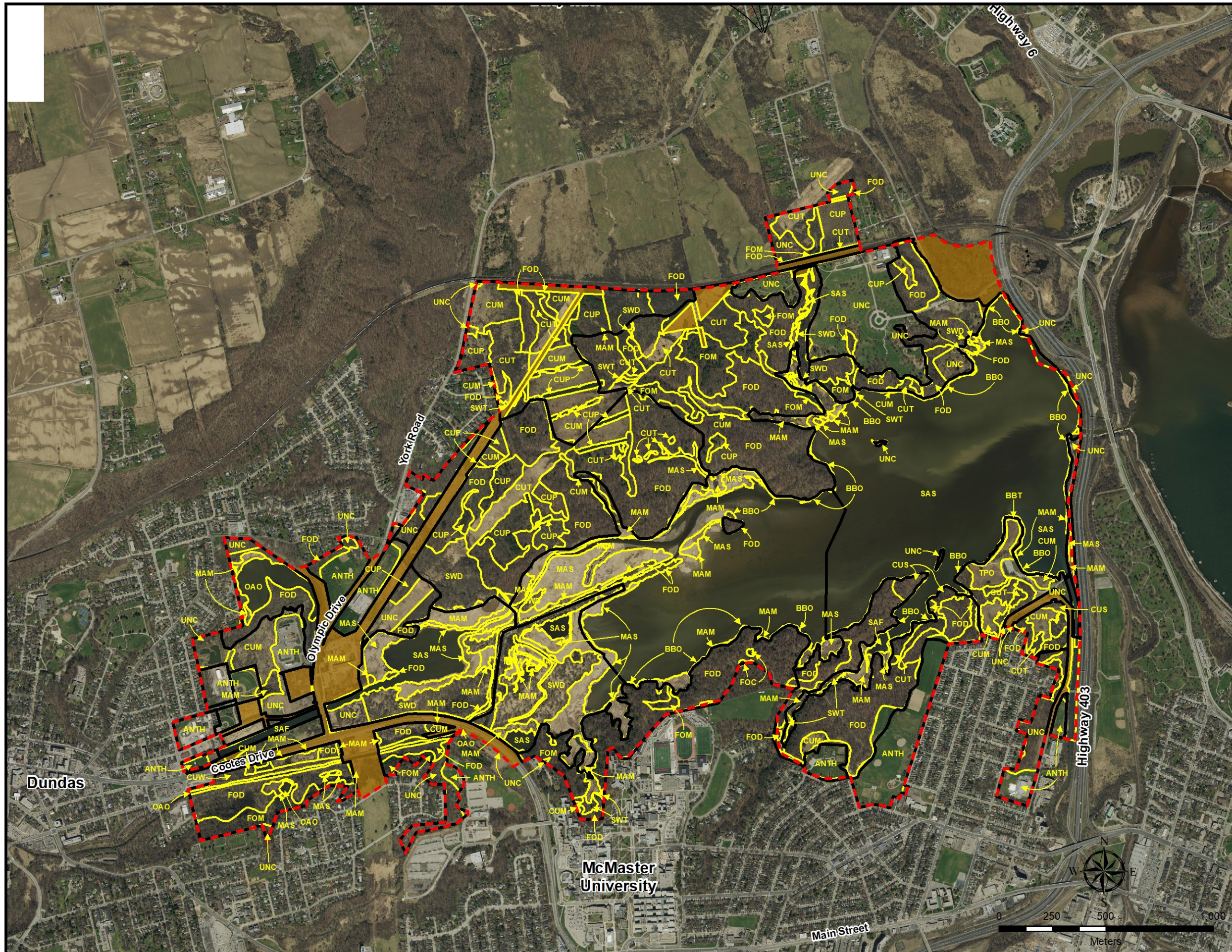
-  Privately Owned Outreach Area
-  Study Area
-  Heritage Lands Boundary
-  Ecological Land Classification

- ANTH** - Anthropogenic
- BBO** - Open Beach/Bar
- BBT** - Treed Beach/Bar
- CLT** - Treed Cliff
- CUM** - Cultural Meadow
- CUP** - Plantation
- CUS** - Cultural Savannah
- CUT** - Cultural Thicket
- CUW** - Cultural Woodland
- FOC** - Coniferous Forest
- FOD** - Deciduous Forest
- FOM** - Mixed Forest
- MAM** - Meadow Marsh
- MAS** - Shallow Marsh
- OAO** - Open Aquatic
- SAF** - Floating-leaved Shallow Aquatic
- SAS** - Submerged Shallow Aquatic
- SWD** - Deciduous Swamp
- SWT** - Thicket Swamp
- TAS** - Shrub Talus
- TAT** - Treed Talus
- TPO** - Open Tallgrass Prairie
- TPW** - Tallgrass Woodland
- UNC** - Unclassified

Note:
Not all ELC codes appear on map.

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

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- Fresh-Moist Sugar Maple – Black Maple Deciduous Forest – S3?
- Fresh-Moist Black Walnut Deciduous Forest – S2S3
- Dry Tallgrass Prairie Type – S1
- Dry Black Oak – White Oak Tallgrass Woodland Type – S1

In addition, prairie and oak savannah communities are present and are one of the most significant ecosystems in the Heritage Lands. Tallgrass Prairie remnants occur at Princess Point and Sassafras Point, as well as other areas, although some of the inclusions are too small (<0.5 ha) to show in the vegetation community mapping (Figure 5). The remnant prairie/savannah communities represent the rarest and most threatened community types within the Cootes Paradise Heritage Lands.

2.4.4 Flora

A total of 1,197 flora species have been documented in the Cootes Paradise Heritage Lands of which 771 (64%) are native. The Native Floristic Quality Index (FQI) of the Cootes Paradise Heritage Lands is 150.9, an extremely high value. The FQI is a measure of both habitat conservatism and species richness and thus an indicator of vegetation quality. In southern Ontario, most natural areas within urban or urbanizing landscapes have FQI values of around 70-80. The southerly exposure of the Heritage Lands results in a relatively warm, dry microclimate that supports many Carolinian and southern plants, including rare and uncommon species, endangered and threatened species, and other Species at Risk. A total of 348 significant flora species have been identified within the study area, including eight provincially endangered species and four provincially threatened species, 66 provincially rare species (S1-S3 provincially ranked), 185 regionally rare species in the City of Hamilton (Schwetz 2014) and 219 species rare on RBG properties (Barr 2014).

Invasive species have been identified as one of the greatest threats to the integrity of the ecosystems of the Cootes Paradise Heritage Lands. Major invasive plant species found within the Cootes Paradise Heritage Lands include: Goutweed (*Aegopodium podagraria*), Garlic Mustard (*Alliaria petiolata*), Dog-strangling Vine (*Cynanchum rossicum*), Rough Mannagrass (*Glyceria maxima*), Miscanthus (*Miscanthus* spp.), Phragmites (*Phragmites australis*), non-native honeysuckles (e.g., *Lonicera tatarica*), Common Buckthorn (*Rhamnus cathartica*), Multiflora Rose (*Rosa multiflora*), Manitoba Maple (*Acer negundo*) and Black Locust (*Robinia pseudo-acacia*).

2.4.5 Fauna

The Cootes Paradise Heritage Lands provide important habitat for many wildlife species including:

- 35 species of butterfly or moth;
- 45 species of dragonfly or damselfly;
- 100 species of fish (38 considered to be extirpated);
- 30 species of amphibian or reptile;
- 185 species of bird (144 considered to possibly breed within the Current EcoPark System Lands); and
- 29 species of mammals.

A conservative approach was used to summarize fauna within the Cootes Paradise Heritage Lands; records without specific location information and that could not be confirmed to have been documented within the Cootes Paradise Heritage Lands were not included in this summary. For example, 185 species of bird have been confirmed by partner agencies within the Cootes Paradise

Heritage Lands, however there are reports which document higher species counts (e.g., 277 migratory birds [RBG 2018])

A total of 13 significant fauna species have been identified within the Current EcoPark System Lands: 1 butterfly, 3 dragonfly, 1 amphibian, 6 reptile, 11 fish, 1 mollusc, 29 bird and 4 mammal species.

2.4.6 Natural Heritage Corridors

Cootes Paradise is part of the provincial-scale Niagara Escarpment and Lake Ontario corridors. To the north of the Cootes Paradise Heritage Lands, much of the landscape is open and relatively undeveloped. It thus offers few barriers to movement for most wildlife species. Because of this, there is a high degree of connectivity within Cootes Paradise Heritage Lands and with adjacent Heritage Lands, including connectivity between Cootes Paradise and the Niagara Escarpment. Also, Cootes Paradise is hydraulically connected to the Lake Ontario shoreline via Hamilton Harbour.

In terms of inter-Heritage Land connections, creek valleys provide natural corridors for species moving between Cootes Paradise Heritage Lands and Borer's Falls-Rock Chapel Heritage Lands, and generally from Lake Ontario to the Niagara Escarpment. Connectivity and linkage opportunities are, however, significantly impeded by the fact that provincial and regional highways bisect the Cootes to Escarpment EcoPark System. The north shore of Cootes Paradise Heritage Lands is well-connected and configured, and interior forest habitat is available for area-sensitive species. However, the remainder of the Cootes Paradise Heritage Lands is fragmented, and existing infrastructure and development limit opportunities for improving the connectivity among areas that contain forest interior habitat (e.g., along the south shore of Cootes Paradise, and connections to Lower Spencer Creek Conservation Area).

Significant wildlife corridor issues have been identified with major roadways within the Cootes to Escarpment EcoPark System, and within the Cootes Paradise Heritage Lands in particular. Roadside nesting and subsequent mortality of turtles is also an issue on several of these roads. A focus of management efforts within the Cootes to Escarpment EcoPark System has been on addressing wildlife corridor issues.

2.4.7 Natural Heritage Summary

Table 2 summarizes the natural heritage features and designations of the Cootes Paradise Heritage Lands. It is also important to note that much of the Heritage Lands are designated as Natural Heritage System by the City of Hamilton.

Table 2. Natural Heritage Summary of the Cootes Paradise Heritage Lands

| Features | Cootes Paradise Heritage Lands |
|---|---|
| Environmentally Significant Area (ESA) | <ul style="list-style-type: none"> • City of Hamilton ESA: Cootes Paradise (DUND-15) |
| Area of Natural and Scientific Interest (ANSI) | <ul style="list-style-type: none"> • Cootes Paradise Drowned Valley Provincial Life Science ANSI |
| Provincially Significant Wetland (PSW) | <ul style="list-style-type: none"> • Cootes Paradise PSW |
| Species at Risk <ul style="list-style-type: none"> • based on provincial ESA • excluding historical records, planted species and non-breeding species | <ul style="list-style-type: none"> • 5 END flora species • 3 END and 7 THR bird species • 1 THR reptile species • 3 END mammal species • 1 END and 3 THR fish species • 1 END and 1 THR mussel species |
| Significant Wildlife Habitat | <p><u>Examples</u> of Significant Wildlife Habitat within the Cootes Paradise Heritage Lands include:</p> <ul style="list-style-type: none"> • Seasonal Concentration Areas of Animals <ul style="list-style-type: none"> ▪ Waterfowl Stopover and Staging Areas (aquatic) ▪ Turtle Wintering Areas • Rare Vegetation Communities <ul style="list-style-type: none"> ▪ Old Growth Forest ▪ Other Rare Vegetation Communities • Specialized Habitat for Wildlife <ul style="list-style-type: none"> ▪ Waterfowl Nesting Area ▪ Turtle Nesting Areas ▪ Marsh Breeding Bird Habitat • Habitat for Species of Conservation Concern • Animal Movement Corridors |
| Surface water and fisheries resources | <ul style="list-style-type: none"> • Cootes Paradise Marsh provides important fish habitat • Permanent streams (including ponds) • Cold-water fish habitat |
| Flora <ul style="list-style-type: none"> • based on provincial ESA • excluding historical records and planted species | <ul style="list-style-type: none"> • 1,197 flora species; 771 native flora species • 50 Carolinian Indicators; 45 Prairie-Savannah Indicators • 150.9 FQI; 5.5 Mean C • 5 END species • 47 S1-S3 species • 185 regionally rare species in Hamilton • 219 species rare on RBG properties |
| Butterflies and Moths <ul style="list-style-type: none"> • based on provincial ESA • excluding historical records | <ul style="list-style-type: none"> • 35 species; 33 native species • 1 S2 species • 6 regionally rare species in Hamilton |

| Features | Cootes Paradise Heritage Lands |
|--|--|
| Dragonflies and Damselflies <ul style="list-style-type: none"> based on provincial ESA excluding historical records | <ul style="list-style-type: none"> 45 native species 3 S1-S3 species 1 regionally rare species in Hamilton |
| Fish <ul style="list-style-type: none"> based on provincial ESA excluding historical records and stocked species | <ul style="list-style-type: none"> 87 species; 80 native species 1 END species; 3 THR species 10 S1-S3 species 15 regionally rare species Hamilton |
| Mussels <ul style="list-style-type: none"> based on provincial ESA | <ul style="list-style-type: none"> 3 native species 3 S1-S3 species 1 END species; 1 THR species |
| Amphibians <ul style="list-style-type: none"> based on provincial ESA excluding historical records | <ul style="list-style-type: none"> 12 native species 1 S3 species 2 regionally rare species in Hamilton 5 area-sensitive species |
| Reptiles <ul style="list-style-type: none"> based on provincial ESA excluding historical records | <ul style="list-style-type: none"> 14 species; 12 native species 4 S1-S3 species 1 THR species 5 regionally rare species in Hamilton 1 area-sensitive species |
| Birds <ul style="list-style-type: none"> based on provincial ESA based on bird species known to breed in the City of Hamilton excluding historical records | <ul style="list-style-type: none"> 138 species; 132 native species 3 END species; 7 THR species 15 S1-S3 species 38 regionally rare in Hamilton 36 area-sensitive species |
| Mammals <ul style="list-style-type: none"> based on provincial ESA excluding historical records | <ul style="list-style-type: none"> 28 species 3 END species 2 S3/S3? species 2 regionally rare species in Hamilton 2 area-sensitive species |

2.5 Cultural Heritage

The Cootes Paradise Heritage Lands are represented in features originating from use by Indigenous People, including trails and archaeological sites, which were then overlaid with the imprints of early military and colonial settlement activity with Dundas representing the principal centre of settlement. Within the Current EcoPark System Lands, cultural heritage resources mainly relate to transportation, such as the construction of the Grand Trunk Railway in the 1850s, and the Desjardins Canal in 1827, both of which contributed greatly to the growth of Dundas as an economic and transportation hub of Lake Ontario. Many of the flatter lands were used as agricultural lands in recent history (last 200 years) and have since regenerated to cultural meadow thicket and/or woodland.

Cootes Paradise was designated as a nature reserve in 1927 through the Ontario legislature to both beautify the Burlington Heights sector and to protect the significant heritage lands surrounding Cootes Paradise. This plan led to the conservation of land including Cootes Paradise and surrounding lands, to development of the Westdale Subdivision, the Royal Botanical Gardens and McMaster University. Any future development plans, including trails would require archaeological investigations to ensure conservation heritage resources are protected, as per the *Ontario Heritage Act*, and recognized in the Provincial Policy Statement (PPS) and *Planning Act*.

3.0 Management Issues

This section summarizes the management issues identified for the Cootes Paradise Heritage Lands. Many of the current types and intensities of use are contributing to the degradation of the natural features and functions of the Heritage Lands. Impacts have been noted within the existing extent of use, and considerably greater use of the Heritage Lands is anticipated in the future, with a subsequent expectation of increased stresses to natural features. Many of the issues are inter-related and, in many cases, cannot be addressed in isolation. For example, over-use of trails from hiking and/or cycling can result in erosion issues, which can lead to ecological management issues such as soil degradation, impacts to ground flora, susceptibility to invasion by non-native plant species, degraded water quality, wildlife displacement, etc.

3.1 Overarching Issues and Opportunities

Several management issues are not constrained exclusively to the Cootes Paradise Heritage Lands, but instead, span the entire Cootes to Escarpment EcoPark System. These issues are generally 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. The numbers provided in paragraph headings provide a cross-reference to the management recommendations listed in Sections 4.2 and 4.3.

[Awareness of the Cootes to Escarpment EcoPark System \(3\)](#)

The Cootes to Escarpment EcoPark System is a relatively recent initiative and is novel in its concept. Each of the partner agencies operates 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 Cootes to Escarpment EcoPark 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.

[Delineation of Current EcoPark System Lands \(4\)](#)

It is often difficult to determine when EcoPark System users are within Current EcoPark System Lands, or within Privately Owned Outreach Areas, as signage is often limited and natural areas (woodlands, open lands, etc.) that compose the majority of the Heritage Lands extend well beyond individual property boundaries. Further, the Current EcoPark System Lands are owned by multiple agencies, and because

the boundaries between ownership is not clear, it is difficult 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). In addition, because property ownership is sometimes unclear, users are unable to determine to whom issues should be reported.

Need to Better Communicate the Multi-agency Management of the EcoPark System (5)

Each partner agency has unique policies and rules that reflect 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 BTC and RBG allow only pedestrian traffic on their trails; however, cycling is permitted in sanctioned areas by the City of Hamilton, Hamilton Conservation Authority, and 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.

Population and Use (6)

A major overarching management issue is the anticipated increase in use. This particular issue is of less significance for Cootes Paradise Heritage Lands than some other Heritage Lands with respect to more development, owing to the limited opportunity for major development on adjacent lands. However, the continued growth of the nearby major urban areas, (Cities of Burlington and Hamilton) and the increase in people engaged in passive recreation, will exert greater pressure on the Heritage Lands in the future. Thus there is an expectation of ongoing degradation of the natural, recreational and cultural resources of the Cootes Paradise Heritage Lands unless mitigation in the way of increased management initiatives are implemented.

At present, there are no policies that would directly facilitate the implementation of relevant management recommendations in the management plan through development approvals (e.g., through a Condition of Draft Plan approval). 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 on Heritage Lands 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 from future development, this higher value should be considered when determining mitigation, such as 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 Cootes Paradise Heritage Lands these are the City of Hamilton and Hamilton Conservation Authority), 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 (7)

There are differences in approach to management by the partner agencies. Individual partners manage lands in a variety of models, from pay to use to free to use. This reflects the fact that Cootes to Escarpment EcoPark System includes three distinct organizational types: government, not for profit and registered charities. 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. 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 (8)

A key overarching issue for the Cootes to Escarpment EcoPark System is that multiple trails within Cootes Paradise Heritage Lands cross railways. These pose connectivity and safety concerns. 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 (9)

A potential corridor that is currently in private ownership remains through Borer's Falls-Rock Chapel Heritage Lands that would substantially add to the connection of Cootes Paradise to the Niagara Escarpment. This corridor is 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 thus is an important issue with respect to land acquisition.

Desire and Need for Trail Connections and Trail Plan (10)

Pedestrian and cycling use of York Road has been described as a significant recreation issue. Although not strictly within the Heritage Lands, it has repercussions for both the Cootes Paradise and Borer's Falls-Rock Chapel Heritage Lands, due to safety concerns. York Road is an old, narrow and winding road

without a shoulder. It is used as a commuter route, but it is also 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, the need for 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 Tract and Nicholson Tracts to Old Guelph Road, just south of the Bruce Trail crossing of Highway 6. This is a planned multi-use trail initiative (13-7) recognized in the City of Hamilton's Recreational Trails Master Plan (City of Hamilton 2016). The multi-use trail would begin at the intersection of York Road and Valley Road, connect into and run along the hydro corridor line and terminate at Valley Community Centre Park along Old Guelph Road. There is also an on-road bike route planned that would continue the route on Olympic Drive to York Road and Valley Road. The Cootes to Escarpment EcoPark System does not currently have a Trail Plan in place to provide guidance on trail-related issues that span individual Heritage Lands boundaries and land-owning partners. This task would require a separate funding arrangement.

[Desire and Need for a Wildlife Corridor/Crossing Plan \(11\)](#)

The lack of wildlife corridors and crossings has been identified as a major issue of concern for the Cootes to Escarpment EcoPark System, especially within the Cootes Paradise Heritage Lands. The existing assemblage of land parcels that comprise the Current EcoPark System Lands are fragmented across the landscape, and as a result, wildlife are forced to cross roads, hydro-corridors and railways to access lands that are required for fulfilling their various life processes (e.g., nesting, foraging, over-wintering). Vehicular speed and wildlife collision on roads severely impacts the safe passage of wildlife, and ultimately wildlife populations.

3.2 Land Use Planning

Limited land use planning and designations within Cootes Paradise results in management issues for the Current EcoPark System Lands as noted below.

[West End of Cootes Paradise and the "Dundas Gateway" \(16\)](#)

The west end of Cootes Paradise, referred to as the "Dundas Gateway", is a complicated area where future land use planning direction is not clear. RBG identified the need for some major planning in the area in a 2015 project proposal:

"The west end of Cootes Paradise Marsh (an area roughly bounded by West Pond in the east and the termination of the Desjardins Canal in the west) is a particularly complex area within the overall Cootes to Escarpment EcoPark System. It is also an area identified as an important visitor node within the EcoPark System and transition area between the urban environment of Dundas and wild areas of Cootes Paradise Nature Reserve. In addition to many private land owners, a large Hydro One installation, a municipal sewage treatment plant, sports fields, landfills and other waste management facilities, and numerous roads, the area includes lands owned by three EcoPark System partner agencies (City of Hamilton, Hamilton Conservation Authority, and Royal Botanical Gardens). It is also an area of both considerable ecological importance and sensitivity and contamination from industrial pollutants.

The complexity of the area is due to more than the number of landowners in the area. Historical confusion about land ownership and resulting encroachment, concerns over the area as wildlife habitat and a wildlife corridor (particularly as an area of turtle nesting, meadow birds, and mammal movement), aspirations for the area to serve as a “gateway to the EcoPark System”, and conflicting ideas about trails in the area, have all led to a set of present circumstances that call for a thorough, detailed and open planning process involving the partner agencies, to achieve clarity about the issues and the intentions of the land owning agencies in the immediate area, and to seek resolutions to the present issues.”

RBG originally proposed that this planning project be completed by 2016, in advance of the development of this management plan for the Cootes Paradise Heritage Lands, due to the urgency of issues and need for planning in this particular area. This project however was not completed, and thus remains an important issue for Cootes Paradise Heritage Lands.

3.3 Access and Infrastructure

Parking and Access (17)

Parking and access is limited at the Cootes Paradise Heritage Lands (Figure 3). Some parking and access points are sanctioned, and some are not. A few parking areas are available (e.g., 16 Old Guelph Road, 335 Longwood Road, and 85 Oak Knoll Drive). EcoPark System users looking to access RBG’s north shore trail system routinely park along both shoulders of York Road despite RBG signage regarding sanctioned parking locations. EcoPark System users also park at Canadian Tire located to the southeast corner of Dundas Street and Cootes Drive to access Lower Spencer Creek Conservation Area, although this parking lot is not sanctioned, and unauthorized parked vehicles can be ticketed. Utility corridors are also frequently used to access the Heritage Lands, although these access points are not sanctioned.

Boat Access to Marsh (18)

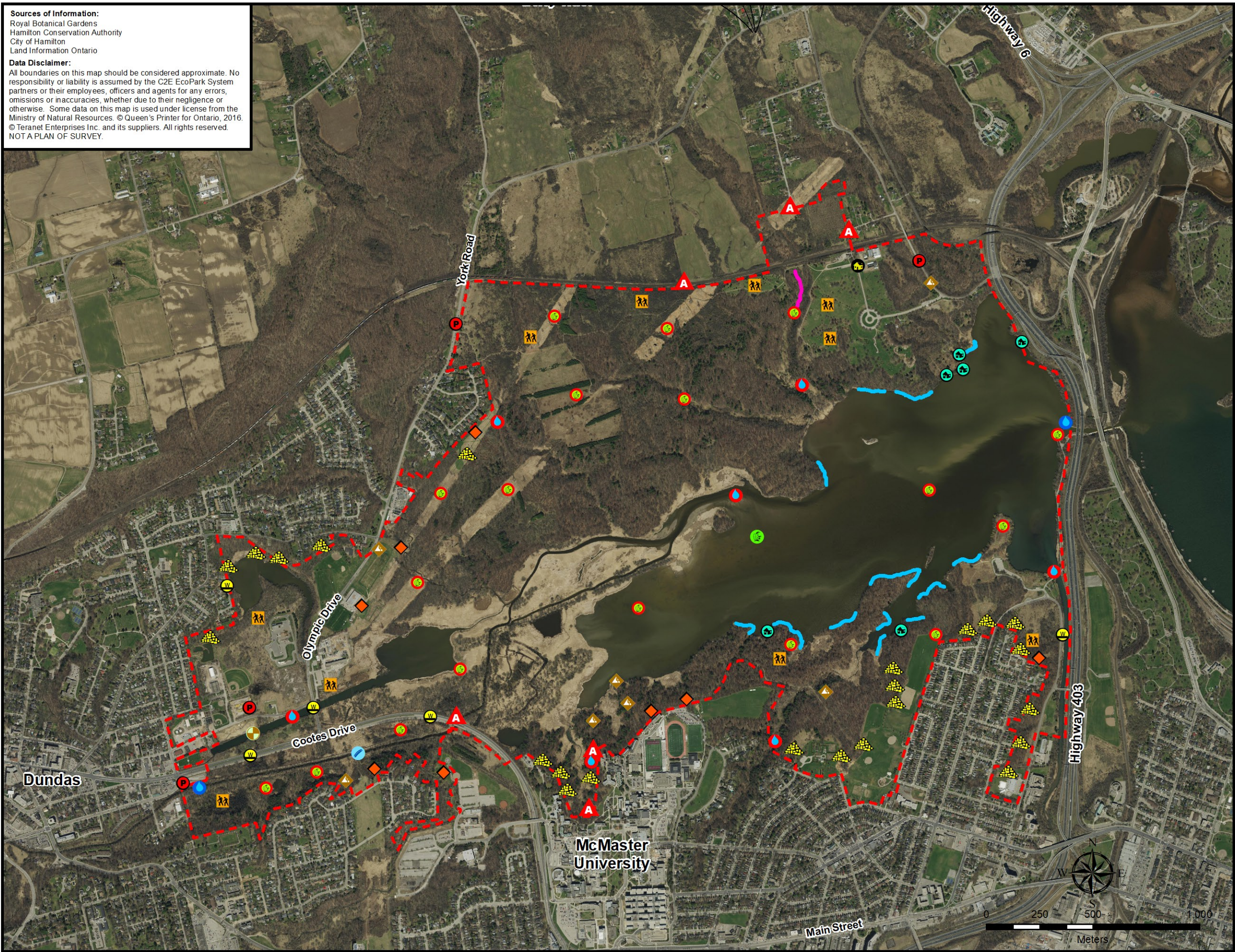
Sanctioned boat access to Cootes Paradise is currently limited. RBG maintains two formal boat launches as public access points at Princess Point (Figure 3). However, the public access the marsh “unofficially” from a number of locations: (1) Spencer Creek south of Cootes Drive; (2) Desjardins Canal east of Olympic Drive; and (3) from Hamilton Harbour at the fishway. There is a desire to access the marsh at the top of the Desjardins Canal, but a weir “upstream” (west) of Olympic Drive prevents this from occurring on public lands. Instead, people currently access the marsh through private lands to launch boats (east of Olympic Drive). Formal access needs to be provided in this location, and there is an opportunity to provide a style, or similar structure, to improve access to the EcoPark System. RBG would like to formalize a canoe/kayak route through the Cootes Paradise Marsh. Signage of a proposed route has been posted at RBG’s boathouse, however, the boathouse is not the primary access point where visitors access the water, thus it is often not noticed. The closest parking to the boathouse is currently 300-400 m away from the water’s edge and there are no options available to move it closer. RBG may move their boathouse to another location to improve boat access to the marsh, with Princess Point being a possibility.

