Credit Valley Conservation

Management Plan **2008**

Terra Cotta-Silver Creek Complex

CVC
CREDIT VALLEY CONSERVATION

APPROVAL STATEMENT FOR THE TERRA COTTA – SILVER CREEK MANAGEMENT PLAN

We are pleased to approve the Terra Cotta – Silver Creek Management Plan as the official policy for the management and development of this park. The plan reflects the Credit Valley Conservation Authority's intent to protect the natural environment of the Niagara Escarpment and the natural features of the Terra Cotta – Silver Creek Complex and to maintain high quality opportunities for natural interpretation, recreation, discovery and enjoyment of the Niagara Escarpment by Ontario's residents and visitors.

Date: July 11 '08

Rae Horst
Chief Administrative Officer
Credit Valley Conservation Authority

Date: July 11, 2008

Pat Mullin
Chair, CVC Board of Directors
Credit Valley Conservation Authority

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

Date: Aug 5/2008

Mark Frawley
Director
Niagara Escarpment Commission

Date: Aug 27/2008

Ray Pichette
Director
Policy and Planning Coordination Branch
Ministry of Natural Resources

Acknowledgements

The Terra Cotta – Silver Creek Management Plan has been the product of many individuals since its inception in 2004. The management plan was primarily authored by Eric Baldin, Jesse de Jager and Heather Hewitt of CVC's Lands and Conservation Areas Department. Support and input was also provided by the Lands Planning and Management team and Operations staff.

Thank you to all CVC staff who participated in the management plan's technical committee, and to all other staff that provided input or contributed to the completion of the management plan; and thank you to the consultants who helped with the management plan in the early stages of development.

Thank you to the staff at the Niagara Escarpment Commission and the Ontario Ministry of Natural Resources who participated in the development and approval of the management plan and helped to ensure that the Terra Cotta – Silver Creek Complex remains a unique and important part of the Niagara Escarpment Parks and Open Space System.

Thank you to the members of the public, community groups and government agencies who participated in stakeholder meetings, provided guidance and supported the plan – and whose continued support will ensure its success well into the future.

Thank you to CVC's municipal and regional partners who continue to support and fund the securement and management of ecologically significant land, and who continue to recognize the importance of investing in the protection of the Terra Cotta – Silver Creek Complex.

It is our hope that this management plan will effectively ensure the protection, appreciation and enjoyment of this spectacular piece of the Niagara Escarpment and Credit River Watershed.

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Vision Statement

CVC's vision for the Terra Cotta-Silver Creek Complex is:

"To protect the conservation area's significant and representative ecosystems, and offer sustainable natural heritage appreciation and recreational benefits to watershed residents and visitors."

The Terra Cotta-Silver Creek Complex is one of the most environmentally and aesthetically significant natural areas in the Credit River watershed. Protection and enhancement of the rugged Niagara Escarpment topography (steep cliffs and valleys, combined with diverse forests, wetlands, and streams) will provide an ideal "Landscape for Learning". Enhanced education programs at the conservation areas will foster protectionist attitudes that will assist CVC in achieving its vision of a healthy Credit River watershed for future generations.

To help achieve that vision, the goals and objectives of this management plan are designed to support the goals outlined in CVC's Strategic Plan:

Water Quantity

To manage the hydrological system of the watershed in a manner that emulates natural processes while recognizing human needs.

Water Quality

To protect and enhance the quality of surface and subsurface water for environmental and human uses.

Terrestrial and Aquatic Species, Communities and Ecosystems

To protect, enhance and restore the ecological integrity of the watershed's natural features, functions and systems.

Natural Hazards

To protect public safety and minimize property damage from natural hazards including flooding, erosion and wetlands.

Social and Economic

To promote the social and economic health of the community through effective watershed management.

Executive Summary

Situated on the Niagara Escarpment (A UNESCO World Biosphere Reserve), Credit Valley Conservation's (CVC) Terra Cotta-Silver Creek Complex (The Complex) is the Authority's oldest and largest land holding. Composed of Terra Cotta, Silver Creek, and Terra Cotta Forest Conservation Areas, in addition to the Jacquith Property (owned by the Ontario Heritage Trust, managed by CVC), the Complex is 764 hectares or 1,887 acres in size. The Complex is among the most environmentally and aesthetically significant natural areas in the Credit River watershed. In fact, almost the entire Complex has been designated within three provincially significant Areas of Natural and Scientific Interest, as the valleys, cliffs, and bedrock plains, together with their diverse forest, wetlands, and streams, represent the best Escarpment habitat in this region of the Province. As such, the area is part of the Niagara Escarpment Parks and Open Space System (NEPOSS) and contributes to the achievement of the provincial Niagara Escarpment Plan's goals and objectives. Rugged topography and numerous lakes, rivers, and ponds also provide outstanding natural appreciation and recreation opportunities.

Development of the property as a recreational area began in 1949 when a pavilion, office, and concession building were constructed in what was then a privately owned commercial park known as Terra Cotta Playground. After CVC established a conservation area, there was intense development driven by recreational demand. By the 1980s, Terra Cotta Conservation Area contained 137 un-serviced campsites; a 10 acre day use area with 376 picnic tables and a 1 acre swimming pool; a gate house; a maintenance compound; a visitor centre; concession stand; mini golf; hiking trails; and, enough parking for 650 cars. Although use of Silver Creek Conservation Area was limited to hiking the Bruce Trail and use of the education centre, combined use of the Complex surpassed 113,000 visitors in 1989. Operating on a year-round basis, maximizing revenue and recreational use of Terra Cotta was just as important as protecting sensitive natural features and functions.

By the late 1980s, management focus was shifting. Despite revenue from over 100,000 visitors per year, it was becoming increasingly difficult to manage extensive land holdings and still provide quality recreation opportunities and experiences. A Master Plan was prepared that placed emphasis on the protection of environmentally significant portions of the conservation areas and provision of passive recreational uses. Although camping opportunities and waterplay facilities were still identified, the management philosophy had changed from recreation and revenue generation to protection before recreation.

The Conservation Areas Strategy, published in 1994, confirmed CVC's dedication to protection. Land managers were directed to classify and zone all conservation areas recognizing environmental protection as the highest priority. Appreciation and recreation opportunities would only be offered if they fit within the protection objective. Emphasis on environmental protection resulted in significant changes within the Complex. By the mid 1990s all camping facilities were removed with affected areas left to regenerate naturally, and the swimming pool was decommissioned and replaced with an award winning wetland.

As a consequence of the changes in conservation area direction, the Terra Cotta-Silver Creek Complex has been without active management since 1995. Existing infrastructure repairs are required, trail impacts are extensive from unmanaged use, and some visiting user groups continue to leave the Complex unsatisfied with their experience.

CVC initiated the current management planning process for Terra Cotta-Silver Creek in 2004. Phase I – the Situation Analysis, provided the characterization of the Complex based on relevant plans, policies, and reports describing the natural features and functions of the property and identified the areas of opportunity and constraint.

Phase II involved three rounds of public consultation on the Situation Analysis Report. With such a large land mass that crosses local and regional municipalities, members of the general public, special interest groups, and local government agencies all held interest in the

process and provided vital insight on the Complex's current state and CVC's planned future initiatives. Phase III began with a draft plan and associated consultations, and will end with approval of this Plan.

While each conservation area within the Complex is classified and zoned separately, as required by the Niagara Escarpment Plan, protection, appreciation, and recreation opportunities are planned at a system level.

Silver Creek and Terra Cotta Forest Conservation Areas (including the Jacquith Property) are classified as Nature Reserves, whereas Terra Cotta is classified as a Natural Environment conservation area. Only the resource management zone is not present in the Complex. The classification and zoning process provides a balance between protection, appreciation, and recreation. Locally or regionally significant natural features and functions present within Silver Creek and Terra Cotta Forest conservation areas are protected with only the most passive uses permitted. Although Terra Cotta Conservation Area contains those same significant features and functions, specific areas are ideal to provide high quality appreciation and recreation opportunities. Consequently, implementation of resource protection, stewardship, recreation, education, and infrastructure development policies will require a focused management effort combined with new revenue generation and partnership initiatives.

Public interest in the planning process is high. Local landowners take pride in the conservation areas and want to enhance their reputation throughout south-western Ontario and beyond. The residents acknowledge that protection of significant natural heritage features and functions is vital to this image; however, they and CVC want to provide appropriate appreciation and recreation opportunities. With such a wide variety of potential activities, operation and management of the Complex will require new funding sources. It is recommended that a Terra Cotta Advancement Cabinet be established as a sub-committee of the CVC Foundation. This Committee will help design campaigns and raise funds to offer various programs within the Complex.

The Terra Cotta-Silver Creek Management Plan will be reviewed every five years. Public consultation will be necessary where proposed changes affect the vision, goals, or objectives for any of the conservation areas within the Complex.

1.0 Introduction

1.1 Conservation Areas Strategy

The conservation areas of Credit Valley Conservation (CVC) represent a cross-section of the natural and recreational landscapes that characterize the Credit River watershed. CVC's Conservation Areas Strategy (1994) creates a vision for managing these conservation areas as a system, recognizing the interconnectedness of these unique landscapes.

CVC's goal for the conservation areas system is:

> *To protect the Credit River watershed's significant and representative ecosystems, and offer sustainable natural heritage appreciation and recreational benefits to its residents and visitors.*

The statement reflects the importance of protecting the natural heritage features and functions of the watershed, while recognizing the need to provide high quality, interactive outdoor experiences through appreciation and recreation opportunities.

The goal statement is reinforced by three supporting objectives for managing the conservation area system, they are:

Protection: To protect significant and representative natural heritage features through selective acquisition and resource management.

Appreciation: To provide the public through various means, with opportunities for understanding the watershed's natural heritage, and role of the Authority in its stewardship.

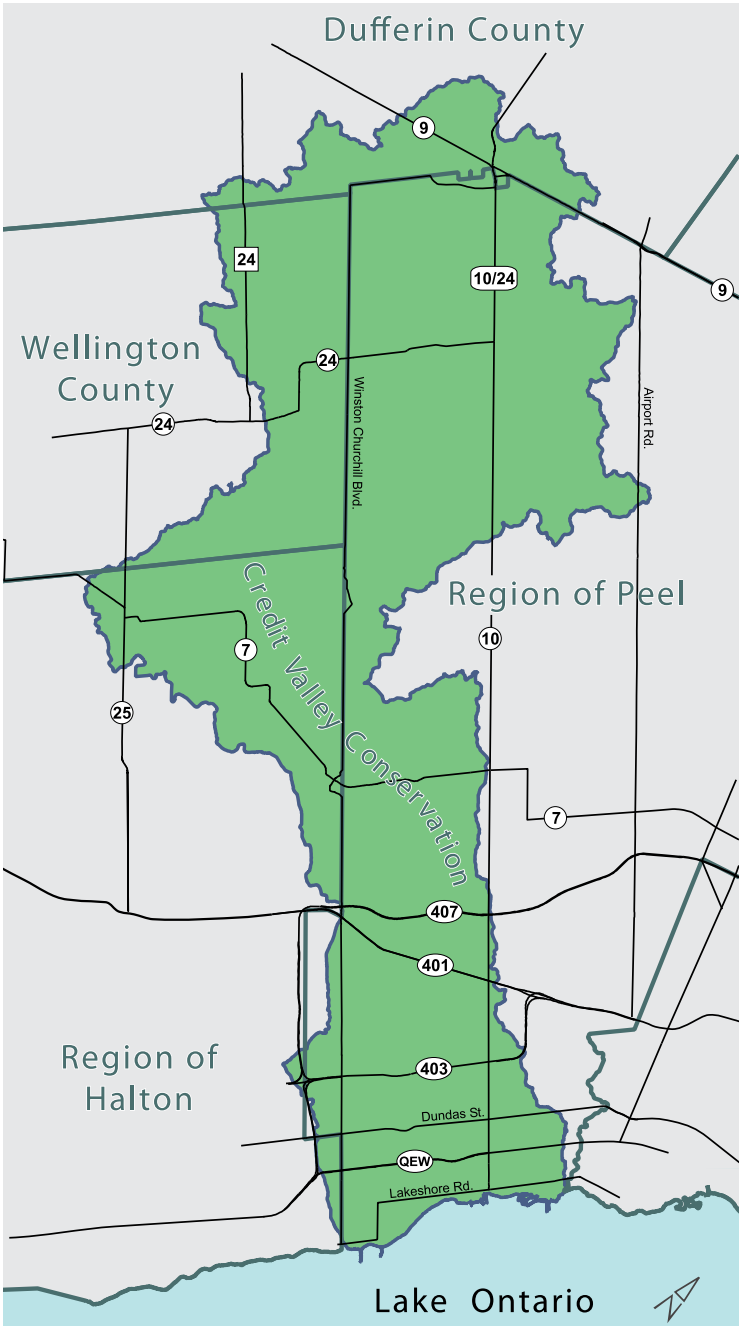
Recreation: To provide opportunities and facilities for selected outdoor recreation activities requiring high quality, sustainable natural environments.

CVC has also adopted several guiding principles that further illustrate the intent of the system goal and objectives. The guiding principles are as follows:

- CVC will endeavour to create a system of conservation areas that contains a cross-section of significant watershed natural heritage features and functions. At a minimum, the features and functions will be significant within the Credit River watershed.

- Conservation Area management practices will be based on a systems approach to planning and the concept of environmentally sustainable development and recreation activities.

- CVC will strive to increase public understanding of natural heritage features and functions present within the Credit River watershed.



- Conservation Area recreational opportunities will be linked to the natural environment and sited appropriately based on the environment's ability to sustain the activity, the demonstrated demand for the program, and CVC's ability to manage the activity effectively within capital and operating budget limitations.

The objectives of protection, appreciation and recreation are important and considered to be the primary, if not only, reason for CVC to own and manage land. The order of priority recognizes that without protection, the quantity and quality of natural heritage features and functions remaining to appreciate, diminishes greatly. It further recognizes that without public awareness of environmental processes and stewardship, it will be difficult for CVC to maintain conservation areas and permit use on a sustainable basis. Finally, it recognizes that conservation areas provide unique settings for outdoor recreation activities that cannot be provided successfully by others.

1.2 Conservation Authorities and CVC

Conservation Authorities are local, watershed management agencies that deliver services and programs to protect and manage water, hazards and other natural resources in partnership with various levels of government, landowners and other organizations. Conservation Authorities represent a liaison between the Province and municipalities, managing, restoring, and enhancing provincial and regional resources alike at a watershed level.

Established in 1954 by the Conservation Authorities Act, CVC is one of 36 Conservation Authorities in Ontario. CVC's mandate is to manage and protect the Credit River watershed; an area of 94,890 hectares that extends from Orangeville south to the Lake Ontario waterfront at Port Credit, and from Acton east to just south of Caledon East (Map 1).

1.3 Terra Cotta-Silver Creek Complex

The Terra Cotta-Silver Creek Complex consists of 764 hectares, or 1887 acres of land, and is formed by three conservation areas – Terra Cotta, Silver Creek, and Terra Cotta Forest – and the Jacquith Property (owned by the Ontario Heritage Trust but managed by CVC).

Located in the watershed's geographic centre and situated near the Village of Terra Cotta, the Complex reaches from Mississauga Road southwest to Highway 7, crossing between two local and regional municipalities (Map 2).

The Complex represents an important protected area within the Niagara Escarpment Plan (Map 3). Significant sections of the Complex are designated as Escarpment Natural or Escarpment Protection Area as defined in the Niagara Escarpment Plan. Smaller sections of the Complex are designated as Escarpment Rural. The entire Complex is part of the Niagara Escarpment Parks and Open Space System (NEPOSS); Terra Cotta Conservation Area is classified as a Nodal Park within this system.

Situated on the Niagara Escarpment, the Complex is among the most environmentally and aesthetically significant natural areas in the Credit River watershed. In fact, almost the entire Complex has been designated within three provincially significant Areas of Natural and Scientific Interest. The valleys, cliffs, and bedrock plains, together with their diverse forest, wetlands and streams, represent the best Escarpment habitat in this region of the province. Land within the Complex also forms part of two subwatersheds: roughly one-seventh of the Silver Creek subwatershed and one-tenth of the Credit River – Cheltenham to Glen Williams subwatershed.

Development of Terra Cotta Conservation Area as a recreational area began in 1949 when a pavilion, office, and concession building were constructed in what was then a privately owned commercial park. At that time, demand exceeded supply of recreation opportunities and facilities. CVC began acquiring land for Terra Cotta Conservation Area in 1958 creating an opportunity to fill a market niche. Revenue generating recreation areas were ideally suited to supplementing funds spent on land acquisition and management activities. A 1979 Master Plan (CVC, 1979) identified Terra Cotta Conservation Area as "…operating on a year round basis as a revenue producing conservation area offering day-use and overnight recreation facilities in a manner consistent with the physical setting of the site." By the 1980s Terra Cotta Conservation Area contained 137 unserviced campsites; a 10 acre day-use area with 376 picnic tables, a 1 acre swimming pool; a gate house, a maintenance compound; a visitors centre; a concession stand; mini golf; hiking trails; and, enough parking for 650 cars.

Although use of Silver Creek Conservation Area was limited to hiking the Bruce Trail and use of the Education Centre, combined use of the properties within the Complex surpassed 113,000 visitors in 1989. Maximizing revenue and recreational use of the conservation areas was just as important as protecting sensitive natural areas and systems.

Terra Cotta - From Swimming Pond (1959), to Swimming Pool (1989), to Naturalized Wetland (1999)

By the late 1980s, management focus was shifting. Despite revenue from over 100,000 visitors per year, it was becoming increasingly difficult to manage extensive land holdings and still provide quality recreation opportunities and experiences. A new master plan (Hough, Stansbury, Woodland Limited, et al., 1990) placed "emphasis on the protection of the environmentally significant portions of the parkland and provision of passive recreational uses." Although camping opportunities and waterplay facilities

were still identified, the management philosophy had changed from recreation and revenue generation to protection before recreation.

The Conservation Areas Strategy (CVC, 1994) confirmed CVC's dedication to protection. Land managers were directed to classify and zone all conservation areas recognizing environmental protection as the highest priority. Appreciation and recreation opportunities would only be offered if they fit within the protection objective. Emphasis on environmental protection resulted in significant changes within Terra Cotta Conservation Area. By the mid 1990s, all camping facilities were removed with affected areas left to regenerate naturally; the swimming pool was also decommissioned and replaced with an award winning wetland. As a result of the changes that had been made to conservation area directives, the Complex has been without active management since 1995. Existing infrastructure is in need of repair, trail impacts are extensive from unmanaged use, and some visiting user groups continue to leave the area unsatisfied with their experience.

The management plan will continue to guide the new management philosophy – **protection before recreation**. A collective decision making process will ensure that provision of recreation and appreciation opportunities and facilities are appropriate for the natural setting and have regard for potential impacts that will extend beyond conservation area boundaries into the surrounding natural and social landscape.

2.0 Developing the Management Plan

2.1 Why Complete a Management Plan?

Management plans guide development and management of natural and social resources in conservation areas. As part of the planning process, background reports contain a comprehensive summary of natural heritage features and functions, existing infrastructure, as well as past and present recreational uses. Information within these documents provides detailed rationale for conservation area goals, objectives, classification and zoning set out in the management plan. Ultimately, the management planning process provides the public and CVC with a high level of confidence that development and recreation activities permitted in a conservation area are appropriate, while adhering to the system goal and objectives set out in the Conservation Areas Strategy.

The Terra Cotta-Silver Creek Management Plan will be CVC's second management plan completed using this planning process and will also fulfil policies of the Niagara Escarpment Plan that require management agencies to complete management/master plans for each park within NEPOSS.

2.2 The Planning Process

The Terra Cotta-Silver Creek Management Planning Process was conducted in three phases.

Phase I – *Situation Analysis* – included background studies and baseline investigations of the natural features and functions of the Complex, as well as the existing infrastructure and facilities. Opportunities and constraints associated with these features and facilities helped establish preliminary management zones for the Complex and provide the basis for public consultation.

Phase II – *Strategic Directions* – began with three consultation sessions with the public and other stakeholders on the Situation Analysis Report. The Strategic Directions Report is a synthesis of the results and issues identified in the Situation Analysis Report and from the three consultation meetings. The issues identified have formed the foundation of this management plan.

Phase III – *Management Plan* – incorporates the results of the Situation Analysis and Strategic Directions phases and presents final vision for the Complex in as much detail as necessary. The Draft Management Plan was reviewed and revised several times through CVC and other government staff. Phase III culminates in the approval of the Management Plan by the CVC Board, NEC and MNR.

2.3 Public Consultation

With a large local population and many government agency interests to consider, a single, all-encompassing consultation was not feasible. The process was split into three groups – general public, special interest groups, and government agencies.

