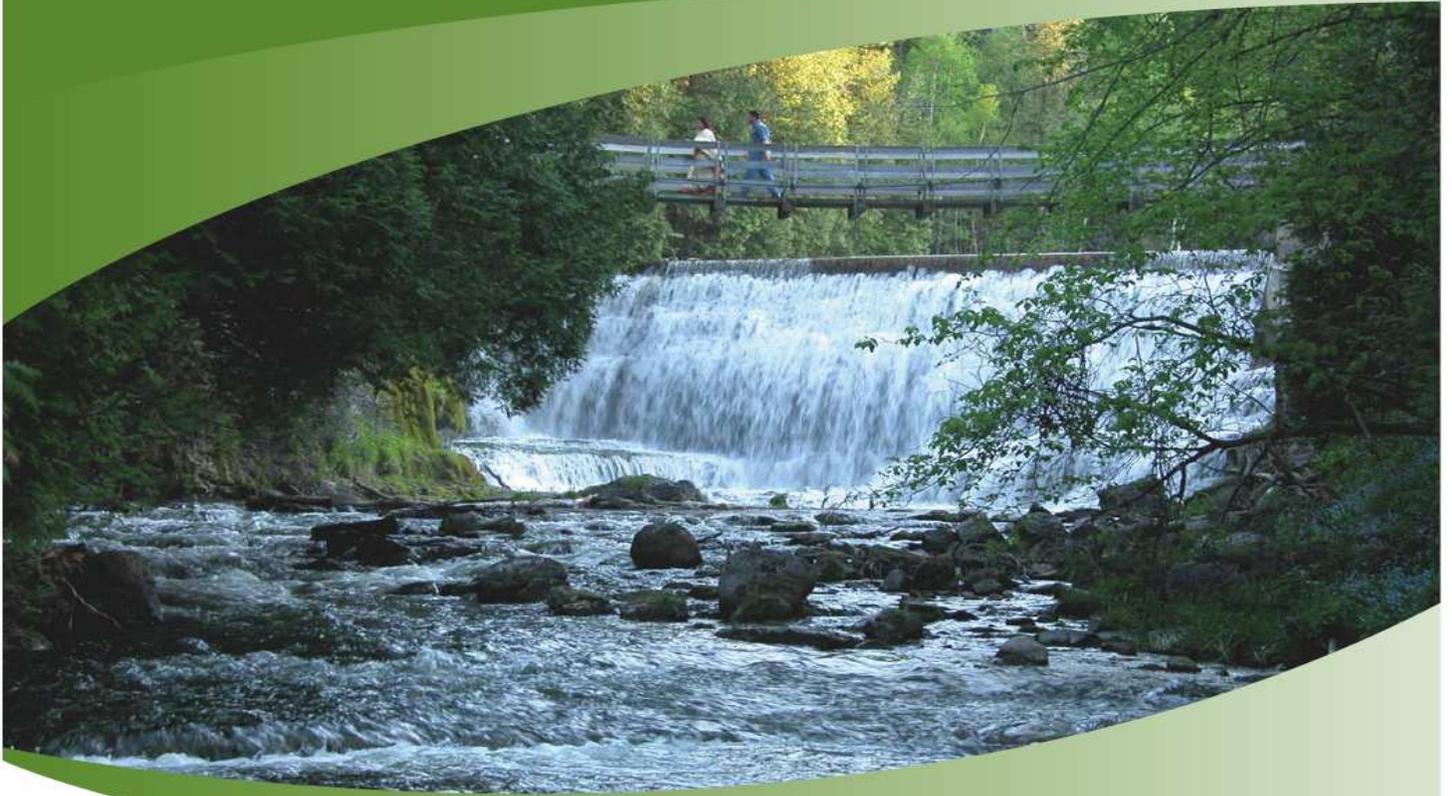


Credit Valley Conservation
Belfountain Complex

Belfountain Conservation Area, Willoughby Property, Cox Property



Management Plan Background Report
DRAFT



DRAFT

Credit Valley Conservation
Background Report for the Belfountain Complex

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Acknowledgements

The Background Report for the Belfountain Complex is a product of the research, studies and resultant technical documents produced by dedicated CVC staff on the internal Management Plan Technical Steering Committee from multiple disciplines. Committee members provided valuable input and feedback throughout the development of this report.

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EXECUTIVE SUMMARY

Located on the Niagara Escarpment near the confluence of the Credit River and West Credit River, the Belfountain Complex spans 56 hectares and contains three separate properties: Belfountain Conservation Area, the Willoughby Property (owned by the Ontario Heritage Trust, managed by CVC) and the Cox Property. While visitation and the recreational attributes of these properties are diverse, they are linked ecologically through the function of large-scale landscape features and share cultural and social connections via the Bruce Trail and a shared history of early aggregate extraction. These features have shaped the environmental, social, cultural and recreational characteristics of the Complex into what it is today.

The Belfountain Complex Background Report has been prepared as part of the first phase of the development of the Management Plan for the Complex. This document describes the natural, social and cultural environments of the Complex, as well as how the relevant federal, provincial, municipal and CVC policies, plans, strategies and legislation apply to the property. Information may be adapted or appended to this Background Report as it becomes available.

Section 1, Introduction, provides a summary of CVC's management planning process, as well as the purpose, goals and objectives of the Management Plan. The introduction also provides a brief overview of the acquisition of the different properties associated with the Complex and a general site description.

Section 2, Natural Heritage Features, summarizes the technical background reports prepared by CVC staff on the biotic and abiotic systems associated with the Complex. The results of ongoing monitoring programs and various inventories and studies conducted to assess the presence of flora and fauna species, the function of natural heritage features, geologic and physiographic attributes and characteristics of forestry compartments are summarized here. This section speaks to the importance of the Complex on a variety of scales; from the provision of habitat for specific species, to the function of the property as a green corridor within CVC's Natural Heritage System, promoting the movement, migration and evolution of species.

Section 3, Cultural Heritage Features, contains information on the local and regional history of the landscapes and features associated with the Complex. This information was compiled by staff in the Archaeology Research Management Services Department at the Toronto Region Conservation Authority. Data sources include historic maps, air photos, contemporary records and secondary sources. This section summarizes important cultural features and landscapes within the Complex and the surrounding area.

Section 4, Conservation Area Visitors, summarizes the information that has been collected on Complex visitors through CVC's Lands Monitoring Program. This information includes the results of Visitor Information Surveys that were conducted in 2010, including general population statistics, as well as data from automated trail counters. Barriers to recreation and accessibility are also discussed.

Section 5, Recreation, Education and Programming, provides a detailed list of current sanctioned and unsanctioned activities occurring within the Complex

and considerations and opportunities for their management.

Section 6, Infrastructure, contains information on the infrastructure that is currently located within the Complex. This includes the trail system and related features, buildings and water control structures. Recommendations for infrastructure needs and improvements are also discussed.

Section 7, Social and Economic Analysis, focuses on the direct and indirect social and economic benefits the Complex offers to visitors as well as to the surrounding community. This section aims to assess the social and economic aspects of the Complex from both a qualitative and quantitative perspective. It is recognized that the study of this discipline requires further research throughout the Credit River Watershed.

The Management Plan for the Belfountain Complex will outline the projects, programs and policies that meet the objectives for conservation area management planning: protection, appreciation and appropriate recreation. This Background Report summarizes the environmental, social and cultural characteristics of the Belfountain Complex as well as the associated planning considerations, impacts and pressures, and will inform the Management Plan.

Section 8, Related Policies, Strategies and Legislation, establishes the context for planning for the Complex. It identifies the planning interests of the municipalities as well as provincial plans and strategies. A brief overview of applicable federal, provincial, municipal, and CVC policies, plans and strategies is provided.

Section 9, Summary of Opportunities and Constraints, discusses guiding principles related to conservation area management, preliminary recommendations, and broader planning considerations that will direct the Management Plan.

Section 10, Next Steps, contains a brief overview of the second phase of the management planning process for the Complex.



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1.0. INTRODUCTION

The Credit River Watershed is situated in one of the most rapidly urbanizing areas of Canada; the 2010 population of 750,000 is projected to double by 2020 (CVC, 2010). Spanning from the Headwaters in the Town of Orangeville to Lake Ontario, the Watershed is composed of dynamic environmental and social systems. Structurally connected by the Credit River Valley corridor, the Watershed is also functionally linked to major bioregional landscapes including the Niagara Escarpment, the Oak Ridges Moraine and the Lake Ontario Shoreline. Land use changes and habitat fragmentation, consequences of an increasing human population, place a variety of pressures upon these natural systems and related processes. Protecting natural areas, their features and the functions that they provide is essential for ensuring the social, economic and ecological health and sustainability of the Watershed and its residents.

Established in 1954, Credit Valley Conservation (CVC) is mandated to conserve, restore and responsibly develop and manage the natural resources located within the Credit River Watershed. Included within this responsibility is the protection and management of the fifty-eight conservation areas owned by CVC. This system of conservation areas represents a diverse cross-section of the natural and recreational landscapes that characterize the Watershed. These natural spaces provide a variety of important ecological goods and services, protect key natural features and their functions, and contribute to appreciation and recreation opportunities that benefit socio-economic aspects of local and regional communities. CVC is dedicated to the long-term sustainable management and monitoring of this system, ensuring that this important resource remains intact for future generations.

Situated on the Niagara Escarpment, the Belfountain Complex Management Plan Area (the Complex) contains significant natural and cultural heritage features that are distinct within CVC's conservation area system. The Complex is composed of three separate properties that are in close geographic proximity and share significant ecological features:

- Belfountain Conservation Area (acquired by CVC in 1959);
- Cox Property (acquired by CVC in 1987) and;
- Willoughby Property (acquired by the OHT in 1986; managed by CVC since 1986)

Belfountain Conservation Area and the Willoughby Property are identified as Niagara Escarpment parks in section 3.0 of the Niagara Escarpment Plan (2005)¹. The steep valley slopes of the West Credit River, rare species, the meandering Bruce Trail and the rich history and remnants of early industry characterize the Complex as a unique and important area in both CVC's Conservation Area System as well as the broader landscape.

¹ The Cox Property is identified as part of the Willoughby Property on NEP Map-10. This will be updated through the management planning process.

The management histories of the three properties that constitute the Complex are diverse. Managed as a park and recreation destination since the early twentieth century, Belfountain Conservation Area is open seasonally to visitors and receives a relatively high number of visitors throughout the summer and fall. The Cox Property was acquired by CVC when policies and regulations regarding the development of hazard lands and the Niagara Escarpment restricted the original owners from building on the site. No formal trail system exists on the property and it is not actively used by the public. The Willoughby Property was purchased by the Ontario Heritage Trust (OHT) in January 1986, and has been managed by CVC since March of that year. Two Bruce Trail side trails are located within the Willoughby Property and they have been used by hikers since the 1960's. While management and visitorship varies greatly on these properties, their common geography and natural features link them functionally.

Planning for the long-term management of these lands as a unit within the context of the Credit River Watershed will ensure that their unique features are protected and that large scale attributes are managed as a system. This management approach allows the character of the entire conservation area to evolve simultaneously and create a distinct identity within the larger conservation areas system.

The Belfountain Complex Management Plan will guide the long range planning and development of the properties and ensure appropriate public use and environmental sustainability for years to come. This report represents the first part of the management planning process and contains summary results of the studies and research conducted on the Complex.

1.1. PURPOSE

1.1.1. Management Plans

Management plans act as implementation vehicles that establish conservation area goals and objectives, and provide the means and strategies for achieving them. A management plan should provide land managers and stakeholders with a long-term vision for the conservation area as well as with direction for guiding the management of the property toward achieving that vision. It should advise day-to-day operational decisions as well as complex problems by clarifying and prioritizing management actions that are required to achieve the objectives for the conservation area.

As a holistic decision making process, management planning balances a science-based approach with a community-driven approach. It is designed to engage municipal and provincial agencies, partner groups and the public in determining the priorities and future management of a conservation area. This transparent process ensures that recommendations are founded on the best science available and that those individuals

and groups that have a vested interest in the property can contribute their thoughts and values to the development of management goals.

CVC's guiding document for management planning is the Conservation Areas Strategy, prepared by CVC in 1994. The overriding goal and purpose of this document is:

To protect the Credit River Watershed's significant and representative ecosystems, and offer sustainable natural heritage appreciation and recreation to its residents and visitors.

Management plans prepared for CVC conservation areas strive to ensure the sustainable management of these properties by respecting the accompanying management objectives laid out in the Strategy; in order of priority they include:

1. Protection: *To protect significant and representative natural features through selective acquisition and resource management*
2. Appreciation: *To provide the public through various means, with opportunities for understanding the Watershed's natural heritage, and role of the Authority in stewardship (i.e. education and interpretation)*
3. Recreation: *To provide opportunities and facilities for selected outdoor recreation activities requiring high quality, sustainable natural resources*

A well-conceived management plan that contains specific, measurable targets will either successfully guide the future use and management of a conservation area, or quickly make it apparent that the management plan is not effective and needs to be adapted or amended.

1.1.2. The Background Report

The purpose of the Background Report is to summarize background studies and baseline conditions, and to identify preliminary opportunities and constraints. The intent is to provide a comprehensive foundation of information on the environmental, social and cultural elements of the property, as well as to define the importance of the Complex from these various perspectives.

This report provides the basis for the analysis of natural and cultural heritage features, social impacts and pressures, and will inform zoning and management actions later in the planning process.

1.2. MANAGEMENT PLAN GOALS, OBJECTIVES AND PRINCIPLES

The ultimate goal of the Belfountain Complex Management Plan is to develop a vision that balances the protection of natural features and the functions they provide with the

development of appreciation and recreation opportunities and the values of the local community and general public. The vision will also identify and delineate the function of the Complex in the context of its role as a Core 10 property within CVC's Conservation Areas System. The main outputs of the management plan include:

- Classification and zoning based on existing natural features and functions as well as recreation and interpretive opportunities
- Management policies, processes, and practices will be reviewed and updated as necessary
- Guidelines and management policies that guide daily operational decisions and implement the long-term vision will be developed
- Options for appreciation and recreational programming opportunities will be identified, prioritized and scheduled
- Infrastructure and development projects for operational and visitor management purposes will be identified, prioritized and scheduled
- Projects related to habitat restoration and rehabilitation, stewardship and monitoring will be identified, prioritized and scheduled
- Site and/or business plans for all applicable, proposed infrastructure, development, programming and restoration projects will be developed

1.3. MANAGEMENT PLANNING PROCESS

CVC's management planning process will occur in three distinct, but overlapping phases:

- *Phase I – Background Studies and Report:* The Background Report compiles baseline investigations and background studies and identifies the opportunities and constraints associated with the study area. The Background Report must take into account all aspects of the study area, including the natural heritage, cultural heritage, infrastructure, existing resources, programming, policies, planning initiatives, and the role of visitors and the local community. This report constitutes a summary of the investigations and studies conducted in order to inform the Management Plan.
- *Phase II – Strategic Directions:* Phase II of the planning process will involve consultation with the public, stakeholders, and various provincial agencies. The findings highlighted in the Background Report will be presented and discussed. The results and issues identified in both the Background Report and through consultations will be combined to produce the Strategic Directions Report, which will form the foundation of the Management Plan.

- *Phase III – Management Plan:* The Management Plan will incorporate the results of Phases I and II and present the final vision for the Belfountain Complex. The final Plan will be the result of carefully reviewed draft plans by both CVC staff and government agencies.

1.3.1. Niagara Escarpment Parks and Open Space System

Both Belfountain Conservation Area and the Willoughby Property are identified in the Niagara Escarpment Parks and Open Space System (NEPOSS) in Part Three of the Niagara Escarpment Plan (NEP). The objectives of all NEPOSS parks are identified in the Plan:

1. To protect unique ecological and historical areas;
2. To provide adequate opportunities for outdoor education and recreation;
3. To provide for adequate public access to the Niagara Escarpment;
4. To complete a public system of major parks and open space through additional land acquisition and park and open space planning;
5. To secure a route for the Bruce Trail;
6. To maintain and enhance the natural environment of the Niagara Escarpment;
7. To support tourism by providing opportunities on public land for discovery and enjoyment by Ontario’s residents and visitors;
8. To provide a common understanding and appreciation of the Niagara Escarpment; and
9. To show leadership in supporting and promoting the principles of the Niagara Escarpment’s UNESCO World Biosphere Reserve Designation through sustainable park planning, ecological management, community involvement, environmental monitoring, research and education.

Section 3.1.6 of the NEP states that each property within NEPOSS must have a master/management plan prepared that will establish policy guidelines for its long-term protection, development and management. Each park within NEPOSS is also assigned a classification based on the predominant characteristics of that property. Belfountain Conservation Area is designated as a *Recreation* class park, where the “management and development of resources is appropriate in order to provide the recreational environment and facilities required to support a wide variety of activities”. Recreation class properties provide some of the best recreation environments along the Niagara Escarpment. The Willoughby Property falls under the *Natural Environment* class which “provides[s] opportunities for the protection of important natural and cultural features” and permitted activities may range from hiking to camping.

CVC’s management planning process aligns with the requirements of the NEP, as outlined in the NEPOSS Planning Manual (2012).

1.4. LOCATION AND CONTEXT

Belfountain Conservation Area (13.14 ha), the Cox Property (3.95 ha), and the Willoughby Property (39.06 ha) are composed of several individual parcels that have been acquired over the past several decades (Table 1). The study area is situated near the Hamlet of Belfountain, in the Town of Caledon within the Region of Peel, at the intersection of the Forks of the Credit Road and Mississauga Road (Figure 1).

The Complex is situated near the confluence of two major coldwater river systems: the West Credit River and the Credit River. All three properties fall within the West Credit River subwatershed (Subwatershed 15). The West Credit River meanders through both the Belfountain Conservation Area and the Willoughby Property before outletting to the main branch of the Credit River approximately 300m east of the Willoughby Property. Although the Credit River itself does not flow through the Complex, the Cox Property is situated within 300m of the river.

The Complex is located within the Niagara Escarpment, a UNESCO World Heritage Biosphere Reserve, a designation which by definition supports the conservation of unique features and ecosystems and promotes the sustainable development of local communities. The three properties are all, to some extent, also located within the Credit Forks – Devil’s Pulpit Environmentally Significant Area (ESA). Although the Cox Property is dissected from the main study area by the Forks of the Credit Road, it remains ecologically linked to the other two properties. Portions of Belfountain Conservation Area and the Willoughby Property also lie within the Credit Forks Life Science Area of Natural and Scientific Interest (ANSI).

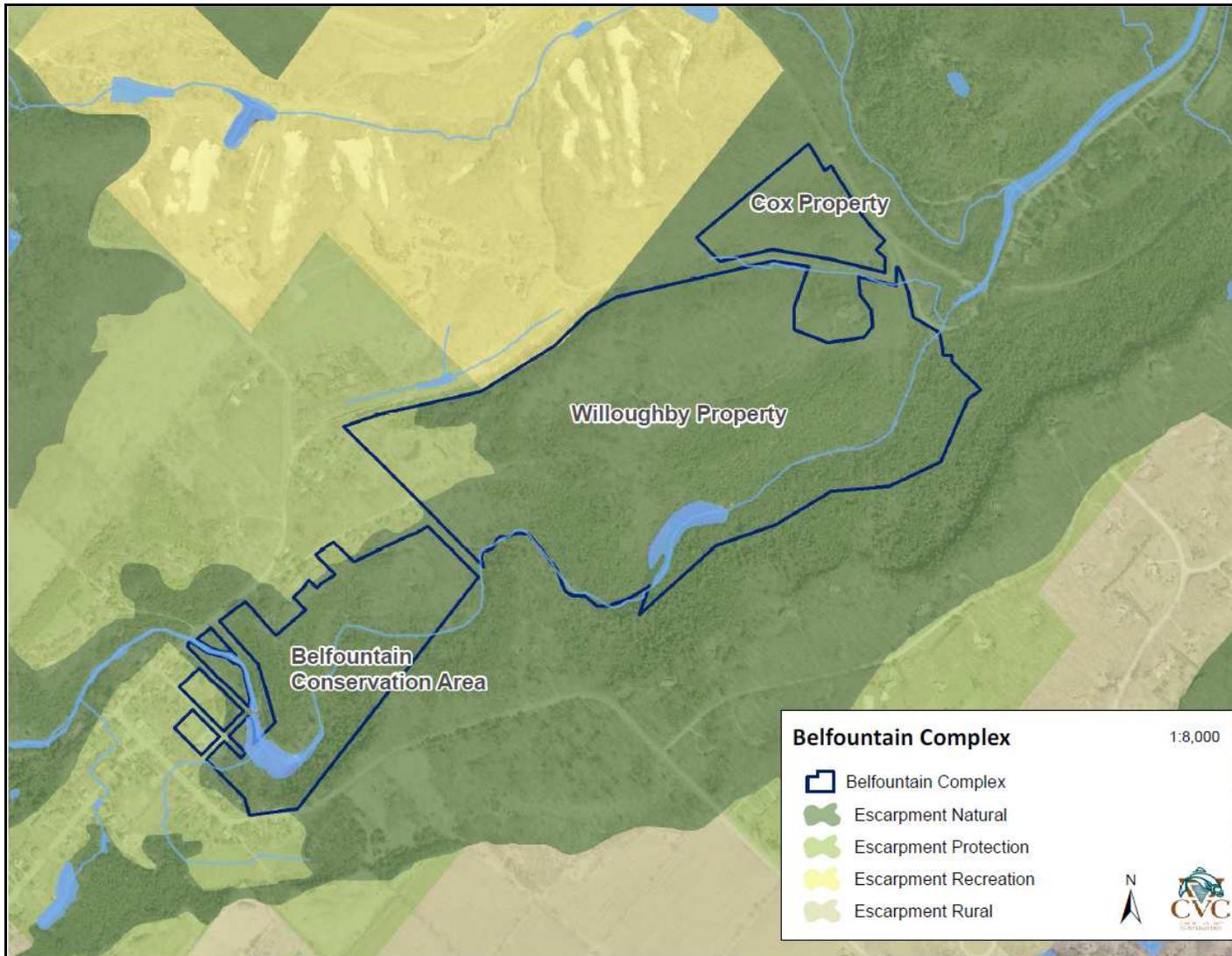


Figure 1 - Belfountain Complex Management Plan Area within the context of the Niagara Escarpment Plan

1.4.1. Regional Context

Regional land uses in the upper Watershed are largely rural and agricultural. The natural areas contain a diversity of forest types and wetlands. Major urban centres in the upper Watershed include the Town of Orangeville, Caledon Village, the Town of Erin and the Village of Alton. Land uses adjacent to the Belfountain Complex primarily consist of coniferous and mixed forests, though urban development directly adjoins Belfountain Conservation Area and deciduous forest flanks most of the Cox Property.

Ecological, social and economic connections between the Belfountain Complex and adjacent natural areas also exist. The Complex is a component of major regional corridors, including the Niagara Escarpment and the Credit River Valley corridor. The Bruce Trail, a nationally important trail system provides direct connections with local communities and other nearby natural areas.

Separated by the Canadian Pacific Railway, the Forks of Credit Provincial Park lies to the north of the Belfountain Complex; its southernmost corner is less than 100m from the boundary of the Cox Property. The Forks of the Credit Provincial Park is 282ha in size and contains scenic vistas, waterfalls and geologic features. The close proximity of the Forks of the Credit Provincial Park, as well as a few other publicly owned lands, forms an ecologically linked but interrupted corridor of protected lands in this area (Figure 2). As this system grows to include more natural areas, whether through acquisition or restoration, the benefits are compounded, and the ecological integrity of the entire system strengthened.

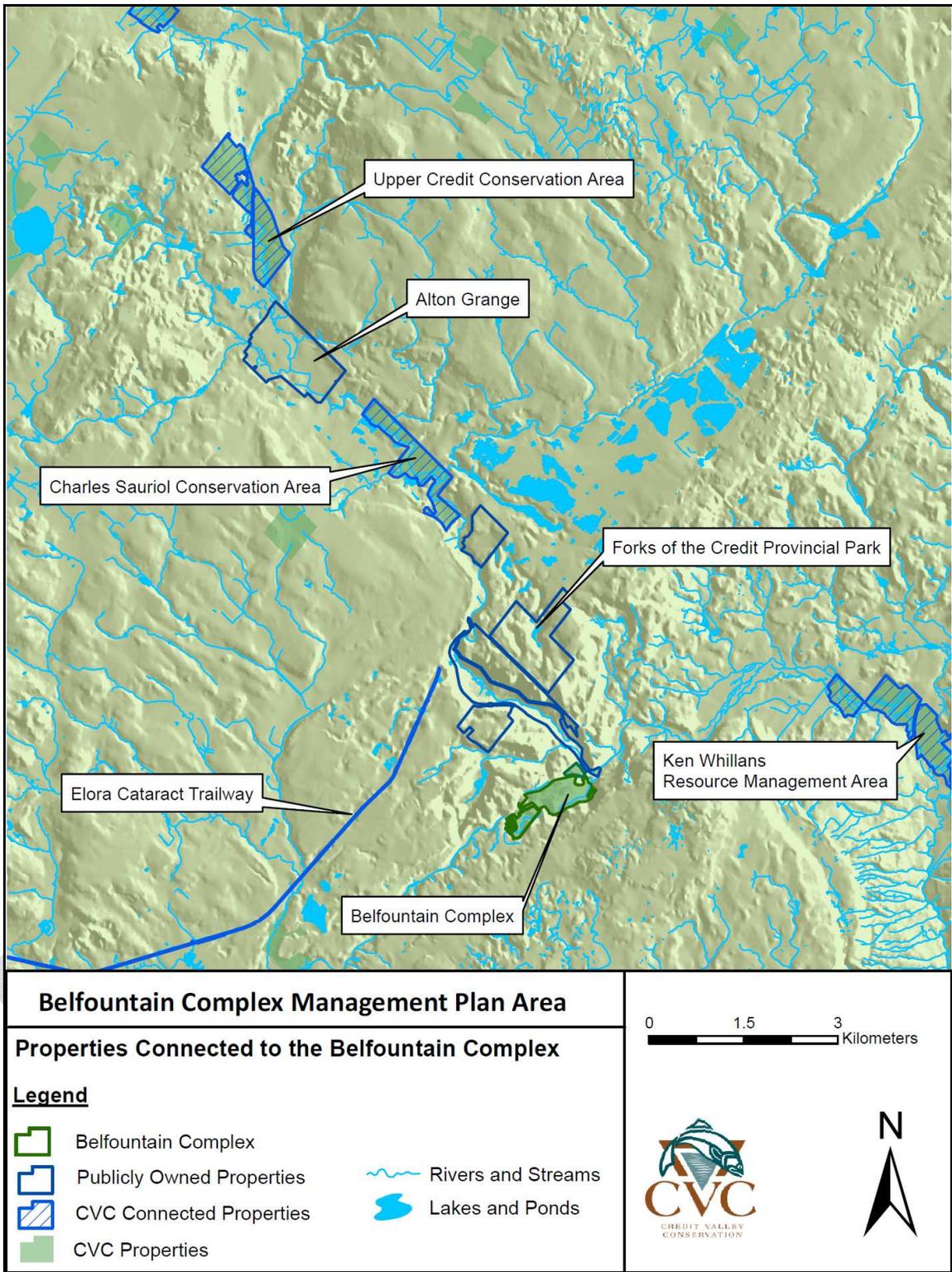


Figure 2 - Publicly Owned, Ecologically Connected Properties in Proximity to the Belfountain Complex

1.5. HISTORY OF PROPERTY MANAGEMENT

The first parcel of what is now Belfountain Conservation Area was purchased by CVC in June of 1959. Since that time, several additional parcels have been acquired, including the Cox Property in 1987. The two parcels that now make up the Willoughby Property were purchased by the Ontario Heritage Trust (OHT) in 1986. Table 1 contains the details of the parcel acquisitions and related dispositions. Parcel dispositions were the result of alleviating access or encroachment issues and account for a very small percentage of the total acreage of the Complex.

Table 1 - Parcel Acquisition within the Belfountain Complex

Parcel Transferor	Parcel Transferee	Transfer Date	Hectares
Belfountain Conservation Area			
William Rodger	CVC	29/06/1959	3.48
Harold Humphery Gray	CVC	08/12/1961	0.16
Gerhard and Annemarie Kletke	CVC	22/12/1964	0.22
Jessie Crosby	CVC	14/09/1966	0.02
Stewart Scott	CVC	19/01/1968	0.55
Ivy Landon	CVC	14/09/1970	0.08
Margaret Elliott	CVC	30/10/1970	0.06
Harry Albert Willis	CVC	02/11/1970	3.47
Eric Ramskogler	CVC	30/12/1970	0.06
Larry Wayne Goss	CVC	02/06/1971	0.13
Edgar Ireland	CVC	13/06/1972	0.20
Harry Hepworth	CVC	30/03/1973	0.11
George Brock	CVC	25/09/1974	0.12
CVC	David & Janice Reed	01/04/1986	0.15
CVC	Grace Hobbs	29/05/1986	.008
Robin & Karen Christie	CVC	11/02/1994	3.87
Eric Hayden & Margaret Watts	CVC	27/12/2007	0.44
Total			13.136
Cox Property			
Mary Catherine Cox	CVC	07/07/1987	.040
Wallace Cox	CVC	07/07/1987	3.91
Total			3.95
Willoughby Property			
Willoughby	OHT	01/04/1986	38.25
Briscoe	OHT	10/15/1986	0.81
Total			39.06
Overall Total			56.15

The development of Belfountain Conservation Area as a recreation destination began in 1908 when a local resident, Charles Mack, purchased a parcel of what is now Belfountain Conservation Area. Shortly thereafter, he began construction of a personal summer retreat as well as recreational and decorative features. Mack's Park was opened to the public in 1914 and has functioned as a publicly accessible natural area, in much the same way it does now, since the early twentieth century.

In 1969 a Development Plan and Report was produced for Belfountain Conservation Area. The recommendations in this report were used to guide the development and operational programming for the site. A more formal Management Plan was created in 1978 (revised in 1984), and provided updated direction for the development of Belfountain Conservation Area. Both reports cite similar improvements: upgraded parking facilities; more accessible washroom facilities; trail management; and maintenance of historical features on the site. Many of these recommendations are still relevant today.

A report entitled '*Willoughby Property – An Interpretive Trail Plan*' was prepared to guide the development of an extended trail system and interpretive signage plan for the Willoughby and Cox properties. The focus of the interpretive signage would be on the natural, cultural and geological history of the area. The report also discusses trail connections as well as marketing strategies and the purpose and role of the system of parks and natural areas in the vicinity of the Forks of the Credit River. Although two interpretive signs are currently located on the Willoughby Property, the plan was never implemented.

The Cox Property, purchased to protect and provide public access to the natural and cultural features of the Niagara Escarpment, is managed as a non-core property. It does not contain any visitor amenities and is not readily accessible.

For the past century the Belfountain Complex has served the broader community as a regional destination area, as well, given its close proximity to the Hamlet of Belfountain, a community park.

1.5.1. Stewardship Plans

The McCurdy parcel (Table 1: Hayden and Watts acquisition) was acquired with assistance from the Ontario Heritage Trust's (OHT) Natural Spaces Land Acquisition and Stewardship Program (NSLASP). The NSLASP has two primary objectives:

- The conservation and protection of provincially significant natural heritage systems through the acquisition of lands and the use of conservation easements; and
- The wise stewardship of these newly acquired lands

To ensure that the second program objective is met, lands acquired through NSLASP are subject to a Heritage Conservation Easement Agreement (HCEA) with the OHT. HCEAs place restrictions, or covenants on title in perpetuity. The OHT is responsible for ensuring that CVC abides by the terms of the HCEA for the McCurdy parcel.