Lack of Defined Access Points (17)

Access points within the Cootes Paradise Heritage Lands are poorly marked and not well-known to the general public; as a result, several unsanctioned footpaths have been established by users looking for quick access/shortcuts to distinct vistas, features, and/or trails (Figure 6). The management plan

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 6: Management Issues in Cootes Paradise Heritage Lands

- Legend**
- Heritage Lands Boundary
 - Management Issues**
 - Access Issues
 - Contaminated Sediment
 - Cultural Heritage Issue
 - Ditched Tributary
 - Dumping
 - Encroachment
 - Invasive Species
 - Lack of Marsh Vegetation
 - Old Infrastructure/Trail Structures
 - Parking Issues
 - Trail/Road Issues
 - Unsanctioned Use
 - Water Quality Issue
 - Water Quantity Issue
 - Wildlife Crossing
 - Shoreline Erosion and Gabion Baskets
 - Watercourse Erosion Sensitivity

Note:
 Not all management issues and locations are mapped

prepared for Churchill Park (Dillon Consulting 2014) highlighted a fragmented visitor experience associated with a lack of defined access points to the five connecting nature trails.

CN Safety Issue (19)

EcoPark System users currently cross the Canadian National (CN) railway to connect to unsanctioned trails in both the Cootes Paradise and Borer's Falls-Rock Chapel Heritage Lands. Users may also walk along the railway to access unsanctioned trails. This is a safety issue.

Lack of Facilities (20)

A larger facility for education is needed at RBG due to the increasing demand for educational programming, which generally surpasses existing space and offered schedules. In addition, the current septic system is near capacity on busy days and, as such, portable toilets have to be brought in during larger events. The general lack of facilities at RBG limits the ability to offer the desired programming.

Trespassing (21)

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

Old Infrastructure and Trail Structures (22)

Several staircases in the Cootes Paradise Heritage Lands, which have been incorporated into trail designs to address steep terrain, are in poor condition and require repair/replacement. A collapsed structure located in Cootes Paradise Sanctuary 12, off Ravine Road Trail, is in need of removal. The boardwalk along Chegwin Trail is also in poor condition and is in need of replacement. Four areas within Cootes Paradise Marsh contain elements of old restoration projects or degraded infrastructure. These items are the old Aquadam, logs and chains, concrete slabs, a concrete-filled garbage can, a concrete pipe, and two rusty culverts (Theysmeyer et al. 2016). Known locations of old infrastructure and trail structures are summarized in the Cootes Paradise Heritage Lands Management Plan Inventory, Issues and Opportunities report (North-South Environmental Inc. 2018).

Lack of Public Transportation (23)

There is currently incomplete public transportation options for users to arrive/depart sanctioned access points within the Cootes Paradise Heritage Lands. For example, there is no public bus service from the City of Hamilton to the RBG Arboretum. A few Hamilton Street Railway (HSR) routes that do exist and work well to serve the Cootes Paradise Heritage Lands include the HSR Route Number 6 services to the head of the parking area on Macklin Street North (sanctioned access point), and HSR Route Number 5 which services the access point near Centennial Park. There are also Bike Share Hamilton (SoBi Hamilton) stations at the termination of Desjardins Trail which could be used to bring users to the trail systems and amenities within the Cootes Paradise Heritage Lands.

3.4 Recreation

The existing trail system through the Heritage Lands is extensive, and as discussed, consists of sanctioned and unsanctioned trail networks (Figure 3). As the Cootes Paradise Heritage Lands' largest land-owner, the RBG manages the majority of trails within the Cootes Paradise Heritage Lands. Trails

are similarly maintained by the City of Hamilton and the Hamilton Conservation Authority on their respective properties. Many trails have been activity decommissioned by the RBG, while others are no longer being used and are naturally regenerating within the Cootes to Escarpment Heritage Lands. In contrast, Sassafras Point Trail is an example of a formerly closed trail that has been reopened to focus and manage access towards eastern Cootes Paradise, in an effort to minimize disruption to the western extent of Cootes Paradise. Trail use within the Heritage Lands primarily consists of walking, jogging, hiking, dog walking, and cycling. Generally, the current level of recreational use appears to be having little impact on the surrounding natural system.

Trail Overuse and Erosion (25)

McMaster University students heavily use south shore trails. 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 the trails. Trail overuse has resulted in soil erosion in places. Some erosion, compaction, and water ponding is considered acceptable as long as it is sustainable (i.e., not expanding) and not impacting significant species, habitats or hydrological functions. Generally, it is considered to be tolerable and part of the trail experience. Unacceptable erosion on trails has however been noted in places and attributed to 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 6). Significant rill erosion caused by cycling activity is evident on steep sections of south shore trails (Figure 6). Some cyclists use Ravine Road Trail to access unsuitable adjoining trails (e.g., Ginger Valley Trail). It is the deviation of cycling onto smaller trails that has occurred historically which has resulted in heavy erosion and trail overuse.

Cycling (26)

Whereas cycling is an approved use on sanctioned City of Hamilton and Hamilton Conservation Authority trails, the RBG and BTC does not permit cycling on their trail system. Regardless, cycling continues to occur on RBG trails. Many cyclists cut through the top of RBG lands, using the Pinetum/Ray Lowes Bruce Side Trail as a shortcut to Old Guelph Road, and to avoid York Road, which is a notoriously treacherous route for cyclists. Cycling use continues despite there being signage posted that indicates that cycling is not permitted. The cycling community is eager to work with RBG to identify appropriate places where cycling may be permitted.

Cycling Route Connectivity (27)

There is a very difficult issue with 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 realize cycling opportunities fully. It would be irresponsible to encourage cycling and/or identify cycling routes on roads that are unsafe. The City of Hamilton's Draft Cycling Master Plan Review and Update identifies cycling route connectivity (City of Hamilton 2018) and includes the western portion of the Cootes to Escarpment EcoPark System.

Unsanctioned Trails (28)

Unsanctioned trails are occasionally constructed and regularly used within the Heritage Lands without consultation or authorization from the land-owning agency. RBG routinely closes unsanctioned trails on their properties by posting signage, placing brush and planting vegetation that deters access (e.g., Prickly Ash, *Xanthoxylum americanum*). RBG has completed a great number of trail closures on the south shore, and all but two unsanctioned trails have been resolved. Single track cycling trails have

been constructed on lands south of Spencer Creek at Lower Spencer Creek Conservation Area (extending from the dead end at Meadow Lane). These trails appear to be used by BMX and mountain bikers. Small footpaths leading from sanctioned trails to the water's edge of Cootes Paradise and Lake Jojo are prevalent in areas where fishing access is desired. The management plan prepared for Churchill Park highlighted that a formal pathway system is lacking at the park (Dillon Consulting 2014). A strong desire line, evidenced by a worn footpath in the turf, extends diagonally through the baseball diamond from Marion Avenue to Parkside Drive. An additional unsanctioned trail occurs along the westerly perimeter of the sports fields at Churchill Park, adjacent to the forest edge (Figure 6). Signs of water runoff and erosion were noted on the adjacent ravine slopes. This trail is regularly used by local schools for cross-country runs (Dillon Consulting 2014). Behind the Olympic Sports Park Arena is a gateway for several unsanctioned trails into the Heritage Lands. Use of unsanctioned trails is exacerbated by the fact that unsanctioned and closed trails have been, and continue to be, posted on Google Maps and other publicly-accessible websites and apps (e.g., Trailforks, AllTrails).

Trail Proliferation (29)

While issues of trail proliferation have been greatly reduced, primarily through RBG's targeted efforts in the south shore area, one issue related to trail proliferation has been identified in Cootes Paradise Heritage Lands. A small loop has formed at the terminus of the dead end trail that comes off the Chegwin Trail as there is confusion as to where the main trail leads at the open water. As a result, trail forking is occurring (which also appears to be a result of circumventing a steep section of trail with heavy root exposure).

Signage (30)

In general, the Cootes Paradise Heritage Lands are heavily signed; however, one exception was noted on the Chegwin Trail. The east access of Chegwin Trail is well-signed with a kiosk, however the west access point does not provide adequate signage to appropriately direct users to the trailhead.

User Conflicts (31)

Potential conflicts between different trail user groups has impacted 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 the EcoPark System Lands, and cycling is not permitted on RBG trails. Conflicts among hikers, dog walkers and cyclists arise on occasion, and are often related to fast-moving bicycles or runners and off-leash dogs. Some cyclists and dog walkers do not respect that you must remain in control of your bicycle or dog at all times. Additional education is needed regarding the appropriate use of trails and trail etiquette.

Off-leash Dogs (32)

Off-leash dog use on RBG property has been reported as a major problem, especially at the Arboretum where users essentially use the area as an off-leash dog park. This use is unsanctioned, but enforcement is often lacking. Off-leash dog use can negatively impact natural areas by causing erosion, soil compaction, water quality impacts, and effects on vegetation and wildlife (e.g., damage to ground flora, the spread of invasive species, harassment/harm to wildlife). Off-leash dogs have been identified as a safety concern by regular users. Off-leash dog use may be deterred by the increasing number of ticks in the area and the growing public concern of tick-borne diseases. Additional off-leash dog parks may provide an opportunity for these users to focus this recreational use outside sensitive natural areas. Traditionally, municipalities offer the service of dog parks as part of their tax-supported Parks and Recreation programs and facilities.

RBG Arboretum Issues (33)

RBG has identified several additional issues with the Arboretum (Cootes Paradise Sanctuary 3, Figure 2), which include:

- the boathouse is old and insufficient to support RBG's summer camps and school group/children's programming;
- Old Guelph Road does not facilitate cycling or walking access to the Arboretum and is in poor repair. Further, it lacks shoulders in the vicinity of the Arboretum entrance;
- various plant collections at the Arboretum are subject to herbivory from wildlife (e.g., deer, rabbits, voles); and
- Cootes Paradise is identified as a Nodal Park within the Niagara Escarpment Parks and Open Space System. The Arboretum is located within the Cootes Paradise NEPOSS Nodal Park and is where the majority of school programs and summer camps are offered, however, Cootes Paradise NEPOSS Nodal Park does not contain geology conducive to facilitating escarpment education/learning on site. Programming on the geology of the Niagara Escarpment is currently offered in the neighbouring Borer's Falls-Rock Chapel Heritage Lands at RBG's Rock Chapel property.

Impacts to Wildlife resulting from Recreational Activities (34)

Canoeists and kayakers can impact sensitive nesting marsh birds in Cootes Paradise during certain times of the year (e.g., early spring-early summer). Because of this, canoeists and kayakers are encouraged to avoid paddling in areas that support sensitive waterbird nesting habitat. RBG has posted a boat route through the marsh on signage at the boathouse, however, the number of people that see this signage or follow the suggested route is not known. In addition, there is an educational opportunity to convey the importance of Cootes Paradise for waterbird nesting habitat protection and migratory bird protection.

Cycling occasionally harms (i.e., injure and/or kill) reptile, amphibian and small mammal species. For example, on Spencer Creek Rail Trail, hatchling turtles are frequently run over by cyclists as the banks of the rail trail are a major nesting area for the turtles of Cootes Paradise. Wildlife corridor work completed in the area may increase the number of turtles nesting in the area in the future that could exacerbate the issue. There is an existing multiuse pathway on the south shoulder of Cootes Drive, running parallel to the Spencer Creek Rail Trail, which currently provides a safe route for cyclists and would avoid the area used by reptiles and amphibians. The Spencer Creek Rail Trail, which closely parallels the multi-use path associated with Cootes Drive, may be considered redundant in terms of cycling connectivity in the area. The Spencer Creek Trail is not identified under the preferred cycling network strategy in the City of Hamilton's Draft Cycling Master Plan Review and Update (City of Hamilton 2018).

Motorized Vehicle Use (35)

Public recreational use of motorized vehicles (including boats) is prohibited throughout the Current EcoPark System Lands. Whereas the use is not permitted, ATV, dirt bike and e-bike activity have been noted in various locations on the north shore, and on the Lower Spencer Creek Rail Trail. Motorized vehicles disproportionately impact trails and the natural environment due to aggressive tire treads and unencumbered ability to travel through muddy site conditions. Motorboats disturb bottom sediments in Cootes Paradise and exacerbate an already serious problem with turbidity in the marsh. Motorized vehicle use is also generally inconsistent with the user experience promoted within the Heritage Lands.

Hunting/Fishing/Poaching (36)

Hunters currently use utility corridors and unopened road allowances to access the Heritage Lands to hunt wildlife using bow and arrow, and firearms. Discharging firearms (which included bow and arrow) is generally prohibited by law within the Heritage Lands. This poses obvious issues for public safety and is not consistent with the conservation mandate of the Heritage Land partners. Poaching of turtles and spawning fish have been reported to be an issue. Ease of access to Spencer Creek makes spawning fish an easy target of poaching activities. RBG has recommended that Spencer Creek and Cootes Paradise be identified as a seasonal fish sanctuary. The cumulative impact of poaching activities has a negative impact on fish and wildlife populations, and also has potential human health impacts due to the high heavy metal content found in larger fish in Lake Ontario (MNR 2017). Issues with fishing line and hooks impacting wildlife have also been reported (e.g., turtles found with hooks in their stomachs).

Foraging (36)

Wild plant and mushroom foraging have been noted to take place within the Heritage Lands. Issues associated with over-harvesting have been reported (e.g., substantial declines in Wild Leek (*Allium tricoccum*) populations). Over-harvesting can lead to the direct loss of biodiversity and can also cause other indirect impacts such as the spread of invasive species and trampling. The impacts of this activity are not currently being monitored and are therefore largely anecdotal.

Wildlife Feeding (37)

Feeding ducks and geese is a popular activity along the Desjardins Canal Pond. This is a contentious issue, as some residents are very opposed to this activity, while others enjoy the up-close interaction with wildlife. Feeding wildlife large volumes of processed food (e.g., loaves of bread) causes wildlife to become habituated, losing their ability to find natural foods independently. Large piles of seed are routinely observed piled in the small pull-off area on the north side of the Desjardins Canal Pond; Canada Geese, Mallards, and Mute Swans, in particular, are routinely observed on foot in this pull-off area as well as on King Street East. Anecdotally, traffic volume is increasing along King Street East as a way to bypass the red light for left-hand turns from Cootes Drive to Olympic Drive for those travelling east. There may also be questions about how this affects the health of wildlife. Some adjacent landowners also feed songbirds, White-tailed Deer and other wildlife.

Use of Drones (38)

Drones have recently increased in popularity, especially as a tool to view secluded natural spaces. However, drones have been noted to have a negative impact on wildlife in the Heritage Lands. Transport Canada regulations currently preclude the use of drones in certain areas based on proximity to hospitals and local airports, such as the emergency helicopter pad at McMaster University Medical Centre. RBG and HCA have both created drone policies to address the use of drones, and other Cootes to Escarpment EcoPark System partners are interested in creating drone policies as well. Commercial or professional drone use on HCA lands requires approval by the HCA and provision of a signed user agreement and liability insurance. Drones for personal recreational use are not permitted on HCA lands.

3.5 Encroachments

Impacts associated with adjacent land uses are creating management issues for Current EcoPark System Lands (e.g., encroachment from residences abutting the northwest shore and along the south shore of Cootes Paradise Marsh) (Figure 6).

Private Unsanctioned Trails (39)

Unsanctioned trails are occasionally created from private residences linking to an adjacent sanctioned (or widely used unsanctioned) trail. Sometimes, gates are installed into rear-lot fencing to facilitate access to heritage lands. This speaks to the frequency of use that some of these trails experience. 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” (40)

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 (often referred to as “property creep”). Apart from being illegal trespass, this has an impact on edge vegetation and reduces the overall size of the natural area.

Dumping (41)

Yard waste, such as grass clippings and trimmed branches, is often thrown into 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 frequently noted in many places within the Current EcoPark System Lands (Figure 6), for example:

- adjacent to parking lots located at the end of Presidents Drive near McMaster University Alumni House;
- various locations along the shared boundary of the Heritage Lands and McMaster University campus;
- from the east boundary of Churchill Park into the edge of Cootes Paradise Sanctuary 13; and
- from Olympic Drive into Lake Jojo and Olympic Sports Park (potentially associated with transfer station off-hours).

As of January 1st, 2018, McMaster University became a Tobacco and Smoke-free campus. This has resulted in an increase in the accumulation of cigarette butts on Cootes Paradise Heritage Lands (Cootes Paradise Sanctuary 12), which is presumed to be associated with an increase in those seeking an off-campus location to smoke.

Vegetation Removal/Trampling (42)

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 Cootes Paradise Heritage Lands include the following:

- A portion of HCA lands along the east edge of Lower Spencer Creek CA, adjacent to the baseball diamond, is frequently mowed.
- Mowing in the hydro corridor and from the hydro corridor to the Hopkins Trail (Figure 6) occurs on a regular basis.
- A putting green has been created by mowing in the hydro corridor south of Hopkins Court/Willowglen Court.

- A portion of the hydro corridor and Cootes Paradise Sanctuary 9 is currently being maintained as a community garden with the permission of RBG (Figure 6). Removal of natural vegetation in the vicinity of the community gardens appears to occur on a regular basis.
- A major issue with vegetation tramping occurs in the ravines behind McMaster University campus (Cootes Paradise Sanctuary 12) (Figure 6). Critical habitat for Species at Risk occurs in this general area, and McMaster University students have trampled Species at Risk populations. RBG has completed a great deal of trail closure in the area, and have provided an appropriate trail loop (i.e., Chegwin Trail) to provide access, but sensitive areas are still being trampled.

Pool Drainage (43)

Evidence of swimming pool drainage into the ravines of the south shore was noted from the Westdale North neighbourhood. Erosion gullies beginning at the rear of residential yards with swimming pools have been noted in several locations throughout Cootes Paradise Heritage Lands (Figure 6).

Semi-permanent Camps (45)

Several semi-permanent camps have been set up in several locations within the Heritage Lands, presumably as shelter for the unhoused (Figure 6). This is an unsanctioned use and is considered trespassing. Management issues, including trampling vegetation and dumping, have been noted to occur in the vicinity of these semi-permanent camps.

Cats/Domestic Pets (46)

Domestic pets, in particular cats which roam freely within Heritage Lands, 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 each year (Marks and Duncan 2009).

3.6 Hydrologic Impacts

Issues related to anthropogenic influences within, adjacent to, and upstream of the Cootes Paradise Heritage Lands were largely moderated by forested and grassland communities which served a number of functions in controlling the movement of water in the landscape through the attenuation of surface flows from precipitation, slow release over time, evapotranspiration, and erosion control. With the advent of land clearing for agriculture, industrialization and urbanization, the widespread removal of vegetation and alteration of surface water features has resulted in a number of hydrologic issues within the Cootes Paradise Heritage Lands – largely related to erosion, sedimentation and reduced water quality.

Run-off and Peak Flows (47)

There is an overarching issue of increased rates of run-off and peak flows as a result of past land clearing for agricultural purposes (e.g., vegetation removal, draining of wetlands to increase the quantity of arable lands, etc.), industrialization, and the continued urbanization resulting in an increase in impervious surfaces associated with development (e.g., buildings and asphalt surfaces restrict the ability of precipitation to infiltrate in the ground and focus precipitation into watercourses resulting in rapid run-off). High run-off rates and peak flows have caused massive erosion of streams and a decrease in groundwater infiltration. Any steps possible to mitigate run-off through Low Impact Development (LID) techniques would benefit the Heritage Lands, in particular, Spencer Creek watershed and Hamilton Harbour.

Erosion and Sedimentation (48)

The tributaries draining to Cootes Paradise historically had natural erosion rates, which slowly increased the incised nature of the valleys. However, changes in land use in recent history have accelerated the rate of erosion considerably in some areas. Impacts resulting from erosion and sedimentation can significantly damage vegetation. In many areas within the Current EcoPark System Lands, bank erosion has exposed tree roots and has resulted in deadfall. Some fallen trees have blocked the creek, which in turn may impact the hydrology and fluvial geomorphology of the watercourse (recognizing that in some cases, woody materials can enhance the stream ecosystem but in more extreme cases can contribute to bank-cutting, channel braiding, steep gradients, and create barriers to fish passage). Habitat for herbaceous plants is also impacted. In some places where creek banks would have naturally sloped gently toward the creek, the soil has been washed away until the banks have become vertical or even under-cut. This impacts the ability of riparian vegetation to establish with subsequent impacts for further erosion and bank stability. Also, sediment accumulation in areas of slower moving water in creek systems and Cootes Paradise Marsh has resulted in some destruction of habitat for aquatic vegetation. Reduction of light penetration from increased water turbidity impacts aquatic wildlife living in creek systems and Cootes Paradise Marsh. Increased turbidity also impacts the germination of emergent vegetation and has been identified as one of the factors that led to the demise of the emergent marsh that once characterized Cootes Paradise.

Surface run-off over impermeable surfaces (e.g., asphalt, concrete, stone-chip paths, compacted soils, etc.) throughout the heritage lands promotes the formation of rills and gullies where the water leaves these areas (e.g., outfalls, where curbs end, etc.). Ravines are particularly susceptible (also as a result from adjacent sheet flow) as are areas adjacent to stone-chip paths on slopes.

Specific examples of erosion caused by unmitigated stormwater run-off noted in the Heritage Lands include:

- erosion resulting from stormwater run-off is occurring from McMaster University lands that drain into the valley in Cootes Paradise Sanctuary 12 (Figure 6). There is a need to relocate the outfall that discharges into the valley; and
- erosion resulting from a curb-cut on Mayfair Crescent on McMaster University campus, causing gullying into the adjacent ravine in Cootes Paradise Sanctuary 13 (Figure 6).

Water Quality (49)

The Hamilton Harbour RAP released two reports in 2016 addressing point-source and non point-sources of pollution in Hamilton Harbour and the resulting impact (Hamilton Harbour RAP 2016a and 2016b). Run-off from cleared areas (e.g., agriculture) from the upper watershed, rural and urban runoff, sediment from current ravine and valley erosion along the creek systems, total suspended solids, and phosphorus loadings into Hamilton Harbour are a major watershed concern related to the delisting of Hamilton Harbour as an Area of Concern. A number of water quality issues have been identified as major impacts to the Cootes Paradise Heritage Lands, as listed below.

- There is a major water quality issue associated with sewer cross connections. There are four Combined Sewer Overflows (CSO) that discharge to Cootes Paradise Marsh. One CSO on Chedoke Creek is completely unmitigated and overflows following the majority of rainfall events. Chedoke Creek Flows through Cootes Paradise Sanctuary 15, discharging highly polluted water (Theysmeyer 2017) into Cootes Paradise Sanctuary 1 to the east of Princess Point. Water quality issues include water flows and overflows, which bring garbage and contaminated water (sewage) to Cootes Paradise Marsh;

- There are major water quality issues associated with leachate emanating from the old landfill site at Kay Drage Park (located across Chedoke Creek/Highway 403 from Coronation Park). Slope reconstruction is currently underway along the banks of Chedoke Creek/Highway 403 to address leachate issues;
- Residential properties located to the north of the Cootes Paradise Heritage Lands are unserved and rely on septic systems. Water quality monitoring at the creek mouth of Hickory Brook has found that septic systems located upstream are negatively impacting water quality in the creek;
- The Dundas Wastewater Treatment Plant is scheduled for upgrades to improve operational efficiency in the near future. The plant is built on top of an old landfill. Leachate and associated water management issues are a concern in the surrounding area;
- There is the potential for a large amount of chloride from de-icing agents, used widely to improve winter road safety, discharging into creek systems, Cootes Paradise, and migrating to the groundwater during snowmelt in the spring;
- The Desjardins Canal is subject to frequent algae blooms due to phosphorus contamination in the sediment. Environment Canada has never authorized a cleanup nor does it currently seem that they have any intention to. Opportunities for provincial or federal funding are not available; therefore, clean up is entirely up to the City of Hamilton (current landowner); and
- Turbidity and warmed water caused by stormwater runoff, erosion, siltation, the invasive non-native Common Carp (*Cyprinus carpio*), limited vegetative buffers adjacent to coldwater streams, etc.

Extreme Fluctuating Water Levels in Cootes Paradise Marsh (50)

Water levels in the lower Great Lakes were very high in 2017 which had a significant effect on Cootes Paradise Marsh and the neighbouring community. This was exacerbated by periods of heavy rainfall in the spring, resulting in major flooding events. Whereas high water is a normal event depending on the timescale that is examined, an increase in intensity and frequency of severe weather events is an anticipated outcome of climate change and is expected to continue to impact the hydrology of Cootes Paradise Marsh over the long term.

The need to raise the Desjardin Trail by approximately half a meter to mitigate the impacts of flooding and prevent future damage is an example of the impacts of highwater levels. The project is being undertaken by Parks at the City of Hamilton and construction work will occur in 2018-2019.

Churchill Park Drainage (51)

Several hydrologic impacts have been identified associated with the drainage from Churchill Park (Churchill Park Management Plan, Dillon Consulting 2014). Churchill Park presently drains to the west and northwest through a number of distributed outlets which convey runoff from the park to Cootes Paradise. Runoff has eroded ravine slopes adjacent to Churchill Park. Surface runoff from the Westdale North neighbourhood enters Churchill Park in some locations, while runoff from the park enters the neighbourhood in other locations. Issues associated with runoff from the park to the neighbourhood include basement flooding and water quantity issues with the neighbourhood CSO which contributes to sewer overflows into Cootes Paradise Marsh. There is a predominance of poorly draining silt-clay subsoils at Churchill Park, which is at least part of the cause for the ponding of water that occurs regularly. The City of Hamilton does, however, plan to implement Low Impact Development features, such as rain gardens, to mitigate the poor drainage at Churchill Park, address flooding in local areas of the neighbourhood, and to improve the water quality at Cootes Paradise Marsh. Construction of the first phase of this project is scheduled to begin in 2018.

Polluting Spills (52)

The roadways, pipelines and railway lines within the Heritage Lands are a potential source of chemical and fuel spills. Spill prevention plans, contingency plans and emergency response plans should aim to protect natural features along roads, railway lines and pipelines, as well as human safety.

3.7 Ecosystem Management and Restoration

Management issues related to ecosystem management and restoration are aimed at identifying potential threats and impacts to ecosystem features and functions and identifying opportunities for management and restoration.

Forest Fragmentation (53)

The forest edge along the south shore of Cootes Paradise is very fragmented and poorly configured, with few opportunities for increasing forest interior habitat. The width of the easement for managing hydro-corridors was increased by approximately five metres on either side in 2017. This increases the extent of forest fragmentation and the overall impact of the hydro-cut. Approximately 75% of Cootes Paradise Heritage Lands are surrounded by urban development and are fragmented from other natural areas in the landscape. Opportunities for making ecological connections are limited due to these adjacent urban land uses and major transportation corridors.