As local land owners and potential visitors, the general public were given several opportunities to participate and voice their opinions on the management planning process. In addition to the two hour public meeting held at the Terra Cotta Nature Centre, members of the general public were given opportunities to read the Situation Analysis Report Executive Summary and fill out an information survey. Attendees were notified of the process and the public meeting through hand delivered invitations, notices posted in local newspapers, and bulletins posted on CVC's website.

Special Interest Groups participated in a workshop separate from the general public. Although the format was similar, the specific needs and concerns for each group required attention that could not be given in a large public forum. Invitation letters with the Situation Analysis Report Executive Summary were mailed to each group.

Staff from government agencies participated in a workshop held at CVC's Head Office. They provided comments on the Situation Analysis Report and draft management directions for the Complex.

Those involved in the consultation process included members of the general public, local interest groups (e.g. Bruce Trail Conservancy, Jack Smythe Field Centre, Hike Ontario), and management agencies (e.g. Department of Fisheries and Oceans, Niagara Escarpment Commission).

The consultation process for the Terra Cotta-Silver Creek Management Plan was very successful. With three well attended sessions, each group was able to voice their specific questions and concerns. The general response to the management plan was favourable.

Terra Cotta wetland construction

Despite different meeting formats and varied personal interests, several common themes became evident from the consultation process:

- **Protection** of the natural features and functions must take precedence over recreation.
- A **land securement** strategy should be developed specifically for the Complex. Local residents want the conservation areas to grow and continue to influence local development.
- With such a large land base and so many interested public, special interest groups, and government agencies, CVC has the opportunity to form several long lasting **partnerships** that will enhance CVC's ability to manage and maintain the environmental significance of

the Complex while offering high quality, appropriate outdoor recreation and appreciation opportunities.

- All interested stakeholders agree the Complex is an ideal location to implement new **education** initiatives about the Credit River watershed and the Niagara Escarpment the importance of balancing protection with recreation and appreciation.

- At almost 1,900 acres in size, the Terra Cotta-Silver Creek Complex is a significant land holding for CVC, and a regionally important greenspace. With proper **marketing and promotion**, the influence of the Complex within and beyond local boundaries, could provide significant benefits. Often referred to as the 'jewel' in the conservation areas system, visitors and local landowners alike, have expressed their pride in this property and support the effort required to further its promotion.

- The **trail system** is one of the great assets of the Complex. The management plan will address trail issues and concerns as they relate to appropriate trail use, system design and signage. Decisions will be evaluated based on the goals and objectives identified within the management plan.

- **Linkages** within and beyond the Complex will be considered. Specific linkages include: those between regional greenlands systems and trail systems; linkages to other local protected areas; linkages between user groups; and linkages between user/interest groups and CVC staff. Discussion of linkages will be present throughout the management plan; each will be addressed based on their advantages and disadvantages within the context of the goals and objectives set out for the Complex.

- Appropriate **recreation opportunities** inherently lead visitors to appreciate their settings. Without appreciation it is difficult to foster beliefs that support protection ideals. Finding an appropriate balance between nature versus development and demand versus carrying capacity has been a key component within the final stages of the management planning process. Trail system planning, marketing and promotion, partnerships, permitted activities, education programs, and daily management activities will all be affected when considering how to suitably meet this balance.

Whether it was a local land owner, a member of a special interest group, or a municipal planner, everyone was excited that CVC had begun a management planning process for the Terra Cotta-Silver Creek Complex. However, response to management of the Complex has not always been positive. While changes in management philosophy have pleased many government agencies and partners, a decade of extensive changes and ineffective management have left many visitors unsatisfied with their experience. CVC recognizes that management change in public spaces provides a difficult period of adjustment for visitors, and for this reason visitor surveying and monitoring will continue at Terra Cotta Conservation Area and throughout the Complex.

Regardless of the numerous and complex opportunities and constraints discussed as part of the consultation process, CVC is now presented with the unique opportunity to start over again, manage the Complex effectively, and improve the image of the Terra Cotta-Silver Creek Complex within and beyond the Credit River watershed.

3.0 Related Strategies, Policies, and Legislation

3.1 CVC Studies, Strategies, and Policies

3.1.1 CVC Strategic Plan (2006) and Strategic Plan Update

The Strategic Plan, and the information it contains on the State of the Credit River watershed, contributes to the growing awareness of the shape of our physical environment and the underlying causes of environmental change. In addition to identifying a corporate vision, mission, goals, and objectives, the Strategic Plan also provides an overview of the resource at both regional and watershed levels, summarizes the main agents of change and how CVC, which is mandated to manage all natural resources within the Credit River watershed, will respond. The recently 2008 Strategic Plan Update re-contextualizes the original Strategy in light of accelerated priorities and added stressors, such as climate change. The Update emphasizes the importance of conservation areas as protected spaces and adds increased impetus to greenlands securement activities.

3.1.2 Conservation Areas Strategy (1994)

The Strategy illustrates the cross-section of significant and representative natural features contained within conservation areas in the Credit River watershed. An ambitious vision was presented. It involved setting targets for land securement which directly led to the development of the Greenlands Securement Strategy (2004). The Strategy also called for the implementation of a management approach that ensured conservation areas were managed as a unified system rather than individual islands of greenspace within the landscape. This system framework for conservation areas presented well defined goals and objectives, with a priority set on protection before appreciation and recreation.

CVC also adopted a classification and zoning system to be assigned through management planning. There are five conservation area classes and six potential zones (Appendix A). Each class will be reflective of the vision for each conservation area and appropriate zoning will reflect the goal and objectives for the conservation area.

3.1.3 Greenlands Securement Strategy (2004)

This Strategy recognizes that greenlands secured within the Credit River watershed contribute to a connected system that provides natural heritage protection, appreciation and recreational benefits for ecological integrity and healthy communities.

The Strategy is designed to complement regulatory and stewardship programs of CVC while providing practical implementation of regional and municipal greenlands securement policies.

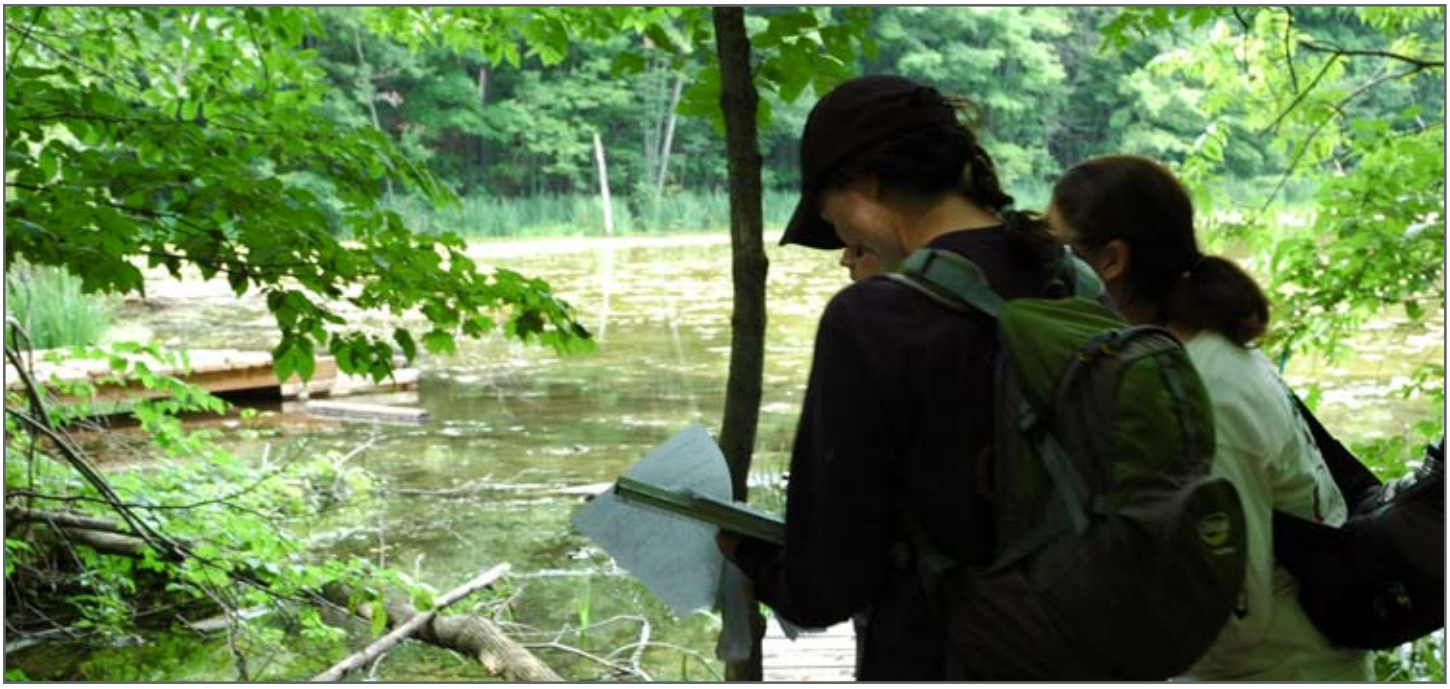
Criteria used in the Strategy ranked all greenlands found within the watershed (34,692 hectares) in relation to terrestrial and water based functions. CVC identified 14,588 hectares of Priority Greenlands with high scores for one or more of the following criteria:

- 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.

It is recommended that by 2024 CVC and its partners secure 5,670 hectares of identified Priority Greenlands through a variety of securement methods including donation, conservation easement, management agreement, and fee-simple purchase.

3.1.4 Authority Land Management Guide (2008)

The Authority Land Management Guide (ALMG) is a comprehensive and dynamic manual that contains all of CVC's land management policies and procedures. This information forms the core of all operational and programming implementation.



Regarding CVC's conservation areas, the Authority Land Management Guide directs the implementation of:

- 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

The Authority Lands Management Guide directs the operations and programming in CVC's conservation areas, including the Terra Cotta – Silver Creek Complex. Policy and procedures within the ALMG have been developed internally in conjunction with Natural Heritage, Water and Stewardship staff and primarily reflect principles of environmental protection and sound ecological management. As a sampling, some topics include: Species at Risk protection, invasive species management, trail management policies, pesticide restrictions, and risk tree abatement.

While comprehensive, the ALMG is also designed to be a dynamic and adaptable document which will accommodate updates, changes and new policies or protocols as the need arises. It is recommended that all the ALMG be reviewed and updated as necessary every two years.

3.1.5 Silver Creek Subwatershed Study (2001-2003)

Roughly one-seventh of the Silver Creek subwatershed is contained within the study area for the Terra Cotta-Silver Creek Management Plan.

The Silver Creek Subwatershed Study addresses environmental and water related issues within the area surrounding Silver Creek. Phase I is a scoping exercise designed to assess the data available and produce a Characterization Report. Phase II assesses the potential impacts of various development scenarios on the features and functions identified in Phase I. Phase II also identifies and evaluates various management options and solutions. Phase III documents the advantages and disadvantages of various management options. This implementation phase also ensures that recommendations are followed, monitoring continues, agency roles and responsibilities are clearly identified, and that residents are informed and have the ability to participate in ongoing management activities.

3.1.6 Credit River Fisheries Management Plan (2002)

The CRFMP was developed through a public process by the MNR and CVC. The Plan directs aquatic resource management within the Credit River watershed based on sustainability and integrity while considering socioeconomic values. Through the first and second stages of public consultation a number of issues and actions were identified. From this extensive list, a number of priority issues and actions were presented:

Water Quality and Quantity

- Develop a water budget to determine the quantity of water available for water taking and the minimum requirements to sustain healthy fish populations;
- Monitor and enforce sediment controls; and,
- Undertake studies to ensure that the assimilative capacity of the Credit River is not exceeded

Physical Habitat

- Remove or mitigate the effects of on-line ponds that are not used for fisheries management purposes.

Angling Opportunities

- Determine the feasibility of continuing or developing new stocking programs.
- Determine the feasibility of maintaining, installing new, or removing specific barriers.

Enforcement

- Increase support for enforcement of fishing and habitat violations through additional funding or partnerships.

Awareness

- Increase fish-viewing opportunities and education about non-consumptive uses through interpretive materials and migratory fish viewing opportunities.

3.1.7 Authority Policies on Floodplain Management (1994)

To carry out the Conservation Authorities Act mandate, CVC administers a regulation and implements policies for development within or adjacent to any of the following CVC Areas of Interest:

- Areas susceptible to flooding;
- Any watercourse (river, stream, creek or other natural or man-made waterway);
- Lands within and adjacent to ravines, valleys, and steep slopes associated with watercourses;
- Wetlands (marshes, swamps, bogs and ponds);
- Areas identified as having environmental significance; and
- The Lake Ontario waterfront.

Floodplain management is a combination of three components: prevention, protection, and emergency response. CVC policies on flood-proofing of buildings and structures, access and parking, and one- and two-zone areas represent a preventative and proactive approach to flood plain management.

3.1.8 Watercourse and Valleyland Protection Policies (1992)

CVC implements policies to ensure that environmental integrity in the Credit River watershed is maintained. To fulfil these objectives, CVC provides planning technical review services made under the Planning Act, the Niagara Escarpment Planning and Development Act, and other municipal, provincial, and federal legislation. In addition to requirements under Ontario Regulation 160/06, development applications are also screened for conformity to CVC policies as they relate to municipal and long range planning, lot creation, existing lots, and erosion control.

Specifically, development applications made for lands located within or adjacent to CVC Areas of Interest, may be submitted to CVC for review and comment. These policies also identify the principles and methodologies for determining the most appropriate development setbacks for watercourses, valleys and ravines, wetlands, woodlands, and other significant environmental features.

3.1.9 Development, Interference with Wetlands & Alteration to Shorelines & Watercourses (Ontario Regulation 160/06)

The Development, Interference with Wetlands & Alteration to Shorelines and Watercourses Regulation is a generic regulation made under Section 28 of the Conservation Authorities Act. A principal mandate of Conservation Authorities is to prevent loss of life and property due to flooding and erosion, and to conserve and enhance natural resources. This Generic Regulation is a key tool in fulfilling this mandate because it 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.

The types of lands that are affected include: river or stream valleys; hazardous lands (e.g. floodplain and meander belts); wetlands; and, watercourses. People planning to do work near these features may require a permit from a Conservation Authority. These activities include: the construction, reconstruction, erection or placing of a building or structure of any kind; any change to a building or

Hurricane Hazel 1954 - Floodplain damage

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

The Wetland and Valley Land Protection Policies as well as the Authority Policies on Floodplain Management, described above, will be revised to reflect the requirements of the Generic Regulation. Any development within the management plan area must abide by this regulation.

3.2 Municipal Planning

3.2.1 Peel Region Official Plan (2005)

The Terra Cotta Forest properties and Jacquith Property are designated as Core Area within the Greenlands System as defined in the Peel Region Official Plan.

The following goal, objectives and policies apply to these properties:

General Goal

- To recognize, respect, preserve and enhance the importance of ecosystem features and functions and enhance the environmental well-being of air, water, land resources and living organisms.

Large Environmental Systems General Objectives

- To recognize and promote connections between local ecosystem functions and large environmental systems and contribute to the protection of larger non-localized systems.
- To conserve and maintain the integrity of Peel's air, water, and land resources.

Greenlands System Objective

- To identify, protect and support restoration and rehabilitation of the Greenlands System in Peel.

Greenlands System Policies

- The Greenlands System consists of Core Areas, Natural Areas and Corridors, and Potential Natural Areas and Corridors.
- Core Areas of the Greenlands System are: provincially significant wetlands, woodlands that are a minimum of 30 hectares or 75 acres in area, Environmentally Sensitive or Significant Areas, Provincial Life Science ANSIs, habitats of endangered, threatened or special concern species,

Escarpment Natural Areas of the Niagara Escarpment Plan, and those valley and stream corridors shown on Schedule A of the ROP.
- Prohibit development and site alterations in Core Areas with some exceptions.
- No Net Loss of Core Areas.
- Environmental Impact Statements (EIS) are required for development proposals and site alterations on lands adjacent to Core Areas with some exceptions.

The Region of Peel is currently undertaking an Official Plan review, which includes identification and mapping of Significant Woodlands and Significant Wildlife Habitat and policies to protect these areas.

3.2.2 Town of Caledon Official Plan (2005)

The Terra Cotta Forest properties and Jacquith Property are designated as Environmental Policy Area (EPA) within the Ecosystem Framework as defined in the Town of Caledon Official Plan. The following goal, objectives and policies apply to these properties:

General Principles, Strategic Direction and Goals
- The Town will seek to preserve, protect and enhance natural physical features and biological communities.
- A key strategy of this plan is 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, enhance, and restore ecosystem attributes and values including: connectivity, viability/ self-sustainability, biodiversity, dynamics, and aesthetics.
- To protect, maintain, enhance, and restore physical and biological systems and features that support ecosystem integrity and associated functions, processes, attributes and values, including: landforms, valley and stream corridors, lakes, ponds, fisheries, wildlife, wetlands, woodlands, ANSIs, 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.

Environmental Policies
- New development is prohibited within areas designated EPA with minor exceptions.
- Proposed new development adjacent to EPA will be required to complete an Environmental Impact Study and/or Master Plan (EIS/MP).
- Lands designated as EPA shall not be damaged or destroyed unless as the result of an approved permit. If EPA is damaged or destroyed, there shall be no adjustment to the boundary or zoning designation of

these areas with the Town and Region requiring the replacement or rehabilitation of the affected ecosystem features, functions, and/or landforms.
- Non-intensive recreation development or uses may be permitted subject to the completion of appropriate environmental studies and investigations, up to and including EIS/MP. Proposed use must adhere to ecosystem principle, goal, objectives, policies, performance measures.
- The Town encourages the preparation of comprehensive Master Plans or comparable documents.

3.2.3 Halton Region Official Plan (2006)

Parts of Terra Cotta Conservation Area are classified as Greenlands B and Silver Creek Conservation Area is classified as Greenlands A and B within the Regional Greenlands System. The following goal, objectives, and policies apply to these properties:

General Goals and Objectives
- To maintain as a permanent landform an interconnected system of natural areas and open space that will preserve areas of significant ecological value.
- Restrict alteration of the physical and/or biological features within the Greenlands system and require an Environmental Impact Assessment (EIA) for development within or adjacent to such features unless otherwise approved.
- Encourage trail development within the Greenlands System provided that trails and associated activities do not impact negatively on ecologically sensitive areas or resource uses.
- Promote the concept and functions of the Greenlands System.
- Promote the donation of private greenlands or protective conservation easements to conservation bodies.

Environmentally Sensitive Area Policies
- Require the Area Municipalities and encourage the Conservation Authorities and Provincial regulations implementing this Plan to provide controls for the protection of ESAs.
- Require proponents of any development with potential to impact ESA to carry out an Environmental Impact Assessment (EIA).
- To preserve native species and communities that are rare, threatened or endangered based on regional, Provincial or national scales of assessment.
- To preserve and enhance biodiversity and ecological integrity.

Escarpment Natural Area Objectives and Policies
- Subject to other policies of this Official Plan, the following uses are permitted in ESAs: non-intensive recreation uses such as nature viewing and pedestrian trail activities; forest, wildlife and fisheries management; archaeological activities; incidental uses; uses permitted in an approved NEPOSS Plan; and watershed management and flood and erosion control projects.

Greenlands A and B Policies
- To protect biodiversity.
- To maintain and enhance water quality.
- To provide appropriate passive recreation opportunities.
- To achieve no net loss of function or area of Provincially Significant Wetlands.
- To maintain or enhance fish habitat.
- The following uses are permitted in Greenlands A and B: non-intensive recreation uses such as nature viewing and pedestrian trail activities; forest, wildlife and fisheries management; incidental uses; uses permitted in an approved NEPOSS Plan; and watershed management and flood and erosion control projects.

3.2.4 Town of Halton Hills Official Plan (2005)

Parts of Terra Cotta Conservation Area are classified as Greenlands B; Silver Creek Conservation Area is classified as Greenlands A and B within the Municipal Greenlands System. The following goal, objectives, and policies apply to these properties:

Natural Heritage Goals and Objectives

- To protect and enhance significant natural heritage features and related ecological functions.
- To recognize that a healthy community is made up of an interconnected system of open spaces and natural heritage features.
- To promote the retention of natural heritage features so that they can be enjoyed by future generations and serve as a legacy of the community's desire to protect their role and function.
- To prohibit development that will result in a negative impact to the critical functions and processes of watercourses, lakes, aquifers and wetlands.
- To prohibit the loss or fragmentation of Provincially Significant Wetlands and significant portions of the habitats of endangered and threatened species.
- To maintain and enhance significant areas of natural and scientific interest, significant valleylands, Escarpment slopes and related landforms, and significant wildlife habitat areas.
- To maintain and enhance surface and groundwater resources in sufficient quality and quantity.
- To encourage the municipal acquisition of valley lands and other environmentally sensitive areas.