Two mandatory studies are outlined in the HCEA: a Baseline Documentation Report identifying the features and species on the property; and a Stewardship Plan outlining

land management and restoration activities. Unless otherwise permitted within an approved stewardship plan, all activities listed within the covenants of the HCEA are not permitted. A stewardship plan is being developed for the McCurdy parcel; any management recommendations identified will be incorporated into the final Belfountain Complex Management Plan.

Although it is unnecessary to create a new conservation area zone to accommodate the covenants of the HCEA, it is essential that zoning imparted on these parcels reflect the sanctioned and unsanctioned activities listed within the HCEA and stewardship plan.

2.0. NATURAL HERITAGE FEATURES

Information regarding the natural heritage features contained within the Complex was compiled through baseline studies, research, and data obtained through CVC's many monitoring programs. For reporting purposes, the analysis of natural heritage features and their functions are divided into four distinct sections:

- Geology and hydrogeology, which contains information on several components: physiography, overburden, bedrock and groundwater;
- Terrestrial Features and System, including vegetation communities, landscape features and rare species;
- Forestry, which includes the identification of forest stand types as well as management prescriptions; and
- Fisheries, which identifies fish populations, habitats, management and restoration activities

2.1. GEOLOGY AND HYDROGEOLOGY

The inventory for the geologic and hydrogeologic resources of the Belfountain Complex was carried out in early 2012. The inventory focused on Belfountain Conservation Area and the Willoughby Property (Appendix A). The Cox Property was not assessed, but observations about its known features are discussed in section 2.1.6.

2.1.1. Physiography

The Complex straddles two physiographic regions: a portion of Belfountain Conservation Area is within the Guelph Drumlin Field physiographic region, while the remainder of the study area falls within the Niagara Escarpment physiographic region (Figure 3). The Guelph Drumlin Field physiographic region is characterized by low, streamlined drumlins that are separated by meltwater channels. This gives the land a rolling topography. The drumlin till is loamy and calcareous and the valleys often have sand and gravel terraces along their edges; the low-lying area is comprised of mostly fluvial materials and is often

swampy. The Niagara Escarpment physiographic region is characterized by an escarpment that forms a significant break in the bedrock of the region. The Complex is situated in the outlet area of the West Credit River valley at the front of the breach point of the Paris Moraine. Physiography of the study area is influenced by three distinctive physiographical and geological units: the Niagara Escarpment; the Paris Moraine; and the Eramosa Meltwater Channel.

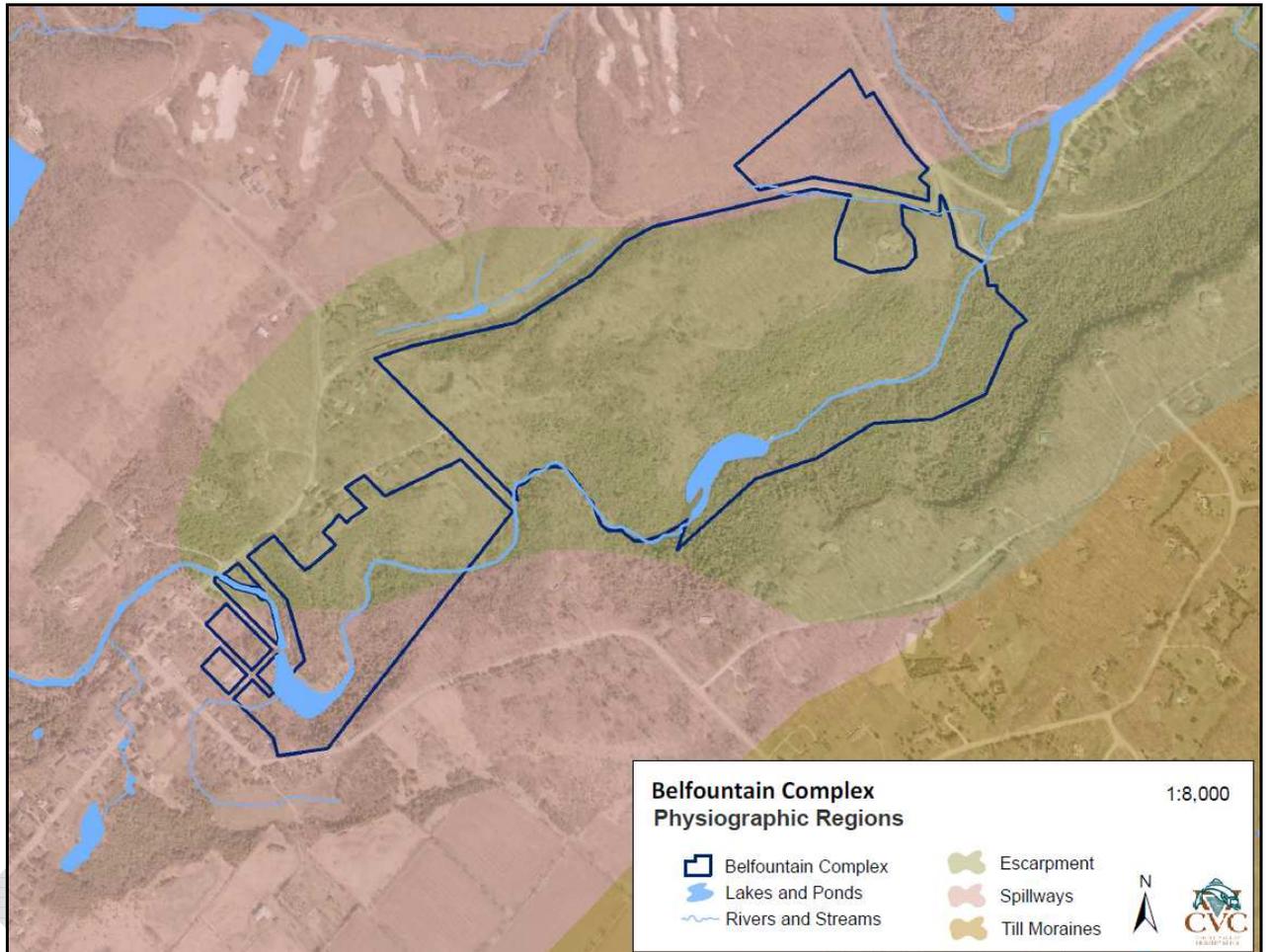


Figure 3 - Physiographic Regions of the Belfountain Complex

The long continuous cuesta of the Niagara Escarpment was created by the differential erosion of the hard dolostone of the Amabel and Guelph Formations of bedrock and the softer clastic sequences of the Queenston Formation and Cataract Group. The Complex lies in the West Credit River valley within the Niagara Escarpment Plan Area, and to the west of the actual cuesta.

The Paris Moraine is a typical end till moraine that lies on the north and south sides of the Complex. Formed by the Ontario ice lobe during its retreat into the Ontario basin, the moraine is composed of sandy Wentworth Till and kame sand and gravel. The

porous moraine materials make up much of the overburden in the Complex, and are discussed in section 2.1.2.

The Eramosa Meltwater Channel is the southern portion of the larger Caledon-Eramosa Meltwater System and was also created by the retreating of the Ontario ice lobe. The Eramosa Meltwater Channel envelopes the modern West Credit River valley which ranges in width between 300 – 400m. It is a composite valley comprised of bedrock, draped with a layer of overburden of various geneses.

2.1.2. Overburden

The study area is typically characterized by sandy loam soils associated with the slope and toe of the Niagara Escarpment. These young, shallow soils contain variable stoniness and neutral to slightly alkaline soil pH. Soil horizons are generally poorly developed and where seepage occurs, there is often on-going erosion with a build-up of muck and/or calcium carbonate. Large boulders, singly or in massive slides, are present across the slopes (Kaiser 1990).

Overburden is defined as loose to weakly cemented sediments that were deposited during the Quaternary Period. Overburden supports the development of soil, sustains efficient and better defined aquifers and aquitards compared to bedrock, and provides high quality habitats for various species. Depending on its mechanical strength it is highly erodible and can fail in slope areas. Overburden in the Complex can be divided into four units:

- *Glacialfluvial Deposits* – Located south of the West Credit River, this porous overburden was deposited by the Caledon Outwash system and consists of outwash gravel and gravelly sands overlain with sand or silt, varying in depth from 6m – 15m
- *Ice-contact Deposits* – Assumed to be the result of processes between two sub-lobes of the Ontario ice lobe, the overburden in this area consists of sand gravel with some lacustrine silt and minor till; thickness may be over 23 m
- *Valley Wall Overburden* - Composed of deposits of various geneses, different types of deposits distribute in different positions and rarely occur in vertical sequence. The thickness and lithology of the slope is highly variable ranging in thickness from zero to two meters.
- *Modern Fluvial Sediments* – River bed deposits are highly variable and are unevenly distributed within the channel; rocky boulders constitute the substrate of cascades and waterfalls, while sand and gravel can be found in reaches of sluggish flow and low thalweg gradient.

Both glacialfluvial and ice-contact deposits are highly permeable and facilitate groundwater recharge.

2.1.3. Bedrock

Bedrock outcrops are widespread on the valley slopes and river bed and play an important role in the geologic environment of the study area; the river valley itself is essentially a bedrock valley with a thin layer of slope complex. Two sequences of bedrock are present in the Complex; the Cataract Group and Queenston Formation (Figure 4). The Queenston Formation underlies the Cataract Group and outcrops only on the east end of the Complex. The Cataract Group contains three distinct formations, all which occur in the study area: the Whirlpool Formation, the Manitoulin Formation, and the Cabot Head Formation.

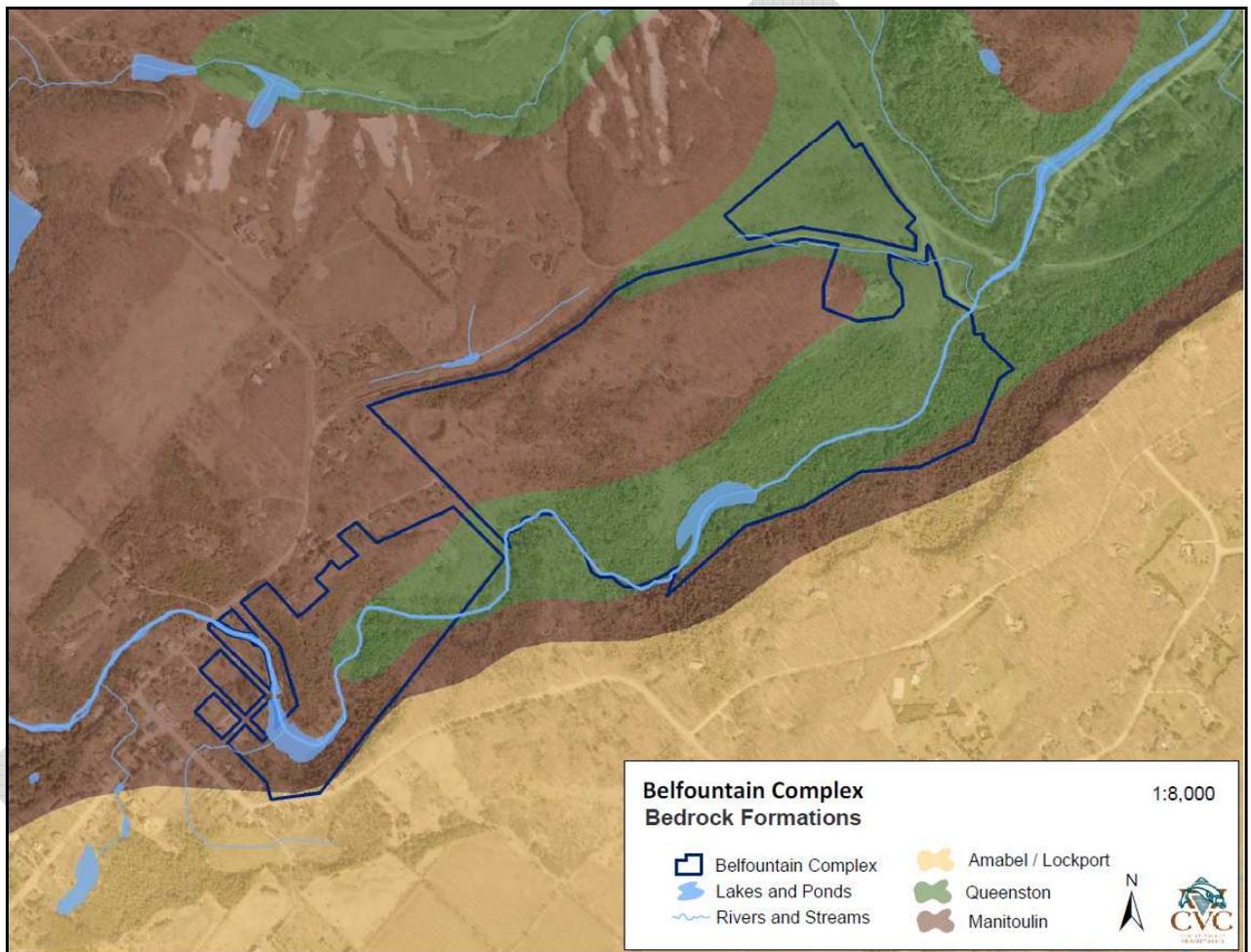


Figure 4 - Bedrock Formations of the Belfountain Complex

Sandstone from the Whirlpool Formation was famously quarried from the area in the 19th and early 20th centuries and existed in a variety of types and colours:

- A grey stone with occasional brown spots throughout
- A uniform grey stone prized as high quality
- A very highly prized stone which ranged from light to dark brown with occasional examples of pink throughout
- A piebald mix of white and pink

The uniquely coloured aggregate was used in the construction of several prominent buildings, including the Ontario Legislative buildings in Toronto.

2.1.4. Hydrology

The fluvial channel of the West Credit River runs the course of the Complex. For the most part, the channel occurs in a single channel form, though anastomosing can be observed in a few areas. The large scale meandering of the river that occurs throughout the site can be attributed to glacial geomorphology.

The height of the fluvial channel ranges from 362 to 308 metres above sea level and has an average gradient of 2.5%. This gradient changes intermittently throughout the channel, likely influenced by the two dams located in the Complex as well as by modern river dynamics.

Two reservoirs, created by the Belfountain and Stonecutter's dams, are located in the Complex:

- *Belfountain Reservoir*: is 47m at its widest point, has a water depth of 0m – 1m and an estimated sediment depth of 2.8m; and
- *Stonecutter's Reservoir*: located on the Willoughby Property is 40m at its widest, has a water depth of 0m – 1.5m, and has an approximate sediment depth of 1.9m.

Both reservoirs have been silted to the extent that the reservoir – dam systems could be considered as silt barriers. The silt deposits are prone to liquefaction in the instance of a strong vibration, such as an earthquake or heavy construction. This could lead to a high-turbidity flow and cause severe damage to downstream ecosystems

2.1.4.1. Groundwater : The characteristics of a groundwater system are controlled by geological conditions such as physiography, and the structure and lithology of geological materials. Several residents adjacent to the Complex rely solely on groundwater for their water supply. The water that feeds the supply for Belfountain Conservation Area is piped from one of the many springs that discharge from the valley walls.

Both an overburden aquifer and a bedrock aquifer have been identified within the Complex. They are well connected hydraulically and if appropriate conditions exist they may unify and flow as one hydraulic unit. The groundwater flows horizontally throughout the Complex and channels through the river valley.

The Complex has moderate to high potential for groundwater recharge given that a large portion of the study area consists of hummocky, highly permeable Paris Moraine. The average recharge for the area has been estimated at 300mm/year. The porous nature of the valley materials suggests that groundwater discharge likely exists in the

river valley, the lowest location in the study area. A number of springs were also identified along the valley slopes in the Complex, approximately 20 to 30 m higher than the river bed. Discharge rates from these springs ranged between .25 and 2.0 litres per second and they all appeared to be rooted in shallow depth bedrock. The position of these springs reflects the height of the regional groundwater table in this area.

Water quality tests conducted on the output of one of the springs indicated that the water quality is high. While data is not available on the groundwater in this area, it is expected that spring was representative. Future testing is recommended.

2.1.6. The Cox Property

While the Cox Property was not surveyed during the geologic inventory for the Complex, several important findings from various resources are worth noting. The Cox Property, similar to the Belfountain and Willoughby properties, contains a spring, once used for drinking water. The Cox Property was actively quarried until the twentieth century, and has similar geologic features to the rest of the study area, such as the presence of bedrock from the Whirlpool Formation. A rare orange coloured celestite is also purported to occur in the sedimentary rock on the property.

2.1.7. Tufa

A provincially and nationally rare type of rock, termed Tufa, was discovered at Belfountain Conservation Area in 2012. Tufa is a variety of limestone that forms in areas of groundwater seepage through the same precipitation process that forms stalagmites and stalactites in caves. Tufa deposits at Belfountain Conservation Area may be the most abundant of any currently known sites in Ontario (CVC, 2013).

2.1.8. Summary of Opportunities and Constraints

Understanding the stability of the valley slopes, which make up much of the Belfountain Complex, is critical, especially because the trail system passes through this area. Slope stability depends on a variety of factors including the bedrock structure, bedrock weathering, geometry and sedimentological structure. Slope shape and mechanics, and therefore stability, are highly variable and slopes need to be assessed on a site by site basis. Periodic surveillance should be conducted for all sites that are deemed potential geological hazards.

Groundwater contamination is a potential threat to the Complex due to the high watertable, porous overburden and cracked bedrock. Educational signage highlighting the geologic and hydrologic features and reminding visitors to be cognizant of littering and groundwater contamination could be beneficial.

The sediment that has built up in the Belfountain reservoir and the Stonecutter's reservoir is prone to liquefaction. The high turbidity flow that could follow could destroy downstream aquatic habitats. As they remain now, the sediment is a potential hazard.

The geologic assessment for the Complex also noted that the site may have high potential for geothermal development.

2.2. TERRESTRIAL SYSTEM

The Belfountain Complex contains a diverse landscape comprised of a variety of deciduous, mixed and coniferous forest communities with isolated pockets of cultural and wetland communities. Significant Wildlife Habitat, Significant Woodlands and the various features of the Niagara Escarpment provide a diverse range of habitat types for a variety of species, including several Species at Risk. The natural features and functions of the Complex's terrestrial and aquatic systems are connected to each other as well as to adjacent natural areas. This is demonstrated in both municipal and provincial plans as well as CVC's Natural Heritage System for the Credit River Watershed.

A natural heritage system is an ecologically connected system of green and natural areas that provides ecological functions over the long term. Natural heritage systems exist at a variety of scales and have been developed at the municipal, watershed, and eco-regional scales in Ontario. A draft NHS for the Credit River Watershed has been identified and is made up of natural heritage features and areas, enhancement areas and buffers. The various features of the Complex have been analyzed against ecological and biological criteria to determine their role in the NHS (CVC, 2011). Natural heritage features and areas include valleylands, wetlands, woodlands, aquatic habitat and the Lake Ontario Shoreline, Centres of Biodiversity and Significant Wildlife Habitat, and where applicable, have been categorized into high functioning, supporting and contributing features. While the entire Complex is located within the NHS, Figure 5 illustrates the designation of prominent features within the Complex: high functioning and supporting woodlands and valleylands and supporting wetlands.

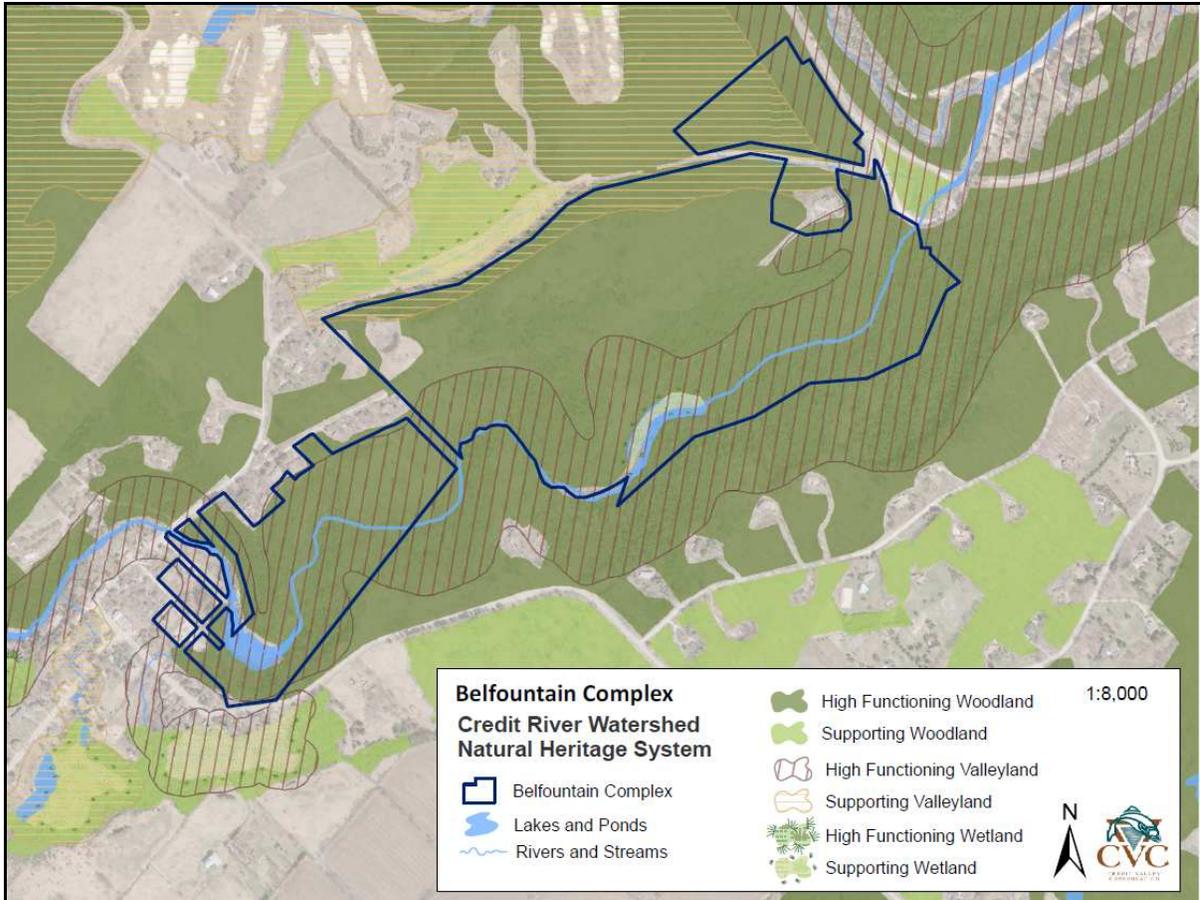


Figure 5 - Components of the Credit River Watershed Natural Heritage System and the Belfountain Complex

Further highlighting the importance of the Complex within the Watershed is its inclusion in a Centre of Biodiversity. A relatively new concept used to identify some of the largest, most biodiverse landscapes in the Watershed, eleven Centres of Biodiversity have been identified. These Centres are generally the largest habitat patches in each physiographic region in the Watershed and contain important aggregations of natural features. The entire Complex lies within the Forks of the Credit Centre of Biodiversity, which contains the confluence of the Credit and West Credit Rivers and a documented 873 native species of flora and fauna. Policies for the for the Credit River Watershed’s NHS and Centres of Biodiversity are currently in draft form and while they are not detailed in the Background Report, when finalized they will be incorporated into the management planning process.

The Complex is situated on the Niagara Escarpment, designated a World Biosphere Reserve in 1990. The Niagara Escarpment is one of only 15 World Biosphere Reserves in Canada and was designated to protect and celebrate its unique ecological, cultural and landform characteristics. This area contributes to a major provincial corridor in the Credit River Watershed; the Niagara Escarpment extends from the Niagara Peninsula north to the Bruce Peninsula.

2.2.1. Data Collection Methods

A detailed inventory and assessment of the terrestrial system was carried out to identify sensitivities, disturbances, opportunities and constraints within the Complex. The results of the following inventories and activities are summarized in this section; the report *Natural Heritage Characterization Report for the Belfountain Complex Management Plan* (CVC, 2014) contains additional detailed information, species lists, methodologies and recommendations.

- Classification of vegetation communities following Ecological Land Classification (ELC) protocols (Lee et al. 1998);
- Multi-season botanical inventory;
- Breeding bird surveys
- Nocturnal owl surveys
- Vernal Pool Surveys;
- Bat Monitoring Surveys;
- Odonata Surveys (targeting rare species) as part of CVC's Significant Wildlife Habitat study;
- Incidental wildlife observations and evaluation of the wildlife habitat potential of the property, including Significant Wildlife Habitat;
- Analysis of data from CVC's Terrestrial Monitoring Program
- Updated Species At Risk mapping (provided by MNR in a letter dated October 30, 2012);
- Reviewed background reports including the Credit Forks – Devil's Pulpit Environmentally Significant Area report, Credit Forks Life Science Area of Natural and Scientific Interest, Ecological Survey Niagara Escarpment Biosphere Reserve report, and the Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study (North South Environmental et al. 2009).

2.2.2. Designated Ecological Features

The ecological significance of the Belfountain Complex is recognized by the local and provincial designations that have been assigned to its communities and features, including an ESA, a Life Science ANSI and Significant Woodlands, as recognized in the Greenbelt Plan and the Region of Peel and Town of Caledon Official Plans (Table 2,

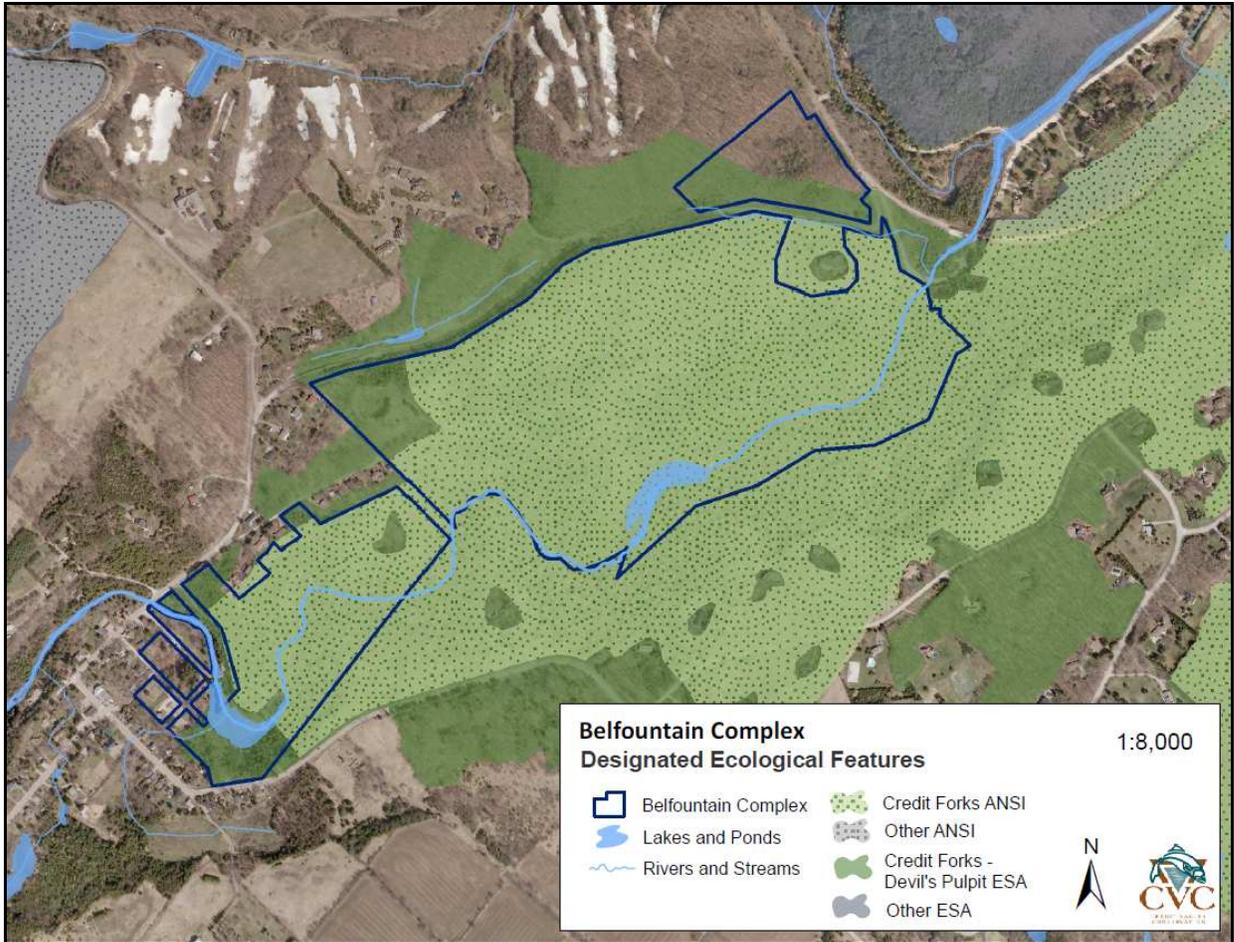


Figure 6).