Decline in Natural Feature Quality (54)

An overall decline in the quality of natural features, including biodiversity, has resulted from increased pressures from adjacent lands and intensification of recreational uses. 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 (55)

Several factors are currently impacting the health of forests in southern Ontario. Climate change and extreme weather events, such as prolonged periods of drought, can significantly impact the health of forests and can lead to the death of trees. Excessive tree blowdown and resulting erosion where they are stabilizing slopes can also impact the health of forests.

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 documented in the Cootes Heritage area, but is another potential threat. Many forests pests, such as Emerald Ash Borer, are killing trees or causing significant dieback of trees, resulting in forest health decline, hazard trees and safety issues. Gaining access to and managing the dead trees creates a secondary management issue, along with invasive species management. Fortunately, ash is a relatively minor component of the forest ecosystem within the Heritage Lands. Stands of ash trees previously occurred on clay extraction sites in Cootes Paradise Sanctuary 6. These areas are now dominated by Common Buckthorn. RBG targets a few areas of heavy ash decline each year to focus replacement plantings and invasive species removal. Also, RBG injects some ash trees along Ravine Road Trail and at the base of Hickory Valley Trail to protect them from Emerald Ash Borer.

Non-native earthworms also appear to be contributing to the decline of forest health, particularly impacting the diversity of the ground flora and soil micro-invertebrate communities (with subsequent issues higher up in the food chain). 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.

Urban-adapted Wildlife (56)

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 Cootes Paradise Heritage Lands, urban-adapted wildlife species include squirrels, raccoons, skunks, Mute Swans, Canada Geese, and deer. Over-population of mesopredators, such as raccoons and skunks, impact other wildlife through predation, resource depletion and by dominating habitat. Their ability to capitalize on urban land use has provided them with a competitive advantage over other wildlife species.

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. The Ministry of Natural Resources and Forestry (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 only seven deer. Although controversial, deer management of some kind should continue within the Current EcoPark System Lands in order to address impacts to natural heritage and human safety. Deer exclusion fencing has also been used to reduce rubbing against, and the consumption of, rare and unusual lilac cultivars at the arboretum, however, exclusion fencing is not long enough to impact deer travel patterns and may result in impediments to the normal use of the area by other resident wildlife.

Canada Goose populations (an urban-adapted species) are also creating management issues as they impede the establishment of restoration plantings (e.g., RBG has had to install one fence to keep geese away from marsh restoration plantings, and another fence to keep people out). There are also water quality repercussions resulting from the excrement of Canada Geese. Maintenance of large expanses of lawn has contributed to concentrations of Canada Geese.

Loss of Open Woodland/Prairie/Savannah Habitat (57)

There is significant literature noting the extent open oak woodland and grassland understory within and around the Cootes to Escarpment EcoPark System, partially as a result of 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, 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.

Over time, these habitats have been diminished within the Heritage Lands due to the loss of natural disturbances, including fire, which would have maintained a more open landscape character. 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 study area and is supported by habitat provided at Princess Point and Sassafras Point that is maintained as open habitat through prescribed burns. RBG conducted a controlled burn at Princess Point on April 13, 2017.

Conservation and Recovery of Species at Risk (58)

The conservation and recovery of Species at Risk in the Cootes Paradise Heritage Lands is largely associated with conserving and restoring marsh and open woodland habitat. Management of habitat in and adjacent to known locations of Species at Risk (e.g., maintaining open woodland characteristics) is necessary, as natural disturbance regimes of some ecosystem types are currently well moderated (fire suppression). In addition, recreational uses that have become established in many locations may not be compatible with the conservation and recovery of Species at Risk and rare species.

Stream Habitat Improvement (59)

Spencer Creek, Ancaster Creek and Chedoke Creek are all trenched and disconnected from their natural floodplains. Spencer Creek was historically channelized to facilitate the construction of the now abandoned rail line and canal. In addition, the alignment of the main channel of Spencer Creek is constrained by the old railway berm, which complicates options for rehabilitation to improve in-stream habitat and efforts to slow the flow of water. Ancaster Creek and Delsey Creek have been impacted through various infilling and Delsey Creek is blocked at Olympic Drive by a grate. Chedoke Creek was modified through the infilling of the marsh for the now closed Kay Drage Landfill and construction of Highway 403. These impacts pose major issues for fisheries, stormwater management, and water quantity and quality.

Cootes Paradise Fishway and Management of Fish Communities (60)

The Cootes Paradise fishway is a barrier designed to keep non-native carp out of the marsh. The fishway has been effective and is also a useful tool for obtaining data about the populations of other fish species that depend on the marsh. The fishway is a key invasive species management tool, and the number one restoration tool used to improve the quality of the Cootes Paradise Marsh. It is also an important public education tool. A session is planned for 2018 to review the efficacy and long-term use of the fishway. The MNRF is concerned with the long-term feasibility of the fishway operations and the associated costs. RBG would like environmental conditions to be improved to the point where carp are no longer favoured and the fishway is no longer required. Canadian and American experts will participate in discussions to determine what is best for the fish community and recommend how long the fishway will operate and in what capacity.

Invasive Species (61)

Tables 6 and 9 in the Cootes Paradise Heritage Lands Management Plan Inventory, Issues and Opportunities (North-South Environmental Inc. et al. 2018) summarize 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, including: Garlic Mustard, Lesser Celandine, Dog-strangling Vine, English Ivy, Periwinkle, Himalayan Balsam, Japanese Knotweed, Phragmites, Miscanthus, Purple Loosestrife, White Mulberry, Common Buckthorn, non-native honeysuckles, Multiflora Rose, Kobus Magnolia, Japanese Barberry, Norway Maple, Manitoba Maple, Tree-of-Heaven, and Black Locust. Some of these are very difficult and/or resource-intensive to eradicate. Woodland Speargrass (*Poa nemoralis*), a non-native invasive grass, is prevalent in some areas (forest adjacent to Churchill Park). Various plant taxa have escaped from horticultural gardens at the Arboretum into surrounding natural areas, indicating that the botanical gardens are a source of some invasive species. RBG is in the process of creating an organization-wide policy on invasive species. High-profile Invasive fauna noted within the Current EcoPark System Lands include Common Carp, Gypsy Moth, and Emerald Ash Borer.

Noxious Plants (62)

Poison ivy and other noxious plants pose health and safety issues for park users. Poison ivy is found throughout the Current EcoPark System Lands in various concentrations, with particularly vigorous populations occurring around Lake Jojo, where massive vines have climbed into the canopy and leaves and fruit are sometimes at head-height. Giant Hogweed has also been noted within the Current EcoPark System Lands.

Wildlife Crossing/Corridors (63)

The lack of wildlife crossings has been identified as a major issue of concern for the Cootes to Escarpment EcoPark System, especially within the Cootes Paradise Heritage Lands. The existing assemblage of land parcels that comprise the Current EcoPark System Lands are fragmented across the landscape. As a result, wildlife is forced to cross roads, hydro-corridors and railways to access lands that are required for fulfilling their various life processes (e.g., mating, nesting, foraging, over-wintering). Vehicular speed and wildlife collision on roads severely impacts the safe passage of wildlife, and ultimately wildlife populations. Road mortality has been attributed to significant declines in amphibian and reptile populations across Ontario.

Noise (64)

Noise (or sound) pollution currently impacts the Cootes Paradise Heritage Lands in a variety of ways, including:

- highway noise associated with Highway 403 travels across the marsh and may negatively affect sensitive wildlife species. As a result, some species may be constrained to the west end of the marsh (i.e., away from Highway 403);
- McMaster University occasionally hosts major events that can be extremely loud and may result in major impacts along the south shore of Cootes Paradise Marsh and extending across the marsh to the north side of the Cootes Paradise Heritage Lands. Wildlife sensitive to noise may be impacted by these events;
- emergency helicopters landing at the Air Ambulance Helicopter Pad, located east of Cootes Paradise on McMaster University campus, can be extremely loud and may impact wildlife sensitive to noise;
- road noise produced by traffic on Cootes Drive may be significant for wildlife. In addition, the death of the adjacent ash forest, which had buffered sound from the road, may result in a higher level of noise in the Heritage Lands; and
- some flights from the Canadian Warplane Heritage Museum fly over the Cootes Paradise Heritage Lands. These aircraft fly at relatively low altitudes compared to commercial flights and the resulting noise may impact sensitive wildlife species.

Removal of Plantings due to Vegetation Maintenance of Pipelines (65)

Rehabilitation plantings within the right-of-way of the Union Gas pipeline area completed by RBG were removed as part of routine vegetation maintenance of the pipeline. Currently, RBG has not acquired the Union Gas maintenance guidelines for their pipeline rights-of-way. Since Union Gas typically restores disturbed areas to a condition that is as good or better than pre-disturbance conditions, this may simply be an isolated example of miscommunication. None-the-less, it is illustrative of the how a relatively small issue (communication) can result in an impact to restoration initiatives.

Establishment of Marsh Restoration Plantings (66)

The restoration of the marsh has long been recognized as an important initiative that would have many overall benefits, and which should be a high management priority. RBG and other partners have been engaged in a number of projects to restore marsh restoration over the past several decades. RBG has recently completed a comprehensive Wetlands Conservation Plan (Theijsmeijer et al. 2016) that documents past and current projects and identifies action items. Several barriers to the establishment of marsh restoration plantings have been identified: turbidity and uprooting of vegetation caused by Common Carp, erosion and stormwater impacts, trampling caused by people, high water levels, and grazing and trampling caused by Canada Geese. Post installation, RBG has had to erect fencing on both sides of marsh restoration plantings to keep people and Canada Geese out (see Unbalanced Wildlife Populations issue above). High water levels are related to overall deepening resulting from plate movement, regulation of water levels in Lake Ontario, and restricted flow through the outlet to Hamilton Harbour.

Shoreline Erosion/Stabilization in Cootes Paradise Marsh (67)

Erosion from wave action has severely undercut several areas of natural sand shoreline within Cootes Paradise Marsh. This issue has complex causes that include a slow deepening of the water level from plate movement, issues with flow through the outlet to Hamilton Harbour, the destructive impact of invasive carp, and increased turbidity from run-off, all of which contributes to the loss of native emergent vegetation. The scale and significance of this issue is considerable.

The shoreline vegetation in Cootes Paradise Marsh provides a significant representation of the remnant native plant communities along the shores of Lake Ontario and the Cootes Paradise ANSI. The difficulty of vegetation restoration is a result of inappropriate (obsolete strategies/technologies) historical shoreline wave protection (such as gabion baskets), unmitigated erosion sites, the various causes of high water levels and water level regulation in the Great Lakes (Theysmeyer et al. 2016). RBG's Wetlands Conservation Plan 2016-2021 states that the shoreline stabilization goal is, in combination with encouraging regeneration of submergent vegetation, to restore undercut eroding shorelines by (1) removing gabion baskets and armour stone where they occur along formerly wind-blown shores; and (2) planting a four-metre-wide band of emergent marsh and shrub thicket to jump start plant re-establishment (Theysmeyer et al. 2016).

Watershed/Sub-watershed Boundary Issues (68)

In reviewing background information and mapping for the Cootes Paradise 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 Conservation Halton and Hamilton Conservation Authority. Issues with consistency in the mapping of sub-watershed boundaries were also encountered. According to some map layers, a portion of

Conservation Halton appears to be within Hamilton Conservation Authority's watershed/drainage. In addition, Hamilton Conservation Authority owns lands within Conservation Halton's jurisdiction (Borer's Falls Conservation Area 2 and 3).

3.8 Cultural Heritage

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

Communication of Cultural Heritage Importance of Cootes Paradise (70)

The cultural heritage resources documented in this report include a wide range of typologies originating from the Middle Woodland period (400 B.C.-A.D. 500) to the late twentieth century. Collectively, these typologies have the potential to communicate the importance of Cootes Paradise in the cultural development of the area known as the Cootes to Escarpment EcoPark System.

Connection between Cultural and Natural Resources at Princess Point (71)

Princess Point stands out as a place that provides a strong connection between the natural and cultural resources of the Heritage Lands. It also provides public access to the water's edge and notable views of Cootes Paradise Marsh. As such, it has the potential to provide an important, if not unique interpretive opportunity, as well as serve as an important entry and destination for visitors to the Cootes to Escarpment EcoPark System.

Identity of Raspberry Farm (72)

The Raspberry Farm site lacks a distinct identity. At present, it includes two distinct landscapes: extant features from farming and plant propagation activity, and the features arising from the 1953 Redman plan.

Cultural Heritage Interpretation of Desjardins Canal (73)

Despite physical deterioration, the context of the Desjardins Canal remains unchanged. The canal provides the opportunity to convey a unique story of technical achievement and water-borne transportation in the nineteenth century, as well as being a cultural feature that had a major influence on the development of the area, in particular, the former Town of Dundas.

Low Profile of Early Settlement History (74)

There are a number of early surveys and other historical documents that provide a picture of the early settlement around Cootes Paradise. These show the holdings of several of the prominent first settlers whose names are commemorated in the Heritage Lands today. The early surveys also show the historic road patterns and watercourse alignments, including the original connection between Cootes Paradise and Hamilton Harbour (then also known as "Lake Geneva").

Need for Corresponding Management Expertise (75)

The large number and differing types of cultural heritage resources in the Cootes Paradise Heritage Lands requires a complementary and corresponding range of management expertise to ensure conservation and sustainability.

4.0 Heritage Lands Management Recommendations

This section of the Management Plan addresses the issues and opportunities identified in section 3.0. The recommendations have been developed predicated on the expectation that use is going to increase as a result of increased human population from several approved development applications adjacent to or in close proximity to the Heritage Lands, and the possibility of additional approvals in the future. The Cootes Paradise Heritage Lands are at a critical juncture; if management is not implemented, current and anticipated increases in impacts will likely result in substantial degradation of the natural, recreational and cultural values of the area. Thus, implementing management of these lands is extremely important and timely. Although the management plan focuses on Current EcoPark System Lands within the Cootes Paradise Heritage Lands, there are also pressures being placed on Privately Owned Outreach Areas within the Heritage Lands, and Adjacent Lands. In some instances, management issues on the adjacent lands affect the Current EcoPark System Lands, and will influence the scope of management initiatives. Communication, education and stewardship with adjacent landowners will be a key consideration in future management. Where appropriate, consideration of these adjacent pressures is provided.

The recommendations of this Management Plan are arranged into 75 “Management Themes”. These themes are based on the issues identified in Section 3.0. Each Management Theme is numbered solely to allow easy reference to a corresponding management issue; the numbers do not reflect any priority for implementation.

4.1 Approach to Management Recommendations

Because much of the Cootes to Escarpment EcoPark System is part of the NEPOSS, the management plans will be prepared following the NEPOSS land classifications and zones as a basis for recommending future management initiatives. The NEP requires that Management Plans be prepared for each park and open space in the NEPOSS. The NEP Management Plans lay out goals and objectives, guide the protection and management of natural heritage features and cultural heritage features, and identify appropriate activities in NEP park and open space areas. This poses a unique situation for the Cootes Paradise Heritage Lands, which are comprised of several parcels, some, but not all of which are classified as separate parks in the NEP, i.e., several NEP parks with different classifications occur within the Cootes Paradise Heritage Lands. In the context of the Cootes to Escarpment EcoPark System, a single Management Plan is being prepared for each of the six Heritage Lands per requirements specified in the Cootes to Escarpment Park System Phase II Land Management Strategy (October 2009). A single overall Management Plan is desirable in order to manage the lands in a holistic and integrated manner, among multiple partners. To reconcile these two different frameworks, the Cootes Paradise Heritage Lands will not be identified as a single park or open space area, but will adopt the classification and zoning for each park as identified in the NEP. For park and open space areas not included under an existing park, or for those not falling within the NEP area, classification and zoning have been recommended. As a result, the Heritage Lands will contain multiple classification and zoning assignments.

This Management Plan intends to provide overall high-level guidance for the future management of the Heritage Lands. Detailed site-specific master plans may be prepared at a later date by individual landowners or agencies to further refine recommendations and, depending on whether their lands are within the NEP area, these may need to be submitted for approval through the NEPOSS process.

4.1.1 Classification and Zoning of the Heritage Lands

To assist in the development of future detailed Master Plans, the classifications and zones from the NEPOSS planning manual were applied to the Cootes Paradise Heritage Lands. These provide a basis for identifying permitted uses and long-term management. The full rationale and description of the Classification and Zoning exercise is provided in Appendix 1. Note that Classifications are applied to entire parks, as defined in the NEPOSS manual, and Zones are areas that guide development and management within each park.

A summary of the Classifications and Zones is provided below.

1: Classification of the Heritage Lands per NEPOSS

The NEPOSS Planning Manual (MNR 2012) provides six Classifications that characterize park and open space areas within the NEP area. Notably, with the release of the updated Niagara Escarpment Plan in 2017, the previous “Historical” Classification was replaced with “Culture Heritage”. The Cootes Paradise Heritage Lands contain two Classifications, Natural Environment and Recreation. Centennial Park and Churchill Park are both located within the NEPOSS. Churchill Park was classified as Recreational in the Management Plan prepared in 2014 (City of Hamilton 2014) however the NEPOSS planning manual states that classifications are subject to confirmation each time a management plan is prepared or revised. Landscape Architectural Services from the City of Hamilton should be involved in the classification of all parks into NEPOSS categories, particularly Churchill Park and Centennial Park as they fall within the NEPOSS.

2: Zoning of the Heritage Lands per NEPOSS

- The use of zoning is outlined in the NEP as “essential to the orderly planning, development and effective management of a park or open space area”. NEP zoning is intended to work within each of the park Classifications to guide uses based on the significance of resources, the need for protection, and the potential for recreation or other activities. The NEPOSS Planning Manual (MNR 2012) provides six zones and each one serves a specific purpose and provides direction on planning and management. The revised Niagara Escarpment Plan (2017) has changed the naming for the zones as identified in the NEPOSS Planning Manual; what was previously “Natural” is now “Natural Environment” and “Historical” is now “Cultural Heritage”. The changes in the name of the zones do not appear to change the intent of their management direction and permitted uses. The Cootes Paradise Heritage Lands contain six Zones: Nature Reserve, Natural Environment, Access, Cultural Heritage, Development, and Resource Management.

In this Management Plan, the Resource Management Zone has been applied to lands with the sole intent of providing for future restoration activities, and not to provide for active resource extraction or harvesting. It is recommended where restoration would be the principal management activity in the future owing to the current characteristics of the area. Zoning recommendations are based on the inventory and analysis completed for the Inventory, Opportunities and Issues Report. Recommended Zoning for the Cootes Paradise Heritage Lands is provided in Appendix 1.

4.2 Overarching Management Recommendations

There are a number of recommendations that are better to be addressed throughout the EcoPark System and are not specific to the Cootes Paradise Heritage Lands. These recommendations are organized according to the Management Themes identified in Section 3.0 and are provided below.

3. Awareness of the Cootes to Escarpment EcoPark System

- 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 include the Cootes to Escarpment EcoPark System and Heritage Lands. 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, Accessibility for Ontarians with Disabilities Act, 2005 (AODA) compliance, placement and size of EcoPark System and partner logos, etc. could be established;
- The placement of signage can be challenging, especially because there are so many access points into the Cootes to Escarpment EcoPark System. The future placement of signage should take into consideration visibility, locations of other signage, the density of adjacent brush and proximity to intersections; and
- Consistently post signage to indicate when users are entering and exiting the Cootes to Escarpment EcoPark System to increase awareness.

4: Delineation of Current EcoPark System Boundaries to Reduce Trespass/Encroachment Issues

- Develop and implement a consistent system to locate and mark boundaries of Current EcoPark System Lands within the Cootes to Escarpment EcoPark System. This could include fencing or where that is not feasible or ecologically appropriate, permanent boundary markers. Increasing awareness of property boundaries will reduce trespass and encroachment issues. It will also provide a basis for enforcement of the policies and permitted uses of each of the partner agencies on their properties. Note that there may also be a need to mark boundaries of partner agency properties within the Current EcoPark System Lands, especially where permitted uses change in response to ownership. This could be more subtle marking along trails where they cross property boundaries.

5: Need to Better Communicate the Multi-agency Management of the 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 but 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;
- Clearly communicate permitted uses to EcoPark System users through improved signage and outreach initiatives; and
- The partner agencies that own land within the EcoPark System should identify and, to the extent that is possible, reconcile inconsistencies in permitted uses and management policies (e.g., cycling on the Bruce Trail, which is not permitted by the BTC, but is by other partner agencies). Preferably, this would be done for the entire EcoPark System, however, if that is not

possible, then at least doing it within each of the Heritage Lands would be helpful to deliver a concise and consistent message to the public.

6: Population and Use

- Responsibility for impacts on Heritage Lands resulting from development and the cost of additional management to mitigate impacts should be borne by the development proponent to the extent possible;
- Planning authorities should consider developing policies that would encourage the implementation of relevant management recommendations made in this Management Plan through development approvals, where appropriate. 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;
- Partner agencies directly involved in the development approval process (in the case of the Cootes Paradise Heritage Lands these are the City of Hamilton, Conservation Halton, and the Hamilton Conservation Authority) should consider and incorporate the significance of the Heritage Lands in their reviews and in the subsequent development of conditions they impose on development approvals, where appropriate;
- Partner agencies should include consideration of increased use pressures and environmental impacts on Heritage Lands in their assessment of development applications on adjacent and nearby land, where appropriate;
- Impacts associated with future developments adjacent to the Heritage Lands should be clearly identified and assessed in Environmental Impact Assessments/Studies in the context of the role the Heritage Lands play in the overall Cootes to Escarpment EcoPark System. Limits of developable areas, buffer widths, and management needs such as design and provision of trails within the Heritage Lands should consider the higher ecological value of the Cootes to Escarpment EcoPark System when determining impact mitigation for future development, where appropriate; and
- Encourage other agencies and landowners that are not directly involved in the development approval process to comment on development applications that may impact their lands.

7: Funding

- Partner agencies should determine how each of the areas that comprise the Current EcoPark System Lands are to be accessed by users and on what terms (e.g., pay for use, payment not required);
- Consider updating the funding formula for the Cootes to Escarpment EcoPark System;
- Identify sources and pursue additional funding for the management of Current EcoPark System Lands; and
- Identify efficiencies for managing the Current EcoPark System Lands collaboratively, and in a holistic manner. Communication among partner agencies on planned management activities may highlight opportunities for reducing costs and improving the efficiency of implementation.

8. Trail/Railway Crossings

- Consult with and clearly demarcate Cootes Paradise Heritage Lands trail crossing points with CN Rail.

- Trail crossings should be consistent with Draft RTD-10 Road or Railway Grade Crossings: Technical Standards and Inspection, Testing and Maintenance Requirements (2002) available from Transport Canada;
- Enter into a discussion with CN Rail to develop an appropriate solution to address trails crossing the CN Rail line; and
- The future Trail Plan developed for the Cootes to Escarpment EcoPark System should limit trail crossings of the CN Rail line to a minimum number of crossings, in consultation with CN Rail.

9. Critical Corridor for Connection of Cootes Paradise to the Niagara Escarpment

- Continue to purchase and 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” existing EcoPark System Lands and lands located with the critical corridor that provides the connection between Cootes Paradise and the Niagara Escarpment; and
- 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 activities that are inappropriate in ecologically significant/sensitive lands. For example, lands that are dominated by non-native invasive species would be better suited for dog walking, mountain biking or other forms of more intensive recreation than ecologically significant/sensitive lands.

10. Desire and Need for Trail Connections and Trail Plan

- Pursue opportunities to develop connecting nature trails as well as multi-use trails on roadside shoulders, in rights-of-way and utility corridors to create these much-needed trail connections. 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 line, 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; and
- Prepare a Trail 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 Trail Plan, and the City of Burlington Community Trails Strategy (2015), the City of Hamilton Recreational Trails Master Plan (2016), and the City of Hamilton Draft Transportation Master Plan Review and Update (2018) should be referenced. Note this is different from the Trail EcoPark Guideline, discussed below in Theme 11, which primarily addresses trail design and maintenance issues.

11. Desire and Need for a Wildlife Crossing Plan

- Maintain and protect the continuity and integrity of corridors through the Cootes Paradise Heritage Lands, particularly across major roads;
- Investigate the need for and feasibility of implementing wildlife corridors and wildlife crossings through the Environmental Assessment process. Ensure that best design principles for wildlife crossings are incorporated, including adequate fencing to accompany wildlife crossings structures;

- As identified through the development of a Wildlife Crossing Plan, prioritize and upgrade existing crossing structures (e.g., road culverts) to improve wildlife passage. This could be completed across a municipal jurisdiction and would not necessarily need to be tied to the Cootes to Escarpment EcoPark System, but should be designed to complement the objectives of the Cootes to Escarpment EcoPark System;
- Identify representatives from the City of Hamilton and the City of Burlington that have responsibility for road maintenance and capital works projects in the Cootes to Escarpment EcoPark System lands and include them in management discussions that involve roads (e.g., salt/de-icing agent management, pedestrian trail-road crossings, wildlife crossings, roadkill clean-up, roadside parking, signage on roads, etc.);
- Contribute to long-term monitoring opportunities by initiating and/or continuing to monitor wildlife crossing and road mortality. Monitoring programs could be developed at a municipal scale, and could be designed to complement the objectives of the Cootes to Escarpment EcoPark System; and
- Results of monitoring should be made publicly available through peer-reviewed journals, conferences, published on partner web-pages, etc., in order to contribute to peer to peer information sharing and the continued improvement in the field of road ecology.

12: EcoPark System-wide Guidelines

There are a number of issues that are generally common to all of the Heritage Lands. It would be most efficient to address these issues through several EcoPark System-wide Guidelines, which address all the common issues and also identify the issues that are limited to one or more Heritage Lands. This approach has the additional advantage of providing consistency among Heritage Lands, thus contributing to the resolution of consistency and identity issues noted above.

- Identify participating partners for each EcoPark System Guideline; and
- Using the guidance provided in this Management Plan, it is recommended that the Steering Committee identify themes or groups of issues that are best addressed through EcoPark System-wide Guidelines and initiate the development of those guidelines. As a starting point, it is recommended that the EcoPark System-wide issues can be grouped into the following themes/guidelines:
 - Trail Guideline;
 - Education and Signage Guideline;
 - Vegetation Management Guideline; and
 - Edge Management Guideline.

The issues to be addressed in these Guidelines, as identified through the Clappison-Grindstone Heritage Lands Management Plan study (North-South Environmental Inc. 2016), are provided in Section 3.0 and recommendations for implementation are provided in Section 5.0. Suggestions for which management issues and opportunities could be addressed by each Guideline are provided in Appendix 3.

Each partner agency may already have some form of guidelines (e.g., guidelines for trail construction and/or trail closure), although not specific to the Cootes to Escarpment EcoPark System. Partner agencies are encouraged to use their existing guidelines as a starting point for developing Guidelines that are specific to the Cootes to Escarpment EcoPark System. The Guidelines are intended to engage the partner agencies in the preparation of a series of short reference documents that can be used to guide future management consistently and holistically across the EcoPark System. For example, the

Trail Guideline could include guidelines that are agreed upon by the partner agencies for trail construction, including specifications for trail width, trail surfacing and proper trail alignment, as well as guidelines for trail closure, including specifications for when trails should be closed, how they should be closed, appropriate signage, etc. Additional detail on the EcoPark System Guidelines is provided in Section 5.2.