Greenlands Objectives

- Ensure that only land uses that maintain, improve or restore the ecological and hydrological functions of the Greenlands system are permitted.
- Provide opportunities, where appropriate, for passive outdoor recreational activities.
- Maintain the Greenlands system as a series of interconnected natural features.

Greenlands A and B Permitted Uses

The following uses may be permitted in accordance with the objectives set out in Section B1.1 of this Plan, other policies of this Plan and Conservation Authority Regulations:

- Passive non-motorized recreational uses, such as nature viewing and pedestrian trail activities, only on publicly owned lands or on the Bruce Trail.
- Where applicable, uses permitted in an approved Niagara Escarpment Park and Open Space Plan.
- Forest, wildlife and fisheries management.
- Essential watershed management and flood and erosion control projects carried out or supervised by a public authority.

Trail Policies

- The development of trails within the Greenlands System shall be encouraged provided that the trails and associated activities do not impact negatively on natural heritage features and ecological functions or resource uses such as agricultural operations as demonstrated through the preparation of Master Plans approved by Council in consultation with the Region and the appropriate Conservation Authority.

3.3 Provincial Legislation and Plans

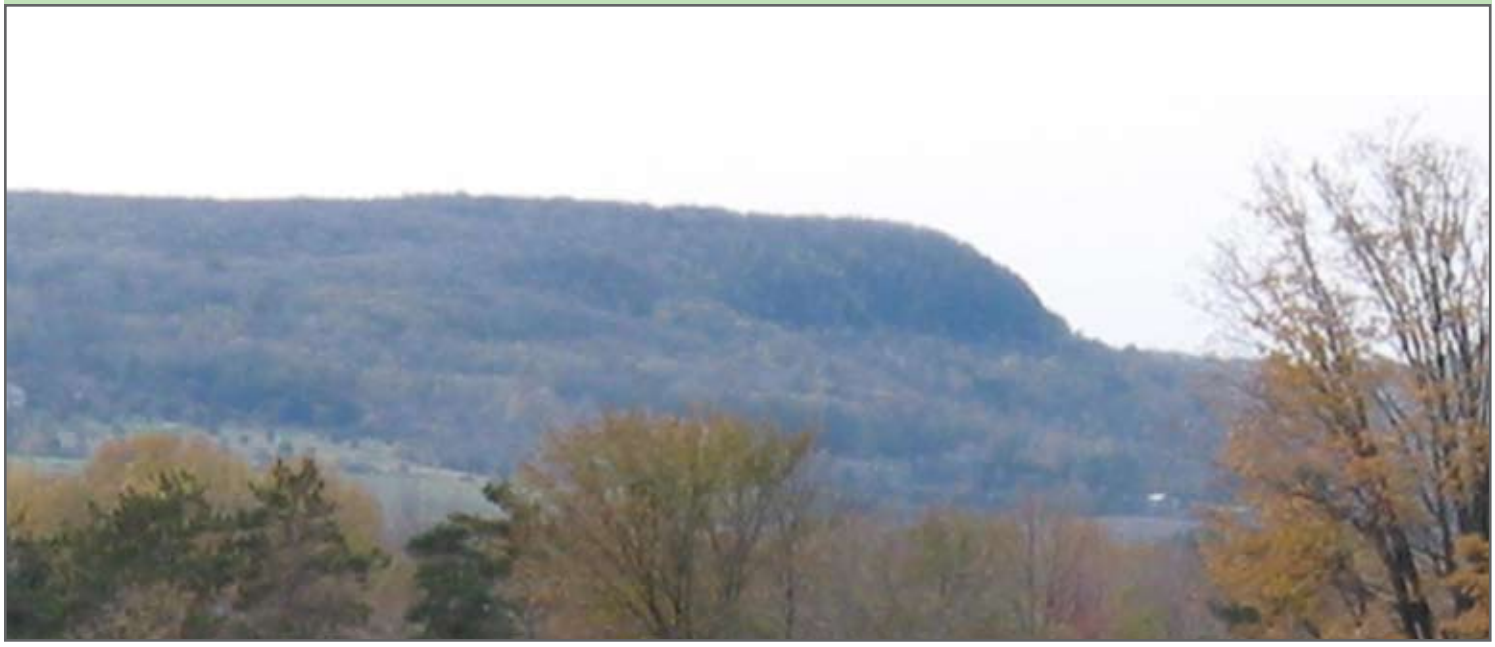
3.3.1 Conservation Authorities Act (1990)

Section 29 of the Act states that an authority may make regulations applicable in the area under its jurisdiction (Regulation 102/90):

- Regulating and governing the use by the public of the lands and the works, vehicles, boats, services, and things of the authority.
- Providing for the protection and preservation from damage of the property of the authority.
- Regulating and governing vehicular and pedestrian traffic and prohibiting the use of any class of vehicle or classes of vehicles.
- Prescribing terms and conditions under which horses, dogs and other animals may be allowed on the lands or any part thereof.

Section 28 of the Act states that an authority may make regulations applicable to lands owned by the Authority (Regulation 160/06).

Ontario Regulation 146/90 as amended (The Fill, Construction and Alteration to Waterway's Regulation) has been adopted by CVC in accordance with Section 28 of the Conservation Authorities Act. This Regulation provides CVC with the statutory authority to review and approve or deny permission for development and/or site alteration within CVC regulated areas. See Section 3.1.7 of this Plan for more detail.



3.3.2 Niagara Escarpment Plan (2005)

The entire Terra Cotta-Silver Creek Complex is within the Niagara Escarpment Plan Area. Terra Cotta Conservation Area is designated as a mix of Escarpment Natural Area and Escarpment Protection Area. Terra Cotta Conservation Area is also designated as a nodal park within NEPOSS. Silver Creek Conservation Area is mostly designated as Escarpment Natural and Escarpment Protection Area with small portions of Escarpment Rural Area. Terra Cotta Forest Conservation Area and the Jacquith Property are designated mostly as Escarpment Natural and Escarpment Protection Area with small portions of western forest parcel being Escarpment Rural Area. The policies and objectives of the Niagara Escarpment and the following objectives and policies of NEPOSS apply to these areas:

NEPOSS Objectives

- To protect unique ecological and historical areas;
- To provide adequate opportunities for outdoor education and recreation;
- To provide for adequate public access to the Niagara Escarpment;
- To complete a public system of major parks and open space through additional land acquisition and park and open space planning;
- To secure a route for the Bruce Trail;
- To maintain and enhance the natural environment of the Niagara Escarpment;
- To support tourism by providing opportunities on public land for discovery and enjoyment by Ontario's residents and visitors; and
- To provide a common understanding and appreciation of the Niagara Escarpment.

Nodal Parks

Elements of the Nodal Park Program include:

- Orientation – to tell visitors where they are in relation to the NEPOSS
- Education – to stimulate an understanding of the Escarpment's natural and cultural values
- Interpretation – to familiarize visitors with the features of a given park or open space area
- Recreation – to identify and provide information on how to participate in Escarpment activities

NEPOSS Policies

Parks and open space in the NEPOSS system will be assigned a classification based on the predominant characteristics of the property.

The six class types (Nature Reserve, Natural Environment, Recreation, Historical, Escarpment Access, and Resource Management Area) are very similar in definition to those in CVC's system (Appendix A).

Zoning assigns appropriate uses based on the natural significance or recreation potential of the land in question: There are six zone types (Nature Reserve, Natural, Access, Historical, Development, and Resource Management) that are very similar to the zones included in CVC's system (Appendix A).

Management agencies are required to prepare master/management plans for parks that establish long-term management, development and protection policies. For parks with approved management/master plans not in conflict with the Niagara Escarpment Plan, specified undertakings may not be subject to land-use policy designations and development criteria of the Plan. Furthermore, undertakings approved within such plans may be exempted from development control, stipulated broadly in Ontario Regulation 828, with specific Conservation Authority exemptions noted under Section 17.

Niagara Escarpment Development Permits
If an agency is proposing a development within the Niagara Escarpment Development Control Area, a Development Permit will be required unless specifically exempted under Ontario Regulation 828/90. With a few exceptions, the Niagara Escarpment Development Control area is the area covered by the Niagara Escarpment Plan.

3.3.3 Provincial Policy Statement (2005)

The Provincial Policy Statement provides the framework for policy protection of significant natural heritage features in Ontario.

- Natural features and areas will be protected for the long term.
- Diversity and connectivity of natural features, long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored, or improved while recognizing linkages.

- Development and site alteration shall not be permitted in (1) Significant wetlands south and east of the Canadian Shield or in the Canadian Shield north of Ecoregions 5E, 6E, and 7E; (2) Significant portions of the habitat of endangered and threatened species; (3) Significant woodlands south and east of the Canadian Shield; (4) Significant valleylands south and east of the Canadian Shield; (5) Significant wildlife habitat; and, (6) Significant areas of natural and scientific interest, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

- Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.
- Development and site alteration shall not be permitted on adjacent lands to features mentioned above unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

The MNR provides general guidelines for identifying significant woodlands and significant wildlife habitat (MNR, 2000), which can be protected through official plan policies that are consistent with the Provincial Policy Statement.

4.0 Environmental Inventory and Analysis

4.1 Geology and Hydrogeology

4.1.1 Physiography and Soils

Two distinctive surficial geology units were observed in Terra Cotta Conservation Area during studies in 2003: bedrock or bedrock drift and thin overburden. The bedrock, exposed in many areas of the Escarpment as well as in river valleys, consists of Palaeozoic sedimentary rocks, composed of limestone, dolostone, sandstone and shale. The overburden consists of glacial deposits (clay till) laid down when a continental ice sheet advanced northward out of the Ontario Basin. Even where overburden exists it is often very thin, generally less than five meters thick throughout the Complex.

The Terra Cotta-Silver Creek Complex is located within the boundary of two distinctive physiographic regions: the Niagara Escarpment and South Slope (Chapman and Putnam, 1984). Each region has different geological characteristics, with differing capacities to transmit water and provide habitat for vegetation and wildlife.

Throughout Ontario, the Escarpment is characterized by steep cliffs, unstable rubble slopes (talus), thin soils and frequent bedrock exposures; a highly stressful environment for many organisms. In the Terra Cotta-Silver Creek area the Escarpment rises to nearly 340 meters above sea level, and is a steep slope with an exposed rock face. The Amabel Formation forms the caprock of the Escarpment and is highly porous due to the formation of solution cavities and fracturing. Water dissolves the rock, creating cavities and channels, allowing the development of microhabitats such as seeps, springs, caves and overhangs which support many habitat-specific plants and animals.

Within the Terra Cotta-Silver Creek area, the South Slope is characterized as flat to gently sloping land consisting of fine-grained, silty to clay-rich, impermeable, red glacial till overburden. This till is known as the Halton Till, and it overlies the red shale bedrock of the Queenston Formation. These soils provide a more fertile, less stressful environment for most organisms, allowing the development of richer forests in a shorter time than on the Escarpment. The matrix of the till is fine-grained silty clay, and therefore it transmits little water compared to the fractured Amabel Formation.

4.1.2 Groundwater

Groundwater quantity and quality is poor within most of the Complex, because the shale bedrock, and the fine-grained till overlying the bedrock throughout the Complex, does not conduct water easily. However, within a very limited area, water is readily available, and the quantity and quality is very good. Groundwater is important for ecological functions as well as recreational activities, so any use of groundwater must be sustainable. It provides baseflow to streams, improves water quality and supports seepages with high diversity of plant communities and species.

Groundwater is only plentiful where the porous Amabel Formation underlies the shallow glacial till on the Escarpment. The Amabel Formation is one of the most productive bedrock aquifers in Ontario. The area above (west of) the Niagara Escarpment acts as a regional groundwater recharge area for this bedrock foundation. East of the Escarpment, creeks and rivers act as groundwater discharge areas. Groundwater flows horizontally in a south-eastern direction within the formation, toward the brow of the Escarpment. Downward flow is prevented by the lower permeability of the underlying shale. Seeps and springs within the Complex originate at the contact between the permeable Amabel Formation and the less permeable Queenston Shale.

4.2 Terrestrial Natural Heritage System

4.2.1 Representation

The Complex lies within a landscape notable for its representation of Ontario's most significant natural landscapes (Map 4). Environmental inventories have been conducted in the Complex since 1976, when natural areas along the Niagara Escarpment were first proposed by the Ministry of Natural Resources (MNR) as provincially significant Areas of Natural and Scientific Interest (ANSIs). Further research has confirmed that large areas within the Complex, particularly on the Escarpment and within the

Silver Creek Valley, qualify as the "best" representation of some of the vegetation/landform associations characteristic of this Ecodistrict within Ontario, and therefore have been designated as provincially significant. An ANSI evaluation first takes into account an area's representation and condition, and provincial or regional significance is then determined according to the area's size, diversity, significant features and ecological and biological functions.

Portions of the three following Provincially Significant Life Science ANSIs are included within the Complex:

- *Caledon Mountain Slope Forest ANSI*: representation of bedrock plain forests, wetland depressions, talus slopes and cliffs
- *Terra Cotta Forest ANSI*: largest natural area on the clay and shale slopes of the Queenston Formation in the northern part of the Halton Section of the Niagara Escarpment
- *Silver Creek Valley ANSI*: largest outlier valley in the Halton Section of the Niagara Escarpment, with talus slopes, cliffs, escarpment plateau

4.2.2 Provincially Significant Wetlands

Wetlands comprise less than 10 percent of the Complex, but are considered highly significant in a provincial, regional and local context as they have biological, hydrological and social functions disproportionate to their size, as well as sustaining significant and sensitive flora and fauna. Two provincially significant wetland complexes (PSWs) have been evaluated within the study area.

The Caledon Mountain Creek PSW Complex encompasses an area of 207 hectares, including 65 individual swamps and 24 marshes on the rolling table land back from the brow of the Niagara Escarpment. The Acton-Silver Creek PSW Complex encompasses 498 hectares of wetlands, mainly including 56 individual swamps, following the drainage from the top to the base of the Niagara Escarpment along Silver Creek within the Silver Creek Conservation Area.

4.2.3 Regionally Significant Areas

Environmentally Significant Areas (ESAs) were delineated in the Credit River watershed in the mid 1980s according to rigorous criteria, including:

- Distinctive or unusual landform;
- Hydrologic functions;
- Provincially and Regionally rare, unusual or otherwise significant species;
- Diversity and amount of habitat and species;
- Representation of remnant ecosystems;
- Large size that affords habitat for species that require extensive blocks of habitat;
- Helps to maintain significant natural biological systems beyond its boundaries; and,
- High aesthetic value.

The following three regionally significant areas, which encompass almost the entire Complex, delineate significant regional representation within the Credit River watershed:

- *Caledon Mountain ESA*: diverse, undisturbed forests on shale bedrock and Amabel Formation bedrock, with a high diversity of wildlife and plant species.
- *Terra Cotta Woods ESA*: a diversity of contiguous forest communities including portions of the Escarpment, clay soils on Queenston Shale, and badlands.
- *Silver Creek Valley ESA*: slope, upland and bottomland forests, swamps and marshes on the face of the Niagara Escarpment, outlier rim and deep intervening valley.

4.2.4 Vegetation

Forest communities, primarily mature deciduous and mixed forest, make up over 67 percent of the Complex. Cultural communities (mainly meadow and woodland) make up 14 percent of the Complex, and wetlands, primarily coniferous and deciduous swamp, comprise 9.6 percent (Map 5). Several of the plant communities on the Niagara Escarpment, which are included in the forest cover, are considered provincially and regionally significant. Some of these communities include mixed rim forest, open cliff, open talus, talus thicket, deciduous talus forest, mixed talus forest and coniferous talus forest. In addition, a small calcareous fen within Terra Cotta Forest Conservation Area is considered to be the southernmost fen community along the Niagara Escarpment.

Many wetland communities within the Complex are considered regionally significant. These wetlands include many types of marshes, thicket swamps, and coniferous and deciduous swamps.

Some forested communities are considered near-old growth. These include fourteen areas of forest between 100 and 125 years of age, and two forest stands greater than 125 years of age.

Three provincial plant Species at Risk (species with a status of S1 to S3 as determined by the Natural Heritage Information Centre) have been identified within the Complex boundaries. Plant species diversity is very high, resulting from habitat diversity within the Complex.

Jefferson Salamander *(Ambystoma jeffersonianum)* is one of several rare species found within the Complex that are protected under the Federal Species at Risk Act (2002) and Ontario's Endangered Species Act (2007)

4.2.5 Wildlife

The Complex is notable for its diversity of wildlife. Included in the list of species found within the Complex are 151 birds, 15 amphibians, 6 reptiles and 14 mammals. Four species are considered provincial Species at Risk (one amphibian, one reptile, one fish, and one bird species) and of these, three are dependent on high quality water features found within mature forests.

Elements of significant wildlife habitat that have been identified within the Complex include:

- Seasonal concentration areas (for example, critical habitat for large numbers of migrating waterfowl);
- Rare or specialized habitats (for example, vernal pools where amphibians breed);
- Migration corridors, and
- Habitat for species of conservation concern.

Significant wildlife habitat is protected by the Provincial Policy Statement.

4.2.6 Rare Species

The Complex supports seven species that have been evaluated by the Committee on the Status of Endangered Species in Canada (COSEWIC) as federal Species at Risk. Five of these species have been listed on Schedule 1 of the federal Species at Risk Act, and two have been listed under Schedule 3. These species are also listed as Ontario Species at Risk. Habitat for Threatened and Endangered species is also protected under the Provincial Policy Statement.

Three plant Species at Risk have been noted within the Complex, two with a status of Endangered and one with a status of Special Concern. Two of the plant species (one Endangered, one Special Concern) are dependent on rich, moist forest habitat, with one of these species highly specific to rock outcrops in this type of forest habitat. One plant species (with a status of Endangered) is found in open forest, on forest edges and in woodlands.

Two wildlife species have a provincial status of Threatened, and two have a status of Special Concern. Three of these species are also highly dependent on wetlands within high-quality forest habitat. The fourth species occupies a variety of habitats, but requires specialized microhabitats, such as access to underground refuge below the frost line for over wintering. Additionally, a newly listed Threatened species, as evaluated by COSEWIC, has been noted within the Complex in shrubby field and thicket

habitat. This species will likely be added to the provincial Species at Risk Act with the same status.

Several more Species at Risk have been noted within the ANSIs and/or PSWs that encompass the Complex. It is not known whether they occur specifically within the Complex, but habitat for them is present and it is highly likely that the Complex supports Species at Risk additional to those discussed here.

4.2.7 Interior Habitat or Core Area

Interior forest core area is important because it represents the protected area of a forest 100-200 metres from the edge. Moisture and disturbance sensitive species tend to thrive in interior forest habitats. The Complex is significant for containing over 260 hectares of forest interior habitat (including several areas that are 200 metres from the forest edge). Most of the core forest area is within Silver Creek Conservation Area.

4.2.8 Relative Community Size

The Complex is also significant because it encompasses open habitat of significant size including; thicket, meadow, thicket swamp and marsh. Larger open habitats tend to have a greater diversity of species than smaller open habitats, and include area-sensitive bird species that are showing distinct declines in the region as well as throughout North America.

4.2.9 Corridor Function

The Niagara Escarpment is one of the least disturbed landscapes in Ontario, providing a provincially significant north-south corridor through the surrounding landscape, which represents some of the most developed areas of the province. The Complex is critical because it protects a large portion of this provincial corridor. It is also significant on a regional scale because it protects linkages between natural protected areas; such as ESA's and ANSI's, to the north and south of the Complex.

4.2.10 Community Diversity and Complexity

The Complex is notable throughout for its high patch diversity, indicating that there is a significant diversity of plant communities within any given area. This in turn supports a healthy diversity of wildlife species. Species found in an area of high patch diversity can include generalist species, as well as habitat-specific species, that would disappear if the habitat were to be eliminated.

4.2.11 Areas of High Terrestrial Priority

Analysis of "minimum standards" required for evaluating terrestrial priorities indicated that the entire Complex was ranked as high priority (Smith and Theberge, 1987). This means that all areas of the Complex, even those that have been developed in the past, meet the minimum standard for at least one importance or significance criteria.

4.2.12 Preservation of Natural Disturbance/Succession Processes

Conservation of disturbance-dependent species has been identified as a concern in North America, because many natural disturbances are suppressed, particularly near urban areas. Natural succession processes are protected within the Complex. Exceptions will be accounted for where health and safety concerns exist, in which case actions will be guided by Land Management Policy. The natural succession processes present within the complex include: the regeneration of meadows, natural cavity formation as a result of tree mortality, changes in hydrology related to beaver activity, and erosion that leads to the formation of open talus slopes, bluffs and beach-bar habitat.