Table 2 - Designated Ecological Features within the Belfountain Complex

Feature Type	Feature	Composition & Significance
Areas of Natural and Scientific Interest	Credit Forks Life Science ANSI	<ul style="list-style-type: none"> - 337 ha - provincially significant - has the best representation in the biophysical section of moraine-mantled escarpment plain, supporting extensive mesic broadleaf forests - characterized by forested lands on the foot, slope, slope terraces and plateau of the Niagara Escarpment along the West Branch of the Credit River - well displayed features include rugged, undisturbed, very moist north-facing talus forests and open talus seepage zones
Environmentally Significant Areas	Credit Forks – Devil's Pulpit	<ul style="list-style-type: none"> - 287 ha - large, relatively undisturbed tract of woodland at the confluence of the

		Credit and West Credit Rivers - Representative features include escarpment rim, talus slope and clay slope - significant recharge area
Significant Woodlands	Woodlands located throughout the Complex	- Woodlands meeting a variety of criteria as defined in the Greenbelt Plan for the north part of the Greenbelt planning area as well as the Region of Peel and Town of Caledon Official Plans - provides an array of ecological, hydrological and social values and benefits

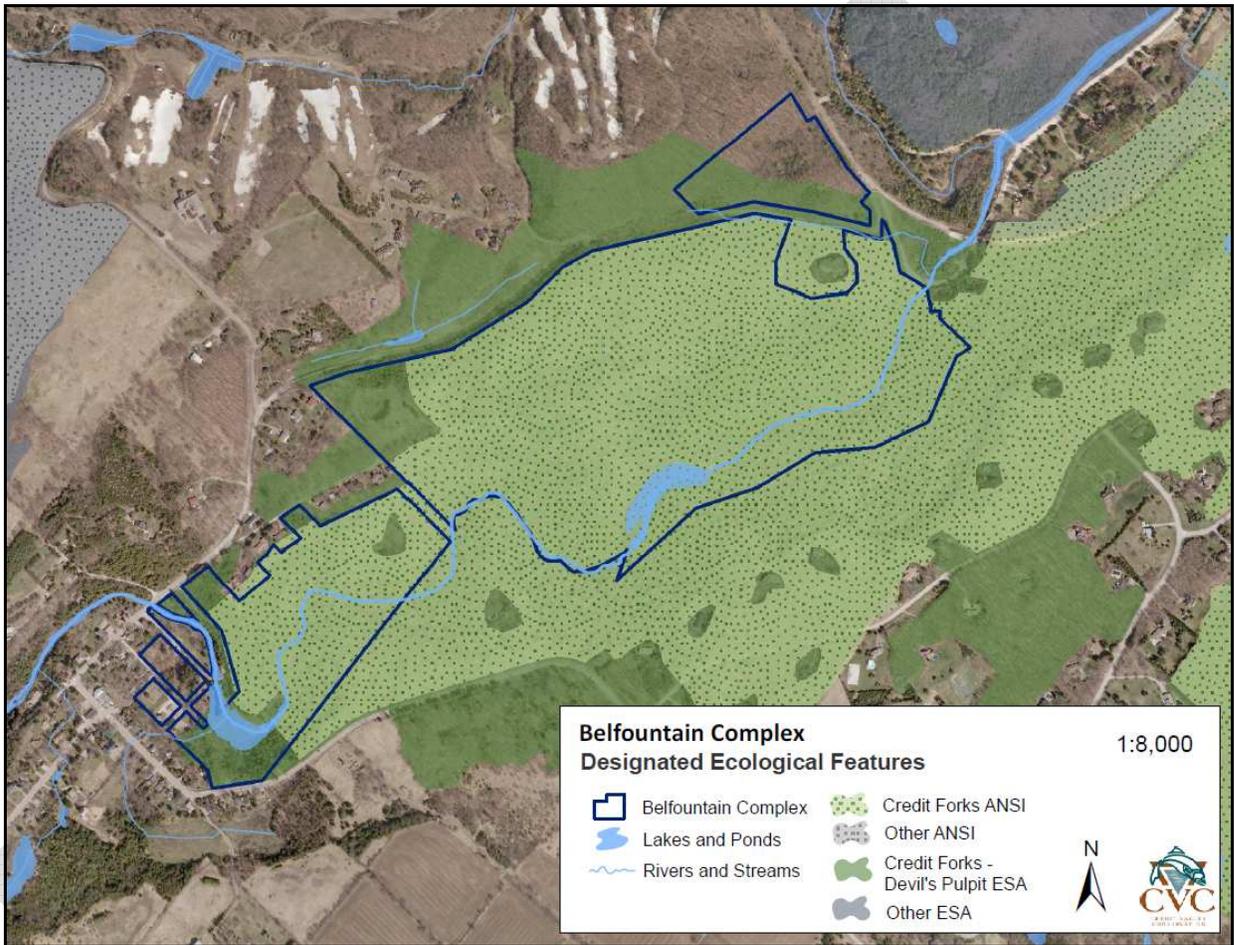


Figure 6 - Designated Ecological Features Associated with the Belfountain Complex

2.2.3. Significant Wildlife Habitat

Wildlife habitat refers to the area required by flora, fauna or other organisms to live and find the resources required to sustain their population. Wildlife habitat is considered significant where it is: *“ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System”*. (MNR, 2000). The Significant Wildlife Habitat Technical Guidelines (MNR, 2000) outlines four major Significant Wildlife Habitat (SWH) categories:

- Seasonal Concentration Areas
- Rare Vegetation Communities or Specialized Habitats for Wildlife

- Habitats for Species of Conservation Concern and;
- Animal Movement Corridors

While the MNR has begun the process of developing draft SWH criteria at the eco-region scale, candidate criteria and thresholds for the identification of SWH have been developed at a more local scale for the Region of Peel and the Town of Caledon (North-South Environmental Inc. et al, 2009). For the development of the Belfountain Complex Management Plan both the provincial and regional guidelines were reviewed.

Although some preliminary targeted surveys for SWH were carried out, the assessment of SWH criteria was largely done through the analysis of data collected through other surveys. To address uncertainties, three levels of confidence have been assigned to the assessment of SWH criteria:

- Candidate: applies to habitat that possesses the features necessary to qualify it as potential SWH, however species data is lacking and therefore it is impossible to determine whether thresholds have been met;
- Probable: has the features and species necessary to qualify as potential SWH, however the abundance and/or assemblage of species identified do not meet the minimum threshold required to confirm significance, and;
- Confirmed: has the features and the recommended abundance and/or assemblage of species to confirm the habitat as SWH under regional or provincial guidelines.

In cases where discrepancies between the regional and provincial thresholds were identified, the more restrictive confidence level is noted.

Table 3 – Candidate, Probable and Confirmed SWH within the Belfountain Complex

Significant Wildlife Habitat Criteria	Confidence Level	Property
Seasonal Concentration Areas		
Turtle Nesting Areas	Confirmed	Willoughby
Snake Hibernacula	Candidate	All
Bat Maternal Roosts and Hibernacula	Probable	Belfountain
	Candidate	Cox, Willoughby
Rare Vegetation Communities or Specialized Habitats for Wildlife		
Cliffs and Talus Slopes	Confirmed	All
Seeps and Springs	Confirmed	All

Significant Wildlife Habitat Criteria	Confidence Level	Property
Amphibian Breeding Habitat (Forested Sites)	Probable	Willoughby
	Candidate	Cox
Habitat for Area-sensitive/Forest interior breeding birds	Confirmed	All
Raptor Nesting Habitat (Raptors associated with woodland habitats)	Probable	Belfountain, Willoughby
	Candidate	Cox
Habitats for Species of Conservation Concern		
Species Identified as Nationally Endangered or Threatened by COSEWIC which are Not Listed as Endangered or Threatened under Ontario's Endangered Species Act	Confirmed	Belfountain, Willoughby
Species Identified as Special Concern Based on Species at Risk in Ontario List that is Periodically Updated by OMNR	Confirmed	Belfountain, Willoughby
Species that are Listed as Rare (S1-S3) or Historical in Ontario Based on Records Kept by the Natural Heritage Information Centre	Confirmed	Belfountain, Willoughby
Species that are rare with the Regional Municipality of Peel/Town of Caledon	Confirmed	All
Animal Movement Corridors		
Corridors and Linkages	Confirmed	All

2.2.4. Vegetation Communities

Thirty vegetation communities were surveyed and mapped within the Complex and encompassed forest, wetland, and cultural communities (Figure 7, Figure 8).

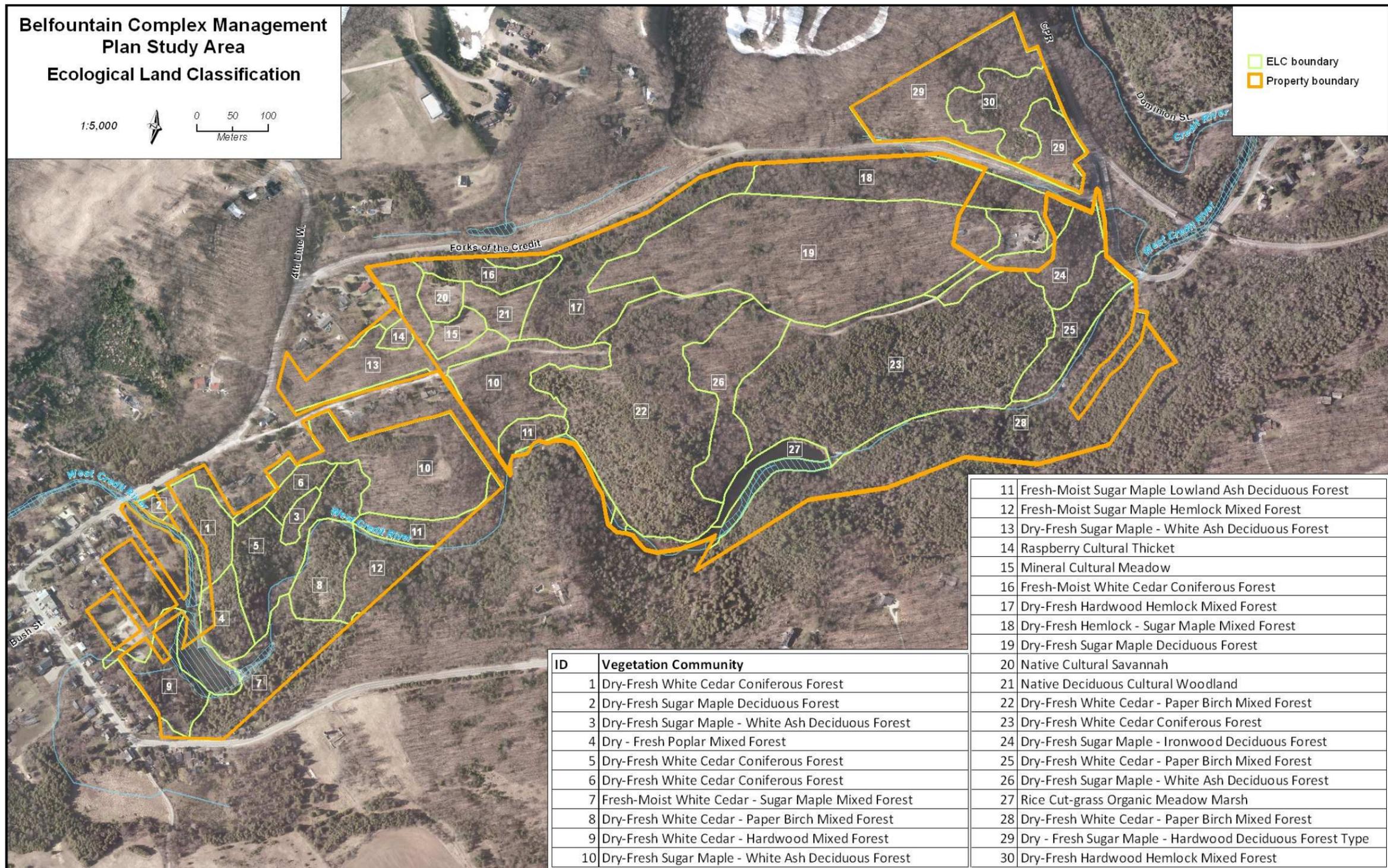


Figure 7 - Ecological Land Classification Mapping at the Belfountain Complex

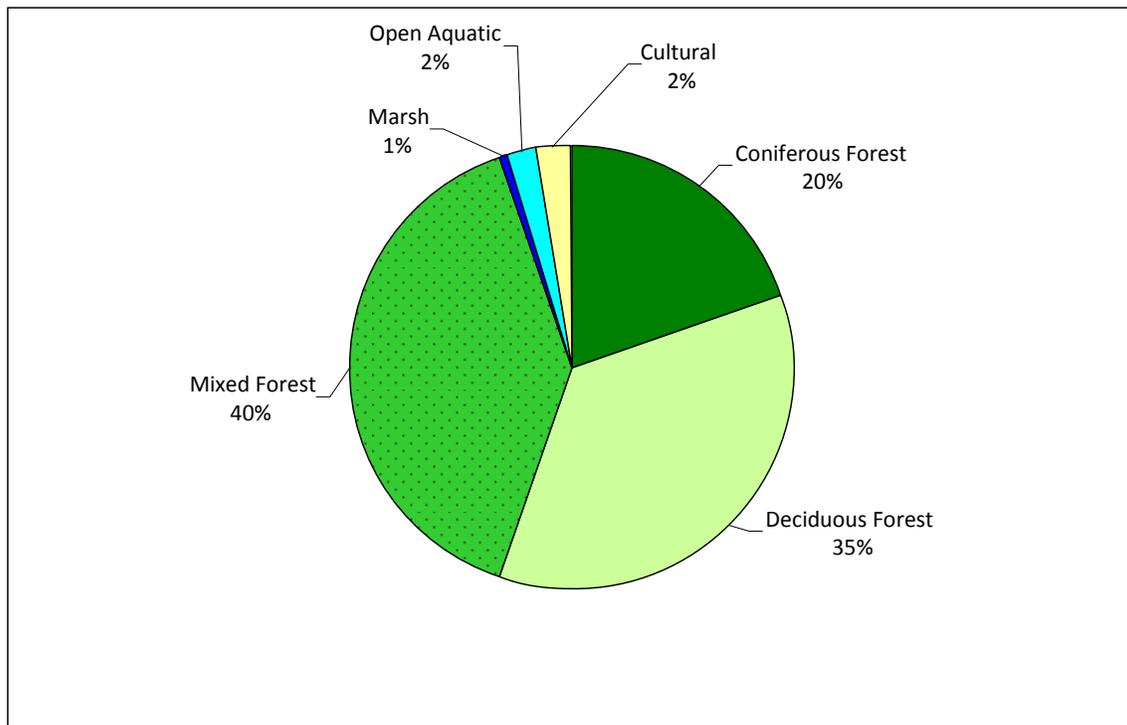


Figure 8 – Vegetation Communities within the Belfountain Complex

2.2.4.1. Forests: Forest communities are ecologically important components of the natural heritage system. They help clean our air and water, contribute to soil regeneration and conservation, and provide habitat to a number of species of flora and fauna. Generally larger woodlands support a higher biodiversity than small, fragmented forests, and are better protected against the negative impacts of edge effects associated with agricultural or urban activities. Forests with interior habitat (generally defined as 100m from an edge) support a niche of wildlife species that are area sensitive and rely on contiguous, un-fragmented habitat in which to carry out their life cycles.

Approximately 95% of the Complex is covered with natural forests; 40% is identified as Mixed Forest; 35% Deciduous Forest and 20% Coniferous Forest. All of the forests within the study area qualify as Significant Woodlands under the Niagara Escarpment Plan and the Region of Peel and Town of Caledon Official Plans.

The forested communities of Belfountain Conservation Area and the Willoughby Property connect to form a large contiguous forest containing approximately 20 ha of interior forest. Although historically connected to the forests on the Cox Property, the Forks of the Credit Road currently bisects the natural communities on the Cox and Willoughby properties, effectively interrupting the forest and reducing the amount of interior habitat. Nevertheless the forested communities on the Cox Property are part of a larger contiguous forest containing 2 ha of interior habitat that provides connections to the Forks of the Credit Provincial Park to the north and the east.

Eastern White Cedar (*Thuja occidentalis*) is present in most of the forested communities within the Complex due to the prevailing influence of limestone bedrock associated with the Niagara Escarpment. Eastern White Cedar is a slow growing, long-lived tree, and examples large diameter old-growth cedars were identified. The vegetation communities in which these trees were noted were not classified as old growth due to the dominance of younger trees in the stand.

Paper Birch (*Betula papyrifera*), Sugar Maple (*Acer saccharum*), White Ash (*Fraxinus americana*) and Eastern Hemlock (*Tsuga canadensis*) are examples of other tree species that are prevalent within the study area. Paper Birch is common in areas where the canopy has opened up, often in talus areas where there has been disturbance related to the steep topography. Sugar Maple, White Ash and Hemlock are more common in areas of deeper soils or on terraces on the escarpment.

The community south of the West Credit River on the Willoughby Property is noteworthy due to the relative lack of any anthropogenic disturbance. This area possesses an understory with a rich diversity of ferns, many of which are locally and regionally rare. Many of the species observed here are habitat specialists, highly sensitive to disturbance and found nowhere else in the Complex.

2.2.4.2. Wetlands: Wetland cover in the Complex is minimal at 1%. Aside from a few meadow marsh inclusions within the forested communities, the only wetland representation within the study area is an organic meadow marsh dominated by Rice Cut-grass (*Leersia oryzoides*). This wetland community is largely the result and function of the Stonecutter's Dam. Consequently, the wetland is a very dynamic system which can be partially or completely washed away during high flow events, and then quickly re-establish itself within the growing season. This wetland is one of the few marshes present within several kilometres of the Complex. In addition to this community, two open water aquatic communities represent 2% of the study area.

2.2.4.3. Early Successional Communities: Four small yet distinct early successional communities covering an area of 1.34ha have been identified within the Complex: a cultural meadow, a cultural thicket, a cultural savannah and a cultural woodland. Historical aerial photography from the 1940s and 1960s shows that these successional areas were previously cleared for agriculture and a small aggregate operation. These communities are in close proximity to residential development and therefore susceptible to encroachment from neighbouring properties and invasion by non-native species.

On account of their small size, it is unlikely that these communities support suitable habitat for open meadow and/or successional habitat-specialized species and would therefore be appropriate for tree planting activities.

2.2.4.4. Riparian Communities: Riparian habitats can be defined as aquatic communities adjacent to or associated with a river or stream, including those areas along a watercourse that are flooded or that have high water tables associated with the stream channel. Riparian systems provide habitat for species of plants that are adapted to periods of inundation and can tolerate saturated roots. Riparian communities provide an important function as wildlife corridors, providing valuable linkages to natural areas across an otherwise fragmented landscape.

Due to the steep slopes of the Niagara Escarpment most riparian communities associated with the West Credit River were too small to map and were generally amalgamated into larger communities.

2.2.5. Flora

A plant inventory was completed during ELC surveys and multi-season botanical inventories were carried out in May 2009 as well as May, June, and July 2010. The ecological surveys resulted in 409 plants being recorded in the Complex, representing almost one third of all the plants identified in the Credit River Watershed. Of these species 107 (26%) are non-native.

Species lists, rarity designations and assessments of floristic quality are located in the Natural Heritage Characterization Report for the Belfountain Complex Management Plan (CVC 2014).

2.2.5.1. Rare Species: Rare species typically have small population sizes, restricted geographic ranges, are sensitive to disturbance or are habitat specialists. The presence of rare species increases the importance of conserving the habitats in which they are found to protect biodiversity within the region. In total, 44 locally rare plants and 31 regionally rare plant species have been identified within the Complex. Additionally, 29 regionally uncommon plants were identified.

2.2.5.2. Non-native Invasive Species: The rapid spread of non-native invasive species is a major concern in the Credit River Watershed. From an ecological perspective, the concern centres on the displacement of native species, a loss of biodiversity, and impacts to associated species of wildlife. Data collected from the Complex reveals that 107 non-native plant species are present; a relatively high number largely attributed to encroachments along property boundaries, garden escapees and historic land uses.

CVC has assigned a value to all non-native species within the Watershed as part of an invasiveness ranking system. This ranking system is based on the document “Invasive Exotic Species Ranking for Southern Ontario” (Urban Forest Associates Inc. 2002) and serves as a tool to help prioritize the management of invasive species. The categories range from 1 to 5, correlating to a respective decrease in the species’ threat to a natural area and the corresponding priority level for management.

CVC generally focuses on managing species with an Invasive Rank of 1, 2 or 3 (Transformer, Highly Invasive and Moderately Invasive species, respectively); however species with a lower Invasive Rank may become a higher priority in some situations (e.g. small localized populations in high quality habitats). A subset of Transformer Species has also been designated as Top Priority by CVC due to their immediate threat to natural areas. Top Priority invasive species require urgent removal when found on CVC lands.

Aggressive invasive species removal has taken place within Belfountain Conservation Area since 2010. To date, targeted species include Japanese Knotweed (*Fallopia japonica*), Garlic Mustard (*Alliaria petiolata*), Goutweed (*Aegopodium podagraria*), Norway Maple (*Acer platanoides*), and Lily-of-the-Valley (*Convallaria majalis*). Japanese Knotweed is considered a top priority species by CVC due to its immediate threat to natural areas and is therefore always considered an Urgent Priority for removal.

Other Transformer species recorded within the Complex include Common Buckthorn (*Rhamnus cathartica*), Purple Loosestrife (*Lythrum salicaria*) and Tartarian Honeysuckle (*Lonicera tatarica*). Removal of these species is highly recommended particularly where habitat quality is high. Preliminary mapping (Figure 9) illustrates the priority communities for invasive species management based on invasive species presence and the existing quality of the habitat. While the Natural Heritage Characterization Report for the Belfountain Complex Management Plan describes additional determinants for identifying communities for invasive species removal (such as accessibility and extent of the invasion) additional work is required to prioritize and create a strategy for removal and management.



Figure 9 - Priority Mapping for Invasive Species Management within the Belfountain Complex

2.2.6. Wildlife

The terrestrial and aquatic systems with the Complex provide habitat for a diversity of wildlife species. Habitat features such as snags, cavity trees, seeps and vernal pools provide shelter and habitat for breeding, nesting and foraging. Several faunal species were observed within the Complex, including 12 mammals, 9 amphibian, 2 reptiles and 72 bird species.

2.2.6.1. Mammals: Twelve species of mammals have been recorded within the Complex, two of which are identified as Endangered: the Little Brown Myotis (*Myotis lucifugus*) and the Northern Myotis (*Myotis septentrionalis*). Other mammals noted include American Mink (*Mustela vison*), Stripped Skunk (*Mephitis mephitis*), Eastern Red Bat (*Lasiurus borealis*), Red Squirrel (*Tamiasciurus hudsonicus*), Grey Squirrel (*Sciurus carolinensis*), Red Fox (*Vulpes vulpes*), Northern Raccoon (*Procyon lotor*), Northern Flying Squirrel (*Glaucomys sabrinus*), White-tailed Deer (*Odocoileus virginianus*), and Porcupine (*Erethizon dorsatum*). Mammal dens have also been observed within the Complex, however species use has not been confirmed.

Northern Myotis was first confirmed in the Credit River Watershed in 2007 when an acoustic detection device was used to analyze bat vocalizations at select areas throughout the Watershed. Both the Little Brown Myotis and Northern Myotis were designated as Endangered in 2012 due to the introduction of a fungal disease known as White Nose Syndrome (*Geomyces destructans*). White Nose Syndrome grows in humid, cold environments (typical of the conditions found in hibernacula) and disrupts the bat's hibernation cycle causing them to wake prematurely. The Eastern Red Bat is a migratory species and is therefore unaffected by the disease. White Nose Syndrome was identified on a dead Little Brown Myotis in Belfountain Conservation Area in 2011, marking the first occurrence of the disease in Peel Region.

In 2005, the MNR conducted a flying squirrel distribution study within the Belfountain Complex. Occasionally Northern and Southern Flying Squirrels can be found inhabiting the same woodlot, and it is possible that both species are present in the area. Southern Flying Squirrel (*Glaucomys volans*), the target of the flying squirrel distribution study, was not captured nor observed within the Complex, though a total of 11 individual Northern Flying Squirrels were caught and released. Although the study confirmed the presence of Northern Flying Squirrel in Habitat Patch 1, it is likely that this inconspicuous species occurs throughout the Complex.

Of the mammals identified within the study area, Porcupine and Northern Flying Squirrel are the only species considered to be sensitive to human activities or disturbances. The other mammals identified are considered to be tolerant and have become adapted to urban environments.

2.2.6.2. Amphibians: Nine species of amphibians have been observed in the Complex including three species of salamander, five species of frogs, and one species of toad.

2.2.6.3. Reptiles: Two species of reptiles have been reported in the Complex, one of which the Eastern Snapping Turtle (*Chelydra serpentina*), is listed as Special Concern under the Endangered Species Act. Targeted surveys have not been completed for reptiles at the Belfountain Complex; records have been collected through incidental observation. Due to the secretive and nocturnal nature of many Ontario reptiles, a lack of observation does not indicate a confirmed absence.

2.2.6.4. Birds: Of the 72 bird species recorded at the Belfountain Complex, 27 are forest specialist species, 23 are habitat generalist species, 15 are edge and early successional species, 5 are wetland species and 2 are long distance migrant species. Although bird species diversity is not particularly high within the Complex on account of a low diversity of habitat type, there are many significant species reported including three Species-at-Risk and eleven area-sensitive forest interior bird species.

The expansive forest communities of the Complex support a rich community of forest specialist birds. Standing snags and cavity trees have been observed throughout the Complex, including large diameter trees that are of high value to wildlife. Thirteen cavity-nesting birds have been identified within the Complex, including Wood Duck (*Aix sponsa*), Pileated Woodpecker (*Dryocopus pileatus*) and Northern Flicker (*Colaptes auratus*).

The status of two forest birds, Eastern Wood-pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*) are currently being reviewed by the Committee on the Status of Species at Risk in Ontario (COSSARO). It is expected that these two species will be designated Species at Risk in line with the current designation recommendations by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Wood Thrush is designated Threatened by COSEWIC while Eastern Wood Pewee is designated Special Concern.

Nocturnal owl surveys were completed at Belfountain Conservation Area and the Willoughby Property and Eastern Screech Owl (*Megascops asio*) was observed. In addition, Great Horned Owl (*Bubo virginianus*) was recorded in Habitat Patch 6 and an unknown owl species (possibly a Northern Saw-whet Owl) was observed in Habitat Patch 2 during winter surveys.

A number of wetland generalist species have been observed in the small Rice-cut Grass Organic Meadow Marsh including Great-blue Heron (*Ardea herodias*), Wood Duck and Belted Kingfisher (*Megaceryle alcyon*). Although no marsh indicator species or marsh obligate nesters have been observed in this community, it does provide an important

habitat function within the Complex. The headpond of the Belfountain Dam has limited value to wildlife due to its design and the presence of a fountain in its centre; however it does provide feeding opportunities for some water forager species.

2.2.6.5. Dragonflies and Butterflies: A total of nine butterfly species, eight dragonfly species and three damselfly species have been observed within the Complex. Of these species, the Monarch Butterfly (*Danaus plexippus*) is listed as a Species at Risk.

Nine butterfly species were observed within the Belfountain Complex, all of which are relatively common in Ontario. Many observations were recorded in early successional communities (Habitat Patch 3) and manicured landscapes. Monarch Butterfly was observed in Habitat Patch 3, however, Common Milkweed (*Asclepias syriaca*), the host plant for Monarch larvae, is rare here. Two non-native species, European Skipper (*Thymelicus lineola*) and Cabbage White (*Pieris rapae*), were recorded in the study area, however both are considered to be naturalized.

Eight dragonfly species have been observed within the Complex, and one provincially rare dragonfly larva, Harpoon Clubtail (*Gomphus desertus*), was recorded within the Complex. Several adult Harpoon Clubtails had previously been identified in the area, however this record confirms that the provincially rare species is in fact breeding within the Complex. As such, the watercourse in which it was found (the headpond of the Stonecutter's Dam) was designated Significant Wildlife Habitat. Only three damselfly species have been recorded within the Complex and it is likely that more may be present.

The influence of the Belfountain and Stonecutter's Dams on the West Credit River has resulted in the creation of both slow-moving and fast-moving river habitat, thereby increasing the diversity of odonate species within the Complex. Species assemblages differ upstream of the dams where water is slow moving and pooled, from downstream of the dams where water is fast moving. The diversity of habitat created by the dams and the subsequent increase in odonate species diversity need to be considered when planning for dam management options and related changes in the water levels and flow.

2.2.7. Species at Risk

Species at Risk include species designated as Special Concern, Threatened or Endangered by COSSARO and those listed as Special Concern, Threatened or Endangered on the provincial Endangered Species Act. Several Species at Risk have been observed within the .

The habitats of Threatened and Endangered species receive protection under the provincial Endangered Species Act (section 8.3.5) as well as the federal Species at Risk Act (section 8.4.1), where applicable. Protection and management actions for these

species will be implemented in the Complex in a manner consistent with species recovery strategies, action plans and/or management plans.

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Opportunities and Constraints

The landscape of the Belfountain Complex is defined by West Credit River, Niagara Escarpment and the historic industrial activities that once took place throughout the Complex. While much of the Complex has now re-forested, the influence of previous land uses can still be seen throughout the Complex: historic quarry operations are now SWH and ponds created by dams now support rare species.

The influence of current land uses both within the Complex and surrounding it can also be observed. Visitation related impacts, such as the creation of unsanctioned trails, off-leash dogs, litter and other detrimental human activity has led to the spread of invasive species and a general reduction in integrity of certain habitats. The close proximity of the Complex to neighbouring properties also presents a variety of issues related to dumping of garbage and garden waste by adjacent landowners and noise pollution from the Forks of the Credit Road. These activities facilitate the spread of invasive species and noise pollution impacts the behaviour of many wildlife species.

Visitor activities may also lead to negative environmental impacts and litter, off-leash dogs and unsanctioned trails have been noted. Heavy and extensive deer browse was noted within the flat topography of Habitat Patch 5. Deer browse can have negative impacts on the growth and regeneration of rare plants and is especially concerning given the abundance of rare species in this area.

Opportunities for restoration and habitat enhancement projects are present in several communities. Invasive species removal, tree planting, and alterations to the Belfountain Headpond can improve habitat and ecosystem conditions on both local and broad scales. Educational and interpretive opportunities, including signage and programming, can highlight and promote the important features and functions of the Complex.

Lastly, the expansion or establishment of monitoring programs that collect information where current gaps exist are encouraged for the Complex. This may include the annual monitoring of a particular species or studies to delineate habitat ranges.

2.3. FORESTRY

The vast majority of the Belfountain Complex is forested. CVC's Forestry Management Guidelines outline the objectives and priorities for managing forests within CVC conservation areas and guides the implementation of forest management prescriptions. Objectives of CVC's Forestry Program include:

- To protect and preserve the forest resource and its inherent natural heritage features and diversity;
- To be compatible with CVC conservation area zoning for nature reserves and natural heritage protection;

- To improve forest health, forest stand structure and ecological viability;
- To protect the integrity and physical condition of CVC forests, improve resilience, and mitigate the potential effects of climate change and invasive species;
- To improve and maintain the inherent wildlife values associated with forests, and;
- To promote and practice ecologically sustainable forest management throughout the watershed.

Any prescriptions for forest management must address resource planning, recreation, education, fisheries, and natural heritage concerns.

2.3.1. Description of Forest Stand Types

Forest stands (also known as forest compartments), are areas of relatively homogeneous forest to which a single set of management principles and activities apply. Forest stand types are similar to community series types defined by ELC but place more emphasis on tree species and habitat than landform. Descriptions of the five Forest Stand Types found within the Complex are discussed in Table 4. Appendix B contains a complete description of the characteristics of each forest compartment in the Complex.