The Management Plans prepared for individual Heritage Lands are intended to provide high-level guidance for the management of each individual Heritage Lands. The EcoPark System Guidelines are intended to provide specific guidance for trails, education and signage, vegetation management, edge management, etc. agreed upon by the partner agencies to enable, to the extent possible, consistent and holistic management across the entire EcoPark System.

The Management Plans, once completed for all six Heritage Lands, will provide the basis for the recommended EcoPark System Guidelines, as well as other future system-wide Plans that will provide direction for actual implementation. Both the EcoPark System Guidelines and other future EcoPark System-wide Plans are proposed future initiatives that are not currently planned and will need to be considered by the Cootes to Escarpment EcoPark System Management Committee. Future proposed initiatives include the preparation of Guidelines at a wider scale including a Trail Plan (to address trails, trail connections, access points, etc.) and a Wildlife Crossing Plan (to address wildlife corridor, wildlife crossings, etc. [see theme 11 above]). The preparation of EcoPark System-wide Plans would be followed by implementation (including detailed design and construction), and monitoring.

4.3 Cootes Paradise Heritage Lands Management Plan Recommendations

4.3.1 Vision

The Vision for the Cootes to Escarpment EcoPark System is that “it will be known internationally 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” (Phase II Report, October 2009). The primary focus of the Vision is to establish a sustainable natural system that will contribute to ecosystem integrity and enhance the quality of life for the public through appreciation of the natural environment. Inherent in providing opportunities for appreciation is realizing the recreational opportunities in the EcoPark System and ensuring that recreation will be promoted and supported where consistent with the protection of natural heritage features and functions.

13: Develop Vision

It is recommended that the Steering Committee for the Cootes Paradise Heritage Lands develop a unique Vision for the Heritage Lands. We suggest the following as a starting point for the Vision:

“The overall vision to guide the long-term use and management of the Cootes Paradise Heritage Lands is to protect, restore and appropriately manage significant natural, recreational and cultural heritage resources. Inherent in this vision is recognition of:

- the integral role the Cootes Paradise Heritage Lands play in preserving biodiversity and the ecological integrity of the Cootes to Escarpment EcoPark System;
- the significance of Cootes Paradise Marsh and the numerous National and Provincial designations to protect it;
- the value of Cootes Paradise Heritage lands as a unique cultural landscape within Canada;

- the value of the Cootes Paradise Heritage Lands for passive outdoor recreation;
- the value of teaching wise stewardship through active involvement in protection and management activities; and
- the responsibility of the partner agencies and community, through management and stewardship, to preserve biodiversity and ecological functions for the well-being and enjoyment of present and future generations.”

This Vision articulates the long-term intent for the protection and use of the Cootes Paradise Heritage Lands. Given the evolving context of the surrounding landscape and anticipated development and urbanization, it is inevitable that active management will be required to mitigate impacts from increased use and to provide and maintain the appropriate infrastructure for public access. The Heritage Lands Management Plan provides a framework for implementing long-term management.

4.3.2 Recommended Permitted Uses

14: Permitted Uses per NEPOSS Classification

This section of the Management Plan provides general directions on permitted uses for each park Classification based on the NEPOSS Planning Manual. Specific management recommendations are provided in Sections 4.3.1 through 4.3.9 to address the management issues identified in Section 3.0. Landowners have the ability to further refine recommended Classifications and permitted uses, as appropriate, at a later date should they opt to develop individual Management Plans for their lands.

Natural Environment Classification:

There are 25 Natural Environment class parks in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). The intent of Natural Environment class parks (e.g., Cootes Paradise Sanctuary) is to protect existing natural heritage features and allow for moderate intensity recreational activities. Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- day use activities in areas accessible by sanctioned trails;
- recreation activities of moderate intensity such as hiking, trail running, cycling, on-leash dog-walking, and nature appreciation (botanizing, bird-watching, etc.); and
- other existing low-impact activities, for example fishing, that are currently allowed by the existing policies of the partner agencies, should continue to be allowed, subject to other management recommendations of this management plan aimed at reducing/eliminating impacts.

Specific management recommendations aimed at minimizing impacts from recreation and other uses are provided in Section 4.3.5.

Recreation Classification

There are seven Recreation class parks, in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- Facilities for overnight camping, including campgrounds, temporary yurts and tents, lean-tos and un-serviced cabins;

- Visitor service facilities with retail components; and
- Small-scale, special-purpose facilities designed and operated in support of natural history, environmental and UNESCO World Biosphere Reserve and related programming, which may include fully serviced overnight accommodations with meals for facility guests.

Specific management recommendations aimed at minimizing impacts from recreation and other uses are provided in Section 4.3.5.

15: Permitted Uses per NEPOSS Zone

This section of the Management Plan provides general permitted uses for each park zone based on the NEPOSS Planning Manual with consideration for the preferred use concept described above. Specific management recommendations that respond to issues identified in Section 3.0 are provided in Section 4.0. Landowners have the ability to further refine recommended zones and permitted uses, as appropriate, at a later date should they opt to develop individual Management Plans for their parks.

Nature Reserve Zone:

There are 15 Nature Reserve Zones identified in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- protect, preserve and restore identified natural heritage features;
- hiking, trail running, on-leash dog walking and passive activities such as nature appreciation, bird watching, etc.;
- visitor uses should be very restricted within the Nature Reserve Zone;
- development should be restricted to maintenance of limited and strategically placed nature trails, interpretive and directional signs;
- any temporary equipment or minor structure required for research or monitoring (e.g., data loggers, quadrats, blinds, recording equipment, etc.);
- cycling and higher impact recreational activities are not recommended or encouraged in the Nature Reserve Zone. However, where they are existing uses, they could be tolerated and management is recommended where it reduces impacts, but does not expand the use;
- activities associated with habitat restoration, conservation and research;
- signage should be provided that indicates when a park user is entering a Nature Reserve, and what the appropriate behaviour is (e.g., staying on trails, no unsanctioned management, etc.);
- a “special protection” sub-zone should be used within Nature Reserve Zones where there are significant and/or sensitive features. Recreational activities, including existing ones (e.g., cycling and hiking), should not be permitted in such sub-zones:
 - this sub-zone may be desired in locations such as rare species habitat, talus slopes, wetlands, etc. where access should not be facilitated;
 - the benefits of applying a “special protection” sub-zone include protecting sensitive and/or significant natural heritage features by directing recreational activities away from these areas; and
 - the “special protection” sub-zone could be established in future property-specific Management Plans.

Natural Environment Zone:

There are 16 Natural Environment Zones identified in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- the Natural Environment Zone is to function as a buffer between Development Zones and Historical or Nature Reserve Zones;
- visitor uses should be limited to low- to moderate-intensity recreational activities;
- hiking, trail running, cycling, on-leash dog walking, nature appreciation, bird watching etc.;
- a major difference in use between Natural and Nature Reserve zones is that cycling will be accommodated (on properly designed and located trails) in the former, but only tolerated and not expanded or encouraged in the latter;
- a minimal level of development (e.g., trails, necessary signs, etc.) should be permitted to support low-intensity recreational activities in ecologically appropriate locations; and
- activities associated with habitat restoration, education, research and conservation-based activities.

Access Zone:

There are five Access Zones identified in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- the Access Zone intends to support the use and access of adjacent zones;
- all uses permitted with adjacent zones;
- development should be limited to facilities that support access to Nature Reserve, Natural Environment and Cultural Heritage Zones, such as parking lots, access roads, signs and trailheads;
- low-impact development techniques, such as permeable pavement, bioretention, and bioswales, should be evaluated and implemented wherever feasible to minimize impacts to water quality and quantity resulting from an increase in permeable surfaces (e.g., access roads and parking lots); and
- consider ecological restoration opportunities in Access Zones where manicured turf is not required.

Cultural Heritage Zone:

There are eight Cultural Heritage Zones identified in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- the Cultural Heritage Zone intends to protect significant archaeological and cultural heritage features and areas;
- management activities should aim to protect and interpret archaeological and cultural heritage features, and could include interpretive, educational, research and management facilities, trails, signs, and historical restorations or reconstructions; and

- within the Cultural Heritage Zone, cultural heritage resources should be conserved using appropriate techniques and practices that are consistent with Municipal, Provincial and Federal policies and standards.

Development Zone:

There are five Development Zones identified in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- the Development Zone intends to provide the main access to the park or open space, and facilities and services to support the recreational facilities available;
- this type of zone allows the development of visitor and park facilities, subject to other recommendations of this management plan;
- development includes parking lots and gates, picnic areas, commercial service facilities, and orientation, interpretive, education, research and maintenance facilities;
- development of facilities must be designed and undertaken in an environmentally sustainable manner that will minimize their environmental and visual impact;
- uses permitted in adjacent zones;
- low-impact development techniques, such as permeable pavement, bioretention, and bioswales, should be evaluated and implemented wherever feasible to minimize impacts to water quality and quantity resulting from an increase in permeable surfaces (e.g., if a large pavilion is installed in Sheppard Quarry, consideration could be given to including a rainwater harvesting tank to reduce runoff to the stormwater management facility); and
- the Development Zone should have a minimal negative impact on natural heritage features and cultural heritage features, the natural landscape and watersheds.

Resource Management Zone:

There are 15 Resource Management Zones identified in the Cootes Paradise Heritage Lands (Appendix 1: Figure 1 and Table 3). As noted previously, in this management plan the Resource Management zone is applied where ecological restoration is recommended as the primary management need and is not intended to facilitate resource extraction or harvesting. Recommended permitted uses provided in the NEPOSS Planning Manual include the following, except where prohibited by the policies of Heritage Lands partners. Not all of the following are relevant for the EcoPark System:

- the intent of the Resource Management Zone for the purpose of this plan is to identify lands where ecological restoration should be a principal management activity owing to the current characteristics of the area and potential for enhancing ecological integrity and biodiversity;
- uses permitted will be the same as those recommended for Natural Zones, excepting that in the future, should the restoration result in an area that would qualify as a Nature Zone, the more restrictive uses of that zone would apply;
- ecological restoration within Resource Management Zones must aim to compliment adjacent natural heritage resources and to the extent possible must use native species of local genetic provenance;
- Resource Management Zones may be used to demonstrate ecologically sustainable resource management practices; and
- establishing permanent research plots for monitoring purposes is also encouraged.

4.3.3 Land-Use Planning

16: West End of Cootes Paradise and the “Dundas Gateway”

- Undertake an appropriate site-specific study (e.g., secondary plan, area specific plan, parkland type study) of the “Dundas Gateway” at the west end of Cootes Paradise Marsh to investigate the area’s possible role as a gateway to the Cootes to Escarpment EcoPark System; and
- As part of the site-specific study, include a review of parking to improve access the Cootes Paradise Heritage Lands from the “Dundas Gateway” area and address current issues related to parking.

4.3.4 Access and Infrastructure Recommendations

This section of the Management Plan provides management recommendations for access and infrastructure-related issues identified in Section 3.3.

17: Lack of Adequate Parking and Access on Land

- Proposed access points and parking areas 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;
- Encourage partners to secure lands that would enable the creation of additional Access Zones and promote trail connections (e.g., Canadian Tire on Cootes Drive in Dundas recently announced that they will be moving from their current location. There may be a future opportunity to acquire/secure parking in this location);
- Contact Canadian Tire Corporation, Limited, the owners of the 50 Cootes Drive property, to see what current opportunities may exist for the Cootes to Escarpment EcoPark System in the context of parking in the lot abutting the current Heritage Lands on the east side of Dundas Street. Should permission be sought for parking in the lot as an access point to the Heritage Lands, then signage could acknowledge the contribution of Canadian Tire Corporation Limited’s contribution;
- Complete recommended trail connections throughout the Heritage Lands and beyond through a comprehensive Trail Plan;
- Evaluate existing parking areas to determine how well they provide access, including: are they located in an appropriate park zone, are they adequately sized, and identify potential safety concerns;
- Parking options adjacent to Centennial Park and Canal Park should be explored;
- Assess the feasibility of improving accessibility for all people;
- Clearly identify existing sanctioned parking areas, where they occur in appropriate zones, as part of the EcoPark System and promote their use;
- Provide interpretive and way-finding signage at designated parking areas to orient and educate EcoPark System users;
- Ensure appropriate levels of security are provided at parking and access locations including addressing adequate visibility, safe access and traffic calming, and Crime Prevention through Environmental Design (CPTED) principles;
- Look for opportunities for additional parking and access and investigate for feasibility. Consider investigating the feasibility of using utility corridors and/or unopened road allowances as additional access points;

- Explore options for addressing the York Road access point parking issue and consider (1) sealing off the trail so that there is no connecting trail to the Bruce Trail; (2) posting “No Parking” signs on York Road; or (3) re-opening the York Road parking lot;
- Explore options for addressing the Old Guelph Road parking issue and consider (1) posting “No Parking” signs on Old Guelph Road; and (2) increasing enforcement;
- Consider the potential for Princess Point to be used to expand RBG programming and access to the Cootes Paradise Heritage Lands;
- Initiate discussions with the City of Hamilton traffic department regarding the installation of a pedestrian crossing at the intersection of Cootes Drive and the Spencer Creek Trail; and
- The current Spencer Creek Bridge at Cootes Drive is undersized. Consideration should be given to rebuilding the Spencer Creek Trail underneath the road when the bridge is scheduled for replacement.

18: Lack of Adequate Parking and Access on Water

- Repair the dock at Princess Point, formalize the sand beach on the west side of Princess Point as a boat launch, improve directional signage to water access points and look for additional opportunities to improve boat access to the marsh;
- If supported by appropriate technical studies, remove the metal weir at Desjardins Canal Pond by Olympic Drive;
- Look for opportunities to formalize a boat launch and access point along Desjardins Canal Pond as the gateway to the EcoPark System; and
- Feasibility of a canoe launch at the Spencer Creek bridge should be considered providing safe access is possible through the current undersized structure. If access is not considered safe, then this should be identified as a priority item for incorporation into future design for a replacement structure.

19: CN Safety

- Consider decommissioning (consistent with Trail Guidelines) unsanctioned trail systems that lead to the CN Railway crossings;
- Consider illustrating CN sanctioned railway crossings on appropriate signage and trail publications

20: Lack of Facilities

- Explore opportunities to support programming and large-scale events at the RBG such as constructing an outdoor shelter/teaching classroom (see Management Theme 33).

21: Trespassing

- Consider installing a fence to provide a physical barrier, thus limiting access where unsanctioned access has been a continual management issue along the outer perimeter of Cootes Paradise Sanctuary 12. Consider potential impacts to wildlife movement when evaluating options for fencing;
- Improve access to other areas of the Heritage Lands by formalizing access points and providing safe parking options; and
- Identify and mark boundaries of the Cootes Paradise Heritage Lands along the entire perimeter in a consistent manner to reduce trespass concerns on neighbouring private properties (see Section 4.2 on consistent designation of EcoPark System boundaries).

22: Old Infrastructure and Trail Structures

- Repair or replace failing staircases, structures and boardwalks; and
- Remove elements of old restoration projects and degraded infrastructure in Cootes Paradise Marsh, including the old Aquadam, logs and chains, concrete slabs, concrete-filled garbage can, concrete pipe and two rusty culverts.

23: Lack of Public Transportation

- Review existing HSR routes and SoBi station locations to develop a tourism public transportation system that would serve to move people around the entrances of the Cootes to Escarpment EcoPark System. This would also assist in addressing parking issues and the lack of public transportation.

4.3.5 Recreation Recommendations

This section of the Management Plan provides management recommendations for recreation-related issues identified in Section 3.4. A review of existing guidelines and procedures currently held by partners (e.g., Bruce Trail Conservancy) could be considered in the implementation of encroachment recommendations.

24: General Trail Recommendations

- Develop EcoPark System-wide Trail Guideline (Management Theme 12 and Section 5.2) that would address the trail-related issues that are common to all or most Heritage Lands. Issues and opportunities that should be addressed, based on the research for this current Management Plan, are provided in the following sections and Section 5.2. The Hamilton Burlington Trails Council could support the development of the Trail Guideline by providing comments and review (see Sections 3.4 and 5.2);
- Create an EcoPark System-wide Trail 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 Recreational Trails Master Plan (2016), Draft Cycling Master Plan Review and Update (2018) and the City of Burlington's Trail Plan;
- Create a trails map for Cootes Paradise Heritage Lands. Show all trails, identify problems/issues and prioritize management issues. For example, in the Cootes Paradise Heritage Lands, the McMaster/Westdale area and the area west of Olympic Drive would benefit from this exercise and should be identified as focus areas for future management efforts;
- Complete recommended trail connections with the rest of the EcoPark System. Refer to City of Hamilton Recreation Trails Master Plan, Cycling Master Plan, and Draft Transportation Master Plan Review and Update as a reference. These Plans include trail standards, future trail connections, etc.;
- Consider creating a trail network around Cootes Paradise Marsh that would unify the North and South trail systems and serve to enhance visitor experience;
- Develop guidelines for trail construction including actual construction protocols, choice of trail surface, storage and within-park movement of materials, etc. Since this is an issue common to all Heritage Lands, it should be addressed in the recommended EcoPark System-wide Trail Guideline (see Management Theme 12):
 - consider optimal trail user operating guidelines (trail type/recommended widths for different uses) and AODA requirements; and

- assess the possibility of reducing the width of trails (and low impact design) through more sensitive areas, where appropriate, etc., including just having unsurfaced footpaths in Nature Reserves and other sensitive areas where access is not encouraged. These could be left off of any public trail mapping.
- Encourage plant salvage as part of trail construction protocols as part of the Trail Guideline;
- Develop trail closure protocols including methods of trail closure, restoration of ground flora, signage, etc.;
- Consider the following principles when assessing options for trail closure, rationalization and formalization:
 - limit access to physically and ecologically sensitive habitats, including banks and seepage areas as trail location should result in the least disturbance to habitat and wildlife;
 - ensure appropriate routing of trails and trail activities 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;
 - 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 resulting in unacceptable impacts;
 - investigate alternative trail surfaces that are commensurate with the trail use and location; and
 - consider retrofitting remnant logging roads/old cart trails and incorporating them into the trail system where doing so would avoid the need for a new trail and where they may complete logical connections.
- Facilitate discussion among experts from each of the partner agencies to determine acceptable targets for minor trail impacts (e.g., instances of widening to avoid wet areas, minor erosion, instances of exposed roots on trails), noting that there are no standard thresholds, and these will be based on professional judgement and consider higher standards for Nature Reserve zones and trail sections in proximity to Species at Risk. For Threatened and Endangered species, “proximity” should be assessed in the context of individual and habitat protection as defined through the Endangered Species Act and the Species at Risk Act (when applicable) and their respective regulations as well as the documents that support these acts (e.g., Recovery Strategies, Government Response Statements, General Habitat Descriptions, Committee on the Status of Species at Risk in Ontario and Committee on the Status of Endangered Wildlife in Canada Assessments, Status Reports, Action Plans, etc.);
- Develop monitoring protocols that include:
 - general monitoring for trail condition;
 - identification of new unsanctioned trails that need to be closed; and
 - monitoring the success of closures.
- Upon dedication of lands to public agencies, evaluate the opportunity to locate access and creek crossing facilities for recreational trails outside the 100-year floodplain, regulatory flood levels, and high-water marks. Relevant Conservation Authorities should be consulted on regulatory flood level boundaries;

- An internal park pathway system at Churchill Park would improve connections between facilities, and facilitate access into/through Churchill Park (Churchill Park Management Plan, Dillon Consulting 2014);
- Formalized opportunities for angling should be considered with appropriate consultation and approval from RBG, City of Hamilton, and Hamilton Conservation Authority;
- Identify and engage individuals and/or groups currently undertaking unsanctioned stewardship initiatives to formalize a good working relationship by providing guidance, support and recognition of their efforts. Consider in-person and online public engagement formats to educate, promote and encourage stewardship; and
- Ensure local ordinances and by-law policies are updated to include the prohibition of unsanctioned uses in natural areas. This is necessary to be able to engage by-law enforcement officers when needed.

25: Overuse and Erosion of Trails

- Construct bridges, boardwalks, and/or ‘natural’ stairways using logs, etc. to address existing erosion and wet trail issues and prevent similar conditions from occurring in the future. Note that some judgement is required as seasonally and/or localized wet areas that are not creating unacceptable impacts are fine and are part of the trail experience. Also, structures should only be used where the trail cannot be re-aligned to prevent the issue or where the re-alignment of a trail would be more impactful on the natural environment than the construction of a structure;
- Investigate alternative trail surfaces (e.g., natural surface, gravel, woodchips, etc.) that are commensurate with site-specific trail use and with consideration for the zone they occur in, the preferred use (as to not encourage non-preferred uses), intensity of use, slope, localized potential for erosion and flooding, etc.; and
- Continue to monitor for trail erosion and implement appropriate trail construction and remediation measures on steeper slopes where warranted. Close trails where management needs are too onerous.

26: Cycling

- Assess unsanctioned structures and trail “improvements” for compatibility with zoning management directions, ecological suitability, safety and effectiveness. Develop a strategy for decommissioning unsanctioned structures and trail “improvements” as well as for retrofitting and maintaining structures and “improvements” that can remain. This could be done as part of the future proposed EcoPark System Trail Guideline and/or Trail Plan. However, portions of this can be completed prior to an approved Guideline or Plan to ensure that trail closure is not delayed at the expense of natural heritage protection;
- There is an opportunity to work with bike shops in the area to educate cyclists about appropriate trail use and trail etiquette. Hamilton Burlington Mountain Biking Association has embarked on this task. Consideration could be given to including a trail use pamphlet with the sale/maintenance of bicycles in area cycling shops. HCA has pamphlets for the different user groups that could provide a useful starting point;
- Develop and initiate a monitoring schedule to identify manage needs for structures and trail improvements; and
- Provide bike parking racks at trail heads, especially at access points to trails where cycling is not permitted.

27: Cycling Route Connectivity

- Collaborate with the City of Hamilton and the Hamilton Burlington Mountain Biking Association to develop a functional cycling route network 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; and
- Discouraging cycling on Spencer Creek Rail Trail to minimize impacts to nesting turtles and turtle hatchlings. At a minimum provide substantial signage and/or structures to force bikes to slow down in critical crossing areas.

28: Unsanctioned Trails

- Identify and close trails that have a negative environmental impact or are considered inappropriate; and
- Engage user groups (e.g., the cycling community) in the ongoing monitoring and management of the trail system.

29: Trail Proliferation

- Identify redundant trails and trails that are in inappropriate locations (e.g., adjacent to sensitive species) and close them.
- Undertake detailed inventory work prior to siting specific new trail segments or re-aligning existing ones to determine the sensitivity of the habitat that the trail will traverse.

30: Signage

- Interpretive and way-finding signage should be developed for all designated parking areas and integrated into a broader Education and Signage Guideline for the Cootes Paradise Heritage Lands;
- Consider developing an Education and Signage Guideline for the EcoPark System (Management Theme 12 and Section 5.2) to improve signage and trail markings (refer to Section 4.2 for recommendations related to signage to address overarching management recommendations). The Education and Signage Guideline could include:
 - acknowledgement of existing ownership, logos, etc.;
 - location of signs (parking areas, trail access areas, changes in property ownership, boundaries of Nature Reserve Zones, etc.);
 - increasing visibility of existing signage;
 - improving messaging;
 - way-finding signs;
 - interpretive signs;
 - property boundary signs;
 - "rules of use" signs;
 - trail closure signs; and
 - trail blazes.
- Ensure that signage can be easily seen and understood by EcoPark System users of all abilities;
- Improve signage and entrance area at the west access to Chegwin Trail to appropriately direct users to the trailhead; and

- Consider alternatives to traditional signs. Signs are not always effective tools for informing trail users and are often targeted for vandalism/removal.
 - using materials that are resistant to scratching/markings;
 - consider the use of Barrier/Sacrificial coatings on signs; and
 - improved lighting.

31: User Conflicts

- Undertake a survey to increase the understanding on how the area is currently being used, what the desires of the park users are, etc. and to better understand potential use conflicts;
- Adopt the 'preferred use' approach to trail use by allowing some flexibility in trail use rather than trying to implement use policies that will be virtually impossible to enforce. Monitor cycling activity and take appropriate action such as closing unauthorized trails and, to the extent possible, enforce;
- 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; and
- Formalize recreational uses at Lake Jojo (trail system, signage, skating, fishing, a platform for wildlife viewing).

32: Off-leash Dogs

- 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);
- Increase education and management (including enforcement) of off-leash dog use where it is a non-permitted use;
- Look for suitable locations for intensive off-leash dog activities to occur, preferably within disturbed open space areas with low natural heritage value. 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; and
- Off-leash dog parks should be located outside of sensitive natural areas; and
- Engage the dog-walking community in evaluating opportunities to accommodate leashed and off-leash dog-walking, where it can be accommodated without impacting sensitive and/or significant natural heritage features.

33: RBG Arboretum Issues

- Explore opportunities to facilitate programming and larger-scale events at RBG's Arboretum, including but not limited to the following:
 - outdoor shelter or outdoor teaching classroom;
 - larger canoe/marsh program facilities;
 - constructed escarpment feature to showcase geology of the Niagara Escarpment and provide learning opportunities that are accessible for school programs and summer camps;
 - possible community garden site; and
 - the potential of shifting focus to Princess Point/Westdale for some of RBG's programming, such as boat/water-based activities and relocation of the boathouse.

34: Impacts to Wildlife resulting from Recreational Activities

- Install a buoy system to restrict canoe and kayak access to sensitive waterbird nesting habitat in Cootes Paradise Marsh; and

- Consider discouraging cycling on Spencer Creek Rail Trail to minimize impacts to nesting turtles and turtle hatchlings. At a minimum, provide substantial signage and/or structures to force bikes to slow down in critical crossing areas. Ensure that accessibility is not limited for other users if considering speed reduction structures for cyclists.

35: Motorized Vehicle Use

- Post signage indicating permitted uses and impacts associated with unsanctioned uses stating fines for illicit uses.

36: Hunting/Fishing/Poaching/Foraging

- Monitor known hunting/fishing areas and wild plant and mushroom foraging areas to enable prioritization of a management response.

37: Wildlife Feeding

- Post signage at key feeding areas to educate the public about the impacts of feeding wildlife.

38: Use of Drones

- Encourage partners in the Cootes to Escarpment EcoPark System to collaborate on creating a policy on the use of drones. Lessons learned by RBG and Hamilton Conservation Authority through the creation of their drone policy may benefit other partners interested in creating a similar policy.

4.3.6 Recommendations for Encroachment

This section of the Management Plan provides management recommendations for encroachment-related issues identified in Section 3.5.