4.3 Fisheries

4.3.1 Fish Habitat and Biodiversity

Sixteen tributaries have been identified within the Complex, within two sub-watersheds of the Credit River: Silver Creek and Credit River – Cheltenham to Glen Williams. Three of the tributaries are relatively lengthy coldwater creeks (Rogers Creek, Snow's Creek, and an unnamed tributary of Silver Creek), and Silver Creek is a mixed coldwater/coolwater system. These streams receive substantial cold groundwater inputs from the Amabel Formation in headwaters above the Escarpment. These streams are considered highly sensitive, with a significant contribution to the baseflow and water quality of the Credit River. Also, Second Creek runs through Terra Cotta Conservation Area and feeds all on-line ponds, as well as Wolf Lake.

Nineteen fish species have been identified within the Complex, a relatively high diversity given that the Complex contains no large river systems. Species diversity is higher below the Escarpment than above it, because there are barriers to fish movement associated with the Escarpment. The interconnection of many small streams within the larger system of the Credit River is one of the critical factors in maintaining the diversity of fish species, especially in the lower tributary reaches.

Fish habitat is determined at a landscape scale by climate and geology. Generally, the habitat at Terra Cotta-Silver Creek supports a variety of hydrogeological and geomorphological conditions or stream types, favouring a wide diversity of fish communities: coldwater, coolwater and warm water fish habitats are all found in the Complex (Map 6).

Coldwater habitats are generally lower in diversity and productivity, but are considered highly significant because they contain some of the most habitat-sensitive species in the Complex. Highly valued species such as trout are found in these streams. Cool/coldwater habitats are transitional and support additional native species such as sculpins, darters, brook lamprey, stonecat and hog sucker.

Small warmwater systems, which in the case of Terra Cotta Conservation Area include the on-line ponds, often contain wetlands. These are highly valued for their fisheries, and also support additional biodiversity.

4.3.2 Fish Productivity

Fish productivity has been measured in several different tributaries using an Index of Biotic Integrity developed specifically for the Credit River. The index is based on total biomass of fish caught, with weighting of some coldwater and coolwater species according to their sensitivity. Productivity is being tracked to discern trends over time. Only a few areas of fish habitat have been sampled, and it is acknowledged that more sampling should be done throughout each tributary to capture the true variability of the streams. However, trends are as follows:

- Of the two stations sampled within the planning area, coldwater streams rate fair to poor in productivity, with only a few brook trout caught in step pools, and reflecting the stresses caused by intermittent flows and downstream barriers to fish migration.

- Transitional cool/coldwater streams were rated in fair to good condition based on fish productivity.

By contrast, stream health in the Credit River near the Complex has been rated as good on average.

4.3.3 Recreational Fishery

Fishing used to be a popular sport within Terra Cotta Conservation Area, but it has declined over the past few years, possibly because of restrictions such as catch-and-release. Species include largemouth bass, perch, pan fish and possibly residual trout left over from the stocking era. Wolf Lake and the on-line pond on Rogers Creek (Tayler Pond) both warmwater habitats, are the most commonly fished water bodies. Wolf Lake still supports a self-sustaining warmwater fishery, and has been the most consistently promoted fishery over the years. In addition, Muskrat Pond is periodically stocked with trout, most recently in 2005. The streams within the Complex are thought to receive little angling pressure, as is appropriate because fish populations are very low. Fishing regulations are reviewed periodically, and changes made to adapt to changing fish populations within the ponds. For example, 'catch and release' regulations on Wolf Lake may be changed because the fish are becoming stunted as a result of competition for food resources.

4.4 Forestry

Forest management recommendations have been prepared to aid in meeting resource management objectives for certain forested lands in the Complex. The recommendations apply to 103 hectares of forest stands included in the Managed Forest Tax Incentive Program (MFTIP) and to 500 hectares of significant forested areas included in the Conservation Land Tax Incentive Program (CLTIP). Together, these forest management plans involve 79 percent of the 764 hectares of the Complex. Forest management plans are consistent with CVC's Business Plan for watershed management (which puts an emphasis on environmental protection) and based on OMNR guidelines for managing southern Ontario forests. CVC forestry management principles are consistent with NEPOSS objectives for positively influencing successional stages and maintaining or promoting biodiversity and are not commercial in nature. Additionally, forestry practices will be consistent with NEC Policy 2.9.6 for forest management principles for ANSI's in public ownership in that they will support, other than Risk Tree Management along trails and low-intensity plantation management, no cutting within an ANSI.

Objectives of CVC's forestry program for these stands are:

- Improve and maintain forest health, forest stand structure and ecological viability;
- Protect the integrity and physical condition of the Terra Cotta–Silver Creek forests;
- Improve and maintain the inherent wildlife values associated with the forests;
- Promote and practice ecologically sustainable forest management in the watershed.

4.4.1 Forest Stand Descriptions

Forest stands (also called "compartments") are areas of relatively homogeneous forest, to which a single set of management principles and prescriptions would apply (Map 7). They are similar to Community Series ELC classes but not identical, as they are based primarily on tree type and habitat, and less on landform. The following provides descriptions of stands that provide the basis for management prescriptions described in Section 6.4.

4.4.1.1 Bedrock, Talus Slope and Upland Hardwood Forest

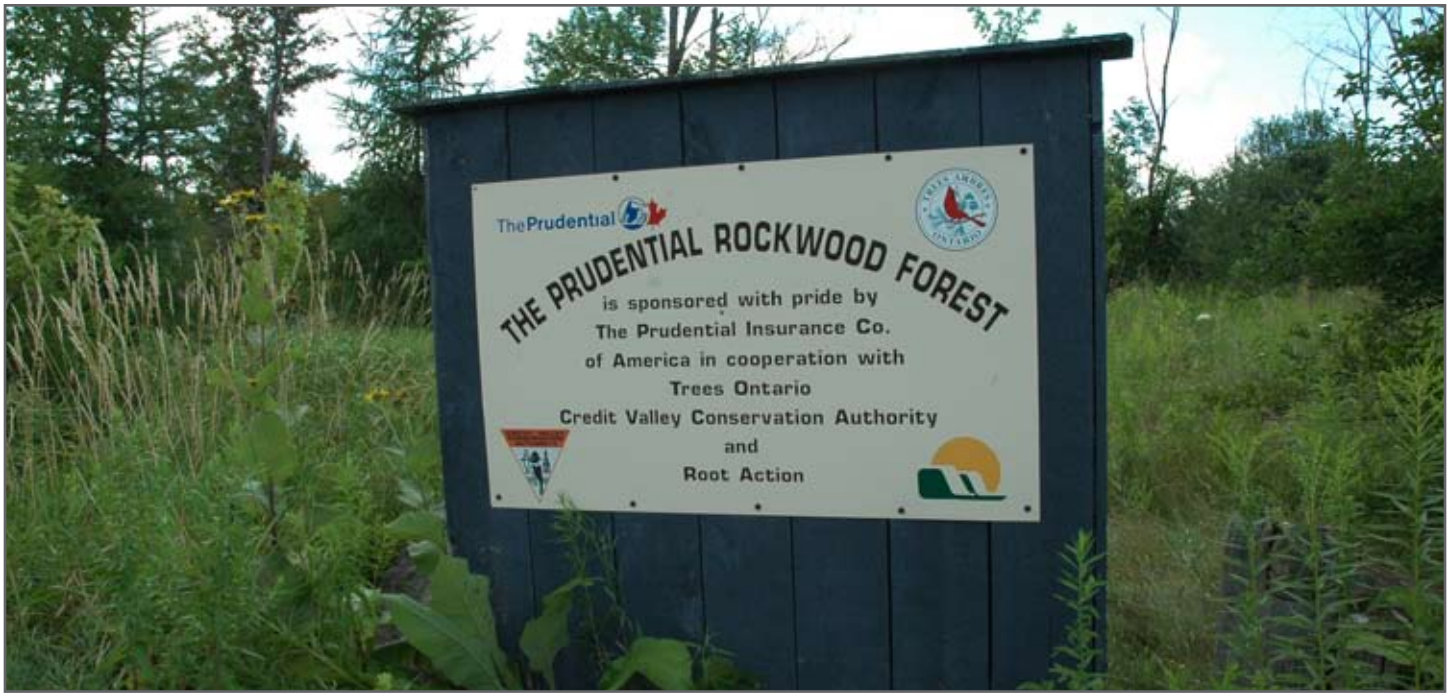
Stands are dominated by sugar maple (*Acer saccharum*) and have a range of age-classes growing within the same compartment. Growing in association with the hard maple are other tolerant and mid-tolerant tree species such as American beech (*Fagus grandifolia*), basswood (*Tilia americana*), ironwood (*Ostrya virginiana*), eastern hemlock (*Tsuga Canadensis*) and white pine (*Pinus strobus*). On moister sites the association will be with black maple (*Acer nigrum*), whereas drier sites will support red oak (*Quercus rubra*), black cherry (*Prunus serotina*), white ash (*Fraxinus americana*) and bitternut hickory (*Carya cordiformis*). These stands can be characterised by a diversity of tree species and having a significant component of mast producing species. The large quantities of hard mast produced by these tree species are an important food source for resident birds and wildlife. The under story is dominated by hard maple regeneration well established in the lower canopy and in the sapling layer. These stands also support a rich and diverse herb layer.

4.4.1.2 Mixed Upland Forest

The majority of these mixed and coniferous forest stands are unique to the east-facing slopes of the Terra Cotta-Silver Creek properties and commonly associated with cooler, moist slopes and valleys, where this microclimate supports mature eastern hemlock and white cedar (*Thuja occidentalis*), along with typical upland deciduous tree species. Dominant conifer species are also found in the lower canopy as advanced regeneration, mixed with sugar maple and white ash (Fraxinus americana). White pine can also be found as a major component of mixed stands on bedrock and southern aspects.

4.4.1.3 Conifer Plantation

Softwood plantations exist widely on CVC properties as part of education, stewardship, land management and conservation programs. Plantation establishment in general has taken place over the past 50 years with some properties being reforested prior to CVC ownership. Authority plantations are multi-aged and in various stages of maturity and management. These plantations are composed of red pine (*Pinus resinosa*), white pine, white spruce (*Picea glauca*) and mixes of the aforementioned species. Some plantations also contain Scots pine (*Pinus sylvestris*), a non-native species that can become invasive in some habitats.



Red pine has been planted on many different sites across the watershed, though this species flourishes on dry, sandy sites. Red Pine requires contact with mineral soils to germinate, and would probably not persist in the long term without management. This species is native to central Ontario, and extends south to the north shore of Lake Ontario. Red pine is generally considered planted in the southern areas of Ontario, and therefore it may not be native to the Complex. Seedlings were generally planted in rows at approximately 1.8m x 2.1m spacing or 2,500 trees per hectare. Red pine is a shade-intolerant tree species and requires regular thinning operations to maintain a healthy compartment.

Young white pine can withstand considerable shade from 10-20 years and then requires more light as the trees get older. It has been found that this working group has a wide range of survival of individuals within the compartment, with fewer well formed trees relative to red pine plantations. Most stands have experience damage from the white pine weevil (*Pissodes strobi*), causing many stems to be crooked and forked.

The mixed plantation group consists of both planted conifer and deciduous species. Some plantings are alternate rows of red pine and white pine or alternate rows of red pine and larch (*Larix decidua*); alternate rows of white pine, white spruce and red pine; blocks of the same species conifers planted in three to four rows and then alternating blocks of different species within the compartment. Many variations are found and in most instances competition between species often leads to high mortality within these mixed stands, creating stocking and residual forest health and quality problems.

4.4.1.4 Old Field Regeneration / Cultural Field and Thicket

Old field regeneration occurs on agricultural fields or pasture lands that are out of use and are regenerating through natural processes. These old fields may contain established species such as hawthorn (*Crataegus spp.*) and wild apple (*Malus spp.*). Depending on surrounding forest tree species, regeneration of the field will occur from these sources. Shade intolerant and mid-tolerant species like white cedar, white ash, white pine, poplars, Scots pine (*Pinus sylvestris*), red oak and black cherry will seed into or colonize and become established if conditions for their survival are favourable. This type of habitat can provide variety to the landscape and increased opportunities for some wildlife species. These areas left undisturbed can allow for natural succession to shape the future woodlot.
Invasive species such as Scots pine and European buckthorn (*Rhamnus cathartica*) and invasive herbs generally establish themselves on these sites. Lack of management can lead to displacement of native plants and some animals. These invasive species will spread through the rest of the woodlands if not controlled. To achieve control a variety of methods should be tested and evaluated with regard to their effectiveness and impacts to the woodlot. Different control methodology may be more appropriate considering proximity to public use or sensitive herbaceous species.

4.4.1.5 Bedrock, Talus Slope and Successional Woodlands

The successional hardwood forests cover a range of site conditions and differ slightly in species composition depending on moisture regime, aspect, soil quality and soil depth. All successional hardwood forests in the Complex are young in age, resulting from recent disturbance. The successional hardwood forests may have resulted from natural disturbances, fire, forestry operations or past agricultural practices.

Semi-open stands also support large shrub and herb communities, with the composition dependant on the amount of available sunlight. The dominant tree species are shade-intolerant and include white birch (*Betula papyrifera*), trembling aspen (*Poplus tremuloides*), largetooth aspen (*P. grandidentata*), white ash and white cedar. Species in the sapling layer include sugar maple, white elm, bitternut hickory, black cherry (*Prunus serotina*) and red oak.

4.4.1.6 Lowland Woodlands: Conifer and Hardwood Swamp

These forest stands are associated with low lying sites, standing water and muck soils. The conifer swamp is primarily dominated by white cedar (*Thuja occidentalis*) along with smaller components of balsam fir (*Abies balsamifera*) and eastern hemlock (*Tsuga canadensis*) depending on local topography. Hardwood swamps tend to be dominated by deciduous species, with silver maple (*Acer saccharinum*) and white elm (*Ulmus americana*) being most common, but also including red maple (*Acer rubrum*) and yellow birch (*Betula alleghaniensis*). There is an absence of evergreen species or evergreen regeneration in hardwood stands, which sets them apart from lowland conifer and mixed lowland forest types.

4.5 Infrastructure

Infrastructure within the Complex is largely a legacy of its more developed past. Though many of the buildings, roads and parking lots are still useable, some have declined to the point that they now must be decommissioned, deconstructed or renovated for use once again. Section 7.4 provides details on infrastructure directives and plans for redevelopment or deconstruction.

4.5.1 Buildings

Seven buildings still stand at Terra Cotta Conservation Area. All require varying degrees of repair. These include four buildings (all with heat and electricity), three picnic shelters, and an old storage structure (Map 8)

- Concession Building
- Central Workshop
- Terra Cotta Nature Centre
- Gatehouse
- Maple Hills Picnic Shelter
- Old Group Camp Picnic Shelter
- Day Use Picnic Shelter
- A-Frame Structure

Currently, two additional buildings are located within the Silver Creek CA. One of these, the Silver Creek Outdoor Education Centre, is leased by the Dufferin-Peel Catholic District School Board for outdoor environmental education purposes. There are no plans to expand this site and it will continue to be leased for educational purposes.

Construction of the original Gatehouse at Terra Cotta CA

4.5.2 Washrooms

Public washroom facilities at Terra Cotta Conservation Area are currently limited to one portable outhouse located between the front and back parking areas. Washroom facilities exist in the Terra Cotta Nature Centre; however they are currently not open to the general public but are undergoing renovation for reopening. The Central Services workshop has an operating staff washroom that is limited, and also not open to the public. The Silver Creek Outdoor Education Centre has washroom facilities with use restricted to the school board and the Centre staff.

Driving Through the campground roads at night (1989)

4.5.3 Access, Parking, and Internal Road Network

Motorized site access for Terra Cotta Conservation Area occurs off of Winston Churchill Blvd. Pedestrian Access occurs at the entrance to the Bruce Trail off of 10th Line, and from the Jack Smythe Field Centre. Pedestrian access is also available from the Caledon Trailway.

Pedestrian Access to Silver Creek Conservation Area occurs at the Bruce Trail entrances off of 8th Line, 9th Line, 10th Line, and 27th Sideroad.

Pedestrian access to Terra Cotta Forest and the Jacquith Property occurs at the Bruce Trail entrances to both properties, including roadside entrances off of Winston Churchill Blvd. and Heritage Road. Two main parking facilities at Terra Cotta Conservation Area are sufficient to support a variety of use levels and types. Together, these areas provide parking for 60-65 cars. An additional parking area adjacent to the nature centre can accommodate approximately 30 cars but it is not open to the public. Additionally, there is a old parking lot north of the Day Use Picnic Shelter that was in use during the operational programming phase of the conservation area before 1990, it has since been partially re-vegetated through natural processes. Silver Creek Conservation Area has a small, gravel-base parking lot appropriate for the permitted activities.

Limited, roadside parking is also available for visitors entering the Complex from Bruce Trail access points, for both Silver Creek Conservation Area and Terra Cotta Forest Conservation Area.

An internal road system at Terra Cotta Conservation Area was historically the main access to the pool, concession and nature centre. The roadway is presently useable for driving as far as the Central Services workshop, but most roads have not been maintained and have been allowed to regenerate naturally. No dedicated internal road system is present at Silver Creek or Terra Cotta Forest, though several regional roads traverse these conservation areas and further access is not needed.

4.5.4 Information and Signage

Proper information and signage are minimal throughout the Complex. Aside from directional signs installed by the Bruce Trail Conservancy, there is a lack of proper signage throughout the existing trail system. Presently, the staging areas at Terra Cotta Conservation Area are insufficient for current and future use. Trail kiosks are adequate, though self-serve brochures would be appropriate.

Information and signage within Silver Creek Conservation Area and Terra Cotta Forest Conservation Area are minimal, and consist mainly of Bruce Trail directional signage.Increased and appropriately placed signage throughout the Complex will occur as directed by the Signage Policies and implementation phases (Section 7.4).

4.5.5 Water

Availability of potable water is limited in the Complex. Steps have been taken to find new sources, and to find a way of conducting water to where it is needed. A test well was drilled and capped on the Terra Cotta Forest parcel near the Jack Smythe Field Centre. This well is producing enough water for any potential programming, but the feasibility of transporting this water for use in buildings for operational programming is quite low. Currently, the existing well that has traditionally provided potable water for Terra Cotta CA is producing enough for short term projected needs. However, local residential demand for connection to the municipal water system may, in the near future, also provide a reliable source of water for Terra Cotta Conservation Area.

4.5.6 Dams, Water Control Structures, Modified Channels, Spring Wells

Six on-line ponds are located within Terra Cotta and several more are found throughout the Complex. All have associated dams and control structures. None of the ponds are essential for maintenance of significant ecological features or for water storage, but several of the ponds are important for social reasons. Most of the water courses within the Complex are natural, but there are a few areas where streams have been channelized (especially between ponds) and modified with rock walls and masonry. Structures such as galvanized pipes have also been installed in some areas of upwelling and springs in order to facilitate water-taking.

Like much of the other infrastructure in Terra Cotta CA, the water control structures are aging and are in need of reinforcing or removal. Additionally, the existing man-made ponds and water courses in Terra Cotta CA are contributing to significant warming of the waters, which threaten the cold-water fishery. The ponds, control structures and channels need to be modified to bring to protect water quality and downstream water temperature (See Section 6.2.2)

A typical summer afternoon at Terra Cotta's 1-acre swimming pool at the height of park visitation in the mid-1980s.

4.6 Recreation and Education

4.6.1 Appreciation and Recreation

Twenty-three activities have been identified within the Complex since the 1950s, ten of which are permitted, and several more that still occur though they are not permitted. Many historical activities were eliminated during the management planning process in the early 1990s. With such a diverse group of activities, management concerns are numerous.

The Terra Cotta-Silver Creek Complex could be considered a classic example of the park paradox of wanting to provide access to a sensitive area, thereby putting the sensitive area at an increased risk of losing its natural value. With such a dramatic change in management philosophy and traditional uses giving way to more appropriate passive uses, there exists a tremendous opportunity to implement extensive educational programming in the Complex.

Trail management is a major issue in the Complex, both from a recreational and an environmental standpoint. Currently, trails are confusing and too numerous, with many unauthorized trails that deviate from sanctioned routes. Trails may have impacts on core forests and other sensitive areas by introducing both direct and indirect human impacts. Direct impacts may include soil disturbance, compaction, and harvesting; indirect impacts may include the presence of dogs and the invasion of non-native plant species in significant or sensitive areas. Some trails should be closed and others improved upon with net environmental gain.

4.6.2 Education

Terra Cotta is a nodal park in the Niagara Escarpment Parks and Open Space System (NEPOSS), and thus CVC is encouraged to educate visitors not only on the environment of the Complex, but on the Niagara Escarpment as a whole.