Table 4 - Forest Stand Types within the Belfountain Complex

Forest Compartment	Description	Primary Species	Forest Stand #’s	Total Area		Other Characteristics Noted
				Hectares (ha)	% of study area	
Successional Forest Slope	- Applies to a range of different habitats and is caused by a disturbance - Formed by human disturbance; there is evidence of past quarrying - Approximately 80 years of age	- White Birch - White Ash - Balsam Poplar (<i>Populus balsamifera</i>) - Sugar Maple - Ironwood (<i>Ostrya virginiana</i>)	1	3.3	5.7%	- Contains characteristics of old growth, including: good quantities of downed woody debris; mast species (including American Beech (<i>Fagus grandifolia</i>); large diameter trees
Conifer Forest	- Situated on well-drained, shallow, calcareous soils of the Niagara Escarpment - Majority of this stand type is located on steep slopes - Dominant forest stand type within the study area	- Eastern White Cedar - Eastern Hemlock, Maple, White Ash and White Birch also noted	7,8	35.2	61.1%	- Characteristics of old growth including: large fallen debris, cavity trees, super canopy trees, large diameter trees, and pit and mound topography
Upland Hardwood Forest Slope	- Located on well-drained, shallow, rocky, calcareous slopes - Compartments are between 70 and 100 years and contain a range of age classes	- Sugar Maple - Ironwood, Eastern Hemlock, American Beech and White Ash also occur	2,3,6	7.3	12.7%	- Regeneration is very slow and under-represented in compartments 2 and 3, while saplings and polewood account for most of the growth in compartment 6
Cultural Woodland	- Shaped by human disturbance, colonization of surrounding species is occurring in this stand	- small clumps of White Ash, Sugar Maple and conifers are present; mix of tree and shrub species are coming in	5	2.0	3.5%	-
Upland Hardwood Forest	- Has deeper and moister soils than other forest stand types - A range of age classes is present	- Sugar Maple - White Ash, Black Cherry (<i>Prunus serotina</i>), Basswood (<i>Tilia Americana</i>), and American Beech were also noted	4,9	9.8	17.0%	- Understory is dominated by Sugar Maple - Good quality wildlife features were identified in (large snags, cavity trees, downed woody debris)

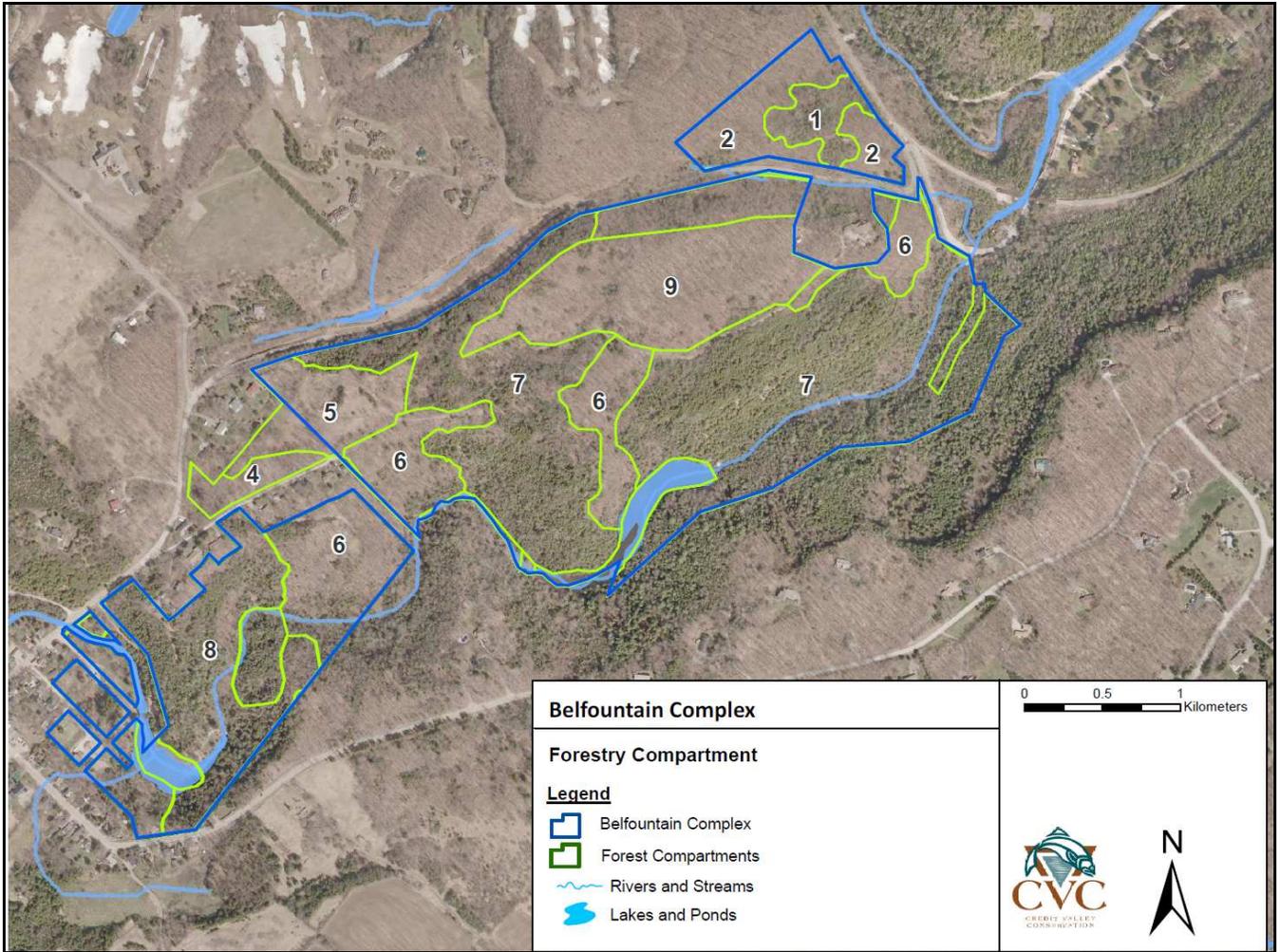


Figure 10 - Forestry Compartments within the Belfountain Complex

2.3.2. Specific Management Activities

The inventory of forest stand types, for the purpose of informing the Background Report, was conducted in August 2010. No prior forestry data or Forest Management Plan had been prepared for the study area previous to the inventory. Forest related management activities that currently occur on the property include hazard and risk tree management and invasive species management. Small scale plantings by volunteers have also taken place on the McCurdy and Christie parcels in recent years.

2.3.2.1 Threats to Forest Health: Forest pathogens and invasive insects pose a very real and immediate threat to forest species throughout southern Ontario. Three of these non-native pathogens occur, or are expected to occur in the near future, in the Belfountain Complex: the Emerald Ash Borer (*Agrilus planipennis*), Butternut Canker (*Ophiognomonia clavignenti-juglandacearum*) and Beech Bark Disease (*Nectria coccinea*).

Butternut canker is widespread throughout southern Ontario and has effectively devastated Butternut populations. There is no known cure for the canker disease, nor any effective methods for reducing the spread of the disease. The Butternut is now listed as federally and provincially endangered. Ongoing monitoring of the health of Butternut within the Complex is recommended.

A relatively new invasive species to North America, the Emerald Ash Borer is capable of attacking and killing healthy ash trees (*Fraxinus spp.*). This threat poses serious problems in forests throughout southern Ontario. Along with ecological considerations and changing forest dynamics, the potential hazard associated with ash trees located along trails and in managed areas, must be considered. Planning for the future management of ash trees, especially in areas frequented for human use, will be an important element of risk analysis and management. Figure 11 indicates the percentage of ash in different forest stand types within the Complex. Further discussions on the management of these species, and habitat impacts, is recommended for CVC's entire conservation areas system.

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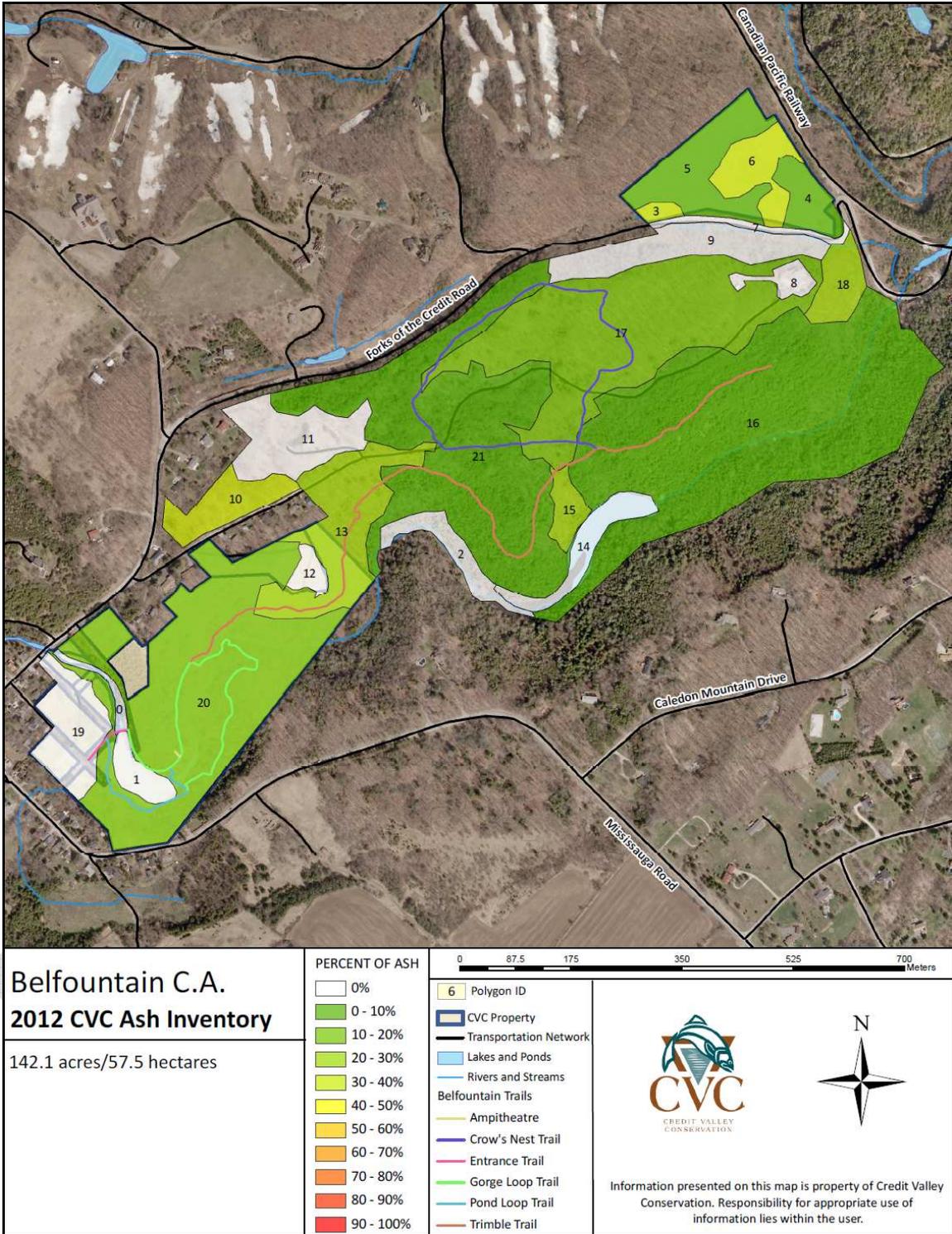


Figure 11 - Percentage of Ash throughout the Belfountain Complex

Beech Bark Disease is responsible for the demise of American Beech throughout the Watershed. Beech Bark Disease is the combined attack of a scale insect and a fungal infection that results in extensive cankering and ultimately the death of the tree.

Infected trees located near the trail system may require removal as the disease progresses. Ongoing monitoring to assess the presence and spread of the disease within the Complex is recommended.

2.4. FISHERIES

Drainage systems are large and complex and incorporate multiple natural features and processes. Planned for and managed at the watershed scale, the management of fisheries and aquatic habitat within a conservation area needs to be integrated with the broader scope of the aquatic system. The West Credit River and associated tributaries facilitate species movement (both native and non-native) as well as the movement of contaminants and fluctuations in water quality and quantity. Understanding the attributes and impacts of the larger system and the holistic approach required for its effective management is crucial for making management recommendations for a specific property.

The Complex is situated near the confluence of two major coldwater river systems: the Credit River and the West Credit River and is located within the West Credit River Subwatershed (subwatershed 15). The West Credit River flows through the Complex and the Cox Property is located 100m from the Credit River, which joins up with the West Credit River approximately 300m downstream of the Willoughby Property.

Nine monitoring sites and two Integrated Watershed Monitoring Program stations are located in the West Credit River within the Complex. Data has been collected at the majority of the sites since 1999. A small tributary that runs alongside the Forks of the Credit Road and enters the West Credit River at the downstream end of the Willoughby Property boundary is also located within the study area, though monitoring has not occurred in this watercourse. Additional information can be found in the Fisheries Technical Report (Appendix C).

2.4.1. Fish Habitat and Biodiversity

There are many habitat variables that drive fish communities and at a landscape level, climate, surficial geology and soils are the main factors influencing fish habitat. The local landscape of the Niagara Escarpment and its high soil porosity resulting in high groundwater discharge rates and steep gradient streams with narrow valleys provides ideal conditions to support coldwater fish communities.

Built structures within the study area also play a role in habitat and the presence of fish communities. Three separate water control structures dissect the river within the Complex: the Belfountain Dam, the Stonecutter's Dam and a Concrete Weir (Figurexxx). The Belfountain Dam, the largest of the three structures, has a sizeable headpond associated with it. The dam is impassable to fish and acts a partition, separating the

native Brook Trout (*Salvelinus fontinalis*) population from the naturalized Brown Trout (*Salmo trutta*) downstream. It also prevents any fish moving downstream of the dam from returning.

The shallow headpond of the Belfountain dam is slowly filling with sediment and likely allows the water to warm before it flows over the dam. The thermal effects of this are likely overcome however, by the well vegetated riparian zone located along the river, as well as the groundwater discharge that occurs throughout the reach.

The Stonecutter's dam and the relatively small concrete weir further constrain the movement of fish on the Willoughby Property. The headpond of the Stonecutter's dam has shrunk in size in recent years, thus reducing its thermal impact on the river system. The dam was thought to be impassable to fish, but in 2011 one adult Atlantic Salmon (*Salmo salar*) was captured upstream, indicating that some fish are able to pass. The concrete weir, a 1.5m concrete structure located approximately 100m upstream of the Forks of the Credit Road, further fragments the river system. Although it is relatively small, passage is limited to jumping fish, such as Trout and Salmon.

A total of 13 species of fish have been captured in the study area, two of which, the Brown Trout and Rainbow Trout (*Oncorhynchus mykiss*), are not native. Historically, this reach of river was home to two salmonoids; Atlantic Salmon and Brook Trout, as well as a variety of other resident species. Brown Trout were introduced to the Credit River between 1948 and 1957 and are now self-sustaining below the Belfountain dam. Rainbow Trout have been found in low numbers since 1999, but their numbers appear to be increasing.

The West Credit River has been a site for Atlantic Salmon stocking as part of Ontario's Lake Ontario Atlantic Salmon Restoration Program. Approximately 500,000 fish have been stocked at Belfountain Conservation Area since stocking began in 1996.

2.4.2. Fish Productivity

CVC's Integrated Watershed Monitoring Program (IWMP) has two sampling stations located within Belfountain Conservation Area; one upstream of the dam and the other approximately 500m below it. The data collected at these two sites is used to calculate the Index of Biotic Integrity (IBI), an indicator that was developed specifically for the Credit River (Morris, 1999). The score is based on the total biomass of fish caught at a sampling station, but the biomass of sensitive species (e.g. Brook Trout and other coldwater species) is multiplied by a factor of two or three, so that the score increases if these species are present. Scores are then used to classify streams and can be compared over time to assess changes in the health of different sites.

The site upstream of the Belfountain dam has been monitored since 1999 and a total of nine species have been observed. This site has an IBI score of 8.1 and is classified as fair. The site has experienced a slight positive trend over time, though it is likely that this

reflects the Atlantic Salmon stocking efforts. Brook Trout consistently dominate the biomass of this site, however the overall biomass has been decreasing since 2009.

The second station, approximately 500m downstream from the Belfountain dam, has been monitored since 2002 and has yielded 11 species, with Brown Trout and Northern Hog Sucker (*Hypentelium nigricanus*) being additional species not captured upstream. Atlantic Salmon consistently rank as first or second dominant biomass due to the stocking program. The IBI scores are driven by the presence or absence of Trout or Salmon at the site, and the IBI is 17.8, or excellent. The three lowest IBI scores at this site occurred in the past 4 years, though interestingly, 2009 resulted in one of the two highest IBI scores since monitoring began. Given potential impacts due to the dam and ongoing stocking program, it is difficult to assess potential reasons for these changes.

The dams and their headponds warm the water, negatively impacting coldwater fish communities and sensitive species. Fish movement is impeded, and while this reduces competition between native Brook Trout and introduced Brown Trout, it also prevents any individuals moving downstream from returning. The sediment collecting in the headpond of the Belfountain dam is also a concern as it is prone to liquefaction. The water control structures in the study area are further discussed in section 6.8.

2.4.3. Recreational Fishery

The West Credit River is a popular destination for anglers who can target both Brook and Brown Trout. The Belfountain Complex is located in Fisheries Management Zone 16, where trout season is open from the fourth Saturday in April to September 30. Anglers fishing within the Complex must also adhere to special regulations applicable in the Town of Caledon, upstream from Old Baseline Road (section 8.3.12.):

- Only artificial lures may be used
- Only one single-pointed barbless hook may be used
- Brook Trout, Brown Trout and Rainbow Trout harvest of 0

Due to the presence of returning adult Atlantic Salmon in the fall of 2011, the Ministry of Natural Resources, under the Trespass to Property Act, made it illegal to fish within 60m downstream of the dam.

2.4.4. Summary of Opportunities and Constraints

Recommendations for the study area relate to the protection of existing aquatic ecosystems and resources. The main restoration goal for the property is to reduce, where appropriate, the thermal and sediment transport impacts of the three dams. The water control structures exert the greatest impact on the stream environment and local fish community and therefore must be assessed for potential mitigation opportunities.

Atlantic Salmon will likely begin to return to the area in larger numbers as stocked fish within the system mature. Atlantic Salmon are currently protected by a zero harvest limit in the study area, but it is likely that anglers will begin to catch these fish on a more

regular basis. Education and reporting programs geared toward anglers is recommended. Monitoring of stocked fish to assess survival rates and spawning surveys are also recommended.

The existing angling regulations are generally sufficient to help protect the fishery; however it has been proposed that the harvesting of Rainbow Trout, a non-native species, be permitted within this reach.

In regards to the local fish community, the alteration of the existing dams and river system could allow for the movement of different species and have major impacts on the current fishery, namely the Brook Trout population located upstream of the Belfountain Dam. More discussions about the future impacts on the local fish community and historic ranges of species need to occur before a preferred method for dam mitigation is recommended.

3.0. CULTURAL HERITAGE FEATURES

A cultural heritage investigation that focused on the historical and cultural significance of the Belfountain Complex was completed in 2013. Conducted by the Toronto and Region Conservation Authority's Archaeology Research Management Services, the review involved the following:

- Archival research
 - Nineteenth century surveyor's maps and land abstracts
 - Documents describing settlements and features of the surrounding area
- Review of documented property alterations
- Research and investigations on select features located within the Complex
- Modern heritage documents

This section discusses the historical context of the region as well as the specific findings associated with the Complex. The entire inventory of the area is contained within the Cultural Heritage Background Study Report (TRCA, 2013).

3.1. REGIONAL HISTORICAL CONTEXT (12,000 BP to 1805 AD)

Human populations established in southern Ontario more than 10,000 years ago. Specific details regarding the early settlement and use of Belfountain Conservation and associated lands is not available; this section provides a general description of early human occupations in southern Ontario.

3.1.1. PalaeoIndian Period – 12,000 to 10,000 BP

Twelve thousand years ago, as the glaciers retreated from southern Ontario, nomadic peoples gradually moved into the area. These PalaeoIndians lived in small family groups and presumably hunted caribou and other fauna associated with the cooler environment of this time period. Traditionally, the PalaeoIndian occupation of southern Ontario has been associated with glacial lake shorelines, however, recent investigations indicate that these peoples also utilized interior locations, such as kettle lake areas along the Oak Ridges Moraine. During this time the entire population of southern Ontario is thought to be somewhere between 100 and 200 individuals.

3.1.2. Archaic Period – 10,000 to 2800 BP

The Archaic Period saw the arrival of many new technologies and subsistence strategies as Aboriginal populations adapted to the warming southern Ontario climate. Woodworking implements and net-sinkers (for fishing) began to appear as did numerous types of spear points. The presence of copper (native to the Lake Superior region) on archaeological sites throughout southern Ontario suggests that Archaic groups were involved in long range exchange and interaction.

The Archaic bands of southern Ontario followed an annual cycle, which exploited seasonably available resources from differing geographic locales. Spring through fall, bands would join together and inhabit sites in lakeshore environments where abundant food enabled the establishment of multi-season occupations. As the seasons changed and resources became scarce, bands would split into smaller groups and move inland to exploit resources that were available during the fall and winter.

3.1.3. Initial Woodland Period - 3000/2800 BP to AD 700

The Initial Woodland period is associated with two technological innovations: clay pots and the bow and arrow. These two advancements allowed for major changes in subsistence and settlement patterns. As populations became larger, camps were equipped with more permanent structures and were occupied longer and more consistently. These larger sites are generally associated with the gathering of two or more band groups into what are referred to as macrobands. It was also during this period that elaborate burial rituals and the interment of numerous exotic grave goods with the deceased began to take place. Increased trade and interaction between southern Ontario populations and groups as far away as the Atlantic coast and the Ohio Valley was also taking place.

3.1.4. Late Woodland Period – AD 700 - 1650

The introduction of maize around A.D. 700 and the subsequent development of horticulture as the predominant subsistence base, gave rise to a tremendous population increase and the establishment of permanent villages. These villages were often surrounded by multiple rows of palisades, suggesting that defence was a community concern. Aside from villages, Late Woodland peoples also inhabited hamlets and special purpose cabins and campsites that are thought to have been associated with larger settlements. Social changes also occurred during this time and are reflected in the use of smoking pipes, burial rituals, increased settlement size, as well as clan development and tribal development.

3.1.5. PostContact Period – AD 1650 to 1805

The PostContact Period is characterized by the arrival of a small number of Europeans interested in exploration, trade, and establishing missions. It is difficult to distinguish between Aboriginal and colonial settler campsites during these early years due to the interaction and adoption of each other's material goods and subsistence strategies. This interaction continued until the Crown established segregated reserves in the eighteenth and early nineteenth centuries for the Haudenosaunee and Anishinaabe communities while granting properties to European settlers. During this period French explorers and fur traders began to travel along the Lake Ontario shoreline and explore inland. It was at this time that the Métis culture developed, resulting initially from the union of indigenous women with the fur traders and a blending of cultural traditions with the ensuing generations began.

3.2. LOCAL HISTORICAL CONTEXT (1805 to 1900)

Historic accounts of southern Ontario Townships are often found in survey diaries, though the Township of Caledon diaries have not survived to present day. In lieu of diaries, the Atlas of Peel County contains information pertaining to geography, settlement and early industry in the area.

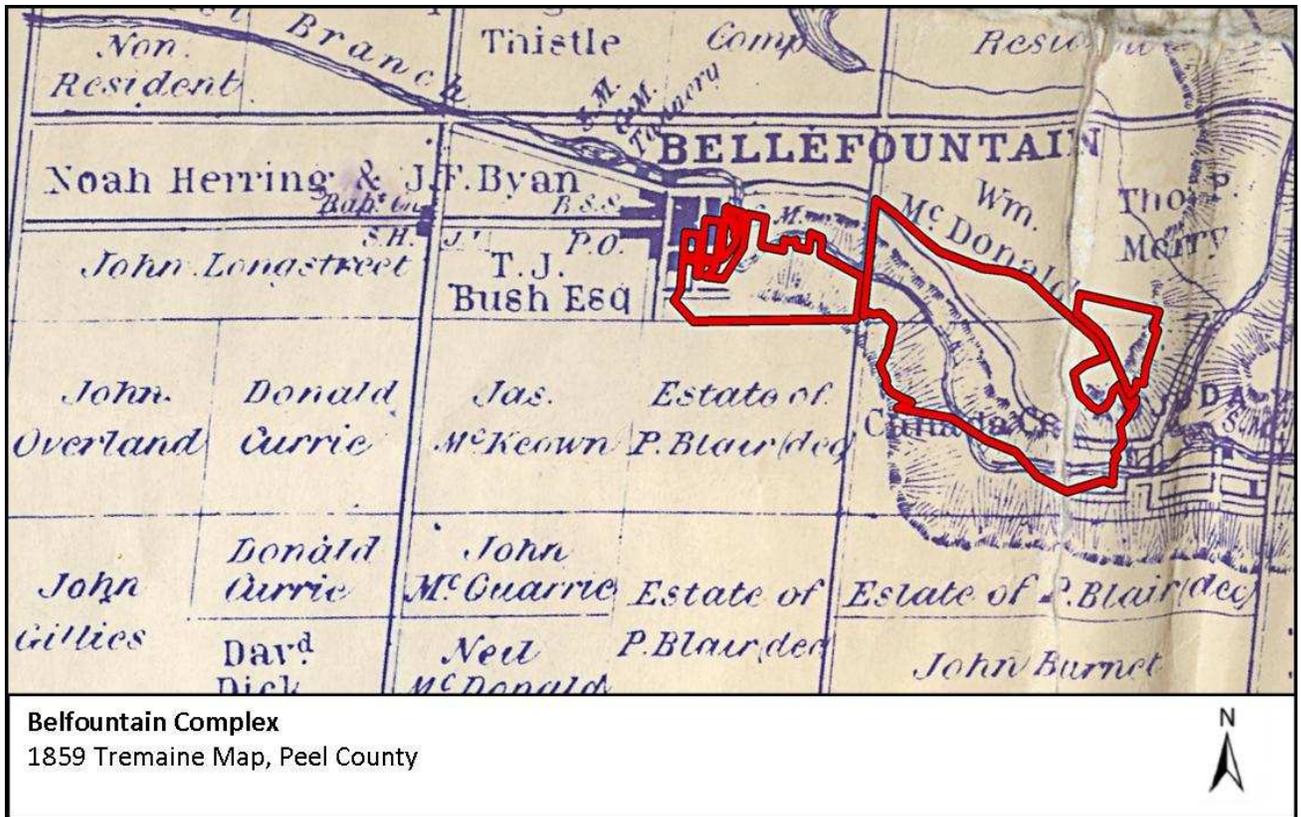


Figure 12 and Figure 13 illustrate the situation of the Complex in the contextual landscape of the region in 1859 and 1877, respectively.

Early accounts of the area indicate the landscape was comprised of rugged forest cover that was ideal for quarrying and milling industries and several small villages quickly developed. A brief history of the areas associated with the Complex are described in this section.

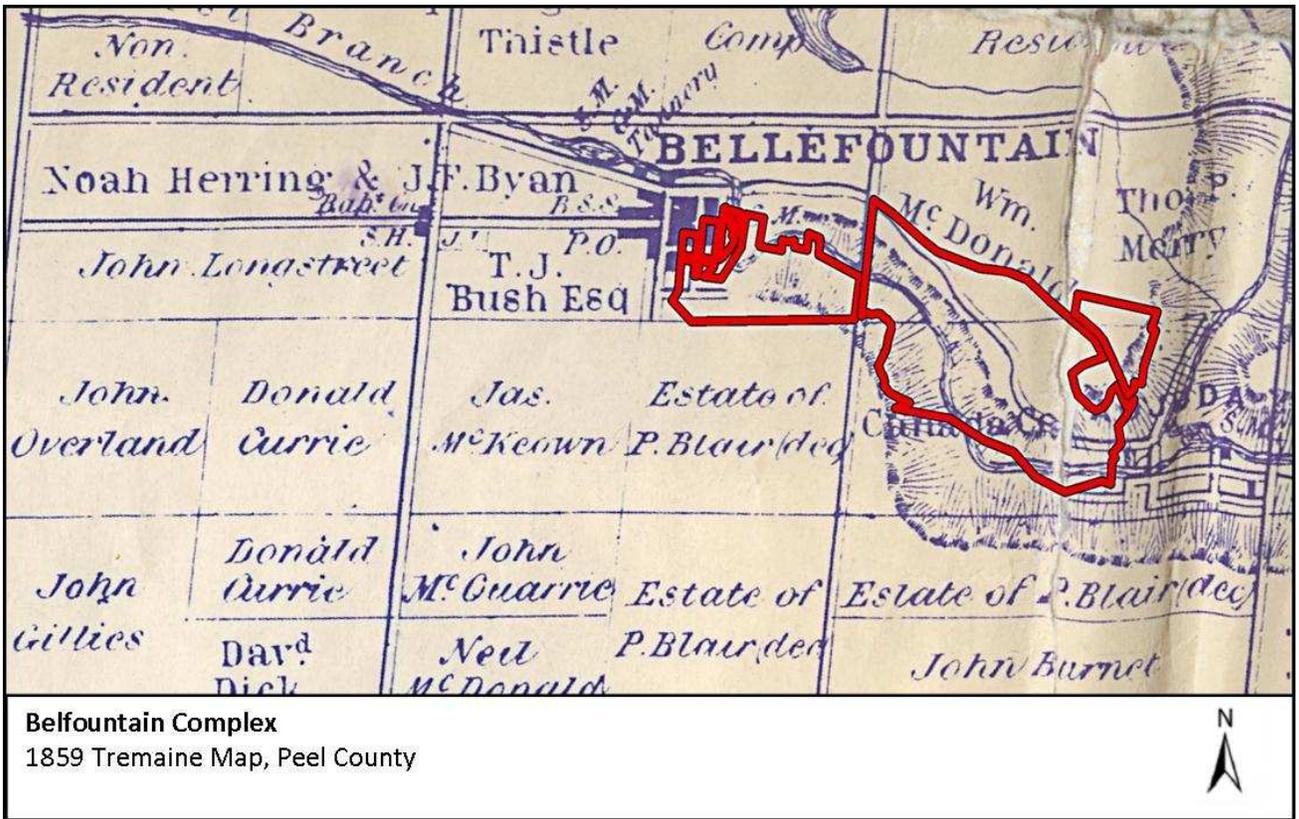


Figure 12 - Tremaine Map (1859) and Situation of the Bellefontain Complex

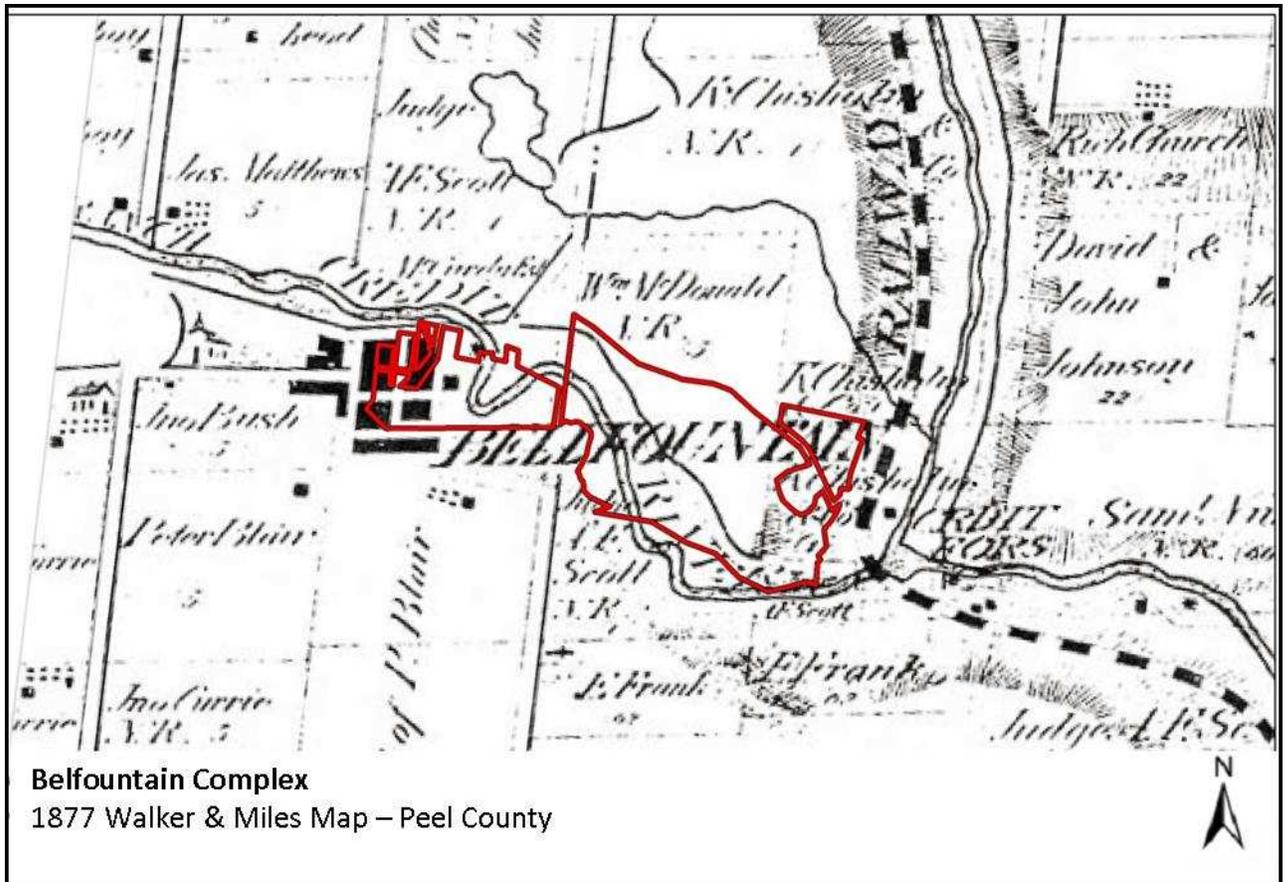


Figure 13 – Walker & Miles Map (1877) and Situation of the Belfountain Complex

3.2.1. Peel County

The county of Peel was established in 1805 following the purchase of the southern part of Mississauga by the British Crown. Additional acquisitions took place in subsequent years, including the remainder of the Mississauga tract in 1818.