39: Private Unsanctioned Trails

- As part of the recommended EcoPark System-wide Trail Plan, evaluate and provide guidance on trail closures including the closure of personal trails from private residences (see Management Theme 28). Priority for closures could be related to the recommended zoning and/or presence of sensitive natural heritage features;
- Consider exclusionary fencing where privately-owned property abuts Nature Reserve Zones and any other areas where there are sensitive/significant natural heritage features (see Management Themes 21 and 41). Priority should be given to fencing where management issues, such as encroachment, have been identified.
- Review and evaluate the effectiveness of existing by-laws and identify gaps in by-laws to facilitate the enforcement of use policies;
- Agency partners should allocate additional resources to enforce encroachment policies. This should be implemented in conjunction with the education/awareness initiatives and Heritage Land boundary identification;
- Consider installing a fence to provide a physical barrier to access at the interface of McMaster University and the Heritage Lands, extending from Cootes Drive to the west access of the Chegwin Trail; and
- The forest adjacent to Churchill Park creates an attractive backdrop to the open space of the park and is highly valued by users and residents. Direct access to the Cootes Paradise Heritage Lands is a unique attribute, but one that needs to be controlled and managed carefully to avert

increasing and potentially irreversible environmental impacts. Defining additional trailheads and establishing directional and educational signage would assist with this (Churchill Park Management Plan, Dillon Consulting 2014).

40: Structures and “Yard Extension”

- Establish a program to educate adjacent residential landowners by providing information on the impacts of disposing of yard waste, garden structures, etc., and other forms of encroachment in natural areas;
- Post signage to educate the public about the impacts associated with encroachment; and
- Provide fencing along the outer perimeter of Nature Reserve Zones and any other areas where there are sensitive/significant natural heritage features, where they abut private property (see Management Theme 21). Priority should be given to fencing where management issues, such as encroachment, have been identified.

41: Dumping

- Identify locations of dumped garbage and yard waste, and facilitate clean up;
- Post signage indicating “No Dumping” and that a fine will be applied if dumping occurs;
- Continue to remove garbage and dumped refuse from the Current EcoPark System Lands;
- Continue conversations with McMaster University in order to address and manage increased cigarette butt litter within the lands adjacent to the campus;
- Install receptacles specific to cigarette butts – assign responsibility for maintenance and timing of clearing receptacles: and
- The landfill at Lake Jojo is capped, but wire, metal pipe, tires and construction debris protrude in many places. There is an opportunity to clean up this debris. This might need to be part of an overall long-term management plan for Lake Jojo that addresses all of the issues noted here.

42: Vegetation Removal/Trampling

- Establish a program to educate adjacent residential landowners by providing information on the impacts of removing natural vegetation and trampling in natural areas;
- Post signage to educate the public about the impacts associated with encroachment; and
- Increase awareness of the McMaster University student population with respect to the significance and sensitivity of the Heritage Lands, including the importance of protecting Species at Risk populations:
 - collaborate with McMaster to deliver guest lectures/seminars/lunch and learns on any number of topics with the Cootes to Escarpment EcoPark System serving as the platform for delivery.

43: Pool Drainage

- Identify and monitor locations where there is evidence of pool drainage (i.e., erosion gullies beginning at the rear of residential yards with swimming pools); and
- Review and evaluate the effectiveness of existing by-laws and identify gaps in by-laws to facilitate the enforcement of use policies, including a by-law that addresses pool drainage.

44: Semi-permanent Camps

- Identify and monitor locations where squatting is occurring; and
- Post signage indicating No Camping and that a fine will be applied if Camping occurs.

45: Cats/Domestic Pets

- Establish a program to educate adjacent residential landowners by providing information on the impacts of free-ranging cats and off-leash dog walking; and
- 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.

4.3.7 Recommendations for Hydrologic Impacts

This section of the Management Plan provides management recommendations for hydrologic impact-related issues identified in section 3.6.

46: Run-off and Peak Flows

- Continue to engage in discussion and initiatives to improve urban infrastructure to mitigate stormwater management, high run-off and peak flows. Hamilton Harbour Remedial Action Plan released a report in 2016 about urban runoff in Hamilton which touches on opportunities for Low Impact Development (LID) (Hamilton Harbour Remedial Action Plan 2016b);
- Low Impact Development initiatives should accompany impervious surfaces created as part of the future park infrastructure; Undertake a community communications campaign to highlight the importance of implementing Low Impact Development to the health of the Cootes Paradise Marsh and its tributaries; and
- Develop a septic system improvement/inspection program targeted for the watersheds that drain the northern portion of the Cootes Paradise Heritage Lands.

47: Erosion and Sedimentation

- Relocate the stormwater outfall draining to Cootes Paradise Sanctuary 12 to mitigate erosion. A Light Rail Transit hub will be constructed in this general area, and there may be an opportunity to relocate this stormwater outfall at the time of construction.

48: Water Quality

- Implement the Bay Area Implementation Team's recommendations for 2017-2021 to continue improving the water quality of Hamilton Harbour;
- Seek opportunities to improve vegetated buffers on coldwater streams;
- Support RBG in continuing monitoring programs that focus on understanding water quality in Cootes Paradise Marsh; and
- Improve water quality in the Desjardins Canal which involves dredging. Consider other/additional opportunities to improve water quality to the extent feasible.

49: Fluctuating Water Levels in Cootes Paradise Marsh

- Provide ongoing feedback to the International Joint Commission on the outcomes at Cootes Paradise following the Jan 2017 implementation of the Plan 2014 Lake Ontario Water level Control Plan; and
- 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.

50: Churchill Park Drainage

- Incorporate measures to redirect and infiltrate on-site drainage to reduce ponding in Churchill Park and run-off that is contributing to the erosion of the forested slope. Seek opportunities such as ‘rain gardens’ and the incorporation of other LID measures into new park developments (e.g., permeable pavement surfaces).

51: Polluting Spills

- Improve 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. Ensure that partner agencies inform themselves of what the spill response protocols are so that if they become aware of a spill, they know whom to call.

4.3.8 Ecosystem Management and Restoration Recommendations

This section of the Management Plan provides management recommendations for ecosystem management and restoration-related issues identified in section 3.7.

52: Forest Fragmentation

- Promote the succession of forest habitat in locations where the creation of forested ecosites has been assessed to be an ecologically sound rehabilitation strategy, with a priority on improving the shape of woodlands to minimize the edge to interior ratio;
- Look for opportunities to increase the area of the interior forest through restoration and management, and improve the buffer along the forest edge, for example at Churchill Park by reducing mowing and completing reforestation plantings; and
- Remove invasive, non-native species along the forest edge and remove existing westerly soccer field to accommodate reforestation (Dillon Consulting 2014).

53: Decline in Natural Feature Quality

- Wherever possible, retain mature trees and snags for cavity-nesting fauna, and fallen logs for salamander and other wildlife habitat;
- Promote the naturalization of depauperate lands; and
- Enhance buffers through edge plantings with native species along Heritage Lands boundaries bordered by residential development.

54: Forest Health Decline

- Continue to manage off-trail use and disturbance to minimize impacts and foster establishment of a native ground vegetation layer and understory;
- Restore degraded woodlands and plantations;
- Remove plantations of non-native species over time;
- Plantations of native species should be managed to encourage healthy trees and understory growth;
- Target areas where there is a high presence of ash and encourage plantings of other native species to mitigate some of the impacts of Emerald Ash Borer. Trees may also be planted in woodlands and thickets to encourage succession of native species;
- Follow management recommendations provided in RBG’s Ecological Land Classification Report (Barr 2014); and

- Manage Black Locust plantations through a selective thinning regime and underplanting with native species and promoting the growth of a native understory.

55: Urban Adapted Wildlife

- Continue to pursue opportunities to control deer populations, including options that engage Indigenous communities; and
- Install exclusion fencing in areas which have been recently restored/planted.

56: Loss of Open Woodland/Prairie/Savannah Habitat

- Identify ecosystem targets for the Heritage Lands, based on historical and current composition:
 - identify best examples of remaining prairie, savannah and open oak woodland as a priority for ongoing management and to serve as example end goals for restoration initiatives;
 - include guidelines for local prairie and/or savannah restoration, including target amount, patch size, and best management practices; and
 - include recommendations for the use of prescribed burns, which are considered the best means of managing prairie, savannah and open woodland habitats.
- Improve the condition of rare and uncommon ecosystems, such as prairie, savannah and open oak woodlands;
- Continue management for tallgrass prairie and oak savannah habitat at Princess Point, including invasive species control, prescribed burns, planting and seeding;
- 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; and
- Consider prescribed burns as a management option for restoring areas to native-plant dominated meadows/prairies elsewhere.

57: Conservation and Recovery of Species at Risk

- Pursue opportunities for habitat creation for amphibians through pond construction in some areas of the Heritage Lands;
- Further explore opportunities to enhance wildlife habitat (e.g., pit and mound restoration, ephemeral pond creation, addition of woody debris);
- Encourage management efforts that follow an ecosystem-based approach to Species at Risk recovery. By considering the ecosystem and all of its components (e.g., species, habitats, interactions and processes) in an individual-species strategy, broader and more synergistic ecological protection and conservation outcomes can usually be achieved;
- Continue ongoing monitoring of the populations of significant plants and wildlife found in the Heritage Lands;
- Develop and implement Species at Risk recovery strategies applicable to the Heritage Lands - plans should be consistent with provincial and federal recovery strategies and response statements and compliant with the Endangered Species Act and the Species at Risk Act (when it applies) and the regulations to these acts;
- Report new location for Species at Risk locations to Conservation Halton/Hamilton Conservation Authority and the Natural Heritage Information Centre;
- Ensure that trails and recreational uses are not impacting Species at Risk and rare species habitat;
- Continue efforts to improve wildlife crossings in the Heritage Lands;

- Address existing recreational impacts on Species at Risk and Species at Risk habitat
 - Cycling and impacts to reptiles along the Spencer Creek Trail between Dundas Street and Cootes Drive;
 - Ad-hoc trails and over-use associated with McMaster University and the south shore of Cootes Paradise Marsh; and
- Address connectivity/wildlife crossing issue on Cootes Drive and consider constructing dedicated crossing structures on Cootes Drive to allow safe movement corridors for wildlife.

58: Stream Habitat Improvement

- 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 included in restoration plans to reduce run-off);
- Remove old concrete headwalls present at Lower Spencer Creek Conservation Area;
- Engage with the operators of the McMarsh and explore opportunities for information sharing; and
- Improve buffers along watercourses, in particular, coldwater streams.

59: Cootes Paradise Fishway and Management of Fish Communities

- Pursue public education opportunities to increase awareness of invasive species management in the marsh; and
- Continue to engage in a review of the efficacy and long-term use of the fishway, per the Wetlands Conservation Plan 2016 – 2020 (Theijsmeiher et al. 2016).

60: Invasive Species

- Formalize the program to document and map the locations of major aggressive invasive species (see Section 2.4.4 and Section 5.4.2/Table 6 North-South Environmental Inc. et al. [2018]), and monitor and control the spread of invasive plant species on an ongoing basis;
- Develop an Invasive Species Management Guideline as part of the EcoPark System Vegetation Management Guideline to direct the removal of priority invasive plant species throughout the Cootes to Escarpment EcoPark System;
- Within the Guideline, prioritize management of invasive plant species populations with consideration given to:
 - high-quality vegetation communities;
 - threats to Species at Risk, rare species or rare vegetation types;
 - newly established and easily eradicated invasive plant populations;
 - budget and staff efficiencies (e.g., other projects occurring in an area);
 - volunteer and partnership opportunities; and
 - ease of access for management.
- Within the Guideline, provide detailed monitoring recommendations to evaluate the success of control/removal initiatives:
 - develop a control strategy for the removal of priority invasive plant species throughout the Cootes to Escarpment EcoPark System;
 - continue to document and map the locations of major aggressive invasive species;
 - monitor and control the spread of invasive plant species;
 - rebuild forest edge and improve forest interior to build a better buffer to provide a screen for invasive species;

- design buffer plantings and zones to manage the interface between horticultural areas and natural areas (e.g., RBG Arboretum and Cootes Paradise Sanctuary 6); and
- continue to work with and engage relevant agencies, experts and stakeholders to address concerns with respect to the continued operation of the fishway.

61: Noxious Plants

- Post educational signage noting the identification and toxic properties of Poison Ivy at key trailhead locations within the Heritage Lands;
- Continue to monitor and remove populations of Giant Hogweed as they are encountered;
- Include recommendations for monitoring noxious plants as part of invasive species monitoring (e.g., to identify potential locations of Giant Hogweed, etc.); and
- Post educational signage noting key identification features and the toxic properties of Poison Ivy and other known noxious species (e.g., Wild Parsnip) in a few key trailhead locations as an educational/precautionary measure.

62: Site-Specific Wildlife Crossing/Corridors

- Continue to look for opportunities to enhance the continuity and integrity of natural corridors connecting the Niagara Escarpment and Cootes Paradise through the Cootes Paradise Heritage Lands, particularly across York Road;
- Investigate the need for and feasibility of implementing wildlife corridors and wildlife crossings, especially in turtle crossing hotspots;
- Dedicated crossing structures and permanent exclusionary/directional barriers should be considered along the length of Cootes Drive in order to allow safe movement corridors for wildlife. Care should be taken to consider design features (e.g., the distance between crossing structures, type of structure and sizing) in order to attempt to mitigate the risk of inadvertently isolating populations (e.g., creating barriers to gene flow). Structures should be considered that maximize longevity and minimize on-going maintenance; and
- Contribute to long-term monitoring opportunities by continuing to monitor wildlife crossing and road mortality. Continue to support Dundas Turtle Watch in their monitoring efforts.

63: Noise

- Collect data and create a map of noise levels within Cootes Paradise Heritage Lands (e.g., decibels);
- Determine if wildlife present in the Cootes Paradise Heritage Lands are susceptible to impacts from noise, and if so, consider implementing noise mitigation measures in areas where noise effect levels are high;
- Based on the outcome of the noise investigations and sensitivity of wildlife explore the following possible mitigation measures:
 - investigate the possibility of adjusting the flight path of air ambulance helicopters to minimize noise impacts to Cootes Paradise Heritage Lands;
 - reducing the speed limit along relevant sections of Cootes Drive; and
 - contact the Canadian Warplane Heritage Museum to discuss adjusting aircraft flight paths to avoid/minimize flying over Cootes Paradise Heritage Lands.

64: Removal of Plantings due to Vegetation Maintenance of Pipelines

- Work with Union Gas on communication and on maintenance guidelines/schedule to ensure restoration plantings are planned appropriately, and not damaged by routing maintenance;
- Partner with Hydro One to manage the hydro-corridor as thicket habitat or meadow habitat, wherever appropriate; and
- Work with utility companies to control invasive species in utility corridors, possibly through a management plan for utility corridors prepared jointly by RBG and Hydro One.

65: Establishment of Marsh Restoration Plantings

- Place a high priority on the continued implementation of actions identified in RBG's Wetland Conservation Plan (Theijmeijer et al. 2016), and periodically assess outcomes in order to refine future restoration efforts and facilitate ongoing assessment of priorities;
- Install exclusion fencing to keep geese and people away from existing marsh restoration plantings.

66: Shoreline Erosion/Stabilization in Cootes Paradise Marsh

- Continue to Implement RBG's Wetlands Conservation Plan 2016-2021(Theijmeijer et al 2016) to restore undercut eroding shorelines by (1) removing gabion baskets and armour stone where they occur along formerly wind-blown shores; and (2) planting a four-metre-wide band of emergent marsh and shrub thicket to jump start plant re-establishment (Theijmeijer et al. 2016).

67: Watershed/Sub-Watershed Boundary Issues

- Collaborate with partners and agencies to address issues related to mapping discrepancies and sub-watershed boundary delineations.

4.3.9 Cultural Heritage Recommendations

This section of the Management Plan provides management recommendations for cultural heritage resource-related issues identified in Section 3.0.

68: Historic and current use by Indigenous People

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.

69: Communication of Cultural Heritage Importance of Cootes Paradise

- Explore opportunities to communicate the importance of Cootes Paradise in the cultural development of the Cootes to Escarpment EcoPark System.

70: Connection between Cultural and Natural Resources at Princess Point

- Continue to highlight the strong connection between natural and cultural resources, including historical Indigenous use and importance of Princess Point, through educational signage, interpretation, and management of natural heritage resources; and

- Explore the potential for Princess Point to serve as an important entry and destination for visitors to the Cootes to Escarpment EcoPark System, including its potential as a site for relocating RBG’s boathouse.

71: Identity of Raspberry Farm

- Consider options, including a cultural heritage assessment, to determine the cultural heritage value or interest of the Raspberry Farm site in developing a distinct identity that highlights the cultural significance of the property.

72: Cultural Heritage Interpretation of Desjardins Canal

- Explore opportunities for cultural interpretation of the Desjardins Canal; and
- Consider developing a cultural heritage conservation plan with appropriate stakeholders for the Canal to ensure its heritage significance is conserved.

73: Low Profile of Early Settlement History

- Assemble copies of early surveys, maps, paintings and other documentation to construct and interpret the early settlement history to draw connections with the current geography of the Heritage Lands and flag important historic features for consideration in developing other management initiatives.

74: Need for Corresponding Management Expertise

- Emphasize the importance of corresponding management expertise to ensure conservation and sustainability of cultural heritage resources.

5.0 Implementation

It is recognized that resources and funding are limited and thus a key concern for implementation of this, and other Management Plans for the six Heritage Lands, is finding efficient and cost-effective ways to prioritize and implement the numerous management recommendations that have been identified. Two approaches that will assist with this are 1) identifying common management needs among the six Heritage Lands and developing solutions that can be used throughout the EcoPark System, and 2) prioritizing so that the management tasks that will reduce impacts (existing and anticipated) and protect high risk or locally threatened natural heritage and cultural features are addressed first. In view of this, it is recommended that the series of “EcoPark System Guidelines” (see section 4.2) be developed, as outlined below. The EcoPark System Guidelines and recommended Trail Plan will address a large portion of the issues identified for the Cootes Paradise Heritage Lands. Although this Management Plan applies only to lands owned by the partner agencies with land holdings in the Cootes Paradise Heritage Lands, many of the issues and recommendations provided are relevant throughout the EcoPark System and are thus of interest to all partner agencies.

Implementation of the management recommendations discussed in Section 4.0 has been organized into three categories:

- 1) Recommendations that are perceived to be a high priority are discussed in Section 5.1;

- 2) Recommendations related to the recommended EcoPark System Guidelines are discussed in Section 5.2 and Appendix 3; and
- 3) Recommendations that are site-specific management tasks are discussed in Section 5.3.

Table 4 provides suggested implementation of the recommendations made per Management Theme under these three categories. Note that in some cases management recommendations covered off in the Guidelines do not fully address an issue identified in the Cootes Paradise Heritage Lands, and these are thus identified as being both Guideline recommendations and site-specific recommendations. Management Themes are marked as high priority because they contain high priority recommendations identified in Section 5.1, however, this does not imply that all the management recommendations in these Themes are a high priority.

Table 4: Suggested Implementation of Recommendations per Management Theme

| Management Themes | High Priority Tasks | EcoPark System Guidelines | | | | Other / Site-specific Management Tasks |
|---|---------------------|---------------------------|-----------------------|-----------------------|-----------------|--|
| | | Trail | Education and Signage | Vegetation Management | Edge Management | |
| Classification and Zoning of the Heritage Lands | | | | | | |
| 1: Classification per NEPOSS | | | | | | X |
| 2: Zoning per NEPOSS | | | | | | X |
| Overarching Management Recommendations | | | | | | |
| 3: Awareness of the Cootes to Escarpment EcoPark System | | X | X | | X | |
| 4: Delineation of Boundaries | | X | X | | X | |
| 5: Better Communicate Multi-Agency Management | | X | X | | X | |
| 6: Population and Use | | X | X | | X | |
| 7: Funding | X | | | | | X |
| 8: Trail/Railway Crossings | | X | X | X | | |
| 9: Critical Corridor for Connection | X | | | | | X |
| 10: Desire and Need for Trail Connections | X | X | | | | |
| 11: Desire and Need for Wildlife Crossings | X | | | | | X |
| 12: EcoPark System-wide Guidelines | | X | X | X | X | |
| Heritage Lands Management Plan Recommendations | | | | | | |
| 13: Develop Vision | | | | | | X |
| Recommended Management Directions | | | | | | |
| 14: Permitted Uses per NEPOSS Classification | | X | X | | | X |

| Management Themes | High Priority Tasks | EcoPark System Guidelines | | | | Other / Site-specific Management Tasks |
|---|---------------------|---------------------------|-----------------------|-----------------------|-----------------|--|
| | | Trail | Education and Signage | Vegetation Management | Edge Management | |
| 15: Permitted Uses per NEPOSS Zone | | x | x | | | x |
| Land-Use Planning | | | | | | |
| 16: West End of Cootes and the “Dundas Gateway” | x | | | | | x |
| Access and Infrastructure Recommendations | | | | | | |
| 17: Lack of Adequate/Appropriate Parking and Access on Land | | x | x | | | x |
| 18: Lack of Adequate/Appropriate Parking on Water | | x | x | | | |
| 19: CN Safety | | | x | | | x |
| 20: Lack of Facilities | x | x | x | | x | x |
| 21: Trespassing | | | x | | | x |
| 22: Old Infrastructure and Trail Structures | | | | | | x |
| 23: Lack of Public Transportation | x | | | | | x |
| Recreation Recommendations | | | | | | |
| 24: General Trail Recommendations | x | x | x | | x | |
| 25: Overuse and Erosion of Trails | x | x | x | | | |
| 26: Cycling | | x | x | | | |
| 27: Cycling Route Connectivity | | x | | | | |
| 28: Unsanctioned Trails | | x | x | | | |
| 29: Trail Proliferation | | x | x | | | |

| Management Themes | High Priority Tasks | EcoPark System Guidelines | | | | Other / Site-specific Management Tasks |
|--|---------------------|---------------------------|-----------------------|-----------------------|-----------------|--|
| | | Trail | Education and Signage | Vegetation Management | Edge Management | |
| 30: Signage | | x | x | | | |
| 31: User Conflicts | | x | x | | | |
| 32: Off-Leash Dogs | | | x | | | |
| 33: RBG Arboretum Issues | | | x | | | |
| 34: Impacts to Wildlife resulting from Recreational Activities | | x | x | | | |
| 35: Motorized Vehicle Use | | | x | | | |
| 36: Hunting/Fishing/Poaching/Foraging | | | x | | | |
| 37: Wildlife Feeding | | | x | | | |
| 38: Use of Drones | | | x | | | |
| Recommendations for Encroachment | | | | | | |
| 39: Private Unsanctioned Trails | | x | x | | x | x |
| 40: Structures and 'Yard Extension' | | | x | | x | x |
| 41: Dumping | | | x | | x | x |
| 42: Vegetation Removal/Trampling | | | x | | | |
| 43: Pool Drainage | | | x | | | x |
| 44: Semi-permanent Camps | | | x | | | x |
| 45: Cats/Domestic Pets | | | x | | | |

| Management Themes | High Priority Tasks | EcoPark System Guidelines | | | | Other / Site-specific Management Tasks |
|---|---------------------|---------------------------|-----------------------|-----------------------|-----------------|--|
| | | Trail | Education and Signage | Vegetation Management | Edge Management | |
| Recommendations for Hydrologic Impacts | | | | | | |
| 46: Run-off and Peak Flows | | | | x | | |
| 47: Erosion and Sedimentation | x | x | | | | |
| 48: Water Quality | x | | | | | x |
| 49: Fluctuating Water Levels | | | | | x | x |
| 50: Churchill Park Drainage | x | | | | x | x |
| 51: Polluting Spills | | | | | | x |
| Ecosystem Management and Restoration Recommendations | | | | | | |
| 52: Forest Fragmentation | | x | x | x | | |
| 53: Decline in Natural Feature Quality | | x | x | x | | |
| 54: Forest Health Decline | | x | | x | | x |
| 55: Urban Adapted Wildlife | | | x | | | |
| 56: Loss of Open Woodland/Prairie/Savannah Habitat | | | | x | | x |
| 57: Conservation and Recovery of Species at Risk | x | x | x | x | x | |
| 58: Stream Habitat Improvement | | | x | x | x | x |
| 59: Cootes Paradise Fishway and Management | x | | | | | x |
| 60: Invasive Species | x | | | x | | |
| 61: Noxious Plants | | | x | x | | |
| 62: Site-Specific Wildlife Crossings/Corridors | x | x | x | | | x |

| Management Themes | High Priority Tasks | EcoPark System Guidelines | | | | Other / Site-specific Management Tasks |
|--|---------------------|---------------------------|-----------------------|-----------------------|-----------------|--|
| | | Trail | Education and Signage | Vegetation Management | Edge Management | |
| 63: Noise | | | | | | x |
| 64: Removal of Plantings due to Vegetation Maintenance of Pipelines | | | | x | | |
| 65: Establishment of Marsh Restoration Plantings | | | | x | | |
| 66: Shoreline Erosion/Stabilization in Cootes Paradise Marsh | x | | | | x | |
| 67: Watershed/Sub-Watershed Boundary Issues | | | | | | x |
| Cultural Heritage Recommendations | | | | | | |
| 68: Historic and current use by Indigenous People | | | x | | | x |
| 69: Communication of Cultural Heritage | | | x | | | |
| 70: Connection between Cultural and Natural Heritage Resources at Princess Point | | | x | | | |
| 71: Identity of Raspberry Farm | | | x | | | |
| 72: Cultural Heritage Interpretation | | | x | | | |
| 73: Low Profile of Early Settlement History | | | x | | | |
| 74: Need for Corresponding Management Expertise | | | | | | x |
| Monitoring the Implementation of Recommendations | | | | | | |
| 75: Review Schedule for Monitoring | x | | | | | x |

5.1 High Priority Management Tasks

We note that overall, the Cootes Paradise Heritage Lands are in surprisingly good condition, especially given their level of use and proximity to large population centres. However, there are some high priority management needs that should be completed as soon as possible to address safety concerns and existing high priority impacts. Table 5 lists the tasks that are considered high priority management tasks and includes recommendations for the partner agency responsible. Although some issues identified in Section 3.0 appear to be obvious candidates for immediate action, there may be others that are deemed high priority owing to the responsibilities and/or mandates of the partner agencies. Thus the list of high priority management tasks provided in Table 5 should be reviewed and refined by the partner agencies.