Curriculum based programs are currently offered at the Silver Creek Education Centre (leased to Dufferin-Peel Catholic District School Board) and the Jack Smythe Field Centre (owned by the Peel District School Board).

Reinstating formal education and non-formal education programs throughout the watershed is important to CVC, and the Terra Cotta-Silver Creek Complex has been identified as an ideal location to implement such programs.

Previously, the Nature Centre at Terra Cotta CA was used for educational programming by CVC and by other environmental organizations. The Nature Centre has been identified as an ideal site for a 'Watershed Learning Centre,' to continue being used as a facility for environmental education (See Section 7.4.11).

4.6.3 Natural and Social Linkages

Natural and social linkages are both numerous and wide ranging throughout the Complex (Map 9).

The Bruce Trail traverses through Terra Cotta Conservation Area at its south western end, more or less running parallel to 10th Line. This regional trail connection provides visitors and trail users access to many appreciation and recreation opportunities from hiking to cultural heritage interpretive activities at Scottsdale Farm.

The Caledon Trailway forms part of the eastern boundary for Terra Cotta Conservation Area and is linked to the Bruce Trail through the internal trail system.

Scottsdale Farm, a 212 hectare property owned by the Ontario Heritage Trust (and formerly managed by CVC), is linked to Silver Creek Conservation Area naturally via the Acton-Silver Creek PSW, Snow's Creek Woods ESA, and Silver Creek Valley ESA, as well as socially via the Bruce Trail. North of Terra Cotta Forest, the Cheltenham Badlands (a 37 hectare property also owned by the OHT) is a property linked to the Complex through the Bruce Trail.

The Jack Smyth Field Centre, a 70 hectare parcel owned by the Peel District School Board, is linked to Terra Cotta Conservation Area through Terra Cotta Woods ANSI and ESA as well as Caledon Mountain PSW. Social connections between the properties also exist via the Bruce Trail.

These natural and social corridors function at a provincial, regional, and local scale. Protecting their function is an important aspect of this management plan.

Recommendations of the Plan must account for opportunities to work with the OHT and Peel District School Board to combine resources and manage the natural and social resources effectively.

4.7 Opportunities and Constraints

Map 10 provides an illustration of high, medium, and low constraints within the Complex. These constraints can be used to zone areas of the Complex and manage use within each zone. CVC has adopted a policy through the Conservation Area Strategy of zoning all lands within conservation areas. The zones are based on public input and on the staff's best understanding of the significant and representative features of the Complex. At the same time, zoning also recognizes the existence of ideal locations for appreciation and recreational opportunities.

To establish zoning, some kind of discriminatory tool is needed to distinguish different degrees of sensitivity within the landscape. Activities with higher impacts can then be restricted to the least sensitive areas, whereas low-impact activities can be planned, albeit judiciously, in the areas that may be more sensitive.

In all constraint areas, detailed site level planning will determine appropriate locations and intensities of development whether it is infrastructure, recreation, or restoration/resource management activities.

4.7.1 Zones of Highest Constraint

In Map 10, the areas of highest constraint (dark green shading) are a composite of polygons pooled to include the most sensitive features in the Complex:

- ANSIs and ESAs;
- Interior habitat or core area;
- Rare plant communities;
- Wetlands;
- Significant wildlife habitat;
- Habitat for Species at Risk, regionally and locally significant species;

- Plant communities significant because of their size in relation to relative frequency (mainly intended to include significantly large thickets and fields, for example); and
- Fish habitat.

Many of these features (e.g. deciduous and coniferous forest) are resilient enough to accommodate low impact activities such as sensitively placed, carefully monitored public access. It is understood that within this zone, some features will not withstand any human disturbance at all (e.g. talus slopes, areas of shallow or wet soils, cliffs and stands of significant plant species), and that access must be planned to avoid them through site-specific trail routing studies. Although a separate, more restrictive zone for these most sensitive features would be ideal, it is usually not possible to map them separately because they are small and many cannot be represented by polygons.

4.7.2 Zones of Medium Constraint

Zones of medium constraint include all areas outside those mapped as high constraint, with the exception of areas previously developed for high intensity recreation such as the nature centre and picnic areas. These areas may present opportunities for recreation activities with slightly higher impacts. They include smaller fields and thickets (i.e. those not significant because of their size), successional forest and cultural plantation outside core forest areas.

4.7.3 Zones of Low Constraint

This zone is determined by the "development" areas; those that have sustained the greatest disturbance due to agriculture, development of recreational facilities, and development of buildings. The vegetation in these areas tends to be dominated by non-native species, which are relatively stable and confined to open fields. This type of vegetation is very resilient to impacts of human use, and can be managed by mowing and other methods that do not impact natural areas.

4.7.4 Opportunities

Terra Cotta-Silver Creek should continue to be regarded as a space primarily devoted to the display of Niagara Escarpment features, with the utmost consideration for sensitive and significant terrestrial and aquatic features. The present undisturbed environment should be maintained and enhanced; affording visitors a chance to experience a near-wilderness setting that will become more and more of a premium as the surrounding land develops. However, within this framework there is room to promote a higher level of recreational and education activities that develop stewardship and appreciation of natural heritage features, the outdoor experience, and outdoor exercise.

5.0 Goal, Objectives, Classification, and Zoning

The abundance of key natural heritage features and functions the Terra Cotta-Silver Creek Complex illustrates the local and regional significance of the Complex. In fact, some features and functions are so significant that strict protection is the highest priority. The protected natural heritage features also provide excellent appreciation and recreational opportunities throughout the Complex. CVC's hierarchical objectives of protection, appreciation and recreation can all be achieved throughout the Complex to varying degrees for the benefit of each other. Each conservation area within the Complex – Terra Cotta, Silver Creek, and Terra Cotta Forest – will be classified and zoned individually to take advantage of the unique recreation and appreciation opportunities, while protecting and enhancing the area's significant features and functions.

All conservation areas within CVC's jurisdiction fall into one of five classes: Nature Reserve, Natural Environment, Recreation, Resource Management, and Access (Appendix A). Classification allows each conservation area to achieve its role within the system while focusing programs and development efforts within appropriate areas. Conservation Area classification aims toward achieving the Authority's goal of managing a diversified system of conservation areas.

Through CVC's planning process, the classification for conservation areas within the Terra Cotta – Silver Creek Complex has confirmed the provincial classifications for the conservation areas listed in Part 3 of the Niagara Escarpment Plan. These classifications, and the subsequent zoning (guided by NEP designations), recognize the broader context of the Complex within the Niagara Escarpment, and fulfil NEP goals expressed in policy 3.1.6 as well as contribute to the achievement of the goals and objectives of the Niagara Escarpment Parks and Open Space System.

On a smaller scale, zoning of conservation areas generally results in efficient use of resources. By creating areas to which different management philosophies can be applied, zoning will:

- protect key natural heritage features and functions;
- segregate conflicting recreation activities;
- foster attitudes of protection before appreciation and recreation.

CVC has defined six management zones: Nature Reserve, Natural Heritage Appreciation, Resource Management, Cultural Heritage, Development, and Access (Appendix A), all of which correspond very closely to recommended NEPOSS zones. Additionally, the Bruce Trail Corridor is used as a zone to identify and manage the Main Bruce Trail Route and the Optimal Route.

Please note that the definitions in Appendix A are written in general terms to apply to the entire conservation area system. The classifications described in the following sections are altered slightly to accommodate the specific and unique characteristics of the conservation areas within the Terra Cotta-Silver Creek Complex.

CVC's conservation areas system is based on the protection of significant natural features and functions. To provide opportunities for recreation within and appreciation of these features and functions, some level of infrastructure development is necessary.

Infrastructure can range from signage at trail heads to interpretive centres with displays, washrooms, septic systems, and offices. Further detail on development regulations is available in Appendix A.

5.1 Terra Cotta Conservation Area Classification and Zoning

5.1.1 Classification

Terra Cotta is a Natural Environment Conservation Area that combines protection of representative natural heritage features and functions with high quality passive and limited appropriate active recreation opportunities.

5.1.2 Goal

To protect and enhance Terra Cotta Conservation Area's outstanding natural heritage features and functions while providing environmentally sustainable, high quality recreational, interpretive, and educational opportunities.

5.1.3 Objectives

The goal statement is reinforced by three supporting objectives for managing the conservation area. In order of priority, they are: protection, appreciation and recreation. Terra Cotta Conservation Area has the capability to contribute to all three objectives.

5.1.3.1 Protection Objective

To protect the conservation area's outstanding natural heritage features through appropriate park zoning, research, monitoring, resource management, enhancement, and restoration activities.

5.1.3.2 Appreciation Objective

To provide organized programming and self-guided opportunities for appreciating the conservation area's natural heritage features including their role within the watershed's ecosystem, the earth and life science features of the area, and resource management programs implemented to protect and enhance them.

5.1.3.3 Recreation Objective

To provide conservation area visitors with opportunities, facilities, and services for a variety of high quality passive and limited appropriate active, day-use recreational activities. Recreation will be nature based, environmentally sustainable and connect with local opportunities, such as the Bruce Trail.

5.1.4 Zoning

All but one (Resource Management) of the six potential management zones are present in Terra Cotta Conservation Area (Map 11), including the Bruce Trail Corridor. Each zone has specific permissible uses and will be managed according to the objectives of the conservation area, CVC policy, and applicable municipal/provincial policy. Zone boundaries have not been verified on the ground. Minor changes to zone boundaries resulting from site level planning will not require amendments to this Plan.

5.1.4.1 Natural Heritage Appreciation Sub-Zone 1

This zone is designated such that cycling opportunities may be permitted on Terra Cotta Lane and along the Access Road. Although CVC policy permits limited appropriate active recreation opportunities within the Natural Heritage Appreciation zone, the Conservation Area's size, number of significant natural heritage features and functions present, as well as perceived and real impacts associated with cycling, will require this activity to be limited to a specific set of trails. The existing conditions of the proposed cycling trails are such that they could withstand an active recreational opportunity like cycling, thus increasing CVC's ability to manage the activity effectively. For a full definition of cycling please refer to Appendix E.

5.2 Silver Creek Conservation Area Classification and Zoning

5.2.1 Classification

Silver Creek Conservation Area is classified as a Nature Reserve. Nature Reserve conservation areas focus on protecting provincially significant natural features and functions, while providing only passive, day-use activities.

5.2.2 Goal

To protect and enhance Silver Creek Conservation Area's exceptional natural heritage features and functions, while providing environmentally sustainable, high quality interpretive and passive recreational activities.

5.2.3 Objectives

The goal statement is reinforced by three supporting objectives for managing the conservation area. In order of priority, they are: protection, appreciation and recreation. Silver Creek has the capability to contribute to all three objectives.

5.2.3.1 Protection Objective

To protect the conservation area's outstanding natural heritage features through appropriate park zoning, research, monitoring, resource management, enhancement, and restoration activities.

5.2.3.2 Appreciation Objective

To provide unstructured opportunities for appreciating the conservation area's natural heritage features including their role within the watershed's ecosystem, the earth and life science features of the area, and the resource management programs implemented to protect and enhance them.

5.2.3.3 Recreation Objective

To provide conservation area visitors with opportunities for exceptional passive, day-use outdoor recreational activities through minimal infrastructure development while maintaining the integrity of natural features.

5.2.4 Zoning

Only two management zones, plus the Bruce Trail Corridor, are present in Silver Creek Conservation Area: Nature Reserve and Natural Heritage Appreciation (Map 12). Each zone has specific permissible uses and will be managed according to the objectives of the conservation area, CVC policy, and applicable municipal/ provincial policy. Zone boundaries have not been verified on the ground. Minor changes to zone boundaries resulting from site level planning will not require amendments to this Plan.

5.3 Terra Cotta Forest Conservation Area

Classification and Zoning

5.3.1 Classification

Terra Cotta Forest Conservation Area is a nature reserve class park. Nature reserve conservation areas focus on protecting provincially significant natural features and functions while providing only passive, day-use activities.

5.3.2 Goal

To protect and enhance Terra Cotta Forest Conservation Area's exceptional natural heritage features and functions while providing environmentally sustainable, high quality interpretive and passive recreational activities.

5.3.3 Objectives

The goal statement is reinforced by three supporting objectives for managing the conservation area. In order of priority, they are: protection, appreciation, and recreation. Terra Cotta Forest has the ability to meet all three objectives.

5.3.3.1 Protection Objective

To protect the conservation area's outstanding natural heritage features through appropriate park zoning, research, monitoring, resource management, enhancement, and restoration activities.

5.3.3.2 Appreciation Objective

To provide unstructured opportunities for appreciating the conservation area's natural heritage features including their role within the watershed's ecosystem, the earth and life science features of the area, and the resource management programs implemented to protect and enhance them.

5.3.3.3 Recreation Objective

To provide conservation area visitors with opportunities for exceptional passive, day-use outdoor recreational activities through minimal infrastructure development while maintaining the integrity of natural features.

5.3.4 Zoning

In addition to the Bruce Trail Corridor, only two management zones are present in Terra Cotta Forest Conservation Area: Nature Reserve and Natural Heritage Appreciation (Map 13). Each zone has specific permissible uses and will be managed according to the objectives of the conservation area, CVC policy, and applicable municipal/provincial policy. Zone boundaries have not been verified on the ground. Minor changes to zone boundaries resulting from site level planning will not require amendments to this Plan.

6.0 Resource Protection and Stewardship Policies

As the objectives for each conservation area illustrate, protection of significant natural heritage features and functions is the highest priority. If the protection objective is achieved, visitors will have a chance to experience a near-wilderness setting that is becoming more rare as the surrounding landscape is developed. Through these high quality appreciation and recreation opportunities it is possible to enhance one's commitment to protecting the natural landscape.

Protection and stewardship of natural heritage features and functions will be a key component of this management plan. As managers of the Complex, CVC staff are faced with the challenge of managing a rural, wilderness-like property adjacent to the most urbanized area of Canada.

Resource protection and stewardship activities within the Complex will adhere to the following principles:

- All protection and stewardship activities will be a coordinated effort between all disciplines including aquatic, terrestrial, forestry, fisheries, geology and hydrogeology, and recreation management;
- Activities will be undertaken using approaches that result in minimal conflict and that help achieve the overall goals and objectives for the Complex;
- Maintain, enhance, and restore natural features and functions while recognizing linkages between and within terrestrial and aquatic ecosystems;
- Control invasive exotic species that threaten the function of natural systems and/or the components of that system where appropriate and permitted by the policies within this Plan;
- Improve quality and quantity of appreciation and recreation opportunities through selective management of species and habitats while maintaining or enhancing existing natural heritage features and functions.

Management activities that have the potential to impact terrestrial and/or aquatic species, communities, populations, or habitat functions will be guided by the policies and regulations outlined in Section 3.0 in addition to:

- Species at Risk Act;
- Fish and Wildlife Conservation Act;
- Migratory Bird Convention Act;
- Endangered Species Act;
- Fisheries Act and the No Net Loss of Habitat Policy ;
- Ontario Fisheries Regulations.

Policies described in the following sections will provide the framework for completion of site specific planning.

Appendix A (Conservation Area Classes, Zones and Development Regulations) describes when and where resource protection and stewardship activities can take place.

6.1 Geology and Hydrogeology

The unique environment of the Niagara Escarpment supports many rare and sensitive geological and hydrological features. Appreciation and recreation opportunities adjacent to these features and functions must be managed with the utmost respect to avoid any loss in value or function.

Areas of groundwater discharge and recharge will be identified, mapped, and protected as nature reserve zones.

To assist with various planning activities within the Complex (i.e. recreation, forestry, and fisheries), a hydrology study will be completed for Terra Cotta Conservation Area.

A sustainable supply of safe, potable water must be identified to support appreciation and recreation opportunities provided.

6.2 Aquatic Ecosystems

An Aquatic Ecosystem Management Plan (AEMP) has been completed for this Complex. The habitat characterization and management options were completed as background information to this management plan. The second component outlines fish species, stocking, and regulations for anglers, and is included as Appendix C. The next step in the AEMP would be site plans with details for pond retrofits as well as stream and wetland restoration.

All aquatic habitat features will be monitored as appropriate. Collected data will provide baseline information to design rehabilitation plans prior to any development within or adjacent to these features. Maintenance and planting of natural buffers 30 metres in width will be implemented as a standard practice throughout the Complex to reduce stream temperatures, provide cover, stabilize banks, trap sediment, and remove excess nutrients and pollutants.

6.2.1 Fisheries

A Fisheries Management Plan has been developed for the Complex, as a component of CVC's larger Aquatic Ecosystem Management Plan (Appendix C). Management of fisheries resources will focus on habitat protection and restoration until preferred options for pond and stream reach management have been identified and implemented.

Most spawning areas have now been identified. Further surveys may be required for any proposed site level alteration or for monitoring purposes. Monitoring of biomass, spawning areas, and other sensitive aquatic features will continue as directed by the Credit River Fisheries Management Plan.

Detailed trout spawning surveys will be conducted for the Complex. Mapping will be completed for the three coldwater tributaries within the Complex. This work must be completed prior to any in-stream hydrogeological alterations.

For stocking practices within the Terra Cotta-Silver Creek Complex, please refer to Appendix C. Recreational game fishing opportunities will be encouraged in the ponds, where appropriate and sustainable. Management of fishery resources will centre on habitat protection and restoration, and will be based on the principle that a healthy fishery is the result of a healthy ecosystem.

Creel and pond surveys will be undertaken as part of an ongoing program to monitor and manage the health of aquatic systems in conservation areas.

6.2.2 Pond Options

A hydrological (water budget) assessment of the ponds within Terra Cotta Conservation Area will be implemented. Ontario Streams has also produced a report entitled "Terra Cotta Conservation Area Second Creek Pond Evaluation Study (2007)" which identifies options for mitigating negative impacts on water quality, quantity and temperature in the system. Topographical surveys must also be undertaken to gather baseline data.

Preferred options for pond management (i.e. maintain and enhance, bottom draw, by-pass, drain and naturalize) will be evaluated including the downstream impacts of each option. Generally, removal of larger scale dams and on-line ponds will be encouraged where appropriate; otherwise ponds will be maintained for wetland values. The following preferred options have been identified:

- *Spring Pond* – Decommission dam/berm to reduce impacts and allow natural wetland succession. Stream and wetland planting to follow; stream to be stocked with brook trout.

- *Muskrat Pond* – Off-line pond through construction of a bypass channel; pond to be maintained. Mitigate trampling and protect vernal flooded habitats. Stock pond for trout fishery. Maintain for emergency water purposes. Allow for beaver lodge to persist, in accordance with CVC's Hunting and Trapping Policy.

- *Mink Pond* – A feasibility study is required to evaluate the creation of a by-pass channel for a wetland nursery. Improvement may be required, if feasible, for the beaver baffle, outlet and a naturalized rock channel.

- *Wolf Lake* – Construct bypass channel to mitigate thermal effects, but maintain a link during spring freshet or high flow conditions to maintain Lake water levels. Continue managing pond for self sustaining bass and pan fishery. Provide opportunities for canoeing and fishing.

- *Supply Pond* – Maintain as habitat for Bullfrog population and as storage area for Award Wetland management.

- *Summer Residence Pond* – Amphibian eggs have been noted in this pond. Until more detail is known about the species, the pond will be treated as a seasonal wetland. The pond has already been taken off-line.

- *Beaver Pond* (east of Winston Churchill Boulevard) – Maintain for wetland values.

- *Rogers Creek Pond Complex* – Continue mitigation and management of the Tayler Pond and neighbouring landowners ponds as a complex.

- *Graydon Pond* – Continue Graydon dam removal.

- *Ponds on southwest edge of Terra Cotta* – Amphibian egg masses noted. Maintain for amphibian breeding habitat and other wetland values.

A water budget and water management plan will be required information as part of detailed site plans for the mitigation or removal of dams and wetland restoration projects.

Where the preferred option is to maintain on-line ponds, impacts must be mitigated.
Further directives:

- Maintain any known wetland habitat functions of ponds.

- Establish priorities and implementation schedules for assessing, repairing, adding or removing water control structures (Section 7.4).

- Protect and improve connectivity of stream reaches.

6.2.3 Wetland Management

Wetland restoration and rehabilitation projects (which may involve modification of on-line ponds) will continue where feasible, creating habitats with an increased potential for supporting a greater number of species.

The award winning wetland at Terra Cotta CA can be managed by a control valve between it and Supply Pond. Management of water flow will mimic natural processes as best as possible (e.g. periods of drought) but will maintain, when possible, water levels sufficient enough for interpretive demonstration.

6.3 Terrestrial Ecosystems

There are a number of issues related to the features described in Section 4.2, including:

- Concerns over lack of successional communities;
- Promoting the linkage between all conservation areas in the Complex;
- Identifying areas for reforestation and restoration activities;
- Maintaining soil quality (especially where appreciation and recreation opportunities may be present);
- Management, including control and removal of, invasive species within the Plan area; and,
- Identification and protection of significant species, natural features, and functions prior to management, recreation, or appreciation activities taking place.