Peel County was surveyed between 1818 and 1819; the Townships of Caledon, Albion and Chinguacousy were opened for settlement in 1820. Early settlement developed around water-powered mill sites on the Credit and Humber Rivers and at various crossroads. Although the arrival of various railways in the 1870s spurred growth, many landowners remained as non-residents due to the lack of infrastructure in the area.

3.2.2. Village of Belfountain

Known in its earliest days as McCurdy's Mills, named after one of the first and most influential settlers to the area, Jonathon 'Grize' McCurdy, the village underwent various name changes and spellings before finally settling on Belfountain. Belfountain was surveyed in 1846 and registered in 1853.

The first industry to arise in the area was milling, including the processing of lumber, which resulted in the early establishment of saw mills and a few grist mills to support

the farmlands in the area. As the village continued to grow, new business opportunities arose and a general store and tavern were established in 1840. By 1860 a tannery, two more saw mills and a flour mill had been developed and by 1870 Belfountain had a population of 300.

During the 1870s, quarrying activities and the railway were introduced and Belfountain saw a substantial increase in population. But like many settlements reliant on the natural resources to feed their economy, these resources became scarce and Belfountain began to decline in the 1890s.

3.2.3. Belfountain Conservation Area (Mack Park)

Belfountain Conservation Area, once located near the bustling centre of Belfountain, was occupied by mills. By 1860 the property (east half of Lot 10, Concession 5 of Caledon Township) appeared to have been purchased by George Hughson, and a sawmill was established on the southeast side of Forks Road. By the late 1800's, two additional mills are said to have been in place: Charles Grasley's sawmill on the west bank of the river near the site of the Belfountain Dam; and Pringles sawmill, located on the east bank.

Charles Mack, a wealthy Toronto manufacturer and inventor of the cushion-back rubber stamp, purchased the strip of land now known as Belfountain Conservation Area after having seen it on a motor-camping trip in 1908. He quickly developed the property, constructing a fountain, swing bridge, cave, look-outs and boating pond. He hired Sam Brock, a local stonemason, to build much of the decorative stonework, walls and stairs located around the property. Mack built a summer residence on the edge of the ravine, "Luck-e-nuf", as well as three additional cottages. One of the cottages "Bide-a-wee" was offered rent-free to young Toronto business women who could not otherwise afford a holiday. From 1914, the property was open for public use and enjoyment.

In the late 19th century and early 20th century several houses were built on lots that now represent the entrance to Belfountain Conservation Area. The approximate locations of some of the buildings are represented in Figure 14.

After Mack passed away, his widow, Addie, sold the property, which was used as a commercial park until Credit Valley Conservation purchased the property in 1959. The Peel Historical Society and the Women's Institute ran a museum in the Bide-a-wee cottage from 1963 until the cottages were demolished in 1971.



Figure 14 - Estimated Positions of Historical Resources within the Complex

3.2.4. Willoughby Property

The historical significance of the Willoughby Property is largely related to the mid 19th century industrial activities that took place on it. Quarries located throughout the property extracted sandstone, limestone and gravel materials and two dams likely supplied water power to mill operations. The remains of a railway line that once served the quarries can still be followed and the stone abutments of a short bridge can still be observed.

The “Crownsnest Quarry” consisted of several small quarries of which both limestone and sandstone were extracted using a “pick and wedge” technique. Underground mining occurred at the “Hillis Quarry” on the north edge of the property, though the collapse of the face of the quarry has removed traces of any tunnels. Underground mining of stone is considered unique In Ontario. The gravel pit on the northwest side of the property was active in the 1920’s and 1930’s when glacial till was extracted.

The exact function of the Stonecutter’s Dam and the Concrete Weir located on the West Credit River are not known though they likely supplied power to mill operations. Any historic mills on the property have not been identified and have likely been obscured by rock falls and erosion.

3.2.5. Cox Property

Three separate quarries once occupied the Cox Property for the purpose of stone and possibly till extraction. The quarries opened in the 19th century and closed in the early 20th century when extraction became too expensive.

Completed in 1900, a 300-400ft aerial tramway moved stone from the Cox Property to the nearby Big Hill Quarry in a single car system. The remains of the aerial tramway are a rare example of industrial transportation in Ontario and are considered of provincial significance due to the rare form of technology it represents.

3.3. EXISTING CULTURAL HERITAGE PROGRAMS

The Town of Caledon, through the Ontario Heritage Act, oversees a heritage registry that contains details on the Built Heritage Resources and the Cultural Heritage Landscapes of the area. The Town of Caledon has designated three properties, listed one property and inventoried 69 properties of historical significance within 1km of the study area.

The Town of Caledon has also identified candidate Cultural Heritage Landscapes (CHLs), described as geographical areas that have been modified, influenced, or given a special meaning by people (Scheinman, 2009). Two CHLs are associated with the Complex (Figure 15).

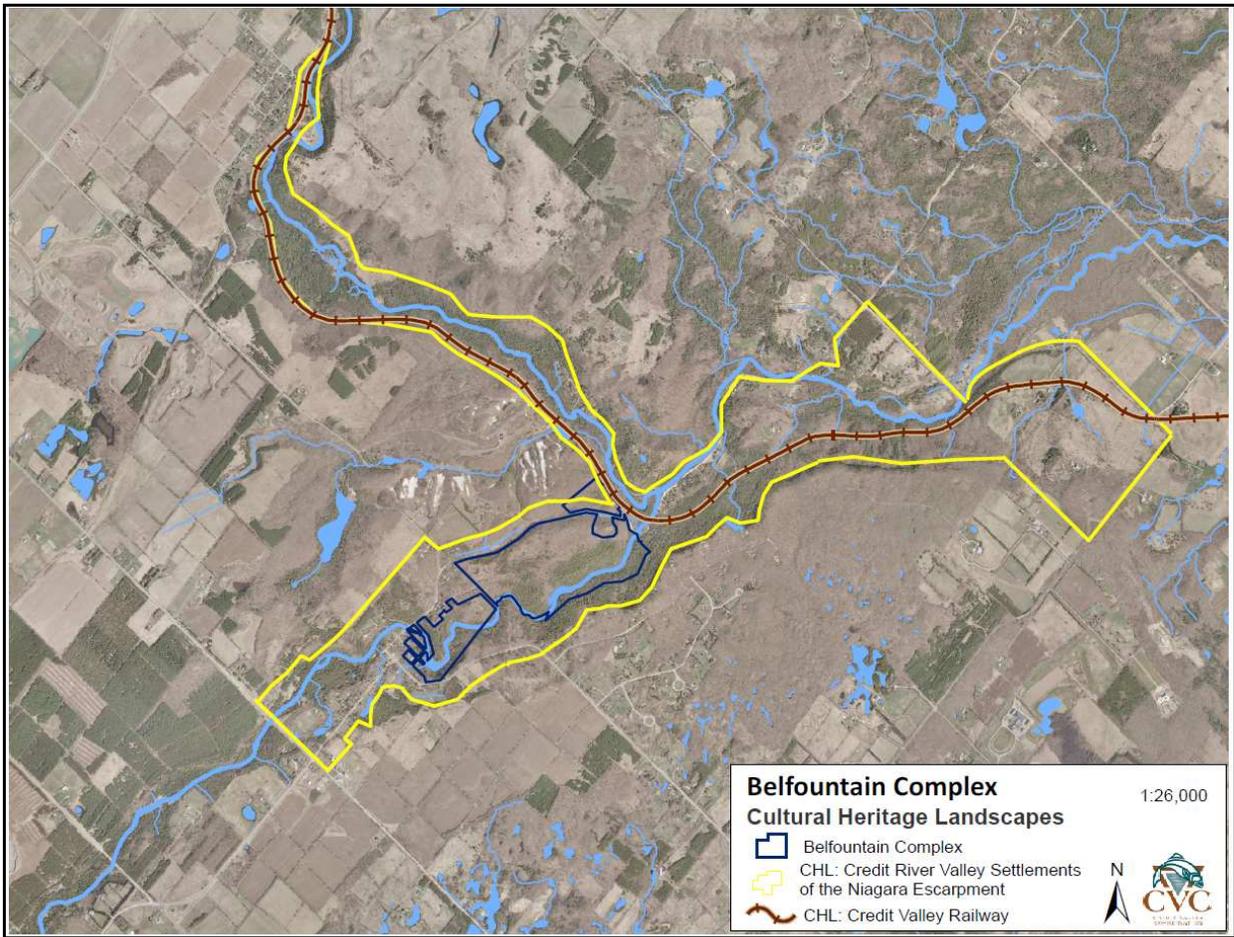


Figure 15 - Cultural Heritage Landscapes that pertain to the Complex

3.3.1. Credit River Valley Settlements of the Niagara Escarpment: Belfountain and the Credit River Gorge

The Belfountain and the Credit River Gorge CHL encompasses the majority of the Complex. This organically developed landscape incorporates settlements, former milling and quarrying sites, railway heritage, recreational sites and natural sites with strong cultural associations within the Credit River Valley. This CHL embodies a number of historic themes, including early industry, transportation, recreation and nature conservation.

This CHL has strong ties to the Caledon’s central themes and embodies distinctive settlement patterns and characteristics influenced by early activities in the area. It is also acknowledged for its harmonious long-standing relationship between the natural and domestic landscape, exemplified by several features within the Belfountain Complex. The 2009 Inventory also states that Mack’s Park “is a jewel within the Belfountain Candidate CHL, and is in itself a significant cultural heritage landscape”.

3.3.2. Credit Valley Railway

The Credit Valley Railway (CVR) runs adjacent to the Cox Property along the northeast portion of the Complex. The CVR can be classified as an organically evolved and continuing landscape which developed through use by activities that directly shaped the landscape, and which historic uses continue today. The development and subsequent decline of the former CVR and its successors influenced the pattern of settlement within the Town of Caledon.

The CV Railway was established in 1871 and constructed through some of the most difficult and scenic terrain in the region. Of the five rail lines that historically traversed the Town of Caledon, it is one of only two that remains intact and still operates as an active rail line today. The CVR is noted as an important character-defining element within several other inventoried CHLs.

3.4. POTENTIAL TO CONTAIN INTACT CULTURAL HERITAGE RESOURCES

The potential for locating cultural heritage resources within the Complex is high in areas that have not been disturbed. The three most significant factors that determine settlement locations of pre-contact peoples include:

- Within 300m of a primary water source (e.g. lake, river);
- Well drained soils; and
- Flat to gently sloping terrain.

Given these variables, and the fact that a range of findspots have been discovered within a 3km radius of the site, the Complex exhibits a high potential for locating pre-contact sites. Due to the development in the Complex over the past 150 years, however, it is likely that many sites and cultural remnants have been removed or disturbed. Various cultural heritage resources have been identified within the Complex, including quarries, mills, water control structures, cottages, infrastructure related to the railway and other structures itemized.

3.4.1. Known Archaeological Sites Within the Complex: A total of nine registered archaeological sites have been identified within three kilometres of Belfountain Conservation Area, including “Mack’s Park” itself. Seven of these findspots are of native cultural origin from aceramic or pre-ceramic occupations and characterized by chipped stone fragments or projectile points. The dates of these occupations date from 5000 years ago to about A.D. 1400. The single 19th century Euro-Canadian archaeological site reflects early immigrant settlement in the area. The wide range of time periods reflected in this area indicates that numerous other locations may exist and have simply not yet been discovered.

Table 5 - Registered Archaeological Sites in Proximity to the Complex

Borden #	Site Name	Cultural Affiliation	Description
AkGx-13	-	Native	Chert artifact
AkGx-14	-	Native, Archaic	Projectile point
AkGx-15	-	Native, Late Archaic	Projectile point
AkGx-16	-	Native	Chert artifact
AkGx-17	-	Native, Early Woodland	Projectile points
AkGx-18	Westerveld	Euro-Canadian	19 th century occupation
AkGx-23	-	Native, Middle Archaic	Chert projectile point
AkHa-8	-	Native, Middleport	Chert projectile point
AkHa-10	Mack Park	Euro-Canadian	19 th century occupation

3.5. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

The Complex contains a wide variety of historic resources and provides ample opportunities for interpretation and educational programming. Given the cultural significance of this area, maintenance, and where feasible restoration activities, should be undertaken to ensure that the unique cultural resources remain in good condition.

Due to its high potential to contain PreContact and EuroCanadian sites archaeological assessments are recommended prior to any construction in areas that have not yet been disturbed.

4.0. CONSERVATION AREA VISITORS

Visitors to the Belfountain Complex vary widely in terms of demographics, city of origin, behaviour and leisure pursuits. Visitor information is collected through CVC's Lands Monitoring Program. A component of the Program focuses on the collection of visitor data. Methods for data collection include Visitor Information Surveys, automated trail counts, postal code analysis and observation collection. Section 4.0 highlights the results of this work; additional reference to these data-sets is found throughout sections 5.0, 6.0 and 7.0. Visitor data collection has focused on Belfountain Conservation Area and while little is known about the number and types of visitors to the Cox and Willoughby properties, it is estimated that the visitation is very low to moderate, respectively.

4.1. VISITOR ANALYSIS

A comprehensive Visitor Information Survey was conducted at Belfountain Conservation Area in 2010 with the goal of gaining baseline information for visitor demographics,

visitor attributes and site attributes. Surveys have also been carried out at Belfountain Conservation Area in 1983, 1991, 2002, and 2007. The information contained in this section of the report is based on the data collected in 2010. Detailed information on the results of the 2010 Belfountain Conservation Area survey can be found in the Belfountain Conservation Area 2010 Visitor Survey Report (CVC, 2011).

4.1.1. Visitor Demographic Data

Demographic information describes the basic characteristics of a population, and identifies standard features, such as age and gender. The statistics gleaned from the 2010 Visitor Information Survey indicate that the majority of visitors travel with their families from large urban centres. The high percentage of visitors in the 30 – 45 and 0 – 12 age ranges, and the increasing average group size is consistent with this trend. The 2010 Survey determined the following:

- Half of visitors are with family members; 22% are with a spouse
- 30% of visitors identified themselves within the 30 – 45 age group; 21% of visitors are classified as children (0 – 12)
- The most common places for visitors to originate were:
 - Brampton (22%);
 - Mississauga (21%); and
 - Toronto (20%),the remaining 37% of visitors travel from 46 distinct locations, including Caledon, Orangeville and Georgetown
- The average visiting group size is 4.3 (5% higher than in 2002, and almost 10% higher than in 1991); 19% of groups contain 6 or more people

4.1.2. Visitor Attribute Data

Visitor attribute data identifies how different groups use Belfountain Conservation Area, and the characteristics of their visit. The primary activity for the majority of visitors is hiking, though visitors tend to participate in more than one activity during their visit. Visitors cited a number of reasons for visiting, including to escape and get fresh air, and to see or experience a particular feature. The survey also determined that the average length of a visit was 1 – 2 hours. Statistics related to visitor attributes include:

- 45% of survey respondents were first time visitors
- The most popular reasons for visiting include:
 - hiking (20%);
 - to escape and get fresh air (19%);
 - to experience a particular feature (e.g. trail system, dam and swing bridge; 17% of respondents); or
 - to see the fall colours (10%).
- The activities that visitors participate in:
 - hiking (77%);
 - photography (33%);
 - picnicking (29%).

- When asked what additional infrastructure or programming they would like to see respondents indicated that Cultural Heritage Appreciation (25%), Educational Programming (22%) and extended seasonal hours (20%) were of most interest.

4.1.3. Site Attribute Data

Site attribute data indicates how visitors perceive a conservation area; what they like, what they would like to see changed, and how they see the Conservation Area meeting the needs of both themselves and their community. Visitors were asked to rate infrastructure and facilities, note the changes that they would like to see and identify how they valued various features. While most components of the conservation area were satisfactory, a few reoccurring comments included the addition of interpretative signage and the condition of washroom and parking lot facilities on busy weekends.

- 15% of survey respondents would like to see additional signage, 8% stated that they would like to see maintenance improvements (reduce litter, cleaner washrooms), and 8% would like to see changes to policies and rules (e.g. ban smoking, reduce fees).
- 90% of respondents rated the trail system, natural habitat, dam and waterfall, and bridge as very high or high importance to their visit
- The cave is regarded as the least important attraction; only 62% of visitors ranked it as being of high or very high importance.

The information collected through the 2010 Visitor Information Survey describes Belfountain Conservation Area visitors and their characteristics. Visitors often pursue more than one activity during their visit, such as gathering to barbecue in the picnic area, fish along the river's edge, and hike, all while capturing their experience with cameras in hand. The majority of visitors are accompanied by family members and group sizes have increased in recent years. Most visitors travel from major urban centres in order to reconnect with the natural environment and escape from their daily routine. Visitor analysis also shows that a number of visitors travel from outside the Watershed, indicating the draw of Belfountain as a regional destination.

4.1.4. General Population Statistics

Under the 2010 Visitor Information Survey at Belfountain Conservation Area, visitors were asked to provide their postal code to allow for further demographic analysis. With support from students in the Geography program at Ryerson University, postal code analysis was conducted in order to develop a visitor profile and define primary and secondary trade areas for the Complex (Ryerson University, 2011). To conduct this work geographic information was evaluated against Statistics Canada data to determine demographic attributes associated with the visiting population.

Belfountain Conservation Area's primary trade area is characterized by its core group of visitors; defined by 2010 postal code data as the area in which 66% of visitors originate. The primary trade area encompasses Orangeville, Caledon, Brampton, Halton Hills and Mississauga. The secondary trade area, identified as the area in which 95% of all visitors

originate, includes Markham, Toronto, Richmond Hill and Vaughan. Highlights from 2006 census data (Table 6) reveals some differences between the two trade areas and the Ontario average.

Table 6 - General Population Statistics for Primary and Secondary Trade Areas

Statistic (2006 census)	Primary Trade Area	Secondary Trade Area	Ontario ²
Median Age	35.4	37.9	39.0
Average Household Size	3.2	2.7	2.6
Median Family Income	\$71, 879	\$65,060	\$60,455
Percent identified as an Ethnic population ³	48.8%	44.6%	22.8%

Residents within both trade areas are younger than the provincial median; the median age of primary trade area residents is almost 3.5 years younger than the province. The higher average household size and median family income within the primary trade area indicates a higher percentage of families with slightly more disposable income.

Populations in both the primary and secondary trade areas have a very high ethnic presence (48.8% and 44.6% respectively), with just less than half of all residents speaking a language other than, or in addition to, English. Across both trade areas, the number of people with a college or university certificate has increased since the 2001 census. Correspondingly, the population without a high school diploma, or equivalent, has decreased by 22% in the primary trade area and 33% in the secondary trade area, since 2001.

Understanding visitor demographics and population statistics is essential for guiding the development of recreation programs, educational and interpretive programming and associated fees. Continued analysis of the postal codes collected at Belfountain Conservation Area is ongoing and as data becomes available it will be incorporated into the broader visitor profile and market analysis for planning at the Complex.

4.2. VISITATION

The 2010 Visitor Information Survey revealed that for 45% of visitors, it was their first visit to Belfountain Conservation Area. Given that some individuals make multiple visits per year, counting individuals would underestimate the true impact of human use. For the purposes of this report, a visit is defined as a single person visiting any part of the Complex for a single visit.

² <http://www12.statcan.gc.ca/census-recensement/2006/dp-pd/92-596/P1-2.cfm?TID=0&Lang=eng&T=PR&PRCODE=35&GEOCODE=35>

³ As per the Statistics Canada definition for this section, this does not include the aboriginal population

Visitation varies widely between the three properties that make up the Belfountain Complex. It is likely that the Cox Property receives very low visitation due to its inaccessibility and lack of a formal trail system, though a site visit in December 2012 confirmed the presence of unsanctioned trails and revealed litter and vandalism. Visitation to the Willoughby Property is limited to individuals using the Trimble Trail and is estimated to be low to moderate. Visitation at Belfountain Conservation Area is monitored through both gatehouse receipts and CVC’s Automated Counter Program; use is considered to be high during the operating season.

Figure 16 illustrates the number of paying visitors to Belfountain Conservation Area over the past 5 years. Visitation numbers appear fairly consistent at the Conservation Area; historic articles and reports confirm that visitation between 20,000 and 25,000 visitors per year has been standard for several years:

- A 1956 article about “Belfountain Park” stated that *“The total seasonal attendance is about 25,000 and on a busy holiday about 1,500 people use the park”*
- In a magazine article entitled “Mack’s Park” (date unknown), it was stated that more than 20,000 people visit the park each year
- A survey conducted in 1991 recorded an annual visitation rate of 17,941 for that year. It is not known what factors contributed to a relatively low visiting population in 1991.

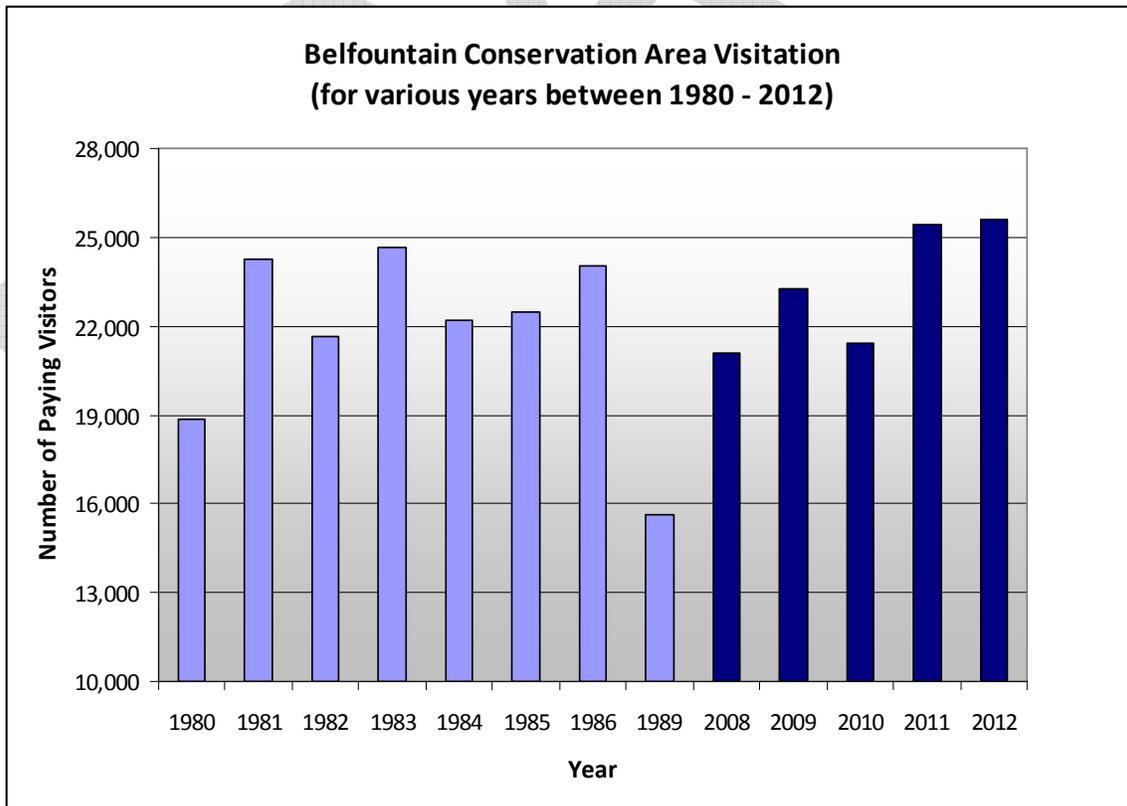


Figure 16 - Gatehouse Receipts for Belfountain Conservation Area in the past 5 years

* The above numbers were admission paid through the gatehouse and not representative of member visitation, wedding visitation, or special events.

4.2.1. Automated Counter Program

Three trail counters were installed at Belfountain Conservation Area in 2009, and are located at the Main Gate access, Pinnacle Street access, and along the Trimble Trail, at the approximate boundary between Belfountain Conservation Area and the Willoughby Property. They are each positioned to collect specific datasets:

- The Main Gate trail counter is primarily used to determine off-season and after-hours activity;
- the Pinnacle Street counter records unsanctioned access to the property at this access point; and
- the Trimble Trail counter was installed to determine trail usage and access from Forks of the Credit Provincial Park.

Due to the complex layout of the property, the most accurate estimation for overall property usage combines both gatehouse receipts as well as trail counter data.

Figure 17 illustrates the data collected by the Trimble Trail counter between 2010 and 2012. An increase in visitation is notable during the spring, summer and fall months when Belfountain Conservation Area is open to the public. A marked increase occurs in October, though data in 2011 and 2012 for the month of October is not accurately depicted due to missing datasets.

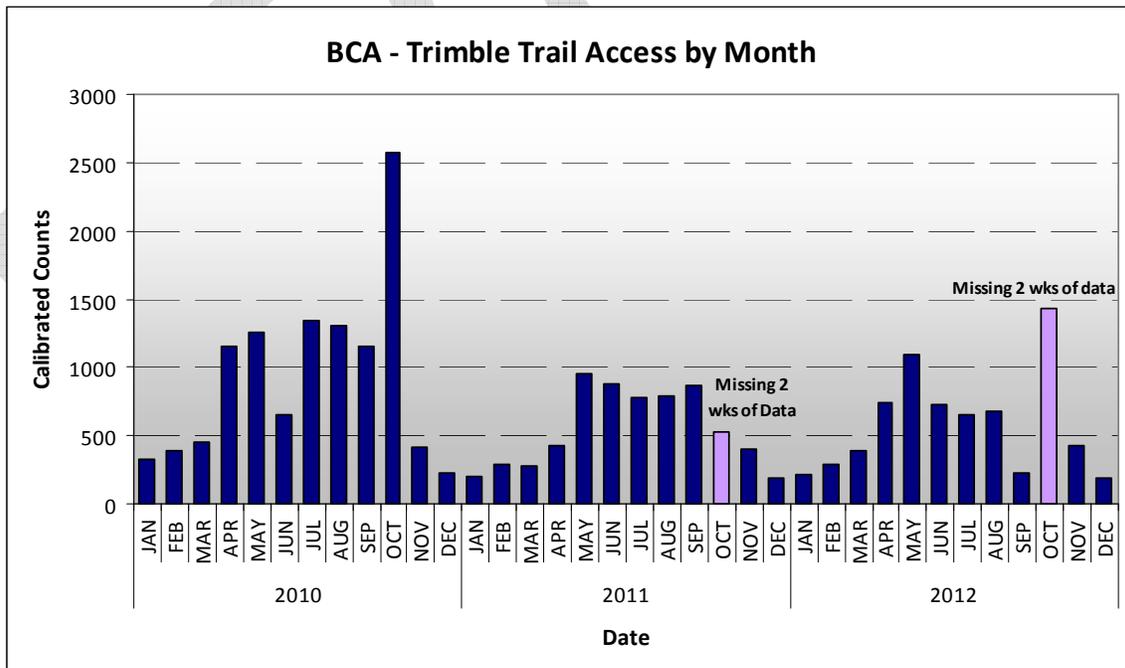


Figure 17 - BCA Trimble Trail Access by Month (2010 - 2012)

The analysis of the trail counter located at the Main Gate access is geared toward understanding after-hours use. After-hours use is considered any visitation that occurs between the last week of October and the last week of April and any visits that occur between 10pm and 5am. Figure 18 demonstrates annual unsanctioned visitation at Belfountain Conservation Area. Use during unsanctioned times appears to closely relate to weather and temperature patterns, which may account for the annual variations between months. High amounts of after-hour use tend to be associated with statutory holidays.

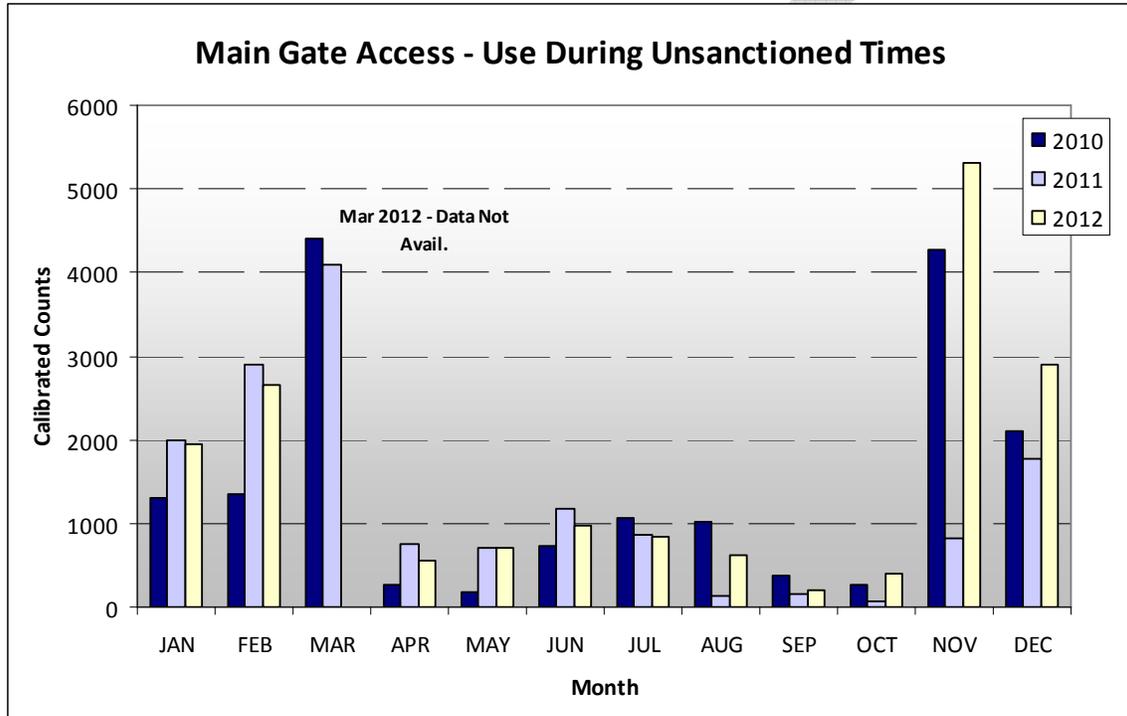


Figure 18 - Unsanctioned Use Captured by the Main Access Trail Counter

The long-term analysis of trail counter data also sheds light on the visitation habits of visitors, such as popular times of day and day of the week, monthly and seasonal trends. This information can be used to characterize visitor patterns, identify linkages between visitation and events or attractions, as well as how different features (e.g. geographic location, proximity to regional trail systems) affect visitation.

Table 7 illustrates general statistics gleaned from trail count data in 2010, 2011 and 2012. The highest visitation is experienced on Sunday afternoons in October.