Table 5. High Priority Management Recommendations for the Cootes Paradise Heritage Lands.

| High Priority Management Recommendations | Partner Agency Responsible |
|--|--|
| 1. Close or re-route trails that are in close proximity to Species at Risk and/or rare vegetation communities if the trail is causing negative impacts to the significant feature (Management Themes 34, 57) | Royal Botanical Gardens, City of Hamilton, Hamilton Conservation Authority |
| 2. Continue initiatives to manage and restore prairie and savannah habitat, particularly at Princess Point (Management Theme 56) | Royal Botanical Gardens, City of Hamilton |
| 3. Instigate measures to reduce invasive species in forested areas (Management Theme 54, 60) | Royal Botanical Gardens, City of Hamilton, Hamilton Conservation Authority |
| 4. Address wildlife crossing issue on Cootes Drive (Management Themes 57 and 62) | Royal Botanical Gardens, City of Hamilton, Hamilton Conservation Authority |
| 5. Continue to implement actions identified in RBG's Wetland Conservation Plan (Management Theme 65) | Royal Botanical Gardens |
| 6. Address over-use of trails on south shore of Cootes, particularly adjacent to McMaster University campus (Management Theme 24, 42, 57) | Royal Botanical Gardens, City of Hamilton, McMaster University |
| 7. Encourage initiation of a Dundas Gateway Plan (Management Theme 16) | Royal Botanical Gardens, City of Hamilton, Hamilton Conservation Authority |
| 8. Encourage ecological status monitoring to support adaptive management and provide ongoing communication on environmental health (Management Theme 11, 24, 26, 28, 48, 57, 60, 61, 62) | Royal Botanical Gardens, City of Hamilton, Hamilton Conservation Authority |

5.2 EcoPark System Guidelines

As noted above, many the issues identified for this Management Plan are relevant across all, or most of the Heritage Lands, and thus are most efficiently implemented in Guidelines that span the entire EcoPark System (see Management Theme 12). These are intended to be short reference documents that would only address generic issues. Partner agencies are encouraged to look internally and across partner agencies at certain management issues (e.g., trails, education and signage, etc.) to address these issues at an EcoPark System level. It is noted that the differing mandates and policies among the Park EcoSystem partners will likely preclude complete consistency across lands with different ownership, however, addressing certain management issues at this higher level through the Guidelines is still viewed as providing broader efficiency and consistency to how the Current EcoPark System Lands are managed. Future Management Plans prepared for the remaining Heritage Lands may identify additional issues and recommendations to consider in the proposed EcoPark System Guidelines. It is noted that there may be instances where one or more partners may wish to move forward with an initiative (e.g., refinement of train maintenance standards) before other partners wish to or are able to engage in it. These Guidelines should not prevent individual partners moving forward with such initiatives independently of the other partners in the EcoPark System.

Four potential EcoPark System Guidelines are listed below, however, some of these could be combined (e.g., Trails, and Education and Signage) and not all may be necessary (e.g., Edge Management):

- EcoPark System Guideline: Trails
- EcoPark System Guideline: Education and Signage
- EcoPark System Guideline: Vegetation Management
- EcoPark System Guideline: Edge Management

The potential purpose (to be refined by those developing the Guideline) of each Guideline is outlined broadly below:

- **Trails:** standardize the trail system within the Cootes to Escarpment EcoPark System (see Section 4.3.5);
- **Education and Signage:** standardize signage and educational messaging used within the Cootes to Escarpment EcoPark System, with acknowledgement of ownership where appropriate;
- **Vegetation Management:** identify guiding principles and best management practices for vegetation management, including the management of invasive species, within the Cootes to Escarpment EcoPark System; and
- **Edge Management:** identify guiding principles and best management practices to restore disturbed natural area edges, and standardize information used to engage adjacent landowners in appropriate management of natural area edges.

Responsibility for Developing EcoPark System Guidelines

The various EcoPark System Guidelines could be prepared internally by the partner agencies or through external contracts. Owing to funding constraints and given that each of the partner agencies have substantial expertise and experience in the management of parks and natural heritage features, it is recommended that the guidelines would be best developed internally. Logistically, it will be most efficient for one partner agency to take the lead in the development of each guideline and coordinate

input from the other partners. The lead partner should be determined through internal discussion with consideration for experience and capacity.

The following provides a suggested framework for the development, organization and content of the EcoPark System Guidelines.

EcoPark System Guidelines Organization

Introduction

The proposed EcoPark System Guidelines should be developed as a series of reference documents. They should have a minimum of introductory text and focus on the identification of issues and their related management needs. It is suggested that they not contain figures showing the location of issues, but just provide guidance on solutions, possibly with illustrations of “typical” situations. The introductory sections that outline the purpose and organization of each EcoPark System Guideline can be generic and minor variations be used for each of the proposed EcoPark System Guideline.

EcoPark System Issues

This section of each EcoPark System Guideline is an iterative task that draws on the collective experience to identify the issues or topics to be addressed. Thus a list of issues or topics for each EcoPark System Guideline, which applies to all or most Heritage Lands, should be developed (suggested lists for each EcoPark System Guideline are provided in Appendix 3, based on the issues identified at the Cootes Paradise Heritage Lands).

Management Recommendations

For each EcoPark System Guideline, compile all existing management approaches and protocols from partner agencies (e.g., trail construction and maintenance, boundary delineation, education/stewardship for adjacent landowners, etc.). The existing documents from the various agencies should be reviewed for consistency and the partners should, to the extent possible, agree on a single protocol for all lands within the EcoPark System. The recommendations provided in Section 4.0 of this Management Plan may also assist in the development of solutions to each of the issues.

References and Contacts

This section of each EcoPark System Guideline would provide reference material and contacts that may be useful in implementing management recommendations.

5.3 Site-specific Management Recommendations

There are a few issues that were identified through this Management Plan that may be specific to the Cootes Paradise Heritage Lands and thus would not be addressed through the proposed EcoPark System Guidelines. These issues are discussed below.

Land-use Planning Management Recommendations (Management Theme 16)

- Complete a comprehensive site-specific study of the “Dundas Gateway” at the west end of Cootes Paradise Marsh to investigate the area’s possible role as a gateway to the Cootes to Escarpment EcoPark System; and

- As part of the site-specific study, include a review of parking to improve access the Cootes Paradise Heritage Lands from the “Dundas Gateway” area and address current issues related to parking.

Access and Infrastructure Management Recommendations (Management Themes 17, 18, 20, 21, 22)

- Contact Canadian Tire Corporation, Limited, the owners of the 50 Cootes Drive property, to see what opportunities may exist for the Cootes to Escarpment EcoPark System in the context of parking in the lot abutting the current Heritage Lands on the east side of Dundas Street. Should permission be sought for parking in the lot as an access point to the Heritage Lands, then signage could acknowledge the contribution of Canadian Tire Corporation Limited’s contribution;
- Repair the dock at Princess Point, formalize the sand beach on the west side of Princess Point as a boat launch, improve directional signage to water access points and look for additional opportunities to improve boat access to the marsh;
- If supported by appropriate technical studies, remove the metal weir at Desjardins Canal Pond by Olympic Drive;
- Consider installing a fence to provide a physical barrier to access where unsanctioned access has been a continual management issue along the outer perimeter of Cootes Paradise Sanctuary 12. Consider impacts to wildlife (access and safety) when evaluating options for fencing;
- Explore opportunities to support programming and large-scale events at the RBG such as constructing an outdoor shelter/teaching classroom;
- Repair or replace failing staircases, structures and boardwalks; and
- Remove elements of old restoration projects and degraded infrastructure in Cootes Paradise Marsh, including the old Aquadam, logs and chains, concrete slabs, concrete-filled garbage can, concrete pipe and two rusty culverts.

Recreation Management Recommendations (Management Themes 33, 34)

- Explore opportunities to facilitate programming and larger-scale events at RBG’s Arboretum, including but not limited to the following:
 - outdoor shelter or outdoor teaching classroom;
 - larger canoe/marsh program facilities;
 - constructed escarpment feature to showcase geology of the Niagara Escarpment and provide learning opportunities that are accessible for school programs and summer camps;
 - possible community garden site; and
 - potential of shifting focus to Princess Point/Westdale for some of RBG’s programming, such as boat/water-based activities and relocation of the boathouse.
- Install a buoy system to restrict canoe and kayak access to sensitive waterbird nesting habitat in Cootes Paradise Marsh; and
- Consider discouraging cycling on Spencer Creek Rail Trail to minimize impacts to nesting turtles and turtle hatchlings. At a minimum, provide substantial signage and/or structures to force bikes to slow down in critical crossing areas. Ensure that accessibility is not limited for other users if considering speed reduction structures for cyclists.

Management Recommendations for Encroachment (Management Themes 41, 42)

- Continue to remove garbage and dumped refuse from the Current EcoPark System Lands;

- Continue conversations with McMaster University to address and manage increased cigarette butt litter within the lands adjacent to the campus;
- Install receptacles specific to cigarette butts – assign responsibility for maintenance and timing of clearing receptacles;
- The landfill at Lake Jojo is capped, but wire, metal pipe, tires and construction debris protrude in many places. There is an opportunity to clean up this debris. This might need to be part of an overall long-term management plan for Lake Jojo that addresses all of the issues noted there; and
- Increase awareness of the McMaster University student population with respect to the significance and sensitivity of the Heritage Lands, including the importance of protecting Species at Risk populations:
 - collaborate with McMaster to deliver guest lectures/seminars/lunch and learns on any number of topics with the Cootes to Escarpment EcoPark System serving as the platform for delivery.

Management Recommendations for Hydrologic Impacts (Management Themes (42, 50)

- Relocate the stormwater outfall draining to Cootes Paradise Sanctuary 12 to mitigate erosion. A Light Rail Transit hub will be constructed in this general area, and there may be an opportunity to relocate this stormwater outfall at the time of construction; and
- Incorporate measures to redirect and infiltrate on-site drainage to reduce ponding in Churchill Park and run-off that is contributing to the erosion of the forested slope. Seek opportunities such as ‘rain gardens’ and the incorporation of other LID measures into new park developments (e.g., permeable pavement surfaces).

Ecosystem Management and Restoration Recommendations (Management Themes 11, 52, 58, 59, 62, 63, 66)

- Look for opportunities to increase the area of interior forest through restoration and management, and improve the buffer along the forest edge, for example at Churchill Park by reducing mowing and completing reforestation plantings;
- Remove old concrete headwalls present at Lower Spencer Creek Conservation Area;
- Engage with the operators of the McMarsh and explore opportunities for information sharing;
- Continue to engage in a review of the efficacy and long-term use of the fishway, per the Wetlands Conservation Plan 2016 – 2020 (Theijsmeyer et al. 2016).
- Dedicated crossing structures and permanent exclusionary/directional barriers should be considered along the length of Cootes Drive in order to allow safe movement corridors for wildlife. Care should be taken to consider design features (e.g., distance between crossing structures, type of structure and sizing) in order to attempt to mitigate the risk of inadvertently isolating populations (e.g., creating barriers to gene flow). Structures should be considered that maximize longevity and minimize on-going maintenance;
- Identify representatives from City of Hamilton that have responsibility for road maintenance and capital works projects in the Heritage Lands and include them in management discussions that involve roads (e.g., salt/de-icing agent management, pedestrian trail-road crossings, wildlife crossing, roadkill clean-up, roadside parking, signage on roads, etc.);
- Contribute to long-term monitoring opportunities by continuing to monitor wildlife crossing and road mortality. Continue to support Dundas Turtle Watch in their monitoring efforts;

- Collect data and create a map of noise levels within Cootes Paradise Heritage Lands (e.g., decibels);
- Compile a list of wildlife present in the Cootes Paradise Heritage Lands are susceptible to impacts from noise, and if so, consider implementing noise mitigation measures in areas where noise effect levels are high;
- Based on the outcome of the noise investigations and sensitivity of wildlife explore the following possible mitigation measures:
 - investigate the possibility of adjusting the flight path of air ambulance helicopters to minimize noise impacts to Cootes Paradise Heritage Lands;
 - reducing the speed limit along relevant sections of Cootes Drive; and
 - contact the Canadian Warplane Heritage Museum to discuss adjusting aircraft flight paths to avoid/minimize flying over Cootes Paradise Heritage Lands.
- Install exclusion fencing to keep geese and people away from existing marsh restoration plantings;
- Implement RBG's Wetlands Conservation Plan 2016-2021 (Theysmeyer et al. 2016) to restore undercut eroding shorelines by (1) removing gabion baskets and armour stone where they occur along formerly wind-blown shores; and (2) planting a four-metre-wide band of emergent marsh and shrub thicket to jump start plant re-establishment; and
- Remove invasive species with highest priority placed on the Nature Reserve Zones and within critical habitat areas of Species at Risk.

Cultural Heritage Management Recommendations (Management Theme 70, 71, 72)

- Explore the potential for Princess Point to serve as an important entry and destination for visitors to the Cootes to Escarpment EcoPark System, including its potential as a site for relocating RBG's boathouse;
- Consider options for developing a distinct identity that highlights the cultural significance of the Raspberry Farm site; and
- Explore opportunities for cultural interpretation of the Desjardins Canal.

Table 6 provides guidance on the priority for implementing EcoPark Guidelines and Site-specific management recommendation. Note that the priorities are relative to one another, thus the implementation of Management Recommendations for: Access and Infrastructure, Hydrologic Impacts and Cultural are not low per se, but are considered to be less urgent than the Management Recommendations identified as Medium priority. High Priority Management Recommendations are addressed separately in section 5.1

Table 6. Implementation Priority for Completion of EcoPark System Guidelines and Site-specific Management Tasks for the Cootes Paradise Heritage Lands

| Action | High Priority | Medium Priority | Low Priority |
|--|---------------|-----------------|--------------|
| Recommended Guidelines | | | |
| Trail Guideline | x | | |
| Education and Signage Guideline | | x | |
| Vegetation Management Guideline | x | | |
| Edge Management Guideline | | x | |
| Site-specific Management Tasks | | | |
| Land-use Planning Management Recommendations | | x | |
| Access and Infrastructure Management Recommendations | | | x |
| Recreation Management Recommendations | | x | |
| Management Recommendations for Encroachment | | x | |
| Management Recommendations for Hydrologic Impacts | | | x |
| Ecosystem Management and Restoration Recommendations | | x | |
| Cultural Heritage Management Recommendations | | | x |

6.0 Management Plan Monitoring and Evaluation

This section of the Management Plan provides direction on how to monitor the implementation of the Plan. This could be achieved indirectly through measures that determine changes in the Heritage Lands (e.g., degradation or improvement of trails, increase/decrease in invasive plants, etc.) or it can be measured directly by monitoring the number of recommendations that are implemented, and possibly the timing of their implementation. The difficulty with the indirect approach is that it will not discriminate between any particular recommendation being implemented, and the effectiveness of the recommendation. For example, trails may continue to degrade either because there was no attempt to implement the trails recommendations, or the trails recommendations were implemented, but the recommendations were either inadequate or use increased beyond the carrying capacity of the trail. Thus, since the main intent of this section is to measure the implementation of the management plan, direct measurement of the implementation of recommendations is preferred, regardless of their effectiveness. It is important to note that the effectiveness of management (i.e., efficacy of the recommendations) is also critically important, and so some guidance is provided on the development of performance indicators, but these can only be developed fully when the tasks that respond to recommendations in this report are developed at the time of their implementation.

6.1 Monitoring the Implementation of Recommendations

Section 4.0 of this Management Plan provides management recommendations in 74 Management Themes, each of which is a general management issue for the Cootes Paradise Heritage Lands. It is recommended that each of these themes be evaluated annually to determine, 1) if action on the theme has been initiated; and 2) has action been completed, or in the case of issues needing ongoing management (e.g., invasive species control), are there active programs in place that are resulting in ongoing management.

Table 7 provides an outline for tracking the implementation and completion of Management Themes. A blank column has been provided for indicating the agency(s) that are involved with implementing each theme. It is recommended that the Cootes to Escarpment EcoPark System Management Committee determine agency involvement. Once this information is available, the “Agencies Involved” column in Table 7 can be filled out. Without a better understanding of the capacity, available funding and other priorities of the partner agencies, it is not possible to provide guidance on realistic timeframes for initiation. Thus, the Steering Committee should review and propose a realistic schedule for implementation. This is identified as the last management recommendation:

75. Review and Refine Schedule for Monitoring Management Themes

- The Cootes to Escarpment EcoPark System Management Committee should identify the agencies involved in each of the Management Themes provided in Table 7.
- The Steering Committee should review and propose a realistic schedule for implementation.

Table 7: Outline for Tracking the Implementation and Completion of Management Themes for the Cootes Paradise Heritage Lands.

| Management Themes | Agencies Involved | Task Initiated (date) | Task Completed (date) |
|---|-------------------|-----------------------|-----------------------|
| Classification and Zoning of the Heritage Lands | | | |
| 1: Classification per NEPOSS | | | |
| 2: Zoning per NEPOSS | | | |
| Overarching Management Recommendations | | | |
| 3: Awareness of the Cootes to Escarpment EcoPark System | | | |
| 4: Delineation of Boundaries | | | |
| 5: Better Communicate Multi-Agency Management | | | |
| 6: Population and Use | | | |
| 7: Funding | | | |
| 8: Trail/Railway Crossings | | | |
| 9: Critical Corridor for Connection | | | |
| 10: Desire and Need for Trail Connections | | | |
| 11: Desire and Need for Wildlife Crossings | | | |
| 12: EcoPark System-wide Guidelines | | | |
| Heritage Lands Management Plan Recommendations | | | |
| 13: Develop Vision | | | |
| Recommended Management Directions | | | |
| 14: Permitted Uses per NEPOSS Classification | | | |
| 15: Permitted Uses per NEPOSS Zone | | | |
| Land-Use Planning | | | |
| 16: West End of Cootes and the “Dundas Gateway” | | | |
| Access and Infrastructure Recommendations | | | |
| 17: Lack of Adequate/Appropriate Parking and Access on Land | | | |
| 18: Lack of Adequate/Appropriate Parking on Water | | | |
| 19: CN Safety | | | |
| 20: Lack of Facilities | | | |

| Management Themes | Agencies Involved | Task Initiated (date) | Task Completed (date) |
|--|-------------------|-----------------------|-----------------------|
| 21: Trespassing | | | |
| 22: Old Infrastructure and Trail Structures | | | |
| 23: Lack of Public Transportation | | | |
| Recreation Recommendations | | | |
| 24: General Trail Recommendations | | | |
| 25: Overuse and Erosion of Trails | | | |
| 26: Cycling | | | |
| 27: Cycling Route Connectivity | | | |
| 28: Unsanctioned Trails | | | |
| 29: Trail Proliferation | | | |
| 30: Signage | | | |
| 31: User Conflicts | | | |
| 32: Off-Leash Dogs | | | |
| 33: RBG Arboretum Issues | | | |
| 34: Impacts to Wildlife resulting from Recreational Activities | | | |
| 35: Motorized Vehicle Use | | | |
| 36: Hunting/Fishing/Poaching/Foraging | | | |
| 37: Wildlife Feeding | | | |
| 38: Use of Drones | | | |
| Recommendations for Encroachment | | | |
| 39: Private Unsanctioned Trails | | | |
| 40: Structures and 'Yard Extension' | | | |
| 41: Dumping | | | |
| 42: Vegetation Removal/Trampling | | | |
| 43: Pool Drainage | | | |
| 44: Semi-permanent Camps | | | |
| 45: Cats/Domestic Pets | | | |

| Management Themes | Agencies Involved | Task Initiated (date) | Task Completed (date) |
|---|-------------------|-----------------------|-----------------------|
| Recommendations for Hydrologic Impacts | | | |
| 46: Run-off and Peak Flows | | | |
| 47: Erosion and Sedimentation | | | |
| 48: Water Quality | | | |
| 49: Fluctuating Water Levels | | | |
| 50: Churchill Park Drainage | | | |
| 51: Polluting Spills | | | |
| Ecosystem Management and Restoration Recommendations | | | |
| 52: Forest Fragmentation | | | |
| 53: Decline in Natural Feature Quality | | | |
| 54: Forest Health Decline | | | |
| 55: Urban Adapted Wildlife | | | |
| 56: Loss of Open Woodland/Prairie/Savannah Habitat | | | |
| 57: Conservation and Recovery of Species at Risk | | | |
| 58: Stream Habitat Improvement | | | |
| 59: Cootes Paradise Fishway and Management | | | |
| 60: Invasive Species | | | |
| 61: Noxious Plants | | | |
| 62: Site-Specific Wildlife Crossings/Corridors | | | |
| 63: Noise | | | |
| 64: Removal of Plantings due to Vegetation Maintenance of Pipelines | | | |
| 65: Establishment of Marsh Restoration Plantings | | | |
| 66: Shoreline Erosion/Stabilization in Cootes Paradise Marsh | | | |
| 67: Watershed/Sub-Watershed Boundary Issues | | | |
| Cultural Heritage Recommendations | | | |
| 68: Historic and current use by Indigenous People | | | |
| 69: Communication of Cultural Heritage | | | |

| Management Themes | Agencies Involved | Task Initiated (date) | Task Completed (date) |
|--|-------------------|-----------------------|-----------------------|
| 70: Connection between Cultural and Natural Heritage Resources at Princess Point | | | |
| 71: Identity of Rasberry Farm | | | |
| 72: Cultural Heritage Interpretation | | | |
| 73: Low Profile of Early Settlement History | | | |
| 74: Need for Corresponding Management Expertise | | | |
| Monitoring the Implementation of Recommendations | | | |
| 75: Review Schedule for Monitoring | | | |

6.2 Guidance for Performance Indicators

6.2.1 Adaptive Management

As noted above, it is important to evaluate the efficacy of management actions to determine if they are producing the desired outcome. The accepted approach to achieve this is Adaptive Management.

Adaptive Management involves the following steps:

1. Implement management actions based on the best available information and analysis;
2. Monitor the outcome of the management actions;
3. Evaluate monitoring outcomes against management objectives and/or targets; and
4. Where objectives and/or targets are not being achieved, refine management prescriptions.

In some instances, Adaptive Management will reveal unrealistic or unattainable objectives and/or targets, in which case they will need to be revised. Monitoring and evaluation should continue until objectives and/or targets are achieved, or in the case where the management action is ongoing (e.g., invasive species management), as long as management is undertaken.

Adaptive Management is especially valuable where the outcome of management actions is uncertain, for example, when introducing a disturbance regime to restore a particular vegetation type, trying a new trail surface, or undertaking habitat modification to conserve a Species at Risk. However, it is also useful for actions such as trail closure, where it is simply a matter of seeing if the method to prevent further use of the trail (signage, restoration at trail entrance, placing obstructions across the entrance, etc.) is effective. Adaptive Management is essential to increase knowledge, i.e., to gain a better understanding of what management techniques work in a particular application. It is also very useful for reporting results, as it provides objective and defensible information on the progress of management.

A key component of Adaptive Management is establishing a benchmark for success; a yardstick against which results can be compared to evaluate progress. These can be objectives, targets or performance indicators. In most cases, these cannot be established until detailed management tasks are developed, and generally require more detail than is available for this Heritage Lands Management Plan. They would be established when the protocols for management are developed, or decisions on management

are made (e.g., which trails should be closed, how EcoPark System boundaries will be demarcated, etc. Also, some management tasks may not lead themselves to establishing performance indicators, such as the development of education/stewardship material, as it would be extremely difficult to measure their efficacy. In such cases, it is probably reasonable to assume that they benefit overall management goals and evaluate the tasks simply by noting if they were completed, as outlined in Table 8.

Notwithstanding the difficulty of providing performance indicators before more detailed plans are developed, guidance for their development is suggested in Table 8. In making these suggestions it is realized that it would be possible to develop metrics to measure and evaluate probably all of the recommendations. However, the time and effort to actually develop and undertake that level of monitoring is probably not justified in most cases. For example, for the recommendation to install perimeter fencing, one could measure the length of fencing completed as a measure of implementation success, but it is probably sufficient to note that the fencing has been initiated, in progress, and finally completed (acknowledging that walkthroughs should be conducted to determine if perimeter fencing has been damaged or cut, and/or if alternative routes have been created). There are other recommendations where the efficacy of the recommendation is more tenuous, for example vegetation management, management of Species at Risk, etc., and it is these cases where targets and performance monitoring is recommended in Table 8. There are no standards for when a rigorous, Adaptive Management approach should be undertaken, thus the recommendations regarding the appropriateness of setting targets and performance measures can be re-evaluated and revised as deemed necessary. "N/A" is used in Table 8 where it is not yet possible to establish Targets of Performance Indicators.

Table 8: Guidance for Setting Targets and Performance Indicators for the Cootes Paradise Heritage Lands.