The following sections describe approaches to be implemented to ensure that management actions maintain and/or enhance ecosystem processes.

6.3.1 Invasive Species Control

Key actions:

- Implement invasive species management based on CVC's Invasive and Alien Species Strategy and Authority Land Management Guide policies.

- Through Lands Monitoring Program, identify invasive species hot spots and problem areas, especially in non-cultural communities, and implement control where needed.

- Incorporate appropriate messages about invasive species into education programs and sign plans.

- Programs to control invasive and non-native species will be permitted in all zones provided that they meet the goals and objectives for the conservation area.

6.3.2 Identification

Identifying species of concern, significant wildlife habitat, and other significant features will continue as necessary. Where implementation of management recommendations, infrastructure development, and/or recreational programs dictates, terrestrial evaluations will use ecosite or vegetation type ELC, as well as detailed flora and fauna surveys.

6.3.3 Protection

Wherever possible, existing meadow habitats will be permitted to regenerate or maintained in their existing condition to promote diversity.

Preservation of existing large patches and core habitat will be promoted and expanded or restored where possible.

Protection of significant ELC communities will be a priority.

Significant wildlife habitat and associated corridors for all species and life-cycle stages will be identified and protected from development. Management will only be permitted when actions will help achieve goals and objectives of the conservation area.

Potential old growth forest stands will be identified and protected through the implementation of CVC forest management prescriptions.

Recreational development, infrastructure & essential services development, and resource management & development will avoid the most sensitive areas.

6.3.4 Restoration

Enhancement or creation of terrestrial corridor will be actively pursued in all locations of the Complex including development zones.

Where possible, application of Species at Risk Recovery Plans will be implemented.

6.4 Forestry

A Forest Management Plan has been created for the Terra Cotta-Silver Creek Complex (Appendix D). The plan describes principles of forest management, goals, and objectives from a CVC perspective as well as management prescriptions for specific forest stand types.

Specific forest management plans are currently applicable to forest stands for which inventory data are available. At present, this only applies to a few forest stands registered in MFTIP. However, as data is collected it will be incorporated into specific management prescriptions for these forest stands. Management prescriptions must reconcile issues such as resource planning, recreation, education, fisheries and natural heritage concerns. As stated in Section 4.4, there will be no cutting within ANSIs other than the removal of risk trees along trails and low intensity silviculture in plantations for the purpose of increasing biodiversity.

6.4.1 Forest Management Plans

The most intensive management to date has consisted of tree planting in successional areas, generally those formerly used for intensive agriculture and the delivery of conservation area programming. Deciduous forest cover has largely been left to develop naturally since acquisition by CVC.

Future plans for forest management have been outlined in general terms for each conservation area. Specific management plans must hold to the objectives outlined above (Section 4.4).

6.4.1.1 Terra Cotta Conservation Area

Management recommendations have been prescribed to deal with 6.8 hectares of stands (of a total of 178.6 hectares) inventoried for MFTIP. These include management of risk trees in high use areas of the conservation area and to facilitate community tree planting events. Monitoring has been proposed to track changes that negatively impact the area in relation to the Niagara Escarpment, to record seedling survival and to track impacts related to public use. Inventory collection, monitoring and prescription writing will be the short term focus for the remaining forest stands not yet inventoried.

6.4.1.2 Silver Creek Conservation Area

Management plans apply to 80.5 hectares of the 388.1 hectares of this conservation area registered in MFTIP. Plantation thinning to promote biodiversity and positively influence successional changes, as well as monitoring of young plantations, is proposed. While almost all plantations are located outside of the Silver Creek Valley Life Science ANSI, any plantation thinning within the ANSI will conform to NEPOSS objectives for Nature Reserve Zones (NEPOSS Manual 2.2.1) and will adhere to NEP policy 2.9.6. for land in public ownership and the maintenance of the values for which it was acquired. Planting of an open field community in the northeast corner of the conservation area is proposed. Short term planning includes inventory collection, monitoring and prescription writing.

6.4.1.3 Terra Cotta Forest and Jacquith Property

15.5 hectares have been assessed for MFTIP, of 115.5 hectares in total. This includes mainly lands that have recently been reforested as part of CVC community stewardship and outreach. Forest stand inventory, monitoring (of wildlife habitat as well as forest health) and prescription writing will be the short term focus for the remaining forest stands not yet inventoried.

6.4.2 Nursery Related Issues

CVC has identified alternatives for removing nursery operations from Terra Cotta Conservation Area in order to facilitate expansion of the program. With the removal of existing nursery operations, the practice of water taking from Wolf Lake will cease.

As previously mentioned, potential for a new wetland plant nursery in Mink Pond will be explored, which will provide native wetland species for public and private stewardship initiatives. Additionally, CVC will evaluate the potential for propagating seeds and cuttings within the Complex.

L. Plant's Brick Works (1914-1929) was one of three area brick factories that made use of Terra Cotta's namesake clay. The last remnants of the operation are located on the Graydon property, at the southern point of the Conservation Area

6.5 Cultural Resources

The region surrounding Terra Cotta-Silver Creek is rich in history and contains significant examples of archaeological or historical resources as illustrated by the Scottsdale Farm property owned by the Ontario Heritage Trust (and formerly managed by CVC).

CVC has zoned a small section at the southern end of Terra Cotta Conservation Area as a Cultural Heritage zone in recognition of the location of the former Brick Works located on the Graydon property. The site is managed for health and safety and CVC does not promote access to this site. There is very limited interpretive value to the site and there are no plans to develop it as such.

If other cultural features are identified, public access will only be permitted in areas where site protection measures have been implemented.

6.6 Scenic Resources

The major viewscapes of the Silver Creek Valley, Rogers Creek Valley, the Niagara Escarpment, and both the Rogers Creek and Wolf Lake waterfalls are spectacular. Public access to these viewscapes through trails and other measures will be considered provided the goals and objectives of the Complex are met and the integrity of the natural environment is maintained.

6.7 Land Securement and Disposition

Priority Greenlands for securement have been identified through CVC's Greenlands Securement Strategy (Map 14). Priority Greenlands will be secured in accordance with CVC's Land Securement and Disposition Policies on a willing seller-willing buyer basis. A full set of securement options (e.g. fee-simple; easement; donation) will be explored for each priority property.

Land disposition will only occur where there is a net environmental gain that helps achieve the goals and objectives of this Plan.

7.0 Recreation, Education and Infrastructure Development Policies

7.1 Recreation Policies

Recreation policies are written to achieve the objective of protection before appreciation and recreation. CVC will locate activities, passive or active, in appropriate zones based on site planning with appropriate staff consultation.

With a variety of potential and existing activities within the Complex, a number of improvements to our capacity and ability to manage use must be made through policy development, infrastructure repair, and management. Directions on how to make these improvements are discussed below with reference to other policies within this Plan and the Authority Land Management Guide.

7.1.1 Permitted Recreational Uses

Delineating management zones within a conservation area enables managers to more effectively manage and protect an area's natural, recreational, and cultural resources by recognizing ideal locations for specific programs and activities. As such, CVC has developed a matrix of permissible recreational uses by type of management zone within the Terra Cotta – Silver Creek Complex (Appendix B).

Each recreational activity, whether pre-existing or proposed, will be evaluated on a number of criteria including:

- Environmental Impacts (real and potential)
- Social Impacts (real and potential)
- Infrastructure Needs
- Ability to Manage (current and future)
- Activity Demand (based on market analysis)
- Cost-Benefit Analysis (including forgoing action on other priorities)
- Liabilities and Hazards
- Appropriateness (does the activity fit within the conservation area's classification and zoning scheme; where else could the activity be offered)

Additional detail on this evaluation process can be found in CVC's Public Use and Access policies in section 3.0 of the Authority Land Management Guide.

As outlined in the goal and objectives for each conservation area, recreation opportunities will be allocated to management zones based on the type of recreation, passive or active. Definitions for these activities can be found in Appendix E.

Enforcement of unsanctioned activities will be completed as per CVC's Enforcement Program.

7.1.1.1 Motorized Use

Motorized use of any kind is not permitted within the Complex, except where necessary by CVC staff to facilitate management and maintenance activities.

7.1.1.2 Cycling and Mountain Biking

Mountain Biking is a prohibited activity in all CVC conservation areas. However, based on the criteria listed in Section 7.1.1, CVC permits cycling on Terra Cotta Lane and all internal roads necessary to access this trail (See Section 7.1.2). Changes to permitted trail sections will not require a change to this Management Plan. CVC will also assess its ability to offer mountain biking at appropriate conservation areas within the watershed.

7.1.1.3 Equestrian Uses

Equestrian use is a prohibited activity at all CVC conservation areas with one exception, the Elora-Cataract Trailway.

7.1.1.4 Hunting/Trapping

Hunting and trapping as a recreational activity is a prohibited activity in all conservation areas. Where there is a potential for damage to person or property from wildlife or there is a science-based justification for the activity, each request will be considered on a case-by-case basis, as per CVC's Hunting and Trapping Policy.

Ice skating on Terra Cottas' Wolf Lake used to be a popular activity– and may yet be again.

7.1.1.5 Camping

Camping is not permitted within the Complex, except for hikers using the Bruce Trail Overnight Rest Area in Terra Cotta Conservation Area. The Overnight Rest Area is located along the Bruce Trail in the western portion of the Conservation Area. This site is managed in co-operation with the Bruce Trail Conservancy, and maintenance occurs as required.

Provision of low impact, group camping facilities at Terra Cotta may be consistent with the goal and objectives of the conservation area, as it would provide a unique recreation opportunity to appreciate the natural environment. However, direct and indirect impacts of camping must be mitigated. CVC will assess the demand for group camping through the Lands Monitoring Program. This recreational opportunity will only be offered if CVC has the ability to manage the activity effectively, while mitigating environmental impacts and ensuring that revenues outweigh program costs.

7.1.1.6 Canoeing/Boating

The lake and pond system at Terra Cotta Conservation Area provides significant appreciation and recreation opportunities. Wolf Lake and Muskrat Pond are ideal locations for fishing, interpretive, and resource management activities. Yet, no formal facilities currently exist to access these opportunities; it may be appropriate to facilitate these activities through the Concession Building (See Section 7.2.10).

CVC will install one boat launch at Wolf Lake and one fishing dock Muskrat Pond. The size, type, and location of these structures will be based on demand as well as environmental conditions and regulations. Instituting limited canoe rentals for use on Wolf Lake would be consistent with goals and objectives for Terra Cotta Conservation Area.

All boat types are limited to canoes or other appropriately sized, self-propelled boats. No motorized boat use will be permitted.

7.1.1.7 Fishing

All rules and regulations related to fishing within the Complex are outlined in the Terra Cotta-Silver Creek Fisheries Management Plan (Appendix C). Rules and regulations will be posted in appropriate locations within the Complex.

Expansion of fishing opportunities within the Complex will be explored with consideration for resource and aquatic ecosystem management.

7.1.1.8 Research

Research is permitted in all conservation area classes and zone types, provided that a CVC permit is obtained and the research assists CVC in achieving the goals and objectives for the conservation area. Permitting research within the Terra Cotta – Silver Creek Complex additionally supports

the goals of the Niagara Escarpment's UNESCO designation as a World Biosphere Reserve – a globally unique ecosystem that requires in-depth understanding. Permits are issued through the Lands Department Permitting Process outlined in the Authority Land Management Guide.

7.1.2 Trail System

A CVC Watershed Trails Strategy will be created outlining the goals and objectives for trail management and development within conservation areas. The Trail Strategy will also guide the management of linkages to regional trail systems that exist within and beyond conservation area boundaries (i.e. Bruce Trail and side trails, the Trans Canada Trail, and Caledon Trailway).

To support the goals and objectives defined in the Watershed Trails Strategy, a Terra Cotta-Silver Creek Trails Plan will also be developed. The Trails Plan will address the following issues:

- Determining the type(s) of trails present within the Complex;
- Development of a strategy to mitigate off-trail use and closure of unsanctioned trails;
- Identify the necessity for, and location of, additional staging areas or kiosks within the trail system, as per Section 7.4.3.

Trails are maintained according to CVC's Trail Maintenance Policy, found in the Authority Land Management Guide.

There will be two main types of trails allowed within the Complex: hiking and multi-use trails. The multi-use trails, based off old internal two-lane roads, are being offered to allow appropriate active recreational opportunities like cycling and cross-country skiing. Cycling is permitted on Terra Cotta Lane, and internal access roads. Cross-country skiing is permitted on Terra Cotta Lane, internal access roads and the Wetland trails. All other trails within the Complex will be considered single-use hiking trails only. The complete trail system within the Complex can be seen in Maps 15, 16 & 17; changes to permitted activities on trail segments (not including Bruce Trail) will not require an amendment to this Management Plan.

Immediate steps will be taken to close unsanctioned trails that present the greatest health, safety, and environmental risks. Steps will also be taken to install boardwalks and other environmentally friendly trail design concepts on the Silver Creek Education Centre trails, in order to mitigate the environmental impacts of extensive use in highly sensitive areas.

The Bruce Trail and associated side trails within the Complex will be operated as single-use footpaths and jointly managed through a partnership agreement between CVC and the Bruce Trail Conservancy.

All trails will be evaluated on their ability to function as interpretive trails as per the education policies, discussed in Section 7.2. In conjunction with education policies, CVC staff will explore opportunities to provide a canoe interpretive trail on Wolf Lake and/or Muskrat Pond (those water bodies that would provide access points through docks). This trail will be identified as a canoe trail and recognized within

the Terra Cotta-Silver Creek Trails plan as a type of trail present in specific conservation areas.

7.1.3 Winter Programming

Offering a winter program at Terra Cotta Conservation Area fits within the goals and objectives for the conservation area. Detailed program development and activity identification will follow the guidelines discussed in Section 7.1 of this Plan.

Potential winter activities include ice fishing, snowshoeing, and cross-country skiing.

Provision of a winter program can be accommodated within existing property infrastructure. Additional staff and program related services can be housed within the Concession Building (See Section 7.4.10). Provided winter programming fulfil conservation are goals and objectives, a business case will be compiled for any new program development. Additionally, the impacts of climate change may need to be considered before investing in infrastructure for recreational activities that may not be feasible due to the possibility of abbreviated winter seasons and increased shoulder seasons.

7.2 Education Policies

CVC will develop a Terra Cotta-Silver Creek Education Plan that is consistent with CVC's Education Strategy and corporate Strategic Plan. The Education Plan will address, but is not limited to:

- Terra Cotta Conservation Area's role as a Nodal Park within the Niagara Escarpment Parks and Open Space System;
- The UNESCO designation of the Niagara Escarpment as a World Biosphere Reserve and the Complex's role within this context;
- Assessing all environmental interpretive opportunities within the Complex;
- Implementing new programs where feasible and appropriate (programs for all seasons; guided and self-guided; curriculum and non-curriculum, adult and youth oriented themes);
- Survey users for input on type and format of education/interpretive programs;
- Identify appropriate existing education/interpretive infrastructure and potential for new infrastructure use;
- Identify staffing requirements;
- Identify potential partnerships with other education programs in the area (Silver Creek Education Centre and Jack Smythe Field Centre);
- Develop a fund raising program to support education/interpretive programs within the Complex.

The Terra Cotta – Silver Creek Complex has been identified as an ideal "Landscape for Learning" – itself a classroom and showpiece for environmental education. The unique, high-quality Escarpment ecology and the scenic trails and viewscapes make the Complex an excellent "place" for CVC's place-based education pedagogy. Developing programs that make use of the Nature Centre as a 'Watershed Learning Centre' (See Section 7.4.11) and providing interpretative informational material for conservation area visitors will best fulfil both CVC's strategic goals and the Appreciation objective for each of the conservation areas within the Complex.

7.3 Natural and Social Linkages

CVC staff will work with the OHT, Peel District School Board, and all other public agencies to facilitate protection, appreciation, and recreation opportunities, and linkages to the Terra Cotta-Silver Creek Complex and all other public lands in the region.

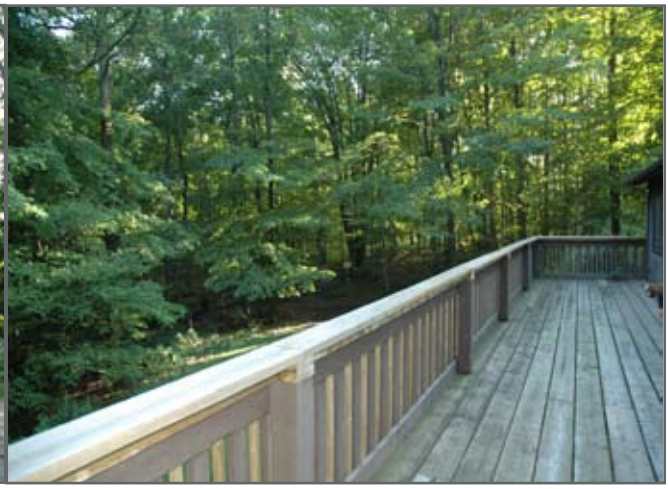
7.4 Infrastructure Development Policies

As the infrastructure component of the Inventory and Analysis section (4.0) indicates, the infrastructure of the Complex, in particular Terra Cotta Conservation Area, is aging and in need of reinvestment or decommissioning. In the past several years, many positive steps have been taken to remedy some of the outstanding or urgent issues related to infrastructure, such as signage improvements, trail and parking facility surface improvement and water system and electrical upgrades. However, to realize the goals and objectives for the conservation areas, infrastructure upgrades and repairs will be necessary.

No changes in use will be occur for existing structures, as previous use patterns remain consistent with current objectives. Rather, investment in upgrades and renovations are required to make use of the present infrastructure for operational and educational programming.

Development, or more accurately, redevelopment of existing infrastructure will occur through prioritization of projects dependent on funding sources. Site planning will determine specific development and will be consistent with all policies outlined in this Management Plan. Further, CVC will ensure that all necessary permits have been acquired before any development project begins.

The central policy of all development within the Complex is the demonstration of sustainability through the reuse and reinvestment in existing infrastructure to minimize environmental impacts that would otherwise occur through new construction. This development principle contributes to the UNESCO World Biosphere Reserve's goal of demonstrating ecologically sustainable land and resource use, as well as the NEP's support of this designation through NEP policy 3.1.6.



7.4.1 Site Access

Current motorized and pedestrian access points are adequate given current use levels. CVC will continue to monitor their condition and appropriateness as use levels change through the Lands Monitoring Program. Should increased use levels justify improvement to existing, or development of new access points, alterations will only be implemented as the Complex's carrying capacity and environmental conditions allow.

Unsanctioned access points will be closed, posted, and monitored for future violations.

Terra Cotta Conservation Area's main entrance off Winston Churchill Boulevard has been recently improved to facilitate increased use and programming, including:

- Installation of a gate at Winston Churchill Boulevard to facilitate the conservation area's operational policies;
- Resurfacing of the main access road from Winston Churchill Boulevard to just beyond the entrance to the Nature Centre parking lot;
- Renovations to the existing gatehouse to accommodate staff and provide optimum service to visitors;
- Installation of entrance signage as per Section 7.4.2.

7.4.2 Signage

Signage, both educational and informational, is lacking throughout the Complex. In some cases the signage that does exist is incorrect and outdated. To facilitate increased programming and use, the quality and quantity of signage must be improved.

A Terra Cotta-Silver Creek Sign Plan will be developed and remain consistent with CVC's Conservation Areas Sign Plan. The Terra Cotta-Silver Creek Sign Plan will among other things:

- Identify the number and type of signs to be installed at all access points (motorized or pedestrian), staging areas, and parking lots throughout the Complex;

- Identify the number, type, and locations of signs to be installed to facilitate educational and interpretive opportunities (as per Education Policies in Section 7.2);

- In conjunction with the Terra Cotta-Silver Creek Trails Plan (Section 7.1.2), develop and install a system of directional and informational signage related to the trail system.

As per the Education Policies (Section 7.2), CVC will fulfil Terra Cotta Conservation Area's role as a Nodal Park within NEPOSS, including all necessary informational and educational signage. All staging area signage throughout the Complex and CVC's land holdings along the Niagara Escarpment will be designed and installed as per the Terra Cotta – Silver Creek Sign Plan and in accordance with Policy 3.1.3 of the NEP. This will include the placement of a logo identifying the property as a Niagara Escarpment park, as the NEC encourages for all parks under the NEPOSS system.

CVC staff will work with the Bruce Trail Conservancy to identify and install necessary signage for sections of the Bruce Trail within the Complex.