Table 7 - Trail Counter Statistics for Belfountain Conservation Area

Statistic	2010		2011		2012	
	Trimble Trail	Main Gate ⁴	Trimble Trail	Main Gate	Trimble Trail	Main Gate
Highest Visitation Month	October	October (Gatehouse)	October	October (Gatehouse)	October	October (Gatehouse)
Most Popular Day of the Week	Sunday	N/A	Sunday	N/A	Sunday	N/A
Most Popular time of the Day	Afternoon (2pm-5pm)	N/A	Afternoon (2pm-5pm)	N/A	Afternoon (2pm-5pm)	N/A
Annual Visits Counted	10,434	17,371	6,585	15,436	7,597	17,144
Days with Data	365	365	353	332	366	349
Estimated Annual Visits	10,434	17,371	6,896	16,473	7,597	17,466
Most Popular Season	Fall	N/A	Summer	N/A	Fall	N/A
Median Visits per Day	11	N/A	9.7	N/A		N/A
Busiest Day of the Year	Thanksgiving (Monday)	March 31 (Movie Shoot)	May 8 (Mother's Day)	Off Season: March 20; After-hours: May 20	Thanksgiving Monday	Off Season: Nov 11 After-hours: July 26

4.2.2. Carrying Capacity and Limits of Acceptable Change

The concept of carrying capacity is based on ecological definitions and principles which identifies the number of individuals that a specific area can sustainably contain over the long term. This model can be loosely applied to protected areas and the determination of the appropriate number of visitors the site should receive by identifying specific indicators and measuring visitor impacts. The Limits of Acceptable Change system evolved from the notion of measuring human impact in protected areas and refines the concept to furthering the understanding of the conditions desired in a protected area and adjusting visitor use around those parameters (Manning, 2006).

While the framework for understanding Limits of Acceptable Change is comprehensive, applying the concepts is difficult because of the complex, non-linear relationship between visitor use and degradation. Impacts of unmanaged visitation can include the degradation of the natural environment, reduction in the quality of the visitor experience and increased demands on infrastructure and resources. Conservation area staff observations have indicated that during specific time frames (on holiday weekends in the summer and the fall), carrying capacity is likely surpassed. While specific indicators are not measured, staff have noted complaints about parking, garbage and washroom facilities, and an increase in visitor-visitor conflicts during peak weekends. Thought should be given to human impacts on the Complex; what is appropriate, what is acceptable and how these parameters can be incorporated into management planning and subsequent monitoring.

⁴ The data for the Main Gate Access only accounts for after-hours data

4.2.3. Accessibility

General accessibility of a protected area contributes to visitation rates, the percentage of repeat visitors and the type of visitors. The accessibility of the Complex, specifically Belfountain Conservation Area, relates to a number of different factors including its operating hours and season, amenities available to disabled visitors, targeted marketing, gate fees and travel times.

Some of these factors, such as travel time, likely promote visitation because of the proximity of the study area to large urban centres. Marketing, which has not been a priority for CVC conservation areas, is likely neutral; neither promoting nor discouraging visitation.

The layout of Belfountain Conservation Area and the design of any infrastructure need to be taken into account and accessible elements and features should be incorporated as appropriate.

During the 2010 Visitor Information Survey of Belfountain Conservation Area visitors, only 5.1% of visitors stated that entry fees were too high. While the cost of entry into Belfountain Conservation Area may be viewed as a barrier to some visitors, it is more likely that individuals who view the cost as prohibitive do not visit the conservation area at all. Understanding, evaluating and planning for barriers to accessibility is crucial for supporting a broad visitor base.

4.2.4. Impacts to Visitation

Annual visitation can be influenced and affected by a number of internal and external factors. As a general rule for any outdoor recreation activity, visitation is closely linked to weather conditions, and poor weather over a long period can lead to a sharp decrease in visitors. Perceived environmental threats and hazards such as the prevalence of West Nile virus, Lyme disease or smog days, may also deter the public from visiting natural areas. Barriers such as road construction and closures and increasing prices of fuel may also play a part in overall visitation. It can also be expected that competing attractions, activities and events may reduce visitation on specific weekends or days. While many of these factors cannot be controlled, it is important to continue to monitor and assess reasons for fluctuations in visitation.

4.3. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

Conservation area visitors, who they are, and how often they visit, are a product of a diverse range of internal and external factors. These factors include the geographic location, the amenities, programming and services it has to offer, past visitor experiences, as well as weather conditions, regional trends, and competition from other attractions.

The temporal dispersion of visitation at Belfountain Conservation Area, as demonstrated with recent visitation statistics, is skewed; visitation is clustered around specific dates and certain times of year. While patterns of visitor use are based on the existing property layout, infrastructure, and regional tourism trends, encouraging visitation at off-peak times and promoting the distribution of visitors throughout the site, may help to diminish social and environmental conflicts.

5.0. RECREATION, EDUCATION AND PROGRAMMING

While this report discusses recreation, education and programming activities for the Complex as a whole, it is important to note that activities and development differ drastically between the properties. Belfountain Conservation Area is operational from April through to October each year and receives heavy visitation throughout the summer and fall. Hiking, picnicking, photography and social and family gatherings are popular activities and facilities and infrastructure exist to meet those needs. The Willoughby Property limits visitor activity to hiking and other non-consumptive activities (e.g. photography, nature viewing) on Bruce Trail side trails. It does not contain the facilities or infrastructure to support additional recreation activities. The Cox Property is currently not accessible to the public and sanctioned hiking trails have not been established.

5.1. RECREATION ACTIVITIES

Development of the existing recreation and appreciation programs in the Complex are largely a result of CVC's conservation area objectives: protection and appreciation before recreation.

Visitors are drawn by an appreciation for natural and cultural heritage and participate in much of the same passive recreation activities that have been occurring since Mack's Park first opened to the public in the early twentieth century. Several activities, both sanctioned and unsanctioned have been identified within the Complex (Table 8).

Reservations for private events are recorded for Belfountain Conservation Area on an annual basis. Tracking statistics for weddings, professional photography sessions and large picnics can help to identify visitor trends and allocations for future resources. Figure 19 contains the data for reservations from 2008 to 2012. Belfountain Conservation Area averages 4.6 weddings per year and 23 reserved picnics. The number

of permits provided for professional photography sessions has also steadily increased; from 4 in 2008 to 19 in 2012⁵.

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⁵ 2013 Statistics were excluded due to limitations with the use of some features within the conservation area

Table 8 - Recreation Activities in the Belfountain Complex

Activity	Permitted?	Facilities Involved	Notes
Hiking	Yes	- Internal trail system (Belfountain CA) and/or Bruce Trail (Trimble trail Side trail) -Belfountain CA and the Willoughby Property only	- 77% of visitors surveyed in 2010 stated that they participated in hiking during their visit (56% stated it was their primary activity).
Picnicking	Yes	- Picnic tables - Four large picnic areas (may be reserved) - BBQ's available for rental rent	- Attracts large groups to Belfountain CA - 29% of visitors surveyed in 2010 stated that they participated in picnicking (15% stated it was their primary activity).
Fishing	Yes, in season, with license	- various sections of the river in Belfountain CA and on the Willoughby Property are popular	- 4% of visitors surveyed in 2010 participated in fishing - Fly-fishing is popular throughout the West Credit River - network of unsanctioned angler trails by the river - Special fishing regulations apply to the areas
Swimming/ Wading	No (historic use – 1950's – 1980's)	- wading pool had mixed success but was filled-in in 1981 - Swimming/wading is not currently permitted	- still occurs on occasion - currently considered to be a health and safety issue
Sun Tanning	Yes	- none	- Not considered to be a common activity, but 41% of survey respondents at Belfountain Conservation Area in 1991 ranked this activity as very important
Mountain Biking	No	- internal trail system and/or Bruce Trail	- evidence noted on both trail systems, particularly through the Willoughby Property - the activity does not appear to be very popular, but should continue to be monitored
Geocaching	No	- trail system and adjacent land – likely occurs off trail - www.geocaching.com shows the location of geocaches located within the Complex	- public initiated activity whereby an individual will hide a 'cache', and other 'geocachers', will attempt to locate it using a portable GPS unit. Often involves off trail use - Not specifically observed within the study area, but likely occurring
Interpretive Programming	Yes	- internal trail system and/or Bruce Trail - amphitheatre - picnic area	- Nature walks and spirit walks have taken place at Belfountain CA in the past though the success of these programs is unknown
Heritage Appreciation	Yes	- Cultural features (built structures as well as early industrial uses) on site - Specific attractions for some visitors	- Some features (Belfountain dam, quarry remnants) are featured in guide books - Potential for development - 25% of visitors surveyed in 2010 stated that they would like to

			see more heritage appreciation initiatives
Nature Viewing	Yes	- internal trail system and/or Bruce Trail - sloped forest area, trails and the Belfountain dam headpond offer some wildlife viewing areas	- 16% of visitors surveyed in 2010 participated in nature viewing during their visit - minimal wildlife viewing opportunities (programming could be geared toward fish, insects, microfauna, etc)
Photography	Yes	- internal trail system, Bruce Trail and natural areas - amphitheatre and other cultural features	- 33% of visitors surveyed in 2010 participated in photography during their visit (9% stated that it was their primary activity) - Permit and extra fees required for professional and wedding/engagement photography
Winter Activities	Not permitted within Belfountain CA; but hiking on the Bruce Trail is permitted	- internal trail system (not permitted) and Bruce Trail (permitted)	- unsanctioned winter use does occur on the property (hiking, snowshoeing, etc)
Weddings	Yes, with permit	- outdoor amphitheatre - cultural heritage features	- limited to ceremony only - possibility of expansion could be explored (e.g. reception facilities, partnering with local businesses) - Permit and extra fees required
Social/Group Gatherings	Yes – both with and without permits	-picnic area (areas may be reserved) - BBQ rentals - open space in picnic area – sports are common	- 18% of visitors surveyed in 2010 participated in social and group gatherings during their visit (8% stated that it was their primary activity)
Salamander Festival	Yes	- picnic area - washroom facilities - parking lot - Belfountain Hamlet	- held in the fall in conjunction with Belfountain Public School the Belfountain Community Organization - Event consists of vendors, interpretive stations, and demonstrations
Garlic Mustard Festival	Yes	- picnic area - washroom facilities - parking lot	- 2012 was the first Festival - held in the spring and hosted by the Belfountain Public School, partners include CVC and the Belfountain Community Organization

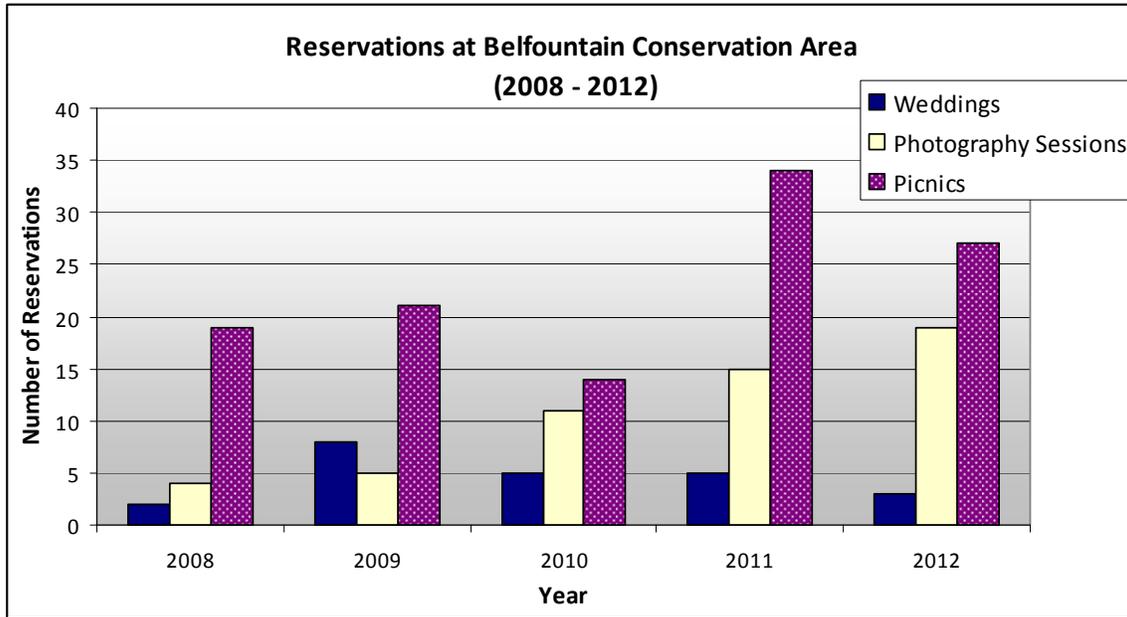


Figure 19 - Reservations at Belfountain Conservation Area (2008 - 2012)

5.1.1. Recreation Programming Strategy

In 2011 CVC retained Schollen & Company Inc and partners to prepare a Recreation Strategy for CVC’s four active conservation areas (Belfountain, Terra Cotta and Island Lake Conservation Areas and Ken Whillans Resource Management Area). The purpose of the Strategy is to identify revenue potential, service and facility improvements and recognize partnership opportunities in order to ensure fiscal sustainability. The plan also intends to address issues related to aging infrastructure and changing visitor trends and demographics.

The Strategy proposes a number of new educational and recreation opportunities for Belfountain Conservation Area, identifies a property theme (Cultural Heritage Interpretation) and makes marketing recommendations. Preliminary ideas generated from this Strategy are highlighted in Table 9.

Table 9 - Preliminary Recreation Concepts for Belfountain Conservation Area

<i>Theme: Celebrating the Cultural Heritage of the Credit River</i>		
IDEAS	ISSUES	OPPORTUNITIES
<ul style="list-style-type: none"> • Geological research/ education • Fishing – fly fishing lessons, fly fishing shop • Playground • Photography workshops/ lessons • Summer Camps • After hours uses • ‘Spirit Walk’ interpretive walk 	<ul style="list-style-type: none"> • Carrying capacity • Build a stronger relationship with Belfountain Village residents • On-line pond impairs fish habitat and sediment accumulation needs to be addressed • Not enough parking • Need to increase office/meeting space 	<ul style="list-style-type: none"> Natural and cultural heritage interpretation • Efficiently utilize existing assets: <ul style="list-style-type: none"> o Lighting and sound at amphitheatre o LCBO licenses for weddings o Historical interpretation o Expanded parking

The information and ideas contained in the Recreational Programming Strategy will help to guide the development of new programs and features within the Complex.

5.1.2. Unsanctioned and Illegal Activities

Unsanctioned and illegal activities have plagued Belfountain Conservation Area and operations staff for the past few decades. After-hours use is common for this conservation area and it is sometimes accompanied with acts of vandalism, partying and general misuse of the property. The situation of Belfountain Conservation Area near the quiet Hamlet of Belfountain, its relatively secluded driveway and lack of street lighting may present increased opportunities for after-hours use. Options to deter illegal and unsanctioned activities should be explored to improve the safety and security of the Complex.

5.2. EDUCATION AND PROGRAMMING

While CVC does not currently host any formal education programs on the property, CVC staff will attend festivals and events and promote various topics as they relate to the event's theme. For example, local flora and fauna are displayed during the Belfountain Salamander Festival.

The Belfountain Public School frequently uses the property for education purposes. Their activities have included organizing the 2012 Garlic Mustard Festival, as well as outdoor classroom education experiences, and supporting invasive species removal events.

5.3. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

The Belfountain Complex is limited in terms of size and shape; recommendations that utilize the property to its optimal capacity are essential. Consistent with the goals and objectives of CVC's Conservation Areas Strategy, the Complex should encourage passive recreation activities that require a high quality natural environment, such as hiking and fishing.

The contrasting development of Belfountain Conservation Area and the Willoughby Property has led to a lack of fluidity between how these sites are managed and how they appear to the public. Enhancing the connection between Belfountain Conservation Area and the Willoughby Property, perhaps with a cohesive interpretive signage plan, may strengthen this connection and invite visitors to further explore the trail system.

Visitor Surveys conducted at Belfountain Conservation Area in 2010 confirm that opportunities exist to develop an increased natural and cultural heritage appreciation program. Implementing an effective, innovative interpretive program will cultivate a public interest in the natural and cultural heritage features found within the Complex as well as facilitate visitor engagement.

Due to the nature of the most common recreation activities noted on site (hiking, picnicking, social and family gathering), adverse weather conditions could severely depress visitation. This could represent a real problem in terms of revenue generation if unfavourable weather conditions occurred during peak visitation periods⁶. Additional infrastructure that offers some protection from the weather would likely increase customer satisfaction and possibly visitation and special events throughout the operational season.

Communicating with partnership groups, the community and identifying connections with other protected areas in close proximity will be essential for changing or expanding the recreation and programming priorities for the study area. Existing stakeholders, such as the Belfountain Public School, Belfountain Community Organization and the Caledon Hills Bruce Trail Club are already involved with hosting events at Belfountain Conservation Area and should be consulted.

6.0. INFRASTRUCTURE

While the vast majority of the infrastructure located within the Belfountain Complex is contained within Belfountain Conservation Area, structures and features also exist on the Cox and Willoughby properties. Infrastructure can be organized into one of three main categories:

- *Decorative infrastructure and assets that were built prior to CVC ownership:* These features have limited functionality in terms of conservation area operations and were primarily built for aesthetic purposes. Many of these features, including the cave and the stonework, act as tourist attractions - reminding visitors of the area's recent past and helping to define the character of Belfountain CA.
- *Recent land improvements and related visitor infrastructure:* This group of structures relates to most of the infrastructure and assets installed by CVC to either enhance the visitor experience or to advance conservation area

⁶ In 2011, 17% of total visitation occurred during one week in October (October 4th – 13th)

operations. The trail system and washroom facilities fall under this category. The combined assets in this category have an estimated value of \$595, 219.46.

- The third type of infrastructure is present throughout the Belfountain Complex and relates to the area’s residential and industrial past. Evidence of milling and quarrying activities and the remains of structures in various levels of deterioration exist within the Complex. These items are detailed in section 3.2.

Appendix D contains a list of all the infrastructure and assets, including signage, within the Complex.

6.1. BUILDINGS

Four main buildings are located within the Complex (Table 10).

Table 10 - Buildings in the Belfountain Complex

Building	Year Built	Size	Features and Use	Notes
Workshop	1990	- one storey - ~250m ²	- contains a staff office, workshop and public washrooms - Heat, hydro, water, and phone set-up	Valued at \$255,592
Gatehouse	2008	- one storey - 14.6m ²	- Staffed during the operating season to welcome visitors and collect gate fees - Heat, hydro and phone set-up	Valued at \$13,166
Pumphouse	2000	- one storey - 14.24m ²	- gravity powered spring feeds water to the pumphouse which is distributed throughout Belfountain - Hydro and water	Valued at \$15,325
Cox Cottage	1930's	- one storey	- small dilapidated structure located on the Cox Property - not currently in use - hydro, spring fed water line	N/A

6.1.1. Workshop and Washroom Facilities

The workshop facilities located in Belfountain Conservation Area also contain the public washrooms and a small staff office. Built almost twenty-five years ago, the footprint of this one storey structure provides an opportunity to re-configure the existing layout of the building as well as to perhaps expand its current functions to include meeting space or other additional features.

6.1.2. Gatehouse

The gatehouse is a small building with a single function; to provide a point place where staff can welcome visitors into the conservation area, monitor use and collect fees. Options to explore additional functions for the gatehouse building, and possibly moving the gatehouse to a better location near the Forks of the Credit Rd, should be explored.

6.1.3. Pumphouse

The small pumphouse located on the north side of the West Credit River within Belfountain Conservation Area distributes spring fed water to the rest of the conservation area. This building may present an opportunity for expansion and options to include accessible washrooms in this area should be discussed.

6.1.4. Cox Property Cottage

Until November 2013, an agreement between CVC and Mary Catherine Cox, the former owner of the Cox Property existed for the lease of the Cox Cottage. The original agreement provided for the “quiet enjoyment” of the cottage for personal use by the tenant. Mary Cox surrendered her right, title, interest in and occupancy of the cottage in a letter dated November 12, 2013.

The cottage is in a state of disrepair and it is recommended that it be demolished and the site restored.

6.1.5. Cultural Structures

Several structures were constructed previous to CVC ownership, and can still be found throughout Belfountain Conservation Area (Table 11). Many of these features are unique remnants from the first half of the 20th century and were constructed for decorative and aesthetic purposes. These features, such as the bell fountain and dam and waterfall have become synonymous with the conservation area as well as the Hamlet of Belfountain.

Table 11 - Cultural Structures Located within the Belfountain Complex

Structure	Year Built	Features and Uses	Notes
Belfountain Dam	- 1908	- visitor attraction - likely a water power generation structure before Mack owned the property	- built to emulate Niagara Falls
Swing Bridge	-early 1900's	- visitor attraction	- originally constructed by Mack, has been re-built and restored multiple times
Bell Fountain	- early 1900's	- visitor attraction; built to celebrate the name of the Hamlet of Belfountain	- Originally constructed by Sam Brock, has been restored multiple times; most recently by the grandson of Sam Brock
Yellowstone Cave	- early 1900's	- visitor attraction	- Should be assessed for structural integrity
Terrace/Outdoor Amphitheatre	- early 1900's	- visitor attraction and location for wedding ceremonies	- original location of Charles Mack's cottage
Brick Work	- early 1900's	- decorative attraction, popular background for photographers	- mostly constructed by Sam Brock and his brother
Concrete Bridge	unknown	- used by conservation area	- structural integrity should

		staff for operations purposes - a remnant of past industrial uses	be assessed - a few reports make mention of a bridge over the Credit River that was the site of carriage accident
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6.2. WASHROOMS

Access to public washrooms at Belfountain Conservation Area is limited to the operating season. The main public washrooms are located in the same building as the workshop and contains separate facilities for men and women. In addition to these facilities, a composting toilet was constructed in 2011 in the southern corner of one of the parking lots. This facility is used almost exclusively by the Belfountain Public School, who partnered with CVC to install the washroom. Washroom facilities do not exist on the Cox and Willoughby properties.

6.3. PARKING AND ROADS

Two parking lots exist at Belfountain Conservation Area; one comprised of gravel (330m²), the other of brick (920m²), and have a combined area large enough for approximately 45 vehicles. Two handicapped parking spaces are available near the gatehouse. Credit Street, the short access road from the Forks of the Credit Road to the parking lot, is approximately 180m in length and paved.

An access way from Scott St. also passes through the north end of Belfountain Conservation Area. This 265m road ends at 25 Scott St, also known as the Christie Property, a 9.57 acre parcel that was acquired by CVC in 1994 and amalgamated into the conservation area. The original house on the site was demolished in 2006 when several deficiencies were found, including the fact that it was not built on a stable slope. The site has since been restored through tree planting initiatives.

Two driveways (owned by the OHT) totaling approximately 1423m, meander through the Willoughby Property as well. The last 1290m of Scott St. ends at a residential property; a 3.5 acre lot that was sold by the Ontario Heritage Trust to the original homeowner in the early 1990's. The street intersects the Crows Nest side trail in two separate areas as the trail loops through the property.

Although one small gravel parking spot does exist at the entrance to the Cox Property, there are no formal parking areas at either the Willoughby or Cox properties. Parking often occurs along the Forks of the Credit Road by Bruce Trail hikers wishing to access the trail system through the Willoughby Property. It is also expected that some hikers

may park at the Forks of the Credit Provincial Park and hike through to the Willoughby Property via the Trimble side trail.

6.3.1. Road Allowances

Several road allowances within the Belfountain Complex have been identified for acquisition by CVC. These parcels are owned by the Town of Caledon, and were originally retained because of their potential value as future transportation linkages. As this is no longer a possibility, CVC is pursuing the acquisition of these parcels so that all of the land within the Complex can be owned and managed by one agency. The road allowances within the complex total 3.67 acres and are outline in **Table 9**.

Table 12 - Belfountain Complex Road Allowances

Street Name	PIN	Legal Description		Size	
		Part	Plan	Square Metres	Acres
McDonald St.	14268-0414	4	43R-24462	1496.12 m2	0.37
	14268-0411	2	43R-24462	267.99 m2	0.07
	14268-0413	3	43R-24462	267.83 m2	0.07
	14268-0004		CAL-20	76.12 m2	0.02
Pinnacle St.	14268-0021	6	43R-24462	623.31 m2	0.15
	14268-0208	5	43R-24462	517.57 m2	0.13
Credit St.	14268-0026	8,9	43R-24462	1884.23 m2	0.47
	14268-0209		CAL 2	50.19 m2	0.01
Gordon St.	14268-0049		CAL-20	4020.01 m2	0.99
5 th Concession WHS	14268-0033	Lot 20A	CAL-20	2483.11 m2	0.61
River St.	14268-0210		A-91	3174.56 m2	0.78
Total					3.67

6.4. INFORMATION AND SIGNAGE

Information and signage have existed in varying states throughout the operational history of Belfountain Conservation Area. Signage throughout the study area currently consists of:

- CVC Core 10 Signage
- Caution Signage (No Lifeguard on Duty; Dam Safety)
- General Notice and Directional Signage
- CVC Trail Directional Signage
- Interpretive Signage (two signs located on the Willoughby Property)
- Regulation Signage
- Bruce Trail Wayfinding Signage

A kiosk that contains information about CVC programs and events is located near the parking lot. The lack of interpretive signage at Belfountain Conservation Area has been

identified as a deficit by visitor survey respondents. Past cases of vandalism have resulted in the removal of much of the interpretive signage on the site. The unique natural and cultural history and features of the site warrant the replacement or installation of new interpretive signage. Information and maps of the site and the trail system would further benefit the visitor experience.

6.5. TRAIL SYSTEMS AND RELATED INFRASTRUCTURE

Both the Bruce and CVC trails contribute to the overall trail system located within the Complex. The Bruce Trail, managed in partnership between the Caledon Bruce Trail Club and CVC, was formally established in the area in the early 1960's. The Bruce Trail on the property exists as two side trails: the Crow's Nest side trail and the Trimble side trail.

Named after founding members of the Caledon Hills Club, the Trimble Trail begins at the intersection of Dominion St and Forks of the Credit Rd. It winds through the Complex and follows River Road until it ends at the intersection of River Road and Bush Street. The Crow's Nest side trail follows the circular route of an old quarry of the same name which opened in 1880.

The trail system at Belfountain Conservation Area has likely been on the property since before it was purchased by CVC. The CVC trail system consists of two distinct trails: the Pond Loop trail and the Gorge Loop trail. The two trails overlap in some areas, but account for approximately 1km of trail. The parameters of the trails within the study area are outlined in Table 13 and illustrated in Figure 20.

Table 13 - Attributes of Trails located within the Belfountain Complex

Trail Name	Length	Surface Material
Trimble Trail	2.6km in total: 1615m located within the study area (276m overlap with Gorge Loop)	Natural Duff (and pavement access trail)
Crow's Nest Trail	1024m	Natural Duff
Gorge Loop Trail	795m	Mostly Natural Duff and Boardwalk
Pone Trail Loop	218m	Mostly Woodchips and Boardwalk
Unsanctioned Trails	unknown	Natural Duff

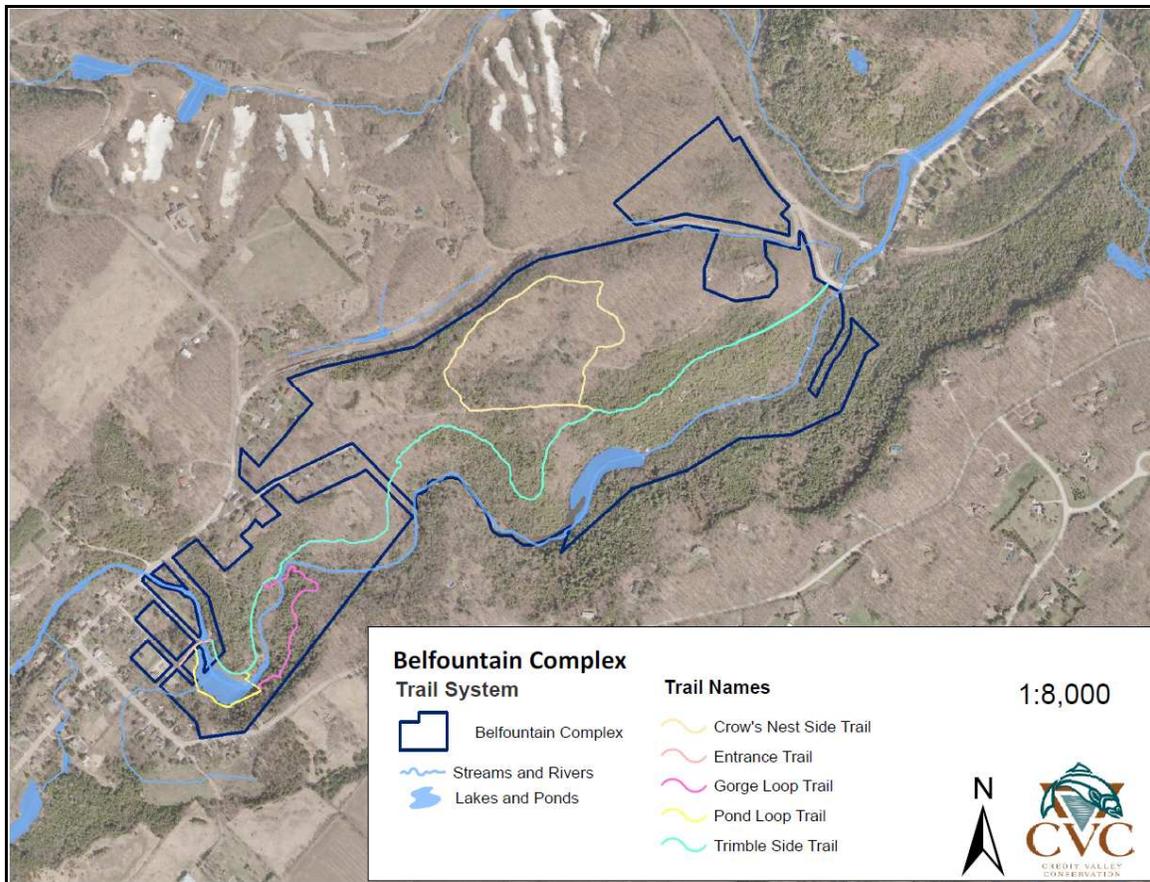


Figure 20 - Sanctioned Trail System of the Belfountain Complex

The steep topography and springs located in the valley slopes contribute to erosion and saturated, muddy areas—less than ideal conditions for a trail system. Specific trail issues are outlined in Appendix E and include wet trail, erosion and unsanctioned trails. In order to mitigate these issues, a network of boardwalks, stairways, trail siding and erosion control measures have already been installed in some areas, and include:

- Approximately 360m of boardwalk
- About a dozen staircases, consisting of approximately 38m of stairs
- In 2011, approximately 30m of trail was protected from erosion using *Envirolok* – a bioengineering system that is used for landscaping to secure and control erosion-prone areas

While a formal trail system has not been established on the Cox Property, a portion of the property has been identified as having trail development potential by both the Caledon Hills Bruce Trail Club (CHBTC) and the Willoughby Property Interpretive Trail Plan. The management planning process will determine whether this is feasible or appropriate.

6.5.1. The Credit Valley Trail

In the late 1980's a plan was conceived to establish a trail that would span the entire Credit River Watershed; from Lake Ontario to Orangeville. This joint venture between the Town of Caledon, OHT, CHBTC, MNR, Caledon Heritage Committee, Niagara Escarpment Commission, Region of Peel and CVC, would see the linking of several regional and inter-regional trail systems as well as the construction of new trail. The Belfountain Complex was identified as a key area for this system because of its existing trail network and popularity.

Planning for the Credit Valley Trail lost momentum when the cost and resources to complete the project were fully realized. The trail system that would have (and may one day still), constitute the section of the Credit Valley Trail that winds through the Complex should be indentified as such. Even if the entire Credit Valley Trail is not realized, identifying possible trail linkages is important for long range planning, greenland securement strategies and partnership development for CVC as well as partnering agencies.

Recent discussions with various partner groups has brought forth ideas about the overall purpose of the trail, as not only a recreational asset that will provide opportunities for people to experience nature, but also as the vehicle that will encourage education and interpretation of the cultural and natural heritage features and landscapes it bypasses. Community groups such as the Credit Valley Heritage Society will be a key partner in promoting some of these programs.