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|---|--|--|
| Classification and Zoning of the Heritage Lands | | |
| 1: Classification per NEPOSS | N | N/A |
| 2: Zoning per NEPOSS | N | N/A |
| Overarching Management Recommendations | | |
| 3: Awareness of the Cootes to Escarpment EcoPark System | N | N/A |
| 4: Delineation of Boundaries | N | N/A |
| 5: Better Communicate Multi-Agency Management | N | N/A |
| 6: Population and Use | N | N/A |
| 7: Funding | N | N/A |
| 8: Trail/Railway Crossings | N | N/A |
| 9: Critical Corridor for Connection | Y | <ul style="list-style-type: none"> Track securement of key land parcels that contribute directly to enhancing the connection between Cootes Paradise and the Escarpment |
| 10: Desire and Need for Trail Connections | N | N/A |
| 11: Desire and Need for Wildlife Crossings | N | N/A |
| 12: EcoPark System-wide Guidelines | N | N/A |
| Heritage Lands Management Plan Recommendations | | |
| 13: Develop Vision | N | N/A |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|---|--|---|
| Recommended Management Directions | | |
| 14: Permitted Uses per NEPOSS Classification | N | N/A |
| 15: Permitted Uses per NEPOSS Zone | N | N/A |
| Land-Use Planning | | |
| 16: West End of Cootes and the “Dundas Gateway” | N | N/A |
| Access and Infrastructure Recommendations | | |
| 17: Lack of Adequate/Appropriate Parking and Access on Land | N | N/A |
| 18: Lack of Adequate/Appropriate Parking on Water | N | N/A |
| 19: CN Safety | N | N/A |
| 20: Lack of Facilities | N | N/A |
| 21: Trespassing | N | N/A |
| 22: Old Infrastructure and Trail Structures | N | N/A |
| 23: Lack of Public Transportation | N | N/A |
| Recreation Recommendations | | |
| 24: General Trail Recommendations | Y | <ul style="list-style-type: none"> Identify all potential trail connections in the EcoPark System (the target) and use proportion of connections achieved as a performance measure. Use total number of trails to be closed as target and use proportion of trails successfully closed as performance measure. Considerations for general condition could include: |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|-----------------------------------|--|---|
| | | <ul style="list-style-type: none"> • owing to extensive trails system, select representative sections of trails to monitor (e.g., 10 100m long sections) including: “typical” sections, sections where issues are contemplated, areas with steep slopes, sections adjacent to Species at Risk, and sections in Natural and Nature Reserve Zones; • measure frequency of trail widening to circumvent wet areas; • measure frequency of substantial erosion issues; and • measure frequency of damage to trail-side vegetation from users leaving trail to avoid conflict with other users (e.g., hiker/cyclist conflicts). • Evaluate efficacy of closures using motion-triggered cameras to record use of newly closed trails; report number of uses per week for 6 weeks following closure and per month for one year and record if trail was accessed by foot and/or bicycle. Evaluate success of closure, determine need for re-visiting closure protocol based on number of users and considering if use is increasing or decreasing. |
| 25: Overuse and Erosion of Trails | Y | <ul style="list-style-type: none"> • Use proportion of erosion sites addressed through structures being installed as performance measure. • Performance measures for evaluating different trails surfaces should be established but these will be dependent on the actual surface used and the impacts they are intended to address; it may be that the measures suggested for Management Theme 24 will suffice. |
| 26: Cycling | Y | N/A |
| 27: Cycling Route Connectivity | N | N/A |
| 28: Unsanctioned Trails | N | N/A |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|--|--|---|
| 29: Trail Proliferation | Y | <ul style="list-style-type: none"> • Measure proportion of inappropriate trails that are successfully closed. • Include trail monitoring wherever trail is in close proximity (e.g., 10 m) of a Species at Risk. |
| 30: Signage | N | N/A |
| 31: User Conflicts | N | N/A |
| 32: Off-Leash Dogs | N | N/A |
| 33: RBG Arboretum Issues | N | N/A |
| 34: Impacts to Wildlife resulting from Recreational Activities | N | N/A |
| 35: Motorized Vehicle Use | N | N/A |
| 36: Hunting/Fishing/Poaching/Foraging | N | N/A |
| 37: Wildlife Feeding | N | N/A |
| 38: Use of Drones | N | N/A |
| Recommendations for Encroachment | | |
| 39: Private Unsanctioned Trails | Y | <ul style="list-style-type: none"> • Determine total number of unsanctioned structures and instances of inappropriate, unsanctioned trail management (targets) and use proportion of structures and improvements removed as performance measures (see Management Theme 28) |
| 40: Structures and 'Yard Extension' | Y | <ul style="list-style-type: none"> • Determine total number of unsanctioned structures and instances of inappropriate yard extensions (targets) and use proportion of structures and removal of yard extensions (e.g., plantings) as performance measures. |
| 41: Dumping | Y | N/A |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|---|--|---|
| 42: Vegetation Removal/Trampling | N | N/A |
| 43: Pool Drainage | N | N/A |
| 44: Semi-permanent Camps | Y | <ul style="list-style-type: none"> Determine total number of unsanctioned semi-permanent camps (targets) and use proportion of structures removed as performance measures. |
| 45: Cats/Domestic Pets | N | N/A |
| Recommendations for Hydrologic Impacts | | |
| 46: Run-off and Peak Flows | N | N/A |
| 47: Erosion and Sedimentation | Y | <ul style="list-style-type: none"> Targets and performance measures should definitely be established for the stormwater management facilities, but this will have to be done collaboratively between ecologists and water resource engineers. |
| 48: Water Quality | N | N/A |
| 49: Fluctuating Water Levels | N | N/A |
| 50: Churchill Park Drainage | N | N/A |
| 51: Polluting Spills | N | N/A |
| Ecosystem Management and Restoration Recommendations | | |
| 52: Forest Fragmentation | N | N/A |
| 53: Decline in Natural Feature Quality | N | N/A |
| 54: Forest Health Decline | Y | <ul style="list-style-type: none"> Targets and performance measures related to the control of invasive insects are specific to the species and largely dependent on the ability/practicality of controlling them; these will need to be established on a case-by-case basis. |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|--|--|--|
| | | <ul style="list-style-type: none"> • Development of targets and performance measures for vegetation restoration and management is a substantial task that should be undertaken within the EcoPark System Vegetation Management Guideline, but some ideas are provided below. • Determine the main vegetation types that are representative of the each of the Heritage Lands and any rare or otherwise significant vegetation types, especially those containing Species at Risk. • Identify areas with the Heritage Lands that are the best remaining remnants of these vegetation types; these may be relatively small patches (2500 - 10,000 m²) within larger units of more disturbed vegetation. • Establish measurable characteristics that define each of the vegetation types (e.g., canopy closure, indicator species, extent of native ground cover, plant species richness, etc.) that could serve as to develop targets and related performance measures. • Determine reasonable timelines for restoration, including response times for vegetation following management action, and use to determine monitoring/evaluation schedules. |
| 55: Urban Adapted Wildlife | N | N/A |
| 56: Loss of Open Woodland/Prairie/Savannah Habitat | Y | <ul style="list-style-type: none"> • Using the targets (see section 4, Theme 56), determine the proportion of habitat that is being maintained as Open Woodland/Prairie/Savannah |
| 57: Conservation and Recovery of Species at Risk | Y | <ul style="list-style-type: none"> • Targets and performance measures for Species at Risk are species dependant and should be developed as part of the restoration/monitoring protocol. • Targets should be informed by the relevant provincial and federal Recovery Strategies, Government Response Statements, etc. and |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|--|--|---|
| | | <p>focus on maintaining or increasing population size(s) (number of individuals or number of patches).</p> <ul style="list-style-type: none"> • Targets and performance measures could also include population health, i.e. monitoring whether flowering/seed set/recruitment is maintained or improved. • Where there are known threats to Species at Risk, consider monitoring and evaluating the threats, rather than the species. • See Geomatics International (1994) for discussion and suggestions for monitoring Species at Risk, and Geomatics International (1991, 1992) and Finney, N. (2012) for monitoring American Columbo. • See suggestions for Management Themes 24, 25 and 39 for trail monitoring. |
| 58: Stream Habitat Improvement | Y | <ul style="list-style-type: none"> • Targets and performance measures would have to be addressed as part of species-specific management recommendations. |
| 59: Cootes Paradise Fishway and Management | Y | <ul style="list-style-type: none"> • TBD |
| 60: Invasive Species | Y | <ul style="list-style-type: none"> • Targets and performance measures are essential to determine the efficacy of control measures. • Targets for species with the capacity for serious degradation of native ecosystems should be complete elimination, where feasible. • Consider most aggressive targets in Nature Reserves, representative vegetation areas, and where there may be threats to Species at Risk. • Performance measures should focus on reduction of individuals, patch size and/or number of patches of invasive species. |
| 61: Noxious Plants | Y | <ul style="list-style-type: none"> • Where noxious species is non-native, targets and performance measures should be determined in concert with invasive species (Management Theme 60). |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|--|--|--|
| | | <ul style="list-style-type: none"> • Targets and performance measures for native noxious species (poison-ivy) should focus on control along sanctioned paths and areas where access is facilitated. |
| 62: Site Specific Wildlife Crossing/Corridors | Y | <ul style="list-style-type: none"> • The number of priority locations for eco-passages can be used as the target, noting this will likely be refined as greater knowledge of the Heritage Lands is gained (e.g., implementation of the top 10 wildlife crossing locations throughout the Cootes to Escarpment EcoPark System). • Performance measures could be the proportion of potential locations where eco-passages are installed. • Efficacy (targets and performance measures) of individual eco-passages can only be determined when they are designed as they should focus on the target species that the passage is designed to accommodate (e.g., targets and performance measures will be different for deer and turtles). |
| 63: Noise | N | N/A |
| 64: Removal of Plantings due to Vegetation Maintenance | N | N/A |
| 65: Establishment of Marsh Restoration Plantings | N | N/A |
| 66: Shoreline Erosion/Stabilization in Cootes Paradise Marsh | N | N/A |
| 67: Watershed/Sub-watershed Boundary Issues | N | N/A |
| Cultural Heritage Recommendations | | |
| 68: Historic and current use by Indigenous People | N | N/A |

| Management Themes | Target/Performance Indicator Appropriate Y/N | Suggestions for Developing Targets and Performance Indicators |
|--|--|---|
| 69: Cultural Heritage Conservation | N | N/A |
| 70: Connection between Cultural and Natural Heritage Resources at Princess Point | N | N/A |
| 71: Identity of Raspberry Farm | N | N/A |
| 72: Cultural Heritage Interpretation | N | N/A |
| 73: Low Profile of Early Settlement History | N | N/A |
| 74: Need for Corresponding Management Expertise | N | N/A |
| Monitoring the Implementation of Recommendations | | |
| 75. Review Schedule for Monitoring | N | N/A |

7.0 References

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Appendix 1: Cootes Paradise Heritage Lands Land Classification and Zoning Report



Cootes Paradise Heritage Lands

LAND CLASSIFICATION AND ZONING

Prepared for Cootes to Escarpment EcoPark System

May 2018

Cootes to Escarpment EcoPark System Partners



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Cover Photograph: South Shore of Cootes Paradise, Ginger Valley Trail by Holly Dodds, 2017

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1.0 Introduction

This report recommends classifications and zones for Cootes Paradise Heritage Lands in accordance with the Niagara Escarpment Parks and Open Space System (NEPOSS) as described in the recently updated Niagara Escarpment Plan (NEP) (MNR 2017) and Niagara Escarpment Parks and Open Space System Planning Manual¹ (MNR 2012). It builds on the Inventory, Issues and Opportunities report that provides a complete inventory of recreation, natural heritage and cultural heritage resources, identifies management issues and opportunities, and provides preliminary recommendations for management of the Heritage Lands. Although the focus of this report is on classifications and zones, permitted uses are also discussed to provide a fuller understanding of the repercussions of the proposed classifications and zones. More detail on permitted uses, as well as overall management recommendations, will be included in the management plan.

1.1 Niagara Escarpment Parks and Open Space System

NEPOSS is comprised of more than 160 parks and open space areas, most of which are, or will be connected by the Bruce Trail (MNR 2017). These parks and open space areas are owned and managed by several conservation authorities and agencies, including local municipalities, Bruce Trail Conservancy and Royal Botanical Gardens. The NEPOSS balances protection, conservation and sustainable development to ensure that the Niagara Escarpment will remain largely as a natural environment for future generations (MNR 2017). The objectives of the NEPOSS are:

- to protect the Niagara Escarpment's natural heritage resources and conserve its cultural heritage resources;
- to provide opportunities for outdoor education and recreation;
- to provide for public access to the Niagara Escarpment;
- to complete a public system of major parks and open space areas through land acquisition and Master/Management planning;
- to secure a permanent route for the Bruce Trail;
- to protect and enhance the natural environment of the Niagara Escarpment, including the protection of natural heritage and hydrologic features and functions;
- to support tourism by providing opportunities on public land for discovery and enjoyment by Ontario's residents and visitors;
- to provide a common understanding and appreciation of the Niagara Escarpment; and
- to show leadership in supporting and promoting the principles of the Niagara Escarpment's United Nations Educational, Scientific and Cultural Organization (UNESCO) World Biosphere Reserve Designation through sustainable park planning, ecological management, community involvement, environmental monitoring, research and education.

Cootes Paradise Heritage Lands include two parks and open space areas that are a part of the NEPOSS: (1) Cootes Paradise Sanctuary; and (2) Churchill Park. These areas are subject to the policies associated with the NEPOSS and contribute to a framework for establishing and coordinating a system of publicly-owned lands on the Niagara Escarpment. The NEP requires that management plans be prepared for

¹ Section 3.1.2.2 of the NEP states that the 2012 NEPOSS Planning Manual may be reviewed by the MNR at the request of the NEC or the NEPOSS Council. The review will be based on the best information available at the time and consultation with the NEC and NEPOSS Council (MNR 2017).

each park and open space in the NEPOSS (Policy 3.1.5.1.1, MNRF 2017). Management plans lay out the goals and objectives and guide the protection and management of natural heritage features and cultural heritage features, and activities in parks and open space areas.

Policy 3.1.5.1.2 of the NEP states that: “The NEPOSS agencies may produce a single Master/Management Plan for a grouping of protected areas where the NEPOSS lands are adjacent or within close proximity to each other”. Furthermore, management plans are required by the Cootes to Escarpment Park System Conservation and Land Management Strategy Phase II Report (Wong 2009) for each of the six Heritage Lands. A single management plan for each Heritage Area (as opposed to several based on the NEP designations) is desirable in order to manage the lands in a holistic and integrated manner, among the multiple landowning and managing agencies.

The Cootes Paradise Heritage Lands are comprised of several parcels, including Cootes Paradise Sanctuary and Churchill Park, the two parks already classified in the NEPOSS, and others that are not classified in the NEPOSS and/or the NEP. Thus, the Cootes Paradise Heritage Lands will not be classified as a single park and/or open space area but will adopt the classifications for the two parks already identified in the NEP, as well as classifying the remaining area. As a result, the Cootes Paradise Heritage Lands will contain multiple classifications, including Natural Environment and Recreation, the existing classifications for Cootes Paradise Sanctuary and Churchill Park respectfully.

The intent of the management plan is to provide high-level guidance for the future management of the Heritage Lands. Detailed park-specific master/management plans may be prepared at a later date by individual landowners or agencies to further refine recommendations. Detailed park-specific master/management plans must be submitted for approval through the NEPOSS process (Policy 3.1.5.3.1, MNRF 2017). There is no intent to submit the management plan currently being prepared for the Cootes Paradise Heritage Lands to the Niagara Escarpment Commission (NEC) for endorsement, or to the Ministry of Natural Resources and Forestry (MNRF) for approval.

Within the NEPOSS, classifications and zones serve as a guide to agencies and other landowners in the management and use of a park or open space. Detailed descriptions of the NEPOSS classifications and zones and the uses permitted in each area are provided in sections 1.2 and 1.3. While not all Cootes Paradise Heritage Lands are in the NEPA, they are part of the broader ecosystem. As such, tools outlined in the NEPOSS Planning Manual (MNR 2012) have been used to guide the classification and zones of all the Current EcoPark Lands within the Heritage Lands, including those outside of the NEPA, in combination with other guiding principles based on best practices. Policy 3.3 of the NEP states that “Municipal parks and open spaces not identified in Appendix 1 or on Map 10 may, upon request by the municipality and with the agreement of the Ministry of Natural Resources and Forestry and the Niagara Escarpment Commission, be included in the NEPOSS”. A discussion of the classifications and zones assigned to the Cootes Paradise Heritage Lands is provided in section 2.0.

The NEPOSS classification and zone policies (sections 3.1.4 and 3.1.5 respectively of the NEP, MNRF 2017) are intended to be applied to park and open space areas along the escarpment that are generally relatively large natural areas. However, the Cootes to Escarpment EcoPark System, and the Cootes Paradise Heritage Lands in particular includes urban parks and public infrastructure which were not anticipated to occur within the NEPOSS. The NEPOSS classifications and zones do not address some of these uses, perhaps because they are outside the intended use. In this report, the NEPOSS planning

manual was applied as best as possible, and where an existing use (mainly municipal infrastructure) did not fit into the NEPOSS framework, they were left “unclassified”

As this management plan is not going through the NEPOSS approval process, the classifications and zones are recommendations which have been based on current understanding of the areas. They will be used to guide the development of future park-specific management plans that must be approved through the NEPOSS process.

1.2 NEPOSS Park Classifications

NEPOSS provides six classifications which are assigned based on the predominant characteristics of the park and open space area. Each of the six classifications serves a specific purpose and provides planning and management direction to agencies. The classifications are included within the NEP and re-classification is generally discouraged. The park classifications are described in the NEP as follows (MNRF 2017):

Table 1. Park Classification Descriptions

| Classification | Description |
|---------------------|--|
| Nature Reserve | <p>These areas represent and protect the most sensitive natural heritage features and landforms along the Niagara Escarpment, such as provincially significant wetlands and provincially significant Areas of Natural and Scientific Interest. Management practices will ensure that the features and values for which the reserve was established are protected.</p> <p>Access to these areas will not be widely promoted and activities will be limited to those that can further scientific understanding and education (i.e., scientific research, natural history interpretation, and trails). The minimum amount of facilities necessary to support these activities will be provided.</p> |
| Natural Environment | <p>These lands are characterized by, and serve to protect, a variety of outstanding natural heritage resources and cultural heritage resources, and scenic resources.</p> <p>Activities may range from back-country hiking in the interior of these areas to car-camping and day-use activities in more developed or accessible areas.</p> |
| Recreation | <p>These are some of the best recreational environments along the Escarpment that occur naturally or can be developed to provide a variety of outdoor recreational opportunities in attractive Escarpment surroundings. Recreation parks or open spaces may include day-use activities, outdoor recreational activities, which may include hiking, mountain biking, skiing, rock climbing, zip lines and athletic fields, and supporting infrastructure for recreational activities where appropriate. Facilities for overnight camping may also be provided, including campgrounds, temporary yurts, tents, lean-to's and unserviced camper's cabins. Special purpose buildings that include overnight accommodations and meals for guests may also be permitted.</p> |
| Cultural Heritage | <p>These areas are intended to protect distinctive areas representative of the Escarpment's cultural heritage resources. Development of facilities will be focused primarily on the conservation of cultural heritage resources.</p> |
| Escarpment Access | <p>These generally small areas will complement the larger, and in some cases, more developed parks and open spaces by providing opportunities for public access to the Niagara Escarpment. These areas may provide modest facilities</p> |

| Classification | Description |
|---------------------------|---|
| | to support day use activities at points of interest (e.g., trailheads, picnic sites, scenic areas, fishing areas, beaches). |
| Resource Management Areas | <p>This classification includes certain public lands that are managed primarily to provide resource-related benefits, such as forest products, fish and wildlife, or flood control.</p> <p>These areas also provide recreation opportunities and allow for the protection of natural heritage resources and the conservation of cultural heritage resources. In most cases, these areas will include more resource management activities relative to other classifications in the NEPOSS.</p> |

1.3 NEPOSS Park Zones

According to the NEP, the development of zone mapping and zone policies is required for orderly planning, compatible development and effective management of a park or open space (MNR 2017). Zones recognize that every park or open space includes a combination of significant natural heritage resources and cultural heritage resources and potential or existing development. Zones are intended to work within each of the park classifications to guide uses based on the significance of resources, the need for protection, and the potential for compatible recreation or other activities. According to the NEPOSS Planning Manual, zones are intended to fulfill a variety of functions in a park or open space area, including the following:

- identification and recognition of the features and attributes;
- protection of key natural heritage features and cultural heritage features and functions;
- segregation of conflicting recreational activities by directing activities with higher impacts to the least sensitive areas and low-impact activities to areas that are more sensitive, if appropriate;
- delineation of areas based on their requirements for management;
- standardization of the approach to support management objectives and actions, based on a variety of features;
- balancing of public use with the preservation of the natural environment; and
- encouraging users to understand the park and open space policies and to appreciate the unique contribution each park or open space makes to NEPOSS.

The NEP outlines six park zones. Each zone serves a specific purpose and provides direction on planning and management. The six park zones and their descriptions are:

Table 2. Park Zone Descriptions

| Zone | Description |
|---------------------|---|
| Nature Reserve | Nature Reserve Zones include the most sensitive natural heritage features and areas that require careful management to ensure long-term protection. |
| Natural Environment | Natural Environment Zones include scenic landscapes in which minimum development is permitted to support recreational activities that have minimal impacts on the Escarpment environment. |
| Access | Access Zones serve as staging areas (e.g., trailheads, parking lots) where minimal facilities support the use of Nature Reserve Zones and relatively undeveloped Natural Environment and Cultural Heritage Zones. |
| Cultural Heritage | Cultural Heritage Zones include cultural heritage resources that require management to ensure long-term conservation. |

| Zone | Description |
|---------------------|---|
| Development | Development Zones provide access, orientation and operational facilities (e.g., visitor centres, maintenance buildings, parking lots) to support nature appreciation and recreational activities. This zone may include areas designed to provide facilities and supporting infrastructure for recreational purposes. |
| Resource Management | Resource Management Zones provide for sustainable resource management (e.g., forest management, fisheries management, watershed management, wildlife management, and flood control). |

The NEP also states that “other zones may be established and applied in specific circumstances to resolve special planning or management considerations that cannot be accommodated by the zones described above” (MNRF 2017). In addition to providing the above descriptions of each zone, the NEPOSS Planning Manual includes the management direction and types of uses that are considered appropriate within the zone description. Management direction and permitted uses within each zone are reviewed in section 4.0.

1.4 Nodal Parks of the Niagara Escarpment Parks and Open Space System

To promote the Niagara Escarpment’s diverse environments for public benefit and to provide destination and starting points within the NEPOSS, the NEP identifies nine focal areas (Nodal Parks), which includes Cootes Paradise Sanctuary. Nodal Parks perform the following functions:

- orientation – to tell visitors where they are in relation to other parks, open spaces, trails, natural features and points of interest;
- education – to stimulate an understanding of the Niagara Escarpment and its natural heritage resources and cultural heritage resources (e.g., UNESCO World Biosphere Reserve designation);
- interpretation – to familiarize visitors with the features of a park or open space; and
- recreation – to identify and provide information on how to participate in nearby Escarpment recreational activities.

Nodal Parks may contain buildings or facilities (e.g., visitor centre, administrative office space) appropriately scaled for the site to support uses directly related to its educational and administrative role in NEPOSS (NEP, MNRF 2017). In addition, to support and enhance their role in the NEPOSS, Nodal Parks may include special purpose buildings with meals and overnight accommodations.

The fact that Cootes Paradise Sanctuary is a Nodal Park within the NEPOSS was considered in the zoning process.

2.0 Establishing Classifications and Zones

2.1 Establishing Classifications

Within the Cootes Paradise Heritage Lands, two park and open space areas have been classified in the NEP:

1. Cootes Paradise Sanctuary – Natural Environment; and
2. Churchill Park – Recreation.

The Inventory, Issues and Opportunities report for the Cootes Paradise Heritage Lands (North-South Environmental et al. 2018) and approved Churchill Park Management Plan (City of Hamilton 2017) was used to review and confirm the classifications applied to the NEPOSS parks and open space areas. Classifications are recommended for those portions of the Heritage Lands that are located outside the NEPOSS and/or NEPA, based on the description and management direction provided for each classification included in the NEPOSS Planning Manual (MNR 2012). The management direction for the classifications applied are as follows:

Natural Environment:

Natural Environment lands provide opportunities for the protection of important natural heritage features and cultural heritage features.

Recreation:

Management and development of resources is appropriate in order to provide the recreational environment and facilities required to support a wide variety of activities, which may be for day use only. While public use of recreation parks may include more intensive activities or uses than at other NEPOSS parks, these activities will still be suited to the natural character of the particular park. Such activities must occur in zones identified in an approved management plan and be conducted in an environmentally sustainable manner. Development of facilities must be designed and undertaken in a way that will minimize the environmental impact of the development.

2.2 Establishing Zones

Within the Cootes Paradise Heritage Lands, zones were applied through a process that examined the Current EcoPark Lands of the Cootes Paradise Heritage Lands in detail to determine:

- what natural heritage features and cultural heritage features exist;
- what permitted uses and development options are appropriate; and
- what management priorities and policies should be put in place for the future.

Zones were applied based on the inventory and analysis undertaken in the Inventory, Issues and Opportunities report (North-South Environmental et al. 2018). It included the location of Areas of Natural and Scientific Interest (ANSI), Environmentally Sensitive Areas or Environmentally Significant Areas (ESA), Species at Risk (SAR) and other rare or uncommon species, rare vegetation communities, current and projected uses, etc. Knowledge of the Heritage Lands gained through fieldwork for this study, existing information, and reference to aerial photography were all used in determining the recommended zones. In general, there is flexibility in the precise location of zoning boundaries and to some extent the exact location is subjective. For example, in Cootes Paradise Sanctuary, the boundary between the Nature Reserve Zone and the Resource Management Zone is more of a transitional area, rather than a discrete line. Zoning boundaries should be refined as part of future park-specific master/management plans.

Zoning assigns uses to lands based on their significance for protection and their potential for recreation within the classification policy (MNR 2012). In the NEPOSS Planning Manual the management direction provided for the zones applied are as follows:

Nature Reserve:

Nature Reserve Zones are predominantly natural and should contain naturally functioning ecosystems. Such zones should protect natural heritage features in the long term.

Natural Environment:

The Natural Environment Zone can function as a buffer between Development Zones and Cultural Heritage or Nature Reserve Zones. Natural Environment Zones are not permitted in Nature Reserve class parks.

Access:

Access Zones are intended to support the use of and access to adjacent zones.

Cultural Heritage:

Management planning for archaeological or cultural heritage features may range from maintaining their present condition to restoring and/or reconstructing the site.

Development:

A Development Zone is usually oriented to the provision of recreational opportunities that are suited to the natural character of the particular park or open space and are conducted in an environmentally sustainable manner. This zone should have minimal negative impact on natural heritage features and cultural heritage features, the natural landscape or watersheds. Development Zones are not permitted in Nature Reserve class parks.

Resource Management:

Resource Management Zones are sustainably managed for many diverse values, such as wildlife, fisheries, forestry and outdoor recreation. Such zones may be places for experimenting with alternative resource management practices and developing a better understanding of ecosystem structures and functions in a scientifically sound manner. This zone should demonstrate exemplary conservation and stewardship. Resource Management Zones should not be established in Nature Reserve parks, provincial parks or in life science ANSIs, except as noted in section 3.1.5.6 of the NEP. These exceptions are:

- a) where existing forestry agreements are in effect;
- b) to facilitate uses permitted under existing approved Master/Management Plan;
- c) to protect and where possible enhance the unique features of an Area of Natural or Scientific Interest, where such features would otherwise disappear without active management;
- d) for emergency access (e.g., fire protection); and
- e) on public lands included in a Resource Management Area class park.

In this report, the Resource Management Zone has been applied to lands with the main intent of providing for future ecological restoration activities, not to provide for active resource extraction. It is recommended where ecological restoration would be a principal management activity in the future owing to the current characteristics of the area. If ecological restoration is undertaken within a Resource Management Zone, consideration could be given to changing the zone from Resource Management to Natural Environment when the restoration has matured and shown to be successful. For example, if woodland ecological restoration is undertaken within an old field, zoning of this area could be changed from Resource Management to Natural Environment once an ELC would classify the land as woodland.

Recreation:

At present, there is no Recreation Zone included in the NEP (MNR 2017) or NEPOSS Planning Manual (MNR 2012). However, a Recreation Zone was created within City View Park in an NEC-approved Management Plan (The Landplan Collaborative Ltd. et al. 2009) in recognition of the recreation facilities planned for the park there. Since there are similar recreation facilities within the Cootes Paradise Heritage Lands, we propose to also use a Recreation Zone, as there is no existing zone in the NEPOSS Planning Manual that easily accommodates this use. The proposed Recreation Zone as described here is only for the purpose of the Cootes Paradise Heritage Lands Management Plan. Such a zone may also be appropriate elsewhere, but it is not the intent of this report to provide a generic description and permitted uses for application elsewhere in the NEPOSS.

The intent of the proposed Recreation Zone is to provide a category that permits recreational uses that require more intensive development such as sports fields, arenas, municipal swimming pools, or off-leash dog parks. Recreation Zones do not include associated infrastructure such as driveways, parking lots, washrooms and other amenities normally associated with urban recreation facilities. Driveways and parking lots are zoned as Access, and washrooms and other buildings are zoned as Development per the NEPOSS Planning Manual (MNR 2012). The Recreation Zone is applied to spaces used for more intensive recreation.

In this report, the Recreation Zone has been applied only to existing intensive recreational sites within the Cootes Paradise Heritage Lands that do not support, or provide only minimal, natural heritage values. This zoning should not be applied to areas with native vegetation or high-quality natural settings. Nor should it be applied to abandoned fields where they provide complimentary ecological functions to adjacent natural features, or where ecological restoration would substantially improve the natural heritage values of adjacent natural sites. The proposed Recreation Zone should have minimal negative impact on natural heritage features and cultural heritage features, the natural landscape and watersheds.

For the Cootes Paradise Heritage Lands Management Plan, the proposed Recreation Zone is proposed for areas where there are existing intensive recreational uses at Olympic Sports Park, Volunteer Field Park, Martino Memorial Park, Centennial Park, and Coronation Park. The proposed Recreation Zone may also be appropriate for lands within Churchill Park; however, the zones from the approved management plan have been applied.

2.3 Unclassified and Unzoned Lands

The three management units referred to as Dundas Transfer Station, City of Hamilton Public Works and Wastewater Treatment Plant are owned by the City of Hamilton and are used for municipal services including waste disposal, public works and wastewater treatment. These lands were not acquired for parkland development. Given these uses, public access to these areas will not be encouraged or supported. These three management units have not been classified or zoned and are identified on the maps as “unclassified”.