7.4.3 Staging Areas

Recent upgrades to staging areas have improved the previously inadequate ones, rectifying some of the problems of misinformation or unfocussed

Terra Cotta's entrace sign through the decades

visitor experiences. Existing staging areas and trailheads have been improved through installation of kiosks, and new kiosks have been installed in locations where the Lands Monitoring Program identified as necessary.

Signs on these stages kiosks will continue to be placed and updated to provide visitors with accurate and current conservation area information, directional maps and issue or topic specific facts. Self-serve brochures will continue to be offered at the gatehouse at Terra Cotta CA and should be offered elsewhere in the Complex, where feasible, to facilitate educational programming and to provide ease of visitor movement throughout.

7.4.4 Parking Areas

Two main parking facilities exist at Terra Cotta Conservation Area. The east lot will serve as the main parking lot. CVC staff will explore new layout options to maximize parking space and ease of movement to and from other parts of the conservation area. The west lot will serve primarily as a staff parking lot. In circumstances where the east lot reaches capacity, the west lot will also serve as a visitor lot. CVC staff will explore new layout options to maximize parking space and ease of movement to and from other parts of the conservation area. Where resurfacing is necessary, CVC will explore options to minimize impervious surfaces as resources permit.

Parking facilities are limited, but suitable for permitted uses, at Silver Creek Conservation Area. The Outdoor Education Centre at Silver Creek is not promoted for visitor parking, though it does get used as such on occasion.

Road parking exists at Bruce Trail access points on 9th and 10th Lines as well as 27th Sideroad. Parking at Terra Cotta Forest and the Jacquith Property is limited to peripheral roads and is considered unsafe in some locations.

Considering amount of visitor use and the public roadways which intersect the conservation areas and the Bruce Trail, CVC does not intend to expand upon parking facilities elsewhere in the Complex specifically for Bruce Trail use.

If visitor use increases significantly at Terra Cotta CA, and if carrying capacity studies permit, redevelopment of the old parking facility north of the Day Use Picnic Pavilion would be appropriate, as it would make use of a flat, hardened, and compacted area and would be consistent with previous patterns of use.

Development of new parking facilities anywhere within the Complex will only be considered when:

- health and safety conditions justify the need;
- use levels necessitate additional parking facilities;
- carrying capacity studies confirm that the Complex could accommodate increased use; and
- where additional parking facilities help to support the goal and objectives for the conservation area.

All signage within parking facilities, whether informational, directional, or trail related will be designed and installed as per the Terra Cotta-Silver Creek Sign Plan.

7.4.5 Washroom Facilities

A necessary prerequisite for the reinstatement of operational programming at Terra Cotta CA, and the accompanying increase in visitor usage, is adequate and modern washroom facilities. Public washrooms have been identified as the most important infrastructure gap at the conservation area since they were closed following the transition from campground to passive day use area in the early 1990's.

Currently, CVC has invested in completely renovating and modernizing the original washroom facilities house within the Concession Building. The washrooms previously handled large capacities related to the 1-acre swimming facility (now the award winning wetland) and will handle projected future use levels consistent with plans for operational programming (e.g. small concession sales, snowshoe, cross country ski and canoe rentals, etc.).

The constraints of the existing water supply will be overcome by use of a 600 gallon water storage tank within the Concession Building which will be continually re-filled at a rate of 3 gallons per minute from the adjacent well.

Alternatives to water use (e.g. composting toilets, waterless toilets) will be explored throughout Terra Cotta CA and the rest of Complex where feasible and demand dictates.

The rafters of the picnic pavillion at Terra Cotta that once reverberated with the sounds of the Saturday night dances now echo with the chirps of baby chicks.

7.4.6 Septic System

CVC has assessed the functionality of current septic systems at Terra Cotta Conservation Area and it has been found to be on good working order and will meet current and future demands of use.

7.4.7 Drinking Water

CVC will continue with studies to identify the best alternative, long-term solution to secure potable water at Terra Cotta Conservation Area for washroom facilities and programming. This includes assessing the feasibility of using existing infrastructure (e.g. well, storage tanks, and pipes) and incorporating new water purification or green technologies.

7.4.8 Picnic Facilities

With a large 2,500 square foot operational picnic shelter and a number of picnic tables, Terra Cotta Conservation Area has the ability to support functions from small group outings to large group functions.

CVC will continue to operate the group picnic shelter, provided that it remains structurally sound and there are no known health and safety risks.

CVC has renovated and reinforced the Maple Hills and Old Group Campground shelters for public use. CVC will continue to ensure that appropriate health and safety conditions are in place for users in these locations.

Additions to existing picnic facilities or construction of new ones (e.g. old Valley View campground) will only be considered if increased use levels and visitor desires dictate the need, and where provision of these additional facilities meets the goal and objectives of the conservation area.

7.4.9 Central Workshop

The Central Workshop located in Terra Cotta Conservation Area is currently sufficient to meet the operational needs within the Complex. It also serves as the Central Services and Forestry Operations point for the entire watershed. The Workshop is closed to public access.

CVC will identify projected operational needs within the Complex and watershed to determine if the existing facilities need to be renovated or expanded. Facility expansion will only be permitted where environmental conditions allow.

Forestry operations are being moved from the Central Workshop to a new facility at Warwick Conservation Area. If necessary, CVC will explore the need to move Central Services to alternative locations. If these operations are removed from the conservation area, existing structures may be used for conservation area operations. If not, they will be demolished and the area will be re-naturalized using appropriate methods.

7.4.10 Concession Building

CVC has identified the most appropriate use and function for the Concession Building as a Visitors Welcome Centre. This requires the renovation of the washroom portion of the building (Section 7.4.5) and the old concession service area of the building into a functional space for staff and visitor services.

The development footprint of the Concession building will not be altered but will make use of the existing structure and will demonstrate sustainability through the reuse of old infrastructure. CVC has already invested in a new roof for the building, as well as in washroom renovations.

Interior renovations to the Concession Building will make use of the old concession section as an open concept, multi purpose space for educational and interpretive materials, recreational rentals, small food and drink concessions, and a sitting and relaxation area for conservation area visitors.

Terra Cotta's Old Nature Centre will be developed into CVC's new Watershed Learning Centre

Redeveloping the Concession Building into a Visitors Welcome Centre for Terra Cotta represents continuity in pattern of use, as the nature of the structure remains as a place to provide services and washroom facilities for the visiting public.

7.4.11 Nature Centre

The Nature Centre at Terra Cotta has been identified for redevelopment as a new Watershed Learning Centre. Capitalizing on the existing building and its educational use, the Watershed Learning Centre

is a multi-phase, funding dependent project to develop the building into a showpiece for green technologies and a centre for group and corporate education on the watershed environment. CVC, the CVC Foundation and municipal partners have committed to seeing Terra Cotta reach its potential for environmental education, the means of which is the project to redevelop the Nature Centre into a superior facility.

Recent upgrades to the floors, washroom facilities and windows have improved the Nature Centre in the short term for use as meeting space for staff and partners. The Nature Centre can continue to be used in this fashion until the next phase of the Watershed Learning Centre project can be implemented.

Development of the Nature Centre into the Watershed Learning Centre will, like the Concession Building/Visitors Welcome Centre, demonstrate sustainability by using much of the same footprint of the old building. Development will be directed upwards and any lateral expansion will be restricted to the immediate development envelope, as recommended by NEC staff, to preserve the integrity of the ANSI boundaries that enfolds the Nature Centre.

7.4.12 Natural Amphitheatre

As part of the redevelopment of the Nature Centre into a Watershed Learning Centre, and based on high demand for group event facilities, the need for an outdoor, natural amphitheatre has been identified. The amphitheatre is intended to serve primarily educational programming purposes but can also be used to facilitate group events.

The Natural Amphitheatre will be located in the old group day use / barbeque area southwest of the Nature Centre/Watershed Learning Centre and will be contained within the existing development zone (Map 11). This location will be suitable as it will minimize impacts by using an existing cleared area and natural grade, has access from Terra Cotta Lane for ease of construction and continued maintenance, and is close enough to the Nature Centre/Watershed Learning Centre for combined programming use.

Construction of the Natural Amphitheatre may require some minor re-grading of the existing slope to raise seating views and address some drainage issues, and may involve the construction of a small sized stage and band shell. It is estimated that the Natural Amphitheatre will use no more than five hundred square metres of the existing old picnic/barbeque area.

While the proposed Amphitheatre location falls just within the perimeter of the Terra Cotta Forest Life Science ANSI, the natural value of site location is negligible considering the area has historically been a cleared group picnic and barbeque area up until 2002. Protective measures will be employed, including appropriate site signage and minimal site disturbance during construction. Additionally the amphitheatre will maintain a minimum of thirty metre setback from Second Creek to abide by CVC's own development regulations.

Group events will be permitted by Lands department Permitting Process and will be subject to fees based on the nature of the event.

7.4.13 Communications

Although modern communication technology does exist at Terra Cotta, it is unreliable and slow. If Terra Cotta is to function as an operational conservation area, implying increased programming and use with associated staff support, phone, fax, and internet connections must be upgraded.

CVC staff will identify the most appropriate technology to use, and if feasible, install in conjunction with other road and parking lot repairs to minimize environmental impact.

7.4.14 Implementation Phases

Sections 6.0 and 7.0 include a number of policy, management and development recommendations. Some projects are essential and must be completed as soon as possible. Other projects must be coordinated and completed together. Identified projects are to be completed within a five-year timeframe to coincide with this Management Plan review (Section 9.0). As resources become available, projects will be completed in order, once a Development Permit from the Niagara Escarpment Commission (if required) is obtained as outlined in the following sections.

The following projects have been identified as necessary to facilitate management and operation of the conservation areas in the Complex:

Project A	Terra Cotta Facilities	
2008	▪ Complete design and renovation of washroom facilities in Concession Building ▪ Complete design of Visitors Welcome Centre (with Architectural Consultants) ▪ Renovate the gatehouse for Conservation Areas Staff use ▪ Begin design of Watershed Learning Centre; explore incorporation of green technologies	
2009	▪ Begin renovations to the Concession Building/Visitor Welcome Centre (Funding dependent) ▪ Finish design and begin phased construction of Watershed Learning Centre (Funding dependent) ▪ Complete a needs assessment for the Central Workshop ▪ Redesign and resurface east and west parking lots to create efficient public use	
2010	▪ Continue development of Watershed Learning Centre ▪ Finish construction of Visitors Welcome Centre	
2011	▪ Continue development of Watershed Learning Centre	
2012	▪ Complete development of Watershed Learning Centre	

Project B	Signage	
2008	▪ Begin development of a **Sign Plan** ▪ Design signage for kiosks throughout Complex ▪ Install regulations signage for trails permitting cycling	
2009	▪ Finish **Sign Plan** and begin installation of Plan recommendations	
2010	▪ Finish implementation of **Sign Plan** throughout the Complex	
2011	▪ Assess effectiveness and additional signage needs through Lands Monitoring Program	
2012	▪ Amend **Sign Plan** if necessary	

Project C	Terra Cotta Potable Water and Septic Systems	
2008	▪ Develop a plan to provide potable water to Terra Cotta Conservation Area ▪ Install pumps, holding tank and water treatment system for Concession Building ▪ Bring Well up to standards	

2009	▪ Continue to investigate and monitor groundwater availability	
2010	▪ Monitor water usage to determine potable water supply sustainability	
2011	▪ Monitor water usage to determine potable water supply sustainability	
2012	▪ Monitor water usage to determine potable water supply sustainability	

Project D	Terra Cotta Recreational and Educational Programming	
2008	▪ Investigate the feasibility of Winter Programming ▪ Begin development of a **Trails Plan** ▪ Begin development of **Education Plan** ▪ Various interpretive projects (e.g. Wetland/Pond Naturalization, Dam Removal Projects, Beaver management, Wetland Nursery, etc.) (will be ongoing)	
2009	▪ Complete development of **Trails Plan** and **Sign Plan** and begin implementation of recommendations ▪ Complete **Education Plan** and begin implementation ▪ Assess demand for picnic facilities at Terra Cotta Conservation Area and, where appropriate, provide access to additional facilities (based on visitor survey data and ability to manage) ▪ Assess demand (market analysis) for existing and absent appreciation or recreation opportunities and begin implementing recommendations where feasible ▪ If demand and management resources exist, install a boat launch on Wolf Lake and a fishing pier on Spring Pond to provide access to appreciation and recreation opportunities	
2010	▪ Continue implementation of **Trails Plan** and **Sign Plan** ▪ Complete market analysis of appreciation and recreation opportunities and continue implementing recommendations where feasible	
2011	▪ Continue implementation of **Education Plan** ▪ Complete implementing market analysis recommendations, where feasible	
2012	▪ Continue implementation of **Education Plan**	

Project F	Promotion and Partnerships	
2008	▪ Begin development of a marketing strategy for the Terra Cotta-Silver Creek Complex ▪ Work with Terra Cotta Advancement Cabinet to produce fundraising materials	
2009	▪ Complete **Marketing Strategy** and begin implementation ▪ Continue with fundraising initiatives	
2010	▪ Continue Marketing Strategy and monitor for effectiveness ▪ Continue with fundraising initiatives	
2011	▪ Continue Marketing Strategy and monitor for effectiveness ▪ Continue with fundraising initiatives	
2012	▪ Continue Marketing Strategy and monitor for effectiveness ▪ Continue with fundraising initiatives	

Project G	Land Securement	
2008	▪ Develop a Terra Cotta-Silver Creek Land Securement Project Area	
2009	▪ Capitalize on local landowner interest to secure land identified in the Project Area (as funding allows)	
2010	▪ Continue Terra Cotta – Silver Creek Lands Securement Project Area	
2011	▪ Continue Terra Cotta – Silver Creek Lands Securement Project Area	
2012	▪ Continue Terra Cotta – Silver Creek Lands Securement Project Area	

Project H	Pond, Stream and Fisheries Rehabilitation	
2008	▪ Complete Pond and Stream Concept Plans ▪ Complete site plans for priority ponds (Spring pond removal / Muskrat Pond fishing infrastructure and shoreline stabilization / Wolf lake bottom draw / Water level management plan for Wetland pond) ▪ Begin implementing Pond rehabilitation project ▪ Complete water budget analysis to help refine site plans and for long term environmental monitoring ▪ Collect needed data for each pond (water budget) ▪ Long term monitoring of existing stations (biomass, spawning) and establishment of new sites (e.g. Wolf Lake ▪ Develop an Ecological Monitoring Program and coordinate with CVC's Integrated Watershed Monitoring Program (IWMP)	
2009	▪ Complete construction of bypass channel for Wolf Lake Natural channel design, barrier removal and riparian / bioengineering planting plans and implementation ▪ Begin trout spawning surveys (in conjunction with hydrological site plans) Assess past and present restoration projects ▪ Install fishing dock on Muskrat Pond	
2010	▪ Complete Bypass channel for Mink Pond	
2011	▪ Continue implementation of pond option site plans	
2012	▪ Complete all preferred pond options and monitor for effectiveness of thermal mitigation measures	

8.0 Operational Policies

As per policies outlined in the Authority Land Management Guide, Terra Cotta Conservation Area will be identified as an operational, active conservation area; Silver Creek and Terra Cotta Forest are identified as non-operational, passive conservation areas.

All three conservation areas within the Complex will be open during daylight hours only.

Through the help of Lands Monitoring Program and the use of visitor surveys, CVC will identify the most appropriate method to collect entrance fees (i.e. self-serve or staffed gate house).

CVC will identify staffing needs based on the type of entrance fee and services offered at the conservation area.

8.1 Property Monitoring and Enforcement

Resolution of issues related to unsanctioned uses, encroachments, and security will be identified and addressed through the Lands Monitoring Program and the Enforcement Program

8.2 Conservation Areas Permits

CVC conservation area permits will be required for the following activities:

- commercial photography and/or filming;
- right to access to conduct work and/or research;
- special events;
- other activities as deemed necessary by CVC.

Permits are issued through Lands Department Permitting Process; fees are determined by the type and size of activity. CVC retains the right to accept or deny any permit application.

8.3 Marketing

An appropriate marketing strategy will be developed for the Complex. The following considerations will be taken into account:

- other operational conservation areas within the watershed;
- permitted uses within the Complex;
- any other plans or strategies developed as per recommendations made in this Management Plan (e.g. trails plan, sign plan, education plan, and fisheries plan).

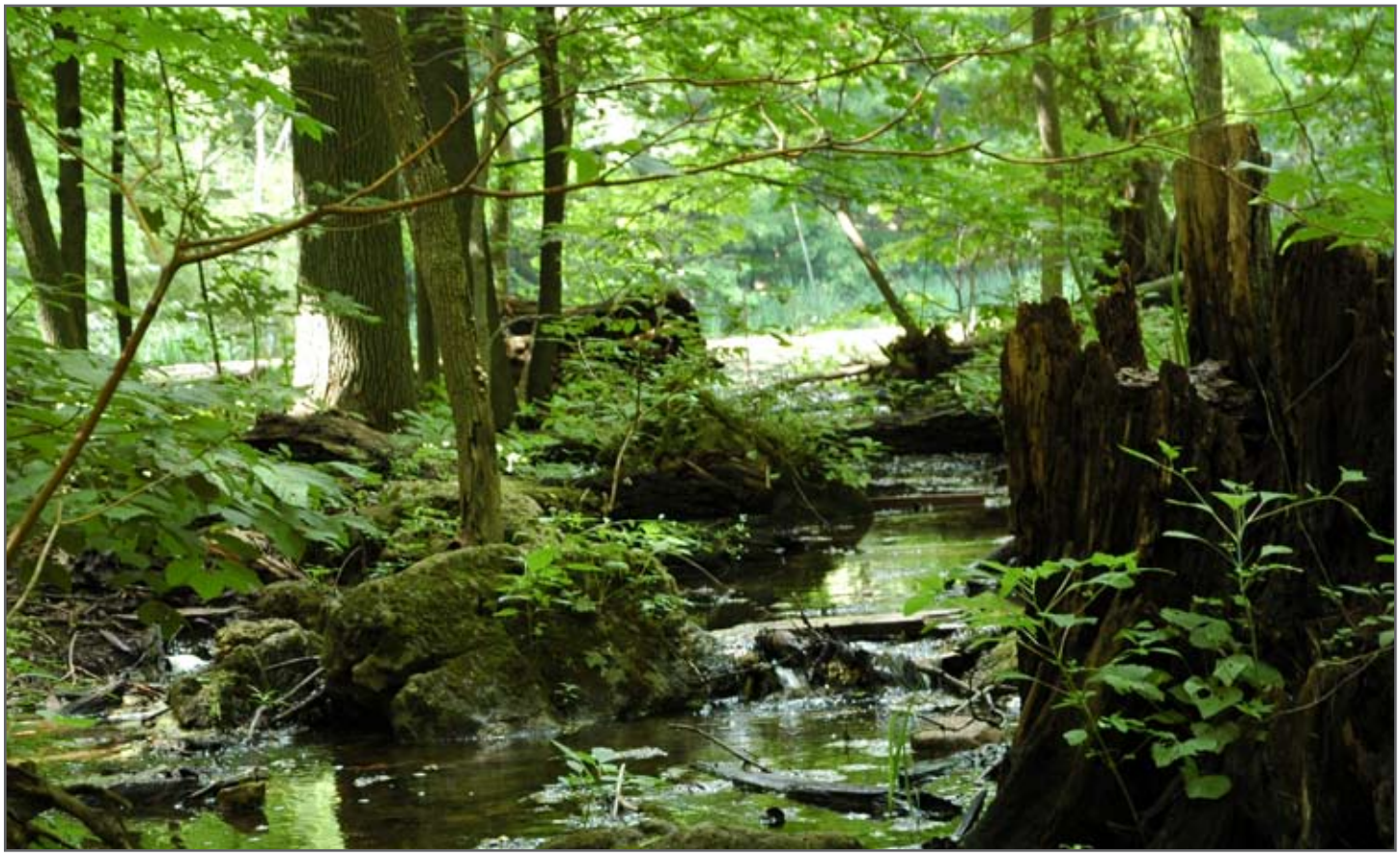
8.4 Partnerships and the CVC Foundation

Wherever possible, CVC will work towards establishing partnerships with groups that share CVC's mandate and could help achieve the goals and objectives for the Terra Cotta-Silver Creek Complex.

The CVC Foundation has established a "Terra Cotta Advancement Cabinet" to focus fundraising and awareness efforts towards support of various programs and related facilities within Terra Cotta Conservation Area. The Terra Cotta Advancement Cabinet's vision is that "*Terra Cotta Conservation Area will become a high-quality, interactive, interpretive environmental education hub and meeting space for Credit Valley Conservation, our community partners, and the public.*" This vision is consistent with goals and objectives for the conservation area and provides excellent direction to focus community support and fundraising efforts.