6.6. WATER, HEAT AND HYDRO

The buildings that are equipped with heat, hydro and water are defined in Table 10. The water system at Belfountain Conservation Area is spring fed and provides water for the workshop and associated washroom facilities, and three water fountains are provided for visitors within the picnic area. Several wells, many of which are not currently in service, are distributed throughout the Complex (section 6.6.1).

Three utility poles are also located on Credit Street; one of the road allowances within Belfountain Conservation Area. While hydro runs to the buildings on site, it does not extend to the picnic areas. This deficit was noted by Stewardship staff as limiting the amount and type of activities that could be provided during events and festivals.

6.6.1. Wells

Several wells are located within the Belfountain Complex (Table 14, Figure 21).

Table 14 - Wells within the Belfountain Complex

Well ID	Location				Materials	Date Completed	Water Type	Depth of Water	Water Use
	Property	Elevation	UTM X	UTM Y					
4904224	Cox Property	370.6	580540.4	4850489	Bedrock – Overburden Layer	23-Dec-75	Fresh	100	Domestic
4901018	Belfountain CA	357.6	579581.4	4849479	Bedrock	16-May-62	Fresh	75	Water Supply
4901017	Belfountain CA	373.1	579561.4	4849643	Bedrock	10-May-62	Not Stated	Not Stated	Abandoned Supply Well
4903225	Willoughby Property	334.2	580414.4	4849973	Bedrock	14-May-69	Fresh	60	Domestic
4900938	Willoughby Property	332.1	580347.4	4849883	Bedrock	30-Jun-67	Fresh	60	Domestic
4902973	Willoughby Property	329.4	580414.4	4849923	Bedrock	30-Oct-68	Not Stated	Not Stated	Abandoned Supply Well
4900930	Willoughby Property	322.5	580705.4	4850108	Bedrock	17-Jun-67	Fresh	89	Water Supply

DRAFT

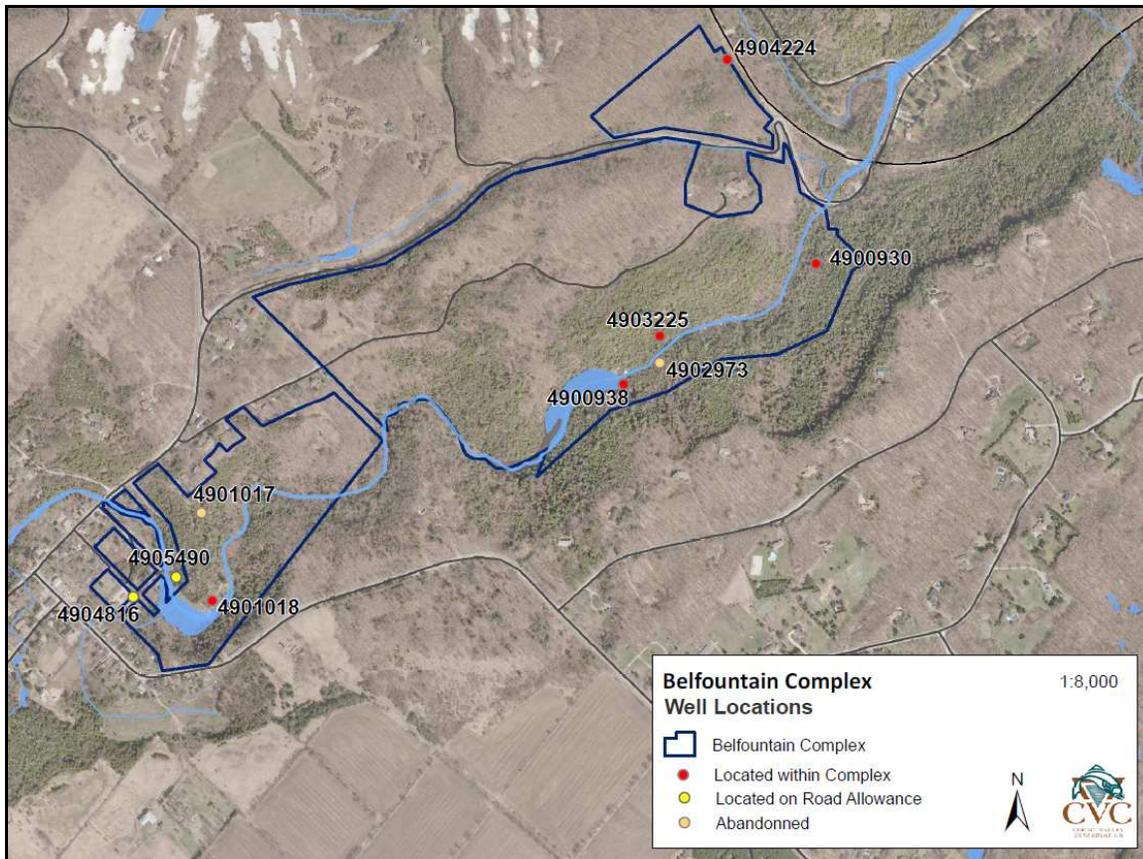


Figure 21 - Well Locations within the Belfountain Complex

While a several wells are located on road allowances or have been abandoned, it would be worthwhile formerly abandoning any wells that no longer service a purpose in order to protect groundwater resources.

6.7. COMMUNICATIONS NETWORK

Belfountain Conservation Area receives its phone service from Bell Canada, which provides access to the workshop and gatehouse. Internet service is currently not provided and cellular service in the area is limited.

6.8. DAMS AND WATER CONTROL STRUCTURES

As discussed above, three water control structures are present within the Belfountain Complex: a large dam within Belfountain Conservation Area and a large dam and concrete weir within the Willoughby Property. These historic structures are each more

than a century old and have played an important role in shaping the West Credit River and adjacent habitats through this reach (Table 15, Figure 22).

Table 15 - Water Control Structures within the Belfountain Complex

Structure	Property	Year Built	Historic Function	Current Function	Significance
Belfountain Dam	Belfountain Conservation Area	Re-built by Charles Mack in 1908	<ul style="list-style-type: none"> - originally a water power generation structure associated with one of the mills on the property (the year that the original dam was constructed is unknown) - re-furbished in 1908 for aesthetic purposes (to emulate Niagara Falls) 	- visitor attraction	- Locally culturally significant (19 th century industry, early 20 th century recreation)
Stonecutter's Dam	Willoughby Property	1850's	- unknown; thought to have conducted water to a turbine that produced water for a mill	- serves no current function	<ul style="list-style-type: none"> - Provincially culturally significant - comprised with stone quarried from the surrounding area - flume of this dam is built of 2 parallel masonry walls capped with heavy stone lintels
Concrete Weir	Willoughby Property	~1900	- unknown; likely built for water power	- serves no current function	<ul style="list-style-type: none"> - Provincially culturally significant - at one time the top 4 – 5ft was constructed with stop logs or a concrete wall, however this is not missing

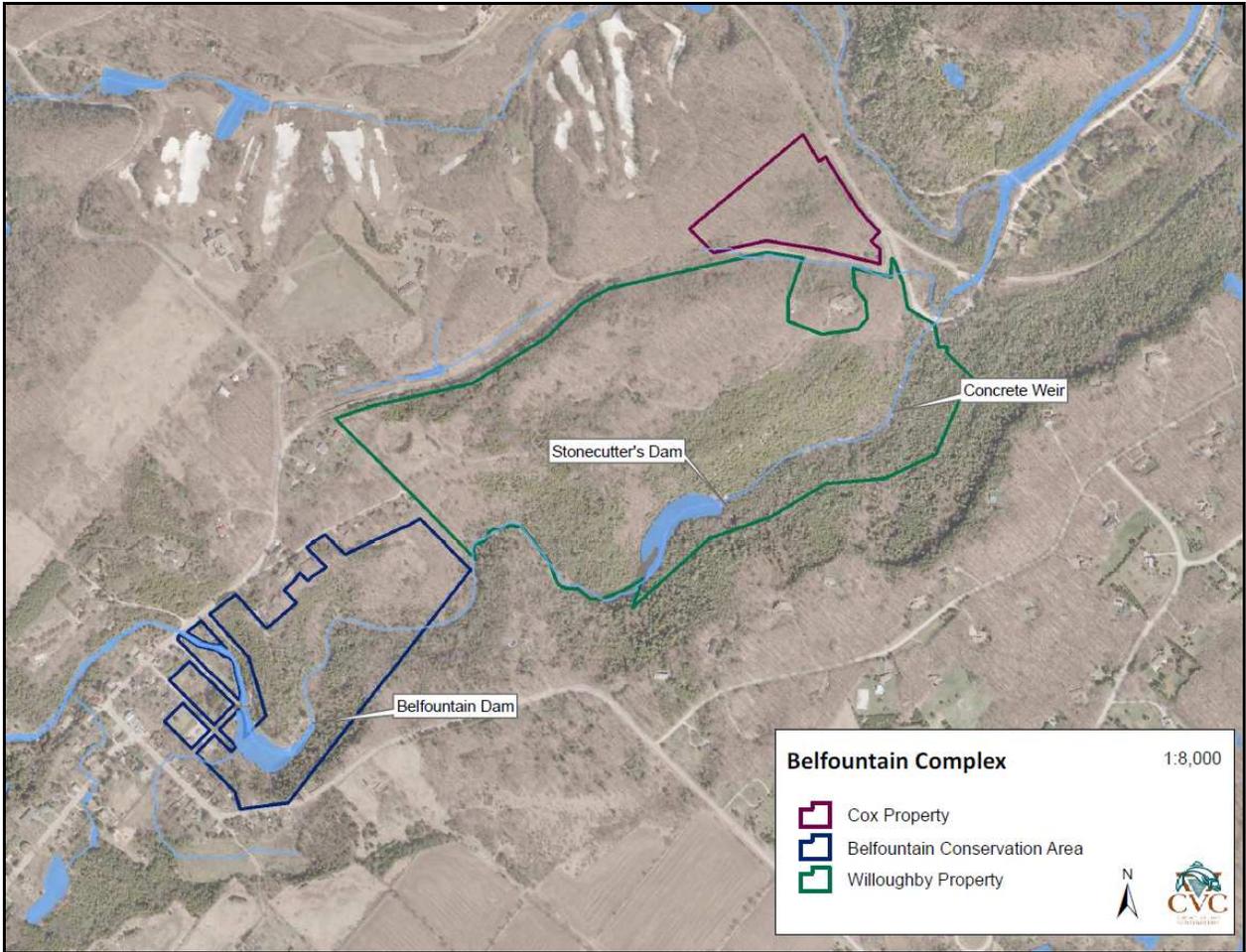


Figure 22 - Situation of Water Control Structures within the Belfountain Complex

The dams located within the Complex are all aging and require maintenance. A discussion regarding the future management of these aging structures is required; any decisions must take into account a variety of competing values. Future management of these structures must balance the natural and cultural heritage values of the area, of the structures themselves, as well as public and visitor perceptions.

6.9. BOUNDARY LINES AND ENCROACHMENTS

A boundary line assessment was conducted at Belfountain Conservation Area in 2012 to determine the length, type and condition of the fence surrounding the conservation area (Table 18) as well as to identify any encroachments.

Table 16 - Existing Fence Type at Belfountain Conservation Area

Fence Type	Length (m)	Issues
Metal Chain Link	26	
Metal Page Wire	398	42.73m are in poor condition
Wood Split Rail	27	
Vertical Wood Plank	50	
Non-existent	1516	

Fifty-one encroachments, ranging in both severity and type, were identified along the boundary line or within Belfountain Conservation Area. The highest concentration of encroachments was located along Scott Street, where incidents of dumping, landscaping/alterations and structures were identified. A list of encroachments and their mapped locations is located in Appendix F.

6.10. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

The size and planning restrictions for the Complex have resulted in very little change in terms of infrastructure development, in the past fifty years. While improvements and upgrades have been made to existing infrastructure, few new structures have been built.

Conservation area staff have also noted that additional facilities would benefit programming, visitation rates and the visitor experience. These include: additional parking, washroom facilities located closer to the picnic area, a building to sell refreshments and merchandise, new gates and paving of the entrance road.

Upgrades have also been identified for many of the structures and a comprehensive schedule that categorizes costs and maintenance cycles is required. A strategy for the maintenance and assessment of cultural resources is also required. For example, a stability assessment on the cave should be considered.

An Environmental Assessment currently underway to determine the best options for road enhancements for portions of Mississauga Road, (including the section adjacent to Belfountain Conservation Area) has identified parking issues within Belfountain Hamlet. Attendees of a public consultation in October 2012 identified that traffic and parking was an issue during the busy tourist season. The limited number of parking spaces within the conservation area intensifies this problem as occasionally visitors choose to park along the road and within the Hamlet.

Issues with the existing trail system are problematic from both an environmental and customer service perspective, and need to be addressed. Minor trail improvements, including the mitigation of muddy areas and unsanctioned footpaths are required on both the Bruce and CVC trail systems. A prominent safety concern on the Willoughby

section of the Trimble Trail exists in the form of an unsanctioned, but well used, look-out. This area requires management, whether it is officially closed or managed for public use.

7.0. SOCIAL AND ECONOMIC ANALYSIS

The Belfountain Complex acts as both a destination location for visitors who are attracted to the areas natural and cultural resources as well as a community park used by local residents. The diverse user groups attracted to the study area both directly and indirectly inject income into the local economy, while receiving a range of health and social benefits.

7.1. DIRECT USE BENEFITS

This section aims to identify the direct benefits received by and provided to users of the Complex. Belfountain Conservation Area is the only active, operational property, and thus economic data only exists for this site.

7.1.1. Economic Benefits

The economic gains for Belfountain Conservation Area are almost exclusively made from the entrance fees of individual visitors. Entrance fees have increased incrementally over the years, from \$3.50 for an adult in 2003 to \$5.00 for an adult in 2011. Figure 23 contains data regarding the annual revenue, the estimated and operating budget for Belfountain Conservation Area from 2007 through to 2012.

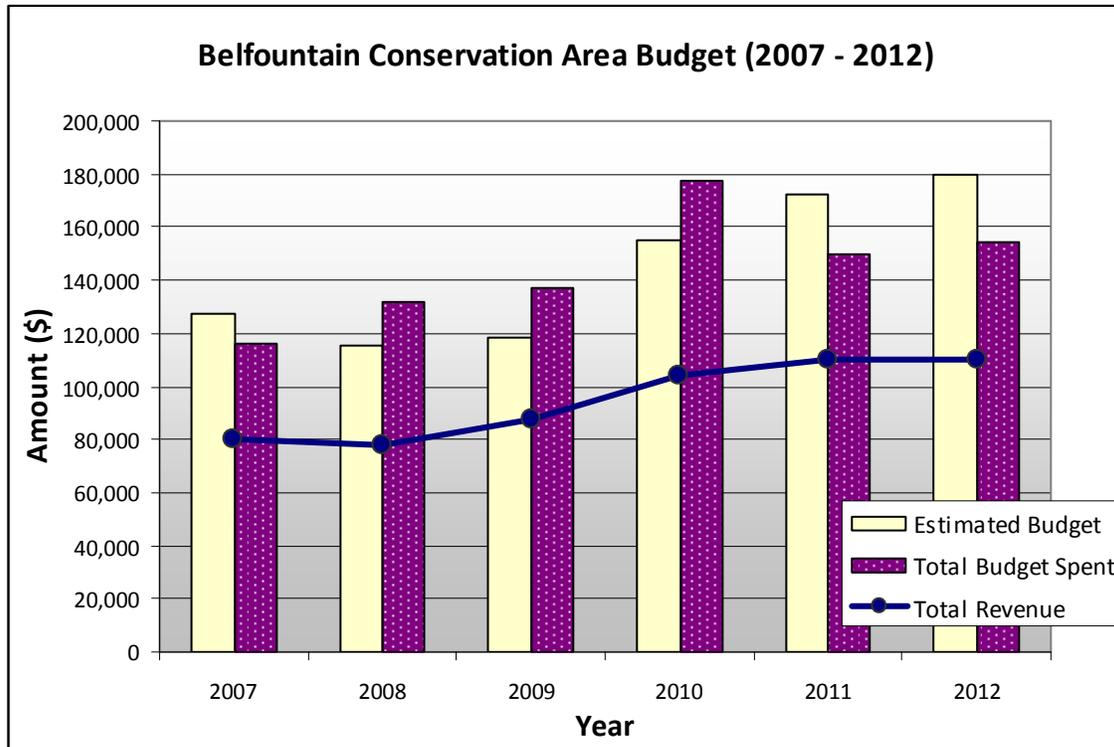


Figure 23 - Budget and Revenue for Belfountain Conservation Area (2007 - 2012)

Revenue has gradually risen from \$80,310 in 2007 to \$110,159 in 2012. On average, the revenue from user fees has contributed to 67% of the operating budget for the previous six years. While data was not collected to confirm a correlation, it is expected that the poor weather during the summer months of 2008 is likely related to the decrease in overall visitation.

7.1.1.1. Staff Allocations: The study area contributes to the surrounding economy through the employment of individuals as well as through the purchase of supplies and materials within the Watershed. While several CVC staff departments and individuals share responsibility for the management of different aspects of the Complex, Belfountain Conservation Area’s staff and their supervisors are responsible for daily operations and customer service. Three full-time staff members share differing amounts of responsibility for the management of Belfountain Conservation Area, and several part-time casual staff are hired on seasonally (Table 17).

Table 17 - Staff Allocations for Belfountain Conservation Area

Position	Timeline	Role
Operations Manager – South Zone (full-time)	Part-time, year round	- Oversees programming and operations and manages staff for all of CVC’s conservation areas located in the south zone
Conservation Area Superintendent (full-time)	Part-time, year round	- Manages staff, administration and programming on a day-to-day basis
4 Customer Service	Full-time; 3 from April –	- Customer service, day to day maintenance,

Representatives and Conservation Area Technicians	August; 1 from April – October	repair and upkeep of the property, infrastructure and assets
3 Customer Service Representatives and Conservation Area Technicians	Part-time; September - October	- Customer service, day to day maintenance, repair and upkeep of the property, infrastructure and assets
Conservation Areas Administrator – South Zone	Part-time, year round	- Responsible for booking events, reservations, programming and day-to-day management

The cost for the staff required to seasonally operate Belfountain Conservation Area, including wages and benefits, averages at 71.3% of the spent budget for the past six years.

Additional information and details about the budget for Belfountain Conservation Area is contained in Appendix G.

7.1.2. Social Benefits

There are many direct and indirect benefits for visitors who choose to use the Belfountain Complex Management Plan Area. The direct benefits include various recreation activities as discussed in section 5.0, as well as natural and cultural heritage appreciation. Visitor surveys conducted at Belfountain Conservation Area in 2010 (section 4.0), identify intrinsic values placed upon the study area by visitors. Figure 24 illustrates the importance of different values that individuals place on their visit to Belfountain Conservation Area.

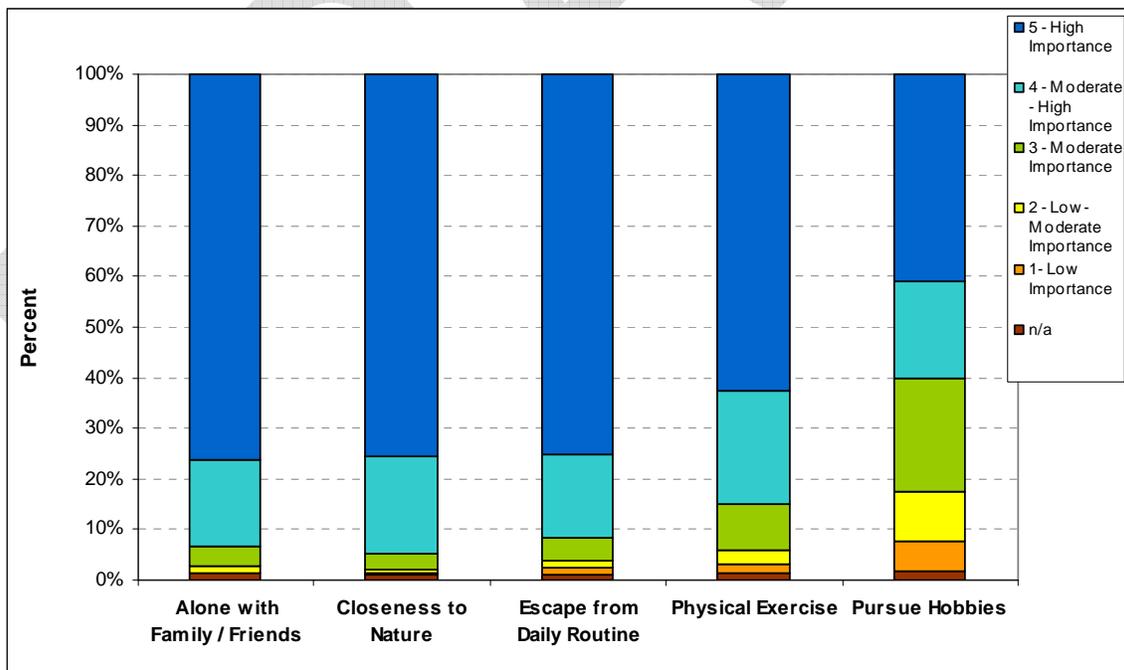


Figure 24 - How important different visitation values are to visitors at BCA (2010)

Proximity or closeness to nature may also provide a variety of indirect benefits, such as improved physical, social and mental functioning and well-being. *The Importance of Ecosystem Services to Human Well-Being in the Credit River Watershed* report (Green Metrics, 2011) tabulates a variety of literature on the topic which concludes a general positive correlation between contact with the natural environment and overall health and well-being. A few of the documented benefits of exposure to natural areas include: improvements to heart rate, blood pressure, and muscle tension; speeds recovery in hospital patients; reduces ADHD symptoms in children; alleviates stress and anxiety; and increases community bonds and social integration.

The 2011 Green Metrics Report also analyzes the results of an online survey that was administered through Ipsos Reid, a company that specializes in survey-based marketing research. The survey was distributed to more than one thousand individuals that reside in watershed municipalities. The survey focused on the connection between the environment and the self-diagnosed well-being of watershed residents. Respondents indicated that contact with natural areas is important for:

- Relieving stress (79.4% of respondents);
- Aiding in physical fitness (76.2%);
- Restoring productivity and concentration (67.4%); and
- Recovering from illness (67%)

Another study conducted by Ipsos Reid in 2011 on behalf of the Nature Conservancy of Canada concluded that 87% of Canadians felt happier when they were connected to nature. The same study also determined that 75% of Canadians felt that preserving natural areas and the variety of native plant life in Canada was important to them.

Many of these studies describe generic natural areas and urban greenspace, and while none of them focus directly on the study area, it is expected that the same benefits to human well-being apply.

7.2. INDIRECT USE BENEFITS

The Belfountain Complex is located adjacent to the boundary of the Hamlet of Belfountain, within the Town of Caledon. 2011 Statistics Canada data indicates that the Town of Caledon has a population of 59,460; 2006 data for the Hamlet of Belfountain gives a population of 315. Main industry sectors include tourism and agriculture, though Caledon's *Investment Attraction Program's* current focus is on manufacturing industries and professional, scientific and technical services. The Complex provides notable economic and social benefits to the surrounding community, which are discussed below.

7.2.1. Economic Benefits

The direct economic benefits of the Complex within the community are difficult to quantify. Four separate topics discuss the data available on the economic benefits of the study area to the community: the local economy; recreation; property values; and ecological goods and services. Though it is expected that the economic benefits are far reaching beyond these topics, actual values are difficult to calculate and further study is required.

7.2.1.1. Local Economy: Several small service-based shops are located in the Hamlet of Belfountain, within 500m to the entrance of Belfountain Conservation Area. While data has not been formally collected, it is expected that a mutually beneficial relationship exists between the Complex and the small shops located within the Hamlet; conservation area visitors are often seen using or eating products purchased at one of the local shops (Table 18). To some extent the Complex and the Hamlet of Belfountain share a customer base, and opportunities promoting this connection could be beneficial to both parties.

Table 18 - Shops Located in the Hamlet of Belfountain

Store	Services	Address	Proximity to BCA
Tammeron's Place	- health and wellness - food and drink items	- 758 Bush St	500m
Cool Scoops	- ice cream parlour	- 815 Forks of the Credit Rd	210m
Higher Ground Coffee Company and the Village of Belfountain Store	- café - food and drink items	- 17277 Old Main St	400m
Belfountain Inn	- restaurant	- 792 Forks of the Credit Rd	270m
Casa Lena Antiques	- antique and hand-made items	- 17277 Old Main St	400m

7.2.1.2. Recreation: While the economic value that visitors to the Belfountain Complex provide is not known, broad scale studies that identify the economic benefit of recreation resources in Ontario have been completed:

- Tourism spending in Ontario is tracked and analyzed by the Tourism Research Unit of the Ministry of Tourism, Culture and Sport (MTCS). Statistics reveal that spending for all types of tourism in Ontario, in 2010 was approximately \$17.1 billion (MTCS). More specifically, recreation spending for pleasure purposes was estimated at \$442,500,000 in 2010 (MTCS, 2010).
- The economic value provided by trails within the province of Ontario is estimated to be \$2 - \$5 billion (Ontario Trail Council, 2007). This number stems from a variety of studies and encompasses all types of trails and trail users within the province.

Two studies that look at the economic value of specific resources related to the Belfountain Complex: the Credit River Fishery and Bruce Trail, have also been conducted.

- **Credit River Fishery:** A 2008 report on the valuation of the Credit River to anglers (CVC, 2008) determined that the Credit River received approximately 30,000 angling days each year, and that an estimated \$1.2 million was spent by anglers.

A specific calculation for the lower West Credit River, in the vicinity of the Belfountain Complex, concluded that approximately \$26,754 was spent per year by anglers to this part of the river.

- **The Bruce Trail:** A study conducted on Bruce Trail visitorship in the 1990's (Schutt, 1998) revealed that of the estimated 410,060 annual Bruce Trail users, 70% purchased non-durable goods (including food, gas and entry fees to parks and conservation areas) during their visit to the Bruce Trail. It was also determined that expenditures averaged \$20.33 per visitor and that approximately 75% of this was spent within a 10km corridor on either side of the trail.

This equation can be loosely applied to visitors using the Bruce Trail side trails that run through the study area. Although side trails were not specifically identified in the study, they do represent part of the Bruce Trail system, and thus it is reasonable to assume that similar values can be applied.

Calibrated data from the trail counter installed on the Trimble Trail in 2009, reveal that approximately 11,248 people used the trail (or at least the portion of the trail that the counter was installed) in 2010. If the formula collected through Schutt's 1998 report is applied, then visitors using Bruce Trail side trails in the study area generate an estimated \$160,074 for the local economy that year.

Staff from the Bruce Trail Conservancy indicated plans to conduct an updated study on the economic impact of the Bruce Trail in the near future.

7.2.1.4. Property Values: In 2009, DSS Management Consultants Inc. prepared a report for CVC focused on the impact of natural areas on property values. The report, entitled: *Property Value Appreciation: Impacts of Natural Features* studied properties in Mississauga Ontario that were in close proximity to a natural area or feature. It determined that, based on a variety of factors, proximity to a natural feature increased property values by \$8,000 - \$10,000. It also concluded that the majority of overall increase in property value could be attributed to green open spaces which includes accessible, publicly owned lands that are not planned for development, such as conservation areas.

While this study focuses exclusively on properties in Mississauga, it is expected that property values in close proximity to the study area also benefit from increased property values.

7.2.1.5. Ecological Good and Services: The ecological goods and services provided by the Credit River Watershed have an estimated value of \$371 million (CVC, Pembina, 2009). These goods and services are related to the healthy functioning of natural areas and include climate regulation, pollination, recreation and the provision of a clean water supply and wildlife habitat. The report looks at the contribution of natural features, such as wetlands, forests, water systems and meadows, and determines the economic value of these resources as it relates to tangible services required by the Watershed's population.

The Credit River Watershed is further divided into subwatersheds in this report, of which each is given a rating related to the economic value of the goods and services that it provides. Subwatershed 15, which encompasses the majority of the Belfountain Complex, receives the highest value; it provides between \$46,700,001 and \$56,000,000 in natural services. While the Belfountain Complex makes up less than one percent of the acreage in subwatershed 15, its naturally functioning features contribute to this system and the benefits it provides.

7.2.2. Social Benefits

Section 7.1 discussed some of the benefits that natural areas can provide through their direct use by visitors. Many of these factors are even more important for communities, as locals are more likely to use a natural area on a regular basis; the most commonly used natural areas are parks and trails within walking distance of the home (33.3%) (Green Metrics, 2011).⁷

Belfountain Conservation Area is used throughout its closed season (October to April) by elementary classes from the Belfountain Public School. Environment-based education promotes conservation values and awareness for both the broader natural environment and the study area itself.

7.2.2.2. Culture Resources: The cultural and recreational features in the Complex are also important to visitors, whether it is for nostalgic values and scenic enjoyment, or for educational purposes. The 2010 Visitor Information Survey asked visitors about the importance of certain natural and cultural features to their visit. Visitors indicated that the following features were important or very important to their visit:

⁷ Although 2010 visitor survey results revealed that the majority of visitors travelled from the GTA, it has been suggested that local residents were not equally represented. Staff have reported that local residents will often use Belfountain Conservation Area when it is closed and staff are not on premises.

- Boardwalk and bridges not associated with the swing bridge (88%)
- Swing Bridge (96%)
- Cave (62%)
- Waterfall [Belfountain Dam] (94%)
- Natural Habitat (92%)
- Picnic Area (76%)
- Pond and Fountain (76%)
- Trails on the Property (92%)

While it is difficult to measure or demonstrate, it is expected that the cultural features and cultural heritage landscape located within the Complex connect to, and help to brand, the character and atmosphere of both the Hamlet of Belfountain and the Town of Caledon.

7.2.2.1. Non-use Values: Complex natural resource systems, such as those located within the Complex, provide multiple sources of economic benefits. The Total Economic Value estimates the total worth of a wide range of market and non-market benefits. In addition to direct use values, such as the collection of user fees, non-use values are included in the Total Economic Value. Several non-use values exist, and generally include:

- The Option Value: The value of maintaining the option for future personal use of the protected area
- The Bequest Value: The ability and need to conserve protected areas for future generations
- The Existence Value: The satisfaction and comfort of knowing that protected areas exist, even if they are not personally used
- The Moral Value: The satisfaction of knowing that moral and legal obligations are fulfilled upon the conservation of a protected area

The survey conducted by Ipsos Reid in 2011 for the Nature Conservancy of Canada found that 85% of Canadians agree that they are worried that the natural areas that they enjoy today will not be here for their children or grandchildren. Non-use values are difficult to measure and quantify, but are important and need to be taken into consideration when planning for protected areas.

While the Total Economic Value of the Complex (or CVC's conservation area system as a whole) has not been assessed, studies have been conducted on various aspects relating to economic value. This includes property values and the natural value associated with different aspects of the environment.

7.3. SCIENTIFIC AND EDUCATIONAL BENEFITS

Protected areas provide a wide range of research opportunities while offering security for long-term studies and trends. The Belfountain Complex is influenced by unique geologic features, provides habitat for rare species, has a steady, diverse visiting population and is located in an area relatively accessible to researchers and educators. These characteristics make it an ideal location for conducting a variety of research projects.

Two external studies have focused on understanding the distribution of unique mammals within the Complex: the MNR led Flying Squirrel Study (2004) and the 2007 Bat Study (section 2.2.6). In addition, CVC's Terrestrial Monitoring Program has two long-term monitoring plots within the Complex. These plots, one situated in a riparian area, the other in a forest, are monitored for a variety of indicators that represent ecosystem composition, structure and function or process. The data from this program has been incorporated throughout section 2.2.