3.0 Recommended Classifications and Zones

Recommended classifications and zones for the Current EcoPark Lands within the Cootes Paradise Heritage Lands are provided in Table 3, which includes supporting rationale. Figure 1 illustrates the recommended classifications and zones. For additional information on property boundaries and property ownership, refer to Figure 2 in the Cootes Paradise Inventory, Issues and Opportunities report (North-South Environmental et al. 2018). The zones for Churchill Park shown in Figure 2 have been approved and adopted by the MNRF and NEC as part of the Churchill Park Management Plan (City of Hamilton 2017).

The Cootes Paradise Heritage Lands mainly consist of a large relatively intact natural area that includes Cootes Paradise marsh, and the predominantly wooded north and south shore areas. The Cootes Paradise Heritage Lands currently support a wide variety of uses which include natural heritage protection, cultural heritage protection, ecological restoration, education, recreation in various forms, and municipal uses (e.g., wastewater treatment). As a result, the range of uses and the subsequent application of zones are quite varied compared to other areas within the Cootes to Escarpment EcoPark System, such as the Borer's Falls-Rock Chapel Heritage Lands and Waterdown-Sassafras Woods Heritage Lands, which are predominantly characterized by escarpment slope forests and other natural areas.

In assigning/confirming the NEPOSS classifications, and in determining appropriate zones, it is very important to consider the context of the Heritage Lands. The NEPOSS Planning Manual applies to the whole of the Niagara Escarpment and must address a variety of parks, each with its own unique characteristics. The Cootes Paradise Heritage Lands are located within an urban context and are subject to several urban pressures, mostly related to unmitigated stormwater runoff and existing uses. Many of the existing uses are well-established and, without management, are expected to escalate with the anticipated increase in use of the Cootes to Escarpment EcoPark System based on growth targets and urban intensification identified for the City of Hamilton (see Growth Plan for the Greater Golden Horseshoe (MMA 2017)). Recognition of the natural and/or cultural heritage value of the Heritage Lands through classification and zoning helps convey their importance to the public (and thus assists in getting acceptance of restrictive management and limited use), as well as providing the mandate for protection, restoration and management of valued resources as required.

Table 3. Cootes Paradise Heritage Lands Classifications and Zones

| NEPOSS Park | Management Unit | Classification | Zoning | Rationale |
|---------------------------|-----------------------------|---------------------|---------------------|---|
| Cootes Paradise Sanctuary | Cootes Paradise Sanctuary 1 | Natural Environment | Nature Reserve | PSW, ANSI, SAR |
| | | | Cultural Heritage | former route of Desjardins Canal |
| | | | Natural Environment | high quality natural setting |
| | Cootes Paradise Sanctuary 2 | Natural Environment | Nature Reserve | PSW, ANSI, SAR |
| | | | Cultural Heritage | former route of Desjardins Canal |
| | Cootes Paradise Sanctuary 3 | Natural Environment | Access | existing driveways, parking lots, pathways |
| | | | Development | plant propagation facilities |
| | | | Cultural Heritage | former Raspberry House, silo, RBG arboretum and plant collections |
| | | | Natural Environment | high quality natural setting |
| | Cootes Paradise Sanctuary 4 | Natural Environment | Recreation | boat storage and launch |
| | | | Natural Environment | high quality natural setting |
| | | | Access | existing boathouse, pathway |
| | Cootes Paradise Sanctuary 5 | Natural Environment | Natural Environment | high quality natural setting |
| | | | Resource Management | hydro corridor, restoration opportunity |
| | Cootes Paradise Sanctuary 6 | Natural Environment | Nature Reserve | ANSI, SAR, ravines |
| | | | Resource Management | hydro corridor, restoration opportunity |
| | | | Natural Environment | high quality natural setting |
| | | | Cultural Heritage | former route of Desjardins Canal |
| | Cootes Paradise Sanctuary 7 | Natural Environment | Resource Management | hydro corridor, plantation, meadow and thicket, restoration opportunity |
| | | | Nature Reserve | ANSI |
| | | | Natural Environment | restoration, high quality natural setting |

| NEPOSS Park | Management Unit | Classification | Zoning | Rationale |
|------------------------------|--|---------------------|--------------------------------|--|
| | Cootes Paradise Sanctuary 8 | Natural Environment | Nature Reserve | ANSI, SAR |
| | | | Resource Management | hydro corridor, restoration opportunity |
| | | | Natural Environment | high quality natural setting |
| | Cootes Paradise Sanctuary 9 (in part) | Natural Environment | Natural Environment | high quality natural setting, buffer to ANSI/Nature Reserve Zone |
| | | | Nature Reserve | ANSI, PSW, SAR |
| | | | Resource Management | restoration, utility |
| | Cootes Paradise Sanctuary 10 | Natural Environment | Nature Reserve | PSW, ANSI, SAR |
| | | | Cultural Heritage | former route of Desjardins Canal |
| | | | Resource Management | restoration |
| | Cootes Paradise Sanctuary 11 (in part) | Natural Environment | Nature Reserve | PSW, ANSI, SAR |
| | | | Cultural Heritage | former route of Desjardins Canal |
| | Cootes Paradise Sanctuary 12 | Natural Environment | Nature Reserve | ANSI, SAR, sensitive ravines |
| | | | Natural Environment | high quality natural setting |
| | Cootes Paradise Sanctuary 13 | Natural Environment | Natural Environment | ANSI, SAR, sensitive ravines |
| | | | Resource Management | edge plantings to buffer Churchill Park |
| Nature Reserve | | | ANSI, PSW | |
| Cootes Paradise Sanctuary 14 | Natural Environment | Development | Churchill Park Management Plan | |
| | | Access | Churchill Park Management Plan | |
| | | Recreation | Churchill Park Management Plan | |
| Cootes Paradise Sanctuary 15 | Natural Environment | Natural Environment | high quality natural setting | |
| | | Resource Management | restoration | |

| NEPOSS Park | Management Unit | Classification | Zoning | Rationale |
|-----------------------------|--|---------------------|---------------------|---|
| | | | Cultural Heritage | indigenous significance |
| | | | Access | existing driveways, parking lots, pathways |
| | | | Development | areas of fill, staging areas for access, potential for development |
| | | | Recreation | Desjardins Recreation Trail |
| | Cootes Paradise Sanctuary 16 | Natural Environment | Nature Reserve | PSW, ANSI |
| Churchill Park | Churchill Park | Recreation | Development | Churchill Park Management Plan |
| | | | Natural Environment | Churchill Park Management Plan |
| | | | Access | Churchill Park Management Plan |
| | Cootes Paradise Sanctuary 13 (in part) | Recreation | Natural Environment | Churchill Park Management Plan |
| | | | Resource Management | Churchill Park Management Plan |
| Not Named/Not in the NEPOSS | Cootes Paradise Sanctuary 9 (in part) | Natural Environment | Nature Reserve | PSW, ANSI, SAR |
| | Olympic Sports Park | Recreation | Recreation | sports fields, arena |
| | | | Natural Environment | high quality natural setting |
| | Lake Jojo | Natural Environment | Nature Reserve | PSW, SAR |
| | | | Natural Environment | high quality natural setting |
| | | | Resource Management | fill, extensive invasive species, restoration opportunity |
| | Dundas Transfer Station | Natural Environment | Resource Management | fill, extensive invasive species, stormwater management pond, restoration opportunity |
| | | Unclassified | Unzoned | Dundas Transfer Station |
| | City of Hamilton Public Works | Natural Environment | Resource Management | fill, extensive invasive species, restoration opportunity |

| NEPOSS Park | Management Unit | Classification | Zoning | Rationale |
|-------------|--|---------------------|---------------------|--|
| | | Unclassified | Unzoned | City of Hamilton Public Works |
| | Volunteer Field Park | Recreation | Recreation | baseball diamond |
| | | Natural Environment | Resource Management | extensive invasive species, restoration opportunity |
| | Martino Memorial Park | Recreation | Recreation | baseball diamond |
| | Dundas Wastewater Treatment Plant | Unclassified | Unzoned | Dundas Wastewater Treatment Plant |
| | Canal Park | Recreation | Development | Canal Park, trails, interpretive signage |
| | Centennial Park | Recreation | Recreation | Centennial Park, butterfly garden, open green space |
| | Desjardins Canal Pond | Natural Environment | Cultural Heritage | former route of Desjardins Canal |
| | Lower Spencer Creek Conservation Area | Natural Environment | Nature Reserve | PSW, SAR, fish habitat |
| | | | Resource Management | restoration opportunity |
| | Cootes Paradise Sanctuary 11 (in part) | Natural Environment | Nature Reserve | PSW, ANSI, SAR, SWH |
| | Coronation Park | Natural Environment | Natural Environment | forest contiguous with ANSI |
| | | | Recreation | open green space, Desjardins Recreation Trail |
| | | | Resource Management | restoration opportunity, buffer plantings to mitigate runoff |






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 1: Classification and Zoning of Cootes Paradise Heritage Lands

Legend

-  Heritage Lands Boundary
-  Unclassified
- Classifications**
-  Natural Environment
-  Recreation
- Zones**
-  Nature Reserve
-  Natural Environment
-  Access
-  Cultural Heritage
-  Development
-  Resource Management
-  Recreation

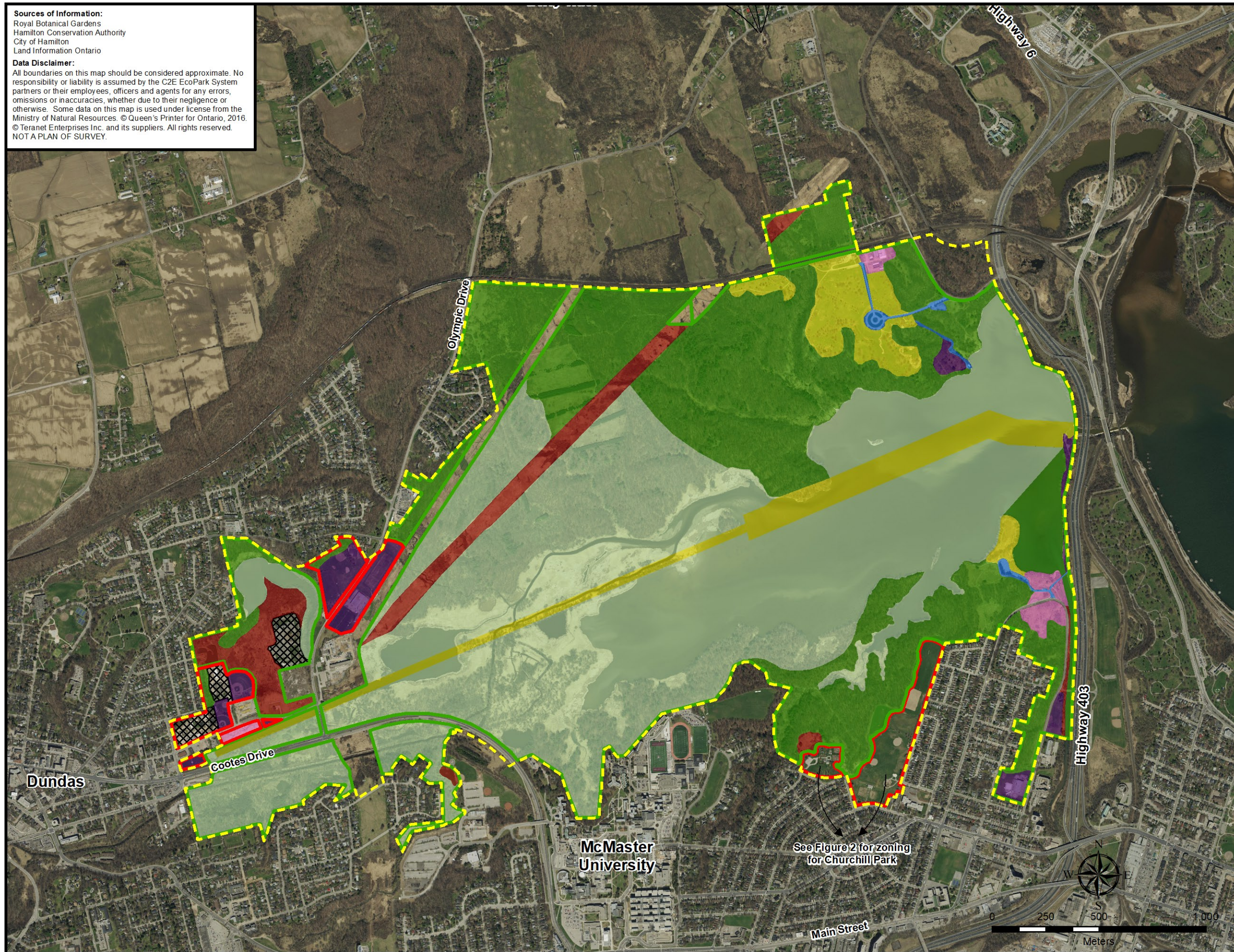
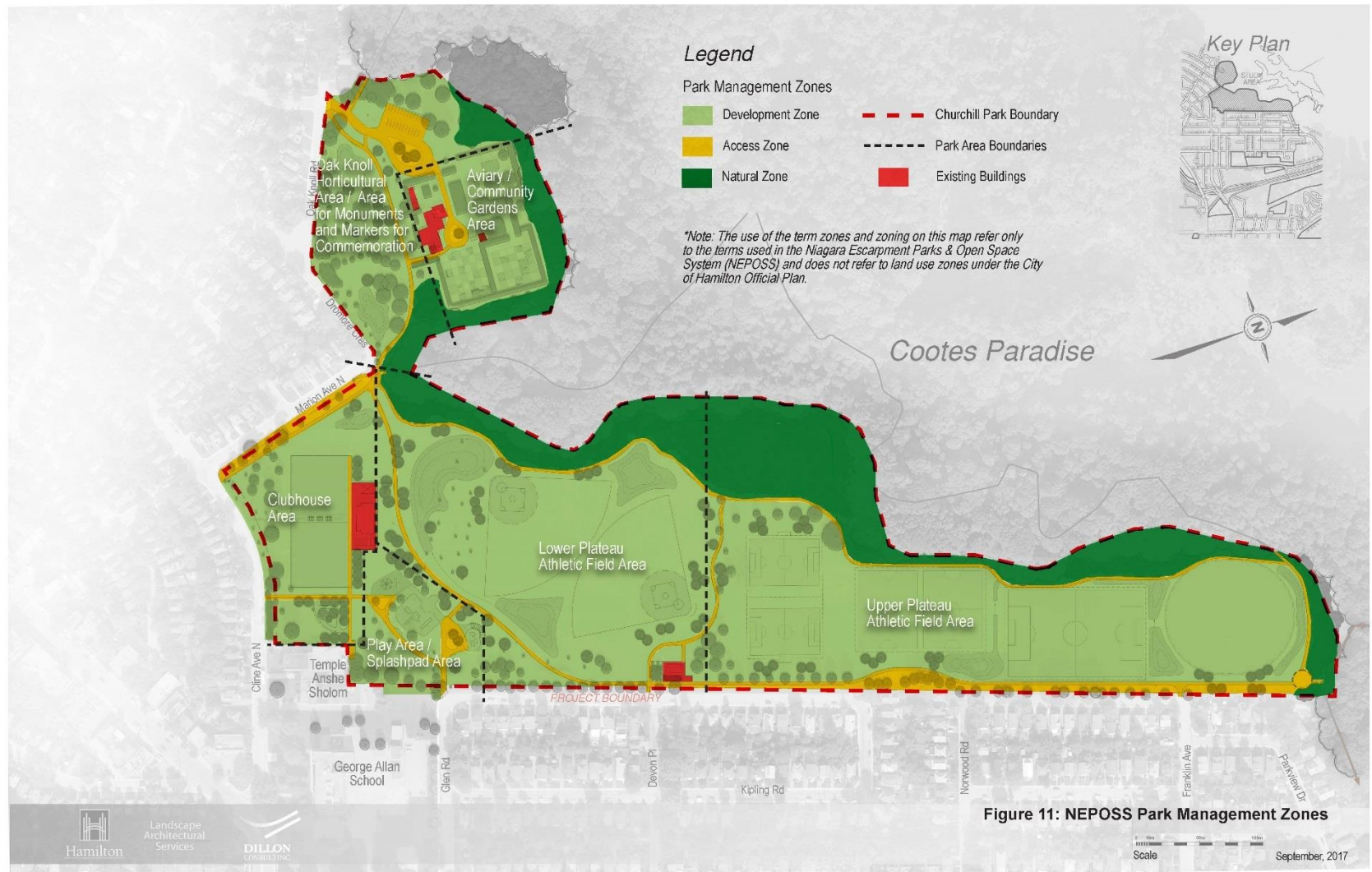


Figure 2. Zoning of Churchill Park as presented in the approved Churchill Park Management Plan



4.0 Permitted Uses

4.1 Permitted Uses per Classification

The NEPOSS Planning Manual provides the following direction on permitted uses for Natural Environment and Recreation park classifications (subject to management planning):

Table 4. Permitted Uses per Classification

| Classification | Permitted Uses |
|---------------------|--|
| Natural Environment | <ul style="list-style-type: none"> Activities may range from back-country hiking in the interior to car-camping and day use activities in the more developed or accessible areas. Agencies should consider compatible uses within the park or open space. |
| Recreation | <ul style="list-style-type: none"> Facilities for overnight camping may be provided, including campgrounds, temporary yurts and tents, lean-to's and unserviced cabins. Visitor service facilities with a retail component may be permitted. Small-scale, special-purpose facilities designed and operated in support of natural history, environmental and UNESCO World Biosphere Reserve and related programming, which may include fully serviced overnight accommodations with meals for facility guests only, are permitted. They may also be allowed as an accessory use if specifically permitted in an approved management plan. Note: Intensive commercial facilities, such as full-service restaurants, banquet halls, lodges, hotels, conference centres, retreats, schools, spas and buildings with provision for fully serviced overnight accommodation, as distinct from camping, will not be permitted. Certain activities or functions such as those listed above may be considered if such use is a secondary or an off-season use at an approved recreational facility. For example, a ski lodge where food is served during the winter may be used for occasional day conferences during off-season periods. |

4.2 Permitted Uses per Zone

Table 5 summarizes the direction provided in the NEPOSS Planning Manual on permitted uses per zone (subject to management planning). As there is no Recreation Zone described in the NEPOSS Planning Manual, it is not included in the table, but is described in section 2.2 of this report.

Table 5. Permitted Uses per Zone

| Zone | Permitted Uses |
|---------------------|---|
| Nature Reserve | <ul style="list-style-type: none"> To protect, preserve and rehabilitate identified natural heritage features, visitor uses are limited or restricted. Development is generally restricted to trails, necessary signs, interpretative facilities (where warranted), temporary research facilities and conservation practices. |
| Natural Environment | <ul style="list-style-type: none"> Low- to moderate-intensity recreational activities are permitted. A minimal level of development (e.g., trails, backcountry campsites, necessary signs and minimal interpretive facilities) is permitted to support low-intensity recreational activities. |

| Zone | Permitted Uses |
|---------------------|---|
| Access | <ul style="list-style-type: none"> Development may include minimal facilities to support Nature Reserve, Natural Environment and Cultural Heritage Zones. Examples include roads, signs, trailheads and parking lots. |
| Cultural Heritage | <ul style="list-style-type: none"> Development will include protection and interpretation of archaeological or cultural heritage features. Examples include interpretative, educational, research and management facilities, trails, signs, and cultural heritage restorations or reconstructions. |
| Development | <ul style="list-style-type: none"> Development may include roads, parking lots and gates, beaches, picnic areas, campgrounds and commercial service facilities, and orientation, interpretative, educational, research and maintenance facilities. Development of facilities must be designed and undertaken in a way that will minimize their environmental and visual impact. |
| Resource Management | <ul style="list-style-type: none"> Resource Management Zones may be used to demonstrate ecologically sustainable resource management practices. Establishing permanent research plots for monitoring purposes (e.g., permanent sample plots for growth and yield studies) is encouraged in these zones. Water may be controlled for purposes related to flood protection, watershed management or municipal water supply. The recreation uses of Resource Management Zones are subject to park management planning. |

The Cootes Paradise Heritage Lands are situated in a largely urbanized environment. Recreational uses have and will continue to become established, and there is an obvious high desire from the public to access the Heritage Lands. This may result in unacceptable impacts to the Heritage Lands, thus it is essential that access and recreational activities are managed. Limiting access and permitted uses are policies currently used to protect natural heritage and cultural heritage values of the area. For example, the Royal Botanical Gardens (RBG) and the Bruce Trail Conservancy currently prohibit cycling and other more intensive types of recreation. Despite this, because of the proximity of the Heritage Lands to a large population base, some illicit cycling occurs, and will likely continue within the Heritage Lands.

If permitted uses are being re-evaluated in the future, consideration could be given to applying the concept of ‘preferred use’ to the management of recreational uses, particularly trails, within the Cootes to Escarpment EcoPark System. This approach provides individual landowning agencies with the opportunity to educate the public about what the preferred use of an area is. For example, within the Nature Reserve Zone, the preferred use may be low-impact hiking; within the Natural Environment Zone, the preferred use may be hiking, cycling or mixed-use. The preferred use concept provides flexibility and is a realistic approach to managing recreational use and impacts to natural areas. For example, strict implementation of permitted uses in a Nature Reserve Zone is probably unrealistic owing to the substantial enforcement effort required. The preferred use concept would encourage and facilitate strictly passive uses, including public education, but would tolerate some alternative uses, recognizing they are usually a continuation of an existing use.

In addition, a “special protection” sub-zone could be added under the Nature Reserve Zone, where there are very sensitive features and no recreational activities are permitted, even low-impact hiking.

This sub-zone may be desired in locations such as rare species habitat, talus slopes, wetlands, etc. The benefits of applying a “special protection” sub-zone include protecting sensitive and/or significant natural heritage and cultural heritage features by directing recreational activities away from these areas. The “special protection” sub-zone could be established in future park-specific management plans.

5.0 Next Steps

The NEPOSS classifications and zones have been applied to the Current EcoPark Lands within the Cootes Paradise Heritage Lands as a means of categorizing and defining appropriate management actions. Two classifications have been recommended: Natural Environment and Recreation. All six of the NEPOSS zones have been applied: Nature Reserve, Natural Environment, Access, Cultural Heritage, Development, and Resource Management. An additional zone, Recreation, has also been applied to existing intensive recreational uses outside Churchill Park (which has an approved Management Plan and zoning) in the Cootes Paradise Heritage Lands.

Zoning explicitly identifies the uses that are deemed most appropriate for a particular area, and in doing so highlights existing incompatible uses. Within the Cootes Paradise Heritage Lands, existing incompatible uses include cycling in Nature Reserve zoned lands. The incompatibility of existing uses will be explored further in the management plan, following refinement and acceptance of the classifications and zones recommended in this report.

Park classification and zones set the management direction for Cootes Paradise Heritage Lands. Following the review and approval of the recommended classifications and zones by the Steering Committee and Stakeholder Advisory Committee, recommendations for bringing existing uses in line with the recommended classifications and zones will be provided in the Cootes Paradise Heritage Lands Management Plan, along with opportunities for education, research, interpretation and restoration.

6.0 References

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- Wong, Janet. 2009. Cootes to Escarpment Park System: Conservation and Land Management Strategy. Royal Botanical Gardens. Burlington, Ontario, Canada.

Appendix 2: Cootes Paradise Heritage Lands Stakeholder Advisory Committee Members

Appendix 2: Cootes Paradise Heritage Lands Stakeholder Advisory Committee Members.

Alexandra Brodka – Hamilton Burlington Trails Council
Dr. Pat Chow-Fraser – McMaster University-Biology
Bryan Czerneda – Hamilton Burlington Mountain Biking Association
Rosemary Horsewood – Dundas Turtle Watch
Scott Martin – McMaster University-Sustainable Archeology
Kristin O’Connor – Hamilton Harbour Remedial Action Plan
Werner Plessl – Hamilton Waterfront Trust
Brian Wylie – Hamilton Naturalists’ Club
Mary Lyn Brown – Royal Botanical Gardens Auxiliary
Lisa Grbinicek – Niagara Escarpment Commission
Lynda Lukasik – Environment Hamilton Incorporated
Susan Cooper – Ministry of Natural Resources and Forestry Regional Office
Shelly Petrie – Greenbelt Foundation

Appendix 3: Suggested List of Issues to be Addressed in Each Proposed EcoPark System Guideline

Appendix 3: Suggested List of Issues to be Addressed in Each Proposed EcoPark System Guideline

EcoPark System Guideline: Trails

- Lack of adequate and safe parking and access
- Lack of accessibility
- Trespassing
- Duplication and density of trails
- Overuse and erosion on trails
- Unsanctioned structures and trail improvements
- User Conflicts
- Off-leash dogs
- Natural area degradation associated with non-permitted recreational uses
- Safety concerns associated with non-permitted recreational uses
- Personal trails

EcoPark System Guideline: Education and Signage

- Consistent branding of the Cootes to Escarpment EcoPark System
- Identification of Current EcoPark System Lands boundaries to reduce trespass and encroachment issues
- Trespassing
- User conflicts
- Off-leash dogs
- Interpretation
- Natural area degradation associated with non-permitted recreational uses
- Safety concerns associated with non-permitted recreational uses
- Dumping
- Unsanctioned structures and trail improvements
- Interpretation
- Natural area degradation associated with non-permitted recreational uses
- Safety concerns associated with non-permitted recreational uses
- Personal trails
- Structures and “Yard Extension”
- Vegetation removal
- Cats/domestic pets
- Drainage and erosion
- Interpretation and commemoration

EcoPark System Guideline: Vegetation Management

- Natural area degradation associated with non-permitted recreational uses
- Vegetation removal (encroachment)
- Forest health decline
- Loss of open woodland habitat
- Conservation and recovery of Species at Risk
- Invasive species
- Noxious plants

EcoPark System Guideline: Edge Management

- Personal trails leading from backyards
- Structures and “yard extension”
- Dumping along edges of Current EcoPark System Lands (e.g., yard waste, Christmas Trees, potted plants)
- Vegetation removal along edges of Current EcoPark System Lands
- Cats/domestic pets
- Drainage and erosion (e.g., caused from swimming pool drainage)

Appendix 4: Definition of Privately Owned Outreach Area as Used Within the Management Plan Document

Appendix 4: Definition of Privately Owned Outreach Area as Used Within the Management Plan Document

Identified privately-owned lands that are situated adjacent to properties owned by Cootes to Escarpment EcoPark System partners are referred to as ‘Privately Owned Outreach Areas’ within this report. This term does not imply that there are formal agreements on these lands between private landowners and any partner within the Cootes to Escarpment EcoPark System. The term references the fact that there are opportunities for private landowners within the Privately Owned Outreach Areas to seek advice from Cootes to Escarpment EcoPark System staff, if the private landowner is interested in projects that enhance the environment on their properties. This Management Plan is intended as a guiding document for partner staff at each of the nine partner organizations within the Cootes to Escarpment EcoPark System and does not impose restrictions to private landowners living in proximity to Cootes to Escarpment EcoPark System partner properties.

Entry onto identified Privately Owned Outreach Areas by members of the public without express permission of private property owners is an act of trespass.