9.0
Plan Review

The Management Plan for the Terra Cotta-Silver Creek Complex can be reviewed by the project team as issues or conditions dictate; however, the mandatory review period is every **five** years. A review, in any format, can reassess all or part of the Plan including goals, objectives, classification, zoning, and policies. The project team will meet a minimum of once every six months to monitor Plan implementation



Appendices

Appendix A – Conservation Area Classes, Zones, and Development Regulations
Appendix B – Permitted Recreational Uses (Terra Cotta–Silver Creek Complex)
Appendix C – Terra Cotta-Silver Creek Fisheries Management Plan
Appendix D – Terra Cotta-Silver Creek Forestry management Plan
Appendix E – Definitions

Appendix A
Conservation Area Classes, Zones, and Development Regulations

Classification

Within CVC's conservation areas system, there are five different conservation area classes:

Nature Reserve:

Conservation areas dominated by large undisturbed natural heritage features which are, as a minimum, considered regionally significant. Management of these areas will ensure long-term protection of features and natural processes for which the reserve was established.

Natural Environment:

Conservation areas that encompass a variety of high quality natural heritage features representing the regional character of the watershed. Management will be directed toward protection of these features and may provide high quality passive and limited appropriate active outdoor recreation opportunities.

Recreation:

Conservation areas that provide the Authority's best recreational environments. In general, they are suitable for moderate to high intensity (active) outdoor recreation opportunities, linked to the conservation area's natural setting. Management will be directed toward developing and operating sustainable outdoor recreation programs.

Resource Management:

Conservation areas managed primarily to provide natural resource related benefits such as forest products, fish and wildlife, erosion control and flood protection. They may also provide passive recreation opportunities and protection to significant or representative natural features.

Access:

Conservation areas that provide appropriate public access to a variety of sites within the watershed that are not part of the Conservation Area System. These Areas provide access to a number of the regional trail systems, the Credit River and its tributaries and other publicly owned lands.

Zoning

CVC has defined six potential management zones as well as the Bruce Trail Corridor:

Nature Reserve:

Zones designated to include aesthetic natural landscapes and representative natural features which are as a minimum considered regionally significant or are sites containing highly sensitive natural features that are integral in maintaining a healthy ecosystem. These zones only permit passive use that is compatible with natural values of the resource. Management activities are limited to those that ensure the long range protection of these natural values.

Natural Heritage:

Zones designated to include aesthetic natural landscapes and representative natural features for the region. Minimal development is permitted in order to support environmentally based passive (and appropriate active) recreational activities that are keeping with the natural character of the site. Resource management is permitted to the extent that it rehabilitates sites by human activity, enhances the natural character of the landscape and does not interfere with other permitted uses.

Resource Management:

Zones designated to provide for intensive resource management of agricultural land, woodlands, fish, wildlife, water and multiple-use activities. Sites requiring active resource management to rehabilitate degraded natural features are included in this zone. Passive recreation opportunities are also provided.

Cultural Heritage:

Zones designated to include significant archaeological or historical sites which require management to ensure long-term protection of significant values. Passive and limited appropriate active recreation opportunities are also provided.

Development:

Zones designated to provide access, orientation and operation facilities that support appreciation, recreation and resource management activities of the conservation area.

Access:

Zones designated to serve as staging areas to access Nature Reserve Zones and relatively undisturbed Natural Heritage and Cultural Heritage Zones for the purpose of passive recreation activities or appreciation programs.

Bruce Trail Corridor:

The Bruce Trail is an essential component of NEPOSS linking parks, open spaces and natural features through the establishment of a Bruce Trail Corridor (which includes the Bruce Trail Main Trail and Optimum Route) in conjunction with Bruce Trail Access Points and Overnight Rest Areas. As stated in Part 3 of the Niagara Escarpment Plan, the long term goal is to secure a permanent corridor for the Bruce Trail along its entire length.

Development Regulations

To help create development regulations for each management zone, development[1*] has been divided into three categories: recreation infrastructure (e.g. trails, signage, kiosks, docks, visitor control structures, interpretive/educational facilities, other day-use facilities, etc), infrastructure (roads, maintenance buildings and similar structures, parking lots, washrooms, essential services, etc), and resource management, restoration, and enhancement activities. Development regulations by conservation area zone are discussed below.

Nature Reserve Zones:

Development and repair or replacement of essential services will be permitted. New infrastructure development not related to essential services is not permitted; however, repair or removal of existing infrastructure will be permitted.

Recreation infrastructure development is limited to environmentally appropriate trails with associated signage. Temporary facilities for environmental research are also permitted.

Resource Management (as defined in Appendix E) is permitted. Environmental restoration and enhancement activities are permitted provided they are consistent with the goal and objectives of the conservation area and other applicable land management policies.

Natural Heritage Appreciation Zones:

Development and repair or replacement of essential services will be permitted. New infrastructure development as well as repair or removal of existing infrastructure not related to essential services will be permitted.

Recreation infrastructure development is limited to trails with associated signage; interpretive and educational facilities; and, visitor control structures necessary to support passive and appropriate active day-use recreation opportunities. Temporary facilities for environmental research are also permitted.

Resource Management (as defined in Appendix E) is permitted. Environmental restoration and enhancement activities are permitted provided they are consistent with the goal and objectives of the conservation area and other applicable land management policies.

Resource Management Zones:

Development and repair or replacement of essential services will be permitted. New infrastructure development not related to essential services is not permitted; however, repair or removal of existing infrastructure will be permitted.

Recreation infrastructure development is limited to environmentally appropriate trails with associated signage, temporary facilities for environmental research, minimal interpretive facilities, and basic infrastructure to support passive recreation opportunities.

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1 ***Note:** Prior to any development an Environmental Impact Study (EIS) or appropriate equivalent will be undertaken to identify the boundaries of the natural features and appropriate set back or mitigation measures. The EIS and/or other appropriate studies and subsequent development will be completed in line with CVC and governmental planning and development policies including those outlined in municipal or regional official plans and any provincial or federal Acts or Statutes that apply.

Resource Management (as defined in Appendix E), as well as environmental restoration and enhancement activities are permitted.

Cultural Heritage Zones:

Development and repair or replacement of essential services will be permitted. New infrastructure development not related to essential services is not permitted; however, repair or removal of existing infrastructure will be permitted. Stabilization, restoration, or dismantling of historical features is also permitted.
Recreation infrastructure development is limited to trails with associated signage, interpretive and educational facilities including signage and displays, and basic visitor control structures such as access points and staging areas necessary to support passive and appropriate active recreation opportunities. Temporary facilities for environmental and/or historical research are also permitted.

Resource Management (as defined in Appendix E), as well as environmental restoration and enhancement activities are permitted.

Development Zones:

Both essential and non-essential infrastructure development is permitted, including: roads; parking lots; service facilities including outfitting areas for recreation activities and interpretive/educational facilities; visitor control structures; conservation area management facilities; storage facilities; washrooms; and, essential services.

Permitted recreation infrastructure development includes trails, signage, kiosks, docks, visitor control structures, interpretive/educational facilities, and other day-use facilities. Temporary facilities for environmental research are also permitted.

Resource Management (as defined in Appendix E), as well as environmental restoration and enhancement activities are permitted.

Access Zones:

Infrastructure development is limited to roads, parking areas, and essential services.

Recreation infrastructure development is limited to trail kiosks/staging areas and associated structures; visitor control structures like gate houses, signage for hours of operation, regulations, and permitted uses; and basic educational or interpretive facilities or signage. Temporary facilities for environmental research are also permitted.

Resource Management (as defined in Appendix E), as well as environmental restoration and enhancement activities are permitted.

Bruce Trail Corridor: The Bruce Trail Corridor will be managed in cooperation with the Bruce Trail Conservancy.

NEP Policies

The policy objective of 2.16 of the NEP (2005) is to design and locate uses within the Bruce Trail corridor in an environmentally sound manner:

- The trail and its associated infrastructure should be designed and located within the corridor so as to minimize the potential conflicts with adjacent private landowners and to comply with municipal official plans and by-laws (where applicable).

- All uses within the Corridor should be designed with consideration to the protection of natural features and with minimized impact to those features.

- All trail activities should be compatible with the natural and cultural landscape; avoiding the need for major engineering works and site modifications over the long teThe trail may need to be periodically rerouted to avoid ecologically sensitive areas which experience heavy use. The redirection of the trail will allow for continued protection of sensitive features; natural regeneration, and minimize negative impacts; and,

- The trail uses should be designed and located to avoid steep slopes, wetlands, erosion prone soils and ecologically sensitive areas, e.g. flora and fauna habitats and sensitive areas within Areas of Natural and Scientific Interest.

Regulation 828

Section 5.5 paragraph 30 of regulation 828 in the Niagara Escarpment Planning and Development Act provides direction for development control of the Bruce Trail within the NEPOSS. Part 30 states that the maintenance of land, buildings and structures and the establishment of the Bruce Trail by the Bruce Trail Conservancy on land owned or managed by agreement with the Bruce Trail Conservancy do not require a development permit. This applies only if the development is not in conflict with the Niagara Escarpment Plan.

Appendix B

Permitted Recreational Uses (Terra Cotta–Silver Creek Complex)

ACTIVITY	Conservation Area Zone					
	NR	NHA	RM	CH	D	A
Adventure Races	N	M	M	M	M	M
Astronomy	N	Y	Y	Y	Y	Y
ATV's	N	N	N	N	N	N
Birding	Y	Y	Y	Y	Y	Y
Boating – Motorized	N	N	N	N	N	N
Camping – primitive sites	N	M	M	N	N	N
Camping – group sites	N	M	M	N	N	N
Camping – yurts	N	M	M	N	N	N
Canoeing / Kayaking	Y	Y	Y	M	Y	Y
Cross Country Skiing	M	Y	Y	Y	Y	Y
Cycling	N	M	M	M	M	M
Dog walking – on leash	M	Y	Y	Y	Y	Y
Dirt Bikes / Mini Bikes	N	N	N	N	N	N
Educational / Interpretative Programming	Y	Y	Y	Y	Y	Y
Environmental Appreciation – self guided	Y	Y	Y	Y	Y	Y
Environmental Research	Y	Y	Y	Y	Y	Y
Fishing	Y	Y	Y	Y	Y	Y
Geocaching	N	N	N	N	N	N
Hiking	Y	Y	Y	Y	Y	Y
Historical Appreciation – self guided	Y	Y	Y	Y	Y	Y
Horseback Riding	N	N	N	N	N	N
Hunting	N	N	N	N	N	N
Ice Skating	N	M	M	M	M	M
Ice Fishing	Y	Y	Y	Y	Y	Y
Mountain Biking	N	N	N	N	N	N
Orienteering	N	N	M	M	M	M
Painting / Photography – non-commercial	Y	Y	Y	Y	Y	Y
Picnicking	M	Y	Y	Y	Y	Y
Snowmobiling	N	N	N	N	N	N
Snowshoeing	Y	Y	Y	Y	Y	Y
Special Events	N	M	M	M	Y	Y
Swimming	N	M	M	M	M	M
Wildlife Viewing	Y	Y	Y	Y	Y	Y

Y – Normally permitted in this zone **M** – May be permitted in this zone where deemed appropriate
N – not permitted in this zone

Note: NR – Nature Reserve; NHA – Natural Heritage Appreciation; RM – Resource Management; CH – Cultural Heritage; D – Development; A - Access

Appendix C
Terra Cotta-Silver Creek Fisheries Management Plan

Fishing Regulations, Conservation Area Rules, Management Objectives and Future Options

General

- Refer to main Management Plan for habitat characterization, protection and conceptual restoration plans. It is unlawful under the Federal Fisheries Act to "harmfully alter, disrupt or destroy" fish habitat directly or indirectly.
- Fishing Regulations refer to the Fish and Wildlife Conservation Act administered by the Ministry of Natural Resources.
- Conservation area rules refer to supplementary management tools under landownership by Credit Valley Conservation to regulate activities in a conservation area and under trespassing laws. Such rules require approval from the Board of Directors as part of an overall Management Plan.
- Management Objectives are stated to explain the purpose of fishery management decisions and to encourage public input to a science based management plan.
- Future options provide additional tools for consideration based on scientific monitoring, public input, approval by the Ministry of Natural Resources and decisions by the Area Superintendent most familiar with the local environment, available resources and clients.

Wolf Lake – Regulations, Rules, Objectives and Options

Habitat

- One of the largest open water bodies in the Credit River watershed for nature appreciation, boating and fishing.
- Protected as a Provincially Significant Wetland and is directly connected to Second Creek draining down the Escarpment into the Credit River.
- Thermal impacts from Wolf Lake on downstream coldwater habitats will be mitigated with the installation of a bottom draw outlet and potentially with the diversion or short-circuiting of incoming stream inputs.

Species Mix

- Lacustrine warmwater fish communities; characterized by self-sustaining largemouth bass, pumpkinseed sunfish, brown bullhead, white sucker and various minnows.
- Ontario Fishing Regulations prohibit the transport or introduction of new species. Yellow perch or other suitable prey species for bass may be considered in the future under licence of the Ministry. Black crappie, although popular with anglers will not be introduced given their recent widespread illegal introductions throughout Southern Ontario; including the Credit River watershed. Potential negative ecological impacts have not been properly researched. Stocked trout are provided on site in Muskrat Pond and would have to compete with an existing self-sustaining fishery in Wolf Lake. It is also too warm and large to stock at suitable densities and fish could more easily escape into the Credit River.

Fishing Seasons

- Ontario Fishing Regulations allow for angling of bass from the last Saturday in June to November 30. There are no season restrictions for the other fish species present in Wolf Lake.
- Conservation Area rules will not allow any angling outside of the bass season. This is done in order to protect against stress and over harvesting of fish, particularly during the spring nesting period. There has been no demonstrated demand for fishing other species present in Wolf Lake.
- There will be no ice fishing permitted on Wolf Lake. Given that bass season is closed and there is no demonstrated demand for the other species present, ice fishing is unnecessary. Ice fishing on Wolf Lake may also cause conflicts between user groups if Wolf Lake was to ever be considered for an ice skating program. Ice fishing may be available on site in Muskrat Pond.
- Angling will only be permitted during the operating hours of the Conservation Area.

Harvest Limits

- Ontario Fishing Regulations permit the harvest of five bass per day with no limits on other species including sunfish, bullhead or suckers. It is illegal to harvest any young of the year sport-fish.
- Currently reduced bass harvest limits following 'catch and release' rules are in place. These limits may be reviewed if evidence suggests that the bass population composition is changing or the presence of anglers becomes more common. Index netting monitoring and creel census of anglers will provide such information.
- A combination limit of 25 of the other fish species present is currently in effect. If over-harvesting of these species is documented through index netting monitoring or creel census of anglers, further restrictions will be considered.
- To prevent escapement into coldwater habitats downstream any stocked rainbow trout originating from Muskrat Pond caught in Wolf Lake must be harvested and not released. This should be reported to gate staff.

Bait, Tackle, Boating and Anglers

- Transport, collection or use of live minnows, frogs or crayfish is prohibited in order to protect native populations and prevent the introduction of alien invasive species. Worms, insects, dead preserved minnows and commercial organic baits are permitted.
- Organic baits that are more readily swallowed by fish may be prohibited if catch and release fishing is used as a management tool in the future.
- The use of lead tackle will be discouraged through education, in order to prevent lead toxins from accumulating in the environment. This is more important for shallow bodies of water frequented by waterfowl. A ban may be considered in the future.
- Motorboats can pollute and disturb other users, aquatic plants and wildlife. Non-motorized boating is permitted for angling purposes. Ontario boating regulations apply. Boaters will be strongly encouraged to wear life jackets that must be onboard with other safety equipment. No overcrowding of vessels. Float tubes and pontoon boaters must wear a life jacket. Launching will be permitted at designated areas only.
- Ontario Fishing Regulations stipulate that all anglers between the ages of 18 and 65 must have a valid Ontario Fishing Licence. Anglers must also pay the appropriate entrance fee to the Conservation Area for purposes of angling.

Muskrat Pond – Regulations, Rules, Objectives and Options

Habitat

- Muskrat Pond is one of the few stocked ponds available in the Credit River watershed for a stocked "put and take" fishery. Such fishing opportunities are encouraged in the Credit River Fisheries Management Plan. Stocked ponds are encouraged in order to provide angling opportunities that are separate from wild river angling, where fish can be more difficult to catch and must be released alive.
- Muskrat Pond is directly connected to Second Creek draining down the Escarpment into the Credit River. Escapement of trout will be controlled with the use of screens on outlets to prevent the loss of fish for anglers and prevent potential disease and competition with wild trout populations downstream.
- Coldwater habitat in the pond will be maintained by the removal of Spring Pond upstream, where many groundwater springs exist. A bottom draw for Muskrat Pond may limit coldwater habitat. To further offset thermal warming and evaporative losses on this tributary, Mink Pond downstream will also be taken 'off-line".
- Habitat structures, wetland and shoreline plantings may be implemented to improve the overall aquatic habitat and food resources.

Species Mix

- Stocked rainbow trout, under permission of the Ministry of Natural Resources, and a self-sustaining population of pumpkinseed sunfish, brown bullhead and various minnows.
- In accordance with Ontario Fishing Regulations, new species will not be introduced to or transported from Muskrat Pond.
- A future option may include the restoration of native brook trout throughout Second Creek, including any ponds or hatchery proposals for Atlantic salmon or other species.

Fishing Seasons

- Ontario Fishing Regulations allow for angling of trout from the last Saturday in April to September 30. There is no season on other species present.
- Under a Preserve Licence, and conditions set out by the Ministry of Natural Resources, ice fishing for trout from January 1 to March 15 may be permitted when ice conditions are deemed safe by CVC staff.
- Fishing will not be allowed outside of Trout Season to ensure that there is no illegal taking of trout, and also because there has been no demonstrated demand.
- Panfish will be limited to a combination of 25 individuals, consistent with Wolf Lake.
- Angling will only be permitted during operating hours.

Harvest Limits

- Ontario Fishing Regulations permit the harvest of five trout per day with no limits on other species, including sunfish, bullhead or suckers.
- Currently reduced trout harvest limits following 'catch and release' rules are in place. These limits may be reviewed if evidence suggests that the bass population composition is changing or the presence of anglers becomes more common. Index netting monitoring and creel census of anglers will provide such information.
- A combination limit of 25 of the other fish species present is currently in effect. If over-harvesting of these species is documented with index netting monitoring or creel census of anglers, further restrictions will be considered.

Bait, Tackle, Boating and Anglers

- Transport, collection or use of live minnows, frogs or crayfish is prohibited in order to protect native populations and prevent the introduction of alien invasive species. Worms, insects, dead preserved minnows and commercial organic baits are permitted.
- Organic baits that are more readily swallowed by fish may be prohibited if catch and release fishing is used as a management tool in the future.
- Use of lead tackle will be discouraged through education, in order to prevent lead toxins from accumulating in the environment. This is more important for shallow bodies of water frequented by waterfowl. A ban may be considered in the future.
- No boating or float tubes will be permitted on Muskrat Pond given its small size, potential conflicts with shore anglers and possible disturbances to fish and habitat.
- Flyfishing on Muskrat Pond is difficult due to the lack of backcasting area that is free of shrub and tree snags. This activity will remain difficult on Muskrat Pond, given the future plans to maintain and improve the riparian area. In order to accommodate the demand for flyfishing opportunities, group reservations for float tubes, pontoon boats, canoes and docks will be considered.
- The addition of a dock on Muskrat Pond will also be considered, to allow access to the pond in a manner that is environmentally responsible. The implementation of all future docks at Terra Cotta Conservation Area will be done under the guidance of a site plan, that will include accessibility design for differing user groups (i.e. handicap, children, flyfishing, seniors) and environmental considerations.
- Programming for ice fishing will be determined by the Senior Superintendent of Conservation Areas, and users will be subject to rental reservations and operating fees and regulations. It is recommended that ice fishing be restricted to four huts. This will limit harvesting during a sensitive time of year, when over harvesting is becomes most likely. Limited ice fishing activity will also allow CVC staff to control safe ice conditions.
- Ontario Fishing Regulations stipulate that all anglers between the ages of 18 and 65 must have a valid Ontario Fishing Licence. Anglers must also pay an entrance fee to the Conservation Area.
- Options for group reservations, fees and alternate rules may be considered on a case by case basis for angling purposes on Muskrat Pond.

Second Creek Tributaries and Connecting Pond Chanels

- Water flows split into two tributaries leaving Muskrat Pond. Most of the tributary flowing from Spring Pond to Muskrat Pond, Mink Pond, Supply Pond and under the Entrance Road has been channelized with rockwork and culverts, most representing barriers. The Award Winning Wetland has a single valve piped control inlet from the Supply Pond. Summer flows are extremely low and this limits fish life. Other than baitfish that will be protected from harvest throughout the Conservation