While a permit has not been issued for scientific research in the past few years, inquiries from universities and other agencies to conduct research at CVC conservation areas is common.

8.0. RELATED STRATEGIES/POLICIES/LEGISLATION

The policies, strategies, guiding documents and legislation in this section relate to the management of the Belfountain Complex. This section provides a brief overview of how the content of each document applies to the study area; specific language and policies can be found in Appendix H.

8.1. CVC STUDIES, STRATEGIES, POLICIES

8.1.1. CVC Strategic Plan Update and Compendium (2008)

The Strategic Plan provides an overview of natural resources at both regional and watershed levels, summarizes the main agents of environmental change and how CVC, which is mandated to manage all natural resources (other than gas, coal, oil or minerals) within the Credit River watershed, will respond. The Plan outlines goals and objectives related to the conservation and wise use of natural resources. A set of principles and values is also included, of which one is directly related to conservation lands planning:

Ensure CVC conservation lands are managed primarily for protection and appreciation. Recreation can occur where it is consistent with the primary goal.

The 2008 Strategic Plan Update emphasizes the importance of conservation areas as protected spaces and adds increased impetus to greenland securement activities. The Strategic Plan provides strategies for supporting and achieving corporate objectives and deliverables, including those related to conservation area management.

8.1.2. Conservation Areas Strategy (1994)

The Conservation Areas Strategy lays out goals for conservation area management, as well as provides a framework for informing operational and management decisions. The Strategy describes the importance of managing conservation areas in a unified system that celebrates the significant and representative natural features found within the Credit River Watershed. The Strategy provides the management objectives and priorities that guide conservation area planning (sections 1.1 and 9.1).

8.1.3. Greenlands Securement Strategy (2004)

The Greenlands Securement Strategy recognizes that greenlands secured within the Credit River Watershed contribute to a connected system that provides natural heritage protection, appreciation and recreational benefits, thereby promoting ecological integrity and healthy communities. The Strategy identifies the criteria by which land is ranked in order to prioritize areas for securement, criterion include:

- Representative within their physiographic region;
- Comprise part or all of a major corridor;
- Comprise part of the regional trail system;
- Identified as a key access area to the Credit River fishery;
- Enhance or protect the value of existing public land;
- Comprise part of a bioregional corridor;
- Comprise part of the Credit River valley or Lake Ontario shoreline;
- Maintain or enhance community connections

The Strategy has, and will continue to guide land acquisition projects near the study area.

8.1.4. Conservation Lands Management Manual (2012)

The Conservation Lands Management Manual (CLMM) contains the policies, procedures, and guidelines that direct the planning and management of all CVC conservation areas. This information forms the core of all operational and programming implementation. Key areas in the Manual include:

- Management Planning
- Land Operations
- Conservation Area Recreational Programming
- Education Programs
- Enforcement Programs

- Monitoring Programs
- Core 10 Initiatives
- Signage Programs
- Risk Management and Mitigation
- Visitor Management
- Partnership Management
- Information Management

The CLMM directs standard operations and management to all properties managed by CVC, including those which the Authority does not own (e.g. the Willoughby Property). Additional policies in the Belfountain Complex Management Plan will be specific to the management of the subject lands and are generally complimentary to the existing policies and procedures of the CLMM.

8.1.5. West Credit River Characterization Report (1998)

The Report identifies the existing environmental data and natural resources of the West Credit subwatershed and provides recommendations for the management of future development, while addressing some of the identified issues and constraints. The management goals for the subwatershed include:

Ground and Surface Waters

- a clean healthy environment with a balance of areas where people can work, live and play;
- areas of natural systems or process including viable habitat of wildlife and fish;
- opportunities for rural, urban and resource use that are compatible within a clean healthy environment;
- areas where recreation will be available including access to public natural areas for passive uses and nature interpretation;
- active areas for swimming and fishing; and
- a ground water resource that is managed to ensure that it is clean and available to use

Because there are no major land use changes predicted for the subwatershed in the near future, efforts should be focused on improving current conditions to ensure that the health of the subwatershed is maintained or enhanced.

8.1.6. Credit River Fisheries Management Plan (2002)

The Plan was developed through a collaborative process between the Ministry of Natural Resources and CVC and included extensive consultation with the public. The Plan directs aquatic resource management within the Credit River watershed based on sustainability and integrity while considering socio-economic values. The Plan provides direction for fish and fish habitat management, as well as guidelines for development and roles of different agencies. The West Credit River (in which the study area lies) is

identified as an important fishery and management planning should reflect the recommendations of the Plan.

The Plan also provides management direction for key water control structures in the Watershed, including the Belfountain Dam:

“The Niagara Escarpment at Belfountain will continue to be managed as the partition between brown trout and brook trout populations. However, it has been accepted that Atlantic salmon historically may have had access above the Belfountain Dam into the West Credit River. Opportunities regarding access for Atlantic salmon above Belfountain Dam will be explored in conjunction with an assessment of rehabilitation options regarding the future of the dam and headpond now underway”.

8.1.7. Development, Interference with Wetlands & Alteration to Shorelines & Watercourses – Ontario Regulation 160/06 (2006)

The Regulation is a generic regulation made under Section 28 of the Conservation Authorities Act. It is implemented through the Watershed Planning and Regulation Policies (section 8.1.7.1). This regulation prevents or restricts development in areas where the control of flooding, erosion, dynamic beaches, pollution, or the conservation of land may be affected by development. Any development within the study area must abide by the Regulation (Appendix I).

8.1.7.1. Watershed Planning and Regulation Policies (2010): This document contains CVC’s watershed planning and regulation policies. These policies provide the parameters against which CVC administers Ontario Regulation 160/06. This document includes guiding policies and objectives in environmental planning areas of interest including: watershed planning; sustainable water management and infrastructure planning; natural heritage and natural hazards. Any proposed development within the study area must conform to and abide to these policies.

8.1.8. Conservation Areas – Credit Valley – Ontario Regulation 102 (1990)

Regulation 102 is made under section 29 of the Conservation Authorities Act which provides conservation authorities with the powers to make regulations regarding authority owned lands. Regulation 102 outlines the specific regulations as they apply to CVC conservation areas and provides support for enforcing unsanctioned uses or activities on CVC owned lands. An example of the items that are not permitted under general regulations includes:

4. (1) No person shall, in the conservation area,
 - (a) beg;
 - (b) deface, remove or damage any property;
 - (c) cut, remove, injure or destroy a plant, tree, shrub, flower or other growing thing;
 - (d) remove or destroy any soil or rock; or

(e) use abusive, insulting or threatening language, make excessive noise or disturb other persons.

8.1.9. Custodianship Agreement between the Ontario Heritage Foundation (now Ontario Heritage Trust) and Credit Valley Conservation for the Willoughby Property (1986)

The agreement grants CVC the right to possession and control of the Willoughby Property for the purposes of development, maintenance, preservation, administration and supervision. The Agreement expired in 2011 and is currently considered to be in over hold. The existing stipulations will be taken into consideration during the management planning process; however, an updated agreement is required.

8.2. MUNICIPAL PLANNING

8.2.1. Peel Region Official Plan (2013)

Peel's Official Plan provides a long-term strategic policy framework for guiding sustainable growth and development in Peel, as well as interprets and applies Provincial legislation and policies within the regional context. The study area is identified as a core area within the greenlands system in the Official Plan, and thus greenlands and environmental policies and objectives apply (Appendix J). Resource policies related to water, recreation and culture also apply. Specific policies are contained within Appendix H; the following goals and objectives apply to the Complex:

2.0 The Natural Environment

General Goal: To create and maintain a system of viable, well-functioning environmental features to ensure a healthy, resilient and self-sustaining natural environment within Peel Region

- *Large Environmental Systems:* To recognize and promote the connections between local ecosystem functions and large environmental systems and contribute to the protection these larger non-localized systems; to conserve, restore and enhance air, water and land resources
- *Greenbelt Plan:* To implement the Greenbelt Plan by enhancing the urban, agricultural and rural areas and overall quality of life within the Protected Countryside through: agriculture and environmental protection; conservation and protection of cultural heritage resources; promotion of recreation and tourism opportunities...
- *Greenlands System:* To identify, protect and support the restoration and rehabilitation of the Greenlands System in Peel

3.0 Resources

General Goal: To protect, manage and utilize the renewable and non-renewable resources of Peel in an efficient manner that conserves and protects environmental

features and functions, and character of rural Peel including its agricultural, social, cultural heritage, community and economic aspects.

- *Water Resources*: to protect, maintain and enhance the quality and quantity of water, to eliminate or minimize negative impacts, and to better understand and promote public education about water resources
- *Recreation*: to support passive recreation opportunities, including those provided by conservation areas, to promote a harmonious relationship between humans and the natural environment, and to support tourism
- *Cultural Heritage*: to identify, preserve and promote cultural resources, to encourage public appreciation and stewardship, to support policies and programs

8.2.2. Town of Caledon Official Plan (2008)

The Town of Caledon Official Plan contains the principles, goals, objectives and policies that guide future land use, development, and the effects on the social, economic, and natural environment within the Town of Caledon. The Belfountain Complex is designated as an Environmental Policy Area within the Official Plan and the ecosystem objectives and environmental policies listed in the Official Plan apply (Appendix K). The study area is contained within a Cultural Heritage Landscape, and consequently the cultural heritage conservation policies apply. Some policies under Open Spaces and Recreation also apply to the study area due to its designation under NEPOSS and the fact that part of a regional trail system (Bruce Trail), passes through the property. Specific policies are contained within Appendix H; the following goals and objectives apply to the Complex:

General Principles, Strategic Direction and Goals

- To preserve, protect and enhance natural physical features and biological communities.
- To protect land resources including landscape features, systems and areas that perform important natural functions or which provide economic and recreational opportunities.
- To protect and steward ecosystems in the Town

Ecosystem Objectives

- To protect, maintain, and, as appropriate, enhance, and restore ecosystem attributes and values including: connectivity, viability/self-sustainability, biodiversity, dynamics, and aesthetics; to features that include: landforms, valley and stream corridors, lakes, ponds, fisheries, wildlife, wetlands, woodlands, ANSIs and ESAs.
- To develop partnerships between various agencies and organizations to coordinate environmental programs, policies, and information.
- To promote a holistic, ecosystems based philosophy at all levels of government.

Open Space and Recreation Objectives

- To develop and maintain a system of parks and publicly accessible open spaces which provide for a diversity of recreational opportunities for a range of citizens
- To preserve and protect existing linear trail systems, including the Bruce Trail
- To participate in, and support, where appropriate, the initiatives of other agencies and interest groups in establishing or expanding interconnected linear and other recreational open space systems within Caledon, and at a broader scale.

Cultural Heritage Objectives

- To identify and conserve the Town's cultural heritage resources through the implementation of appropriate designations, policies and programs including private and public stewardship
- To promote awareness, appreciation and enjoyment of Caledon's cultural heritage

8.2.3. Town of Caledon Cultural Heritage Landscape Inventory Report (2009)

The Report identifies and classifies all cultural heritage landscapes located within Caledon's jurisdiction. The majority of the Belfountain Complex is identified as part of the Credit River Gorge Candidate Cultural Heritage Landscape. This designation emphasizes the cultural importance of the study area and makes it applicable to cultural heritage policies under the Town of Caledon Official Plan.

8.2.4. Town of Caledon Recreation and Parks Masterplan (2010)

The Masterplan establishes a strategy for all parks, recreation services, programs and facilities located within the Town of Caledon. The Masterplan recognizes the importance of trails, and varying types of trails, and identifies them as the most in-demand recreational facilities; the goal of maintaining .8km trail/1000 residents is stated in the Masterplan. The role of conservation authorities as recreation and natural area access providers is addressed, as is the importance of communication and collaboration to ensure that facilities and programming efforts are not duplicated.

8.3. PROVINCIAL LEGISLATION AND PLANS

8.3.1. Conservation Authorities Act (1990)

The Conservation Authorities Act provided the means by which the Province and municipalities could join together to form a Conservation Authority. Three fundamental strengths of a Conservation Authority are recognized in the Act:

- *Local initiative and involvement*; Conservation Authorities were formed in response to interest expressed by local residents

- *Organization on a watershed basis* allows for the holistic management of an entire natural system
- *Provincial and municipal partnership*; funding and program priorities are generated at both the local and provincial level

The Conservation Authorities Act provides the means to implement programs to manage natural resources, and to own and manage lands for parks and recreation purposes. See sections 7.1.8 and 7.1.9.

8.3.2. Niagara Escarpment Planning and Development Act (1990)

The Act ensures the environmental and ecological sustainability of the Niagara Escarpment and surrounding lands by only permitting development to occur that is compatible with the natural environment. The Act provides for the creation of the Niagara Escarpment Plan which contains specific land use policies and development criteria, as well as sets out a policy framework for the establishment of the Niagara Escarpment Parks and Open Space System (NEPOSS). The study area is located in the Niagara Escarpment Development Control Area. Permits from the NEC are required for development and development may be limited depending on specific land designations.

8.3.2.1. Niagara Escarpment Plan (2005): The Niagara Escarpment Plan was created under the Niagara Escarpment Planning and Development Act, and is the mechanism for regulating development within the Niagara Escarpment. The Belfountain Complex Management Plan Area is located within the Niagara Escarpment Plan Area; the Willoughby and Cox properties, and most of Belfountain Conservation Area are designated as Escarpment Natural Areas. Policies within the Plan aim to maintain these areas as natural escarpment features and to encourage compatible recreation and education opportunities, the following activities are permitted: existing uses; non-intensive recreation; forest, wildlife and fisheries management; accessory buildings, structures and facilities, signs and the site modifications required to facilitate them.

The Plan also identifies Belfountain Conservation Area and the Willoughby Property as parks in the NEPOSS and classifies them as recreation and natural environment parks, respectively. Management agencies are required to prepare master/management plans for NEPOSS parks that corresponds with its designated classification.

- ***Ontario Regulation 828/90***: Undertakings approved under management/master plans for properties located in the Niagara Escarpment Planning Area may be exempted from development control, as stipulated in Ontario Regulation 828/90, with specific Conservation Authority exemptions under section 17.
- ***Niagara Escarpment Parks and Open Spaces Planning Manual (2012)***: The Manual provides guidance to agencies on the design, development, implementation and maintenance of management plans for parks that are part of

NEPOSS. The Manual also outlines the processes that agencies should follow to produce and maintain a management plan.

8.3.3. Provincial Policy Statement (2014)

The Provincial Policy Statement is issued under Section 3 of the Planning Act and applies to all applications, matters and/or proceedings. It provides the framework for policy protection of significant natural heritage features in Ontario and contains objectives for sustainable planning and sets the policy foundation for regulating the development and use of land. It also emphasizes the importance of parks, trails, recreation and open spaces for strong, healthy communities, and recognizes that negative impacts on protected areas should be minimized.

8.3.4. Greenbelt Act (2005)

The Act provides for the environmental and agricultural protection of the Greenbelt (which includes the Niagara Escarpment, Oak Ridges Moraine), while promoting socially, culturally, economically and ecologically sustainable practices. The Act provides for the creation of the Greenbelt Plan (under section 3) which contains specific land use policies and development criteria. The Complex is located within the Niagara Escarpment Plan Area, and therefore the Greenbelt Plan Area. Development within the study area must abide by the applicable policies.

8.3.4.1. Greenbelt Plan (2005): The Plan provides land use policies that guides development to protect natural heritage features and systems as well as agriculture. The study area is located within the Niagara Escarpment Plan Area, which supersedes the policies of the Greenbelt Plan with the exception of Parkland, Open Spaces and Trails. The applicable policies for protected countryside apply to the study area.

8.3.5. Places to Grow Act

The Places to Grow Act acknowledges that in order to accommodate sustainable population growth, achieve economic prosperity and promote a high quality of life, planning must occur in a rational and strategic way. This is realized through the development of Growth Plans, which have been prepared for specific urban areas. While the Town of Caledon is not specifically recognized, the Region of Peel is identified as a growth plan area. Policies and strategies related to growth in the Region of Peel have been adopted into the Official Plan. Population growth in areas where a large portion of the Complex's visitor base originates will have unknown effects on the visitation and use.

8.3.6. Endangered Species Act

The Endangered Species Act identifies which species are at risk in Ontario, provides for tools and mechanisms to protect those species and their habitats, and promotes stewardship activities to assist in their recovery. Species at risk and their habitats are found within the Belfountain Complex, and thus the policies in this act apply.

8.3.7. Accessibility for Ontarians with Disabilities Act (2005)

The Act recognizes the rules that businesses and organizations need to abide to in regards to the identification, removal and prevention of barriers to accessibility. Standards for Built Environments include the design of public spaces for new construction and planned development in the built environment. The standards will include specific requirements for recreational trails, accessible parking areas, playgrounds, and picnic and rest areas. Planning and development of infrastructure in conservation areas needs to account for the most current accessibility standards.

8.3.8. Lake and Rivers Improvement Act (1990)

The Act guides the management of dams, water control structures and related infrastructure in Ontario. Related regulations state that the MNR must approve any plans related to the alteration, repair or improvement of a dam.

8.3.9. Beds of Navigable Waters Act (1990)

The Act states that in the absence of an express grant, the beds of a navigable watercourse are owned by the Crown. The Crown Patent for Belfountain Conservation Area reveals that the river was not expressly granted, and thus the bed of the West Credit River, as it runs through the Complex, and if it is deemed navigable, is owned by the Crown and is thus public land.

8.3.10. Public Lands Act (1990)

The Act provides authority to the MNR to manage all crown lands in the Province. The West Credit River, as it flows through the study area is defined as crown land and thus the regulations under this Act apply.

8.3.11. Conservation Land Tax Incentive Program Policy (2010)

The Policy outlines the goals and objectives of the Program, permitted land uses, application, approvals and landowner responsibilities. A large portion of the study area is classified under the Conservation Land Tax Incentive Program (CLTIP) and land use activities on designated areas must abide by CLTIP policies, or may no longer be eligible to receive tax benefits.

8.3.12. Ontario Recreational Fishing Regulation (2013)

The Regulation contains the guidelines for recreational fishing in Ontario, including specific stipulations for the Credit River, located upstream of Old Baseline Road within the Town of Caledon. These special regulations apply to all anglers fishing within the Complex:

- No fishing is permitted between January 1 and the Friday before the 4th Saturday in April, as well as between October 1 and December 31.
- Special regulations applicable in the Town of Caledon, upstream from Old Baseline Road include:

- Only artificial lures may be used
- Only one single-pointed barbless hook may be used
- Brook Trout, Brown Trout, and Rainbow Trout harvest of 0

8.4. FEDERAL PLANNING

8.4.1. Canada Species at Risk Act

The purpose of the Species at Risk Act is to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened. This is realized through the prohibition of damage to the habitat of Species at Risk.

8.4.2. Migratory Birds Convention Act (1994) and Migratory Birds Regulations

Many activities (e.g. development, forestry) that are conducted during the breeding season of migratory birds can result in the inadvertent destruction of the nests and/or eggs. The Act and the associated Regulations seek to prevent damage to migratory birds and their environments by prohibiting the disturbance, destruction or taking of the nests or eggs of migratory birds. In general, the core breeding season of migratory birds in Canada is considered to be between March 15th and August 31st.

9.0. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

9.1. GUIDING PRINCIPLES

The ultimate goal of the management plan for the Belfountain Complex is to develop and guide the implementation of a vision that balances the protection of natural features and the functions they provide with the preservation of cultural heritage resources, recreation opportunities and the values of the local community and general public. The vision will also identify and characterize the function of the Complex in the context of its key role within CVC's Conservation Areas System as well as the Niagara Escarpment and Open Spaces System.

CVC's existing strategies and objectives for conservation area management will direct the development of this vision. In order of priority, principles for the management of the Belfountain Complex include:

1. The **protection** of significant and representative natural features within [and adjacent to]the Complex

2. The provision of natural heritage **appreciation** opportunities to the public
3. To offer opportunities and facilities for appropriate, high quality outdoor **recreation** activities

A collection of key principles to further illustrate the intent of the objectives are identified in CVC's Conservation Area Strategy. As they relate to the Belfountain Complex Management Plan, they are listed below:

Protection

- Conservation area management practices are based on ecosystem principles and the concept of sustainability
- Protection of conservation areas extends to all aspects of natural heritage resources, including biotic and abiotic factors as well as scenery

Appreciation

- Programs and activities will be developed to suit the needs of a wide variety of audiences, including groups of all ages and demographics, as well as environmentally insensitive user groups (for educational purposes), if appropriate
- Promotion of public enjoyment through sustainable use of conservation areas
- Increase public understanding of the natural environment of the Credit River Watershed, its features and its processes
- Increase information base with an emphasis on ecosystem analysis including monitoring the long-term health of ecosystems

Recreation

- Outdoor recreation opportunities should be available throughout all four seasons of the year
- A key attribute of conservation area recreational programming will be the link with the natural environment. Programs and facilities that can be provided independent of this characteristic should be left for other jurisdictions
- Recreation programs are market driven and as such will change with trends over time
- The development of all recreation programs will be based upon:
 - Level of impact: fit to the conservation area's significant and representative natural heritage
 - Market Analysis: demonstrated need for the program
 - Affordability: acceptable capital and operating costs

These objectives and guiding principles will inform the decision making needed to plan for and implement management recommendations and programming.

9.2. PRELIMINARY RECOMMENDATIONS

The recommendations provided in this section have been largely defined by the results of the baseline studies collected for this Background Report. Many of the topics included here are multi-faceted and final resolutions require information and input from a variety of sources. All of the recommendations focus on the objectives of the Conservation Areas Strategy; protection, appreciation, and recreation. These results are considered to be preliminary and the purpose of their inclusion in this report is to direct and advise future consultation and discussion.

9.2.1. Zoning Recommendations

The division of the Belfountain Complex into management zones is an objective of CVC’s Conservation Areas Strategy as well as a requirement for all properties in the Niagara Escarpment Parks and Open Spaces System. Zoning is used as a tool to identify and protect significant features based on their sensitivity to development, human activity of change. Zoning also identifies areas that are most appropriate for development.

CVC’s conservation area zoning system is determined through the Conservation Areas Strategy (8.1.2) and contains six distinct zones (Appendix L).

Constraint mapping, which distinguishes areas of land based on sensitive natural features, has been completed for the Complex (Table 19, Figure 25). Constraint mapping does not equate to zoning, but rather illustrates the overall significance of the Complex. Zoning will be refined to delineate features and habitat patches based on CVC’s zoning definitions.

Table 19 - Criteria for Constraint Mapping

Management Level	Components
Restricted (Highest Level of Protection)	<ul style="list-style-type: none"> - Regulated or critical habitat of species at risk (excluding Butternut) - Designated Ecological Features (PSW, ANSI and ESAs) - Habitat of high diversity of rare plants - Confirmed significant wildlife habitat (e.g. seeps)
Modest Restrictions (Intermediate Level of Protection)	<ul style="list-style-type: none"> - Habitat of or areas adjacent to habitat of area sensitive or forest interior wildlife - Non-provincially significant wetlands plus a 30 m buffer - Cold water streams plus a 30 m buffer - Large Cultural Meadows (5- 10 ha)
Some Restrictions	<ul style="list-style-type: none"> - Plantations - Cultural meadows <5 ha - Manicured open space

Figure 25 illustrates the overall coverage of significant features on the Complex.

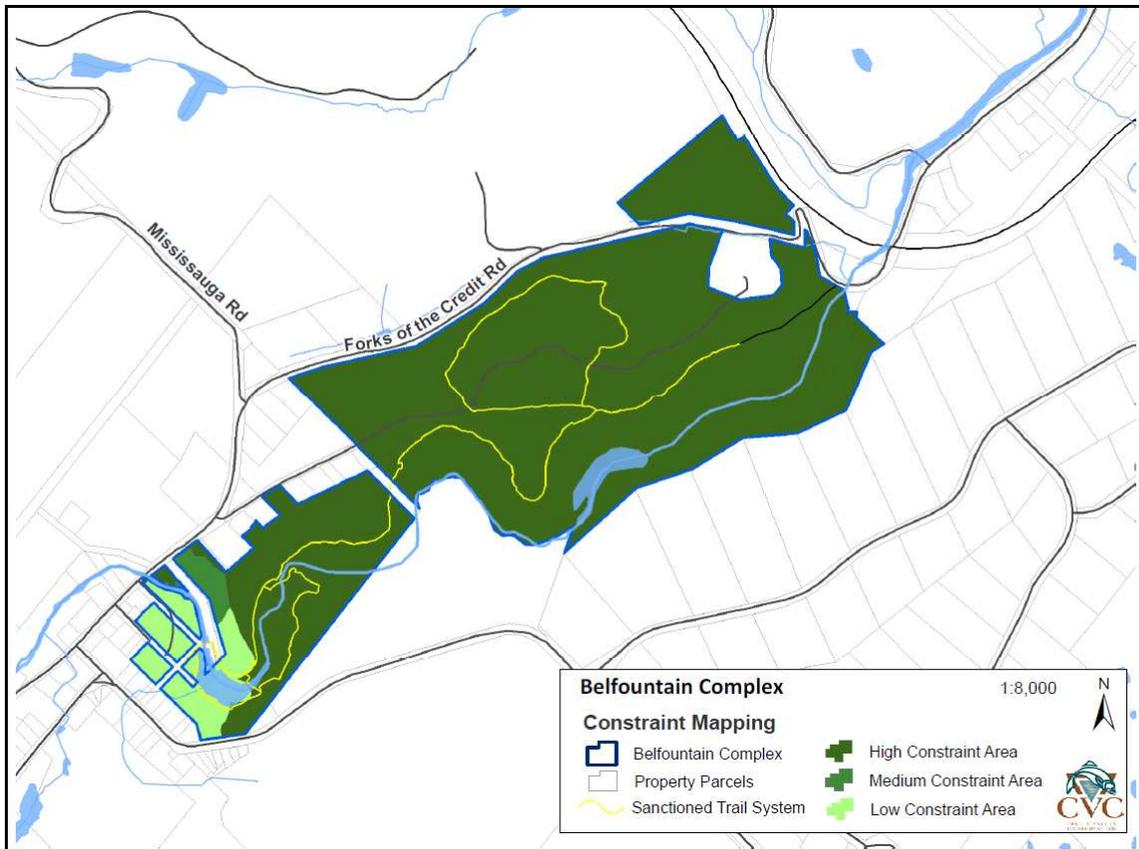


Figure 25 - Constraint Mapping for the Belfountain Complex

9.2.2. Land Securement

Priority lands for acquisition have been identified using CVC’s Greenlands Securement Strategy. The road allowances dissecting Belfountain Conservation Area have been identified for securement. These parcels are owned by the Town of Caledon, and were originally retained because of their potential value as future transportation linkages. As this is no longer a possibility, CVC is pursuing the acquisition of these parcels so that all of the land within the Complex can be owned and managed by one agency. Greenlands located along the length of the West Credit River have also been identified as a high priority but are not currently being pursued.

9.2.3. Health and Safety and Site Security

Undertaking measures to promote a safe and secure site are instrumental in the planning process. Belfountain Conservation Area and the Cox Property have been plagued by vandalism in the past, and unsanctioned activities have been observed throughout the Complex. Recommendations ensuring the safety and security of visitors, staff and the Complex itself integrate into all recommendations. Considerations include:

- Review the Belfountain Conservation Area Emergency Preparedness Plan and update where necessary
- Ensure the security of the boundary line; replace or install fence where necessary

- Install signage regarding the appropriate use of the Complex and enforce unsanctioned behaviour such as mountain biking, after-hours use and vandalism
- Identify the feasibility of options for increasing security, such as the installation of security features or patrol schedules

9.2.4. Infrastructure

The layout of the Belfountain Complex has stayed much the same for the past several decades. The main development area in Belfountain Conservation Area is small, and infrastructure and development plans must use the space as efficiently as possible. Multi-use facilities and facilities that recycle or renew existing footprints should be explored.

- Existing infrastructure, including cultural heritage features, are aging and a schedule is required to determine the following:
 - Dates and costs for recommended maintenance work
 - Dates and costs for whole or partial replacement of the item
 - Alternatives for the placement, function and/or type of structure
- Explore design options that could help to relieve health and safety concerns such as poor lighting, unsanctioned use and vandalism
- Ongoing issues with the trail systems, including muddy areas, unsanctioned trails and look-outs, need to be addressed
- Identify options for internet capabilities for staff with offices on the premises
- Additional infrastructure that will enhance the visitor experience by offering more and/or better services should be investigated. Preliminary ideas from staff include:
 - Additional parking space
 - Additional accessible washroom facilities
 - Pavilions and/or an indoor rental facility

9.2.5. Recreation, Programming and Visitation

Opportunities exist to expand the existing programs for appreciation, education and recreation. Several ideas have been brought forward by staff, as well as through the results of the 2010 Visitor Information Survey at Belfountain Conservation Area. As with the recommendations identified in section 9.3.4., additional programming should consider the limited accessible space within the Complex, as well as the temporal distribution and trends of current visitation. Proposals include:

- Enhancing the connection between Belfountain Conservation Area and the Willoughby Property. This will encourage visitors to explore the entire Complex and may help to ease congestion in heavily used areas. This could be facilitated through a unified interpretive trail, guided hikes or other education-based programming.

- Encouraging visitation at off-peak times and promoting the distribution of visitors throughout the site may lessen social and environmental conflicts. These patterns of use are based on the existing property layout, infrastructure, and regional tourism trends but weekday programming or off-peak savings could help to mitigate this.
- A lack of interpretive signage and information regarding the cultural resources within the Complex has been noted as a deficit by visitors.
- Opportunities may exist to connect with local businesses to provide added-value events and experiences to conservation area visitors.

9.2.6. Restoration and Environmental Management

Protecting the natural features and functions of the Complex is a priority and several recommendations for maintaining and improving the natural heritage of the site exist:

- Appropriate zoning will maximize the protection of natural heritage features, especially habitat associated with Species at Risk
- Habitat restoration opportunities should be explored where appropriate
- Continue to facilitate the needs of long-term monitoring programs within CVC lands

9.2.6.1. Restoration and Habitat Improvement: Several of CVC's long-term monitoring programs have stations or plots near or within the Complex. Both terrestrial and aquatic monitoring groups have identified opportunities to restore and rehabilitate areas within Complex that have been disturbed by anthropogenic processes. These proposals include:

- Develop and implement invasive species management prescriptions; educate the public and neighbouring property owners about attracting nuisance species
- Identify and prioritize areas for riparian, terrestrial and aquatic restoration throughout the Complex
- Develop and implement forestry management prescriptions, where applicable

9.2.7. Community Integration and Partnership Groups

A coordinated, dedicated partner group that provides a supporting role for the management of the Complex would benefit this area. Promoting and encouraging partnerships is recommended:

- Both project-specific and long-term partnerships should be pursued
- Relationships with existing, local groups should be pursued
- The conception of a new partner group with an onus on the maintenance and upkeep of the Complex could be explored

10.0. NEXT STEPS

The Background Report is the first phase of the planning process for the Belfountain Complex. The process will transition into public consultation, and discussions with public agencies and stakeholders upon final review and approval of this document.

10.1. PLANNING SUBCOMMITTEE

The planning subcommittee involved with management planning consists of CVC staff experts from all departments; many of which have supported the baseline inventories and research that informed this document. This committee is instrumental in determining priorities and making decisions for the long term management of the Belfountain Complex.

10.2. PHASE II – STRATEGIC DIRECTIONS

Phase II will commence with the finalization of the Background Report. Community members will be informed, through advertisements, mail outs and social media about public consultation dates. Individuals that participated in the 2010 Visitor Survey may also be contacted. Separate meetings with specific focus groups may be set-up for community groups and agency stakeholders.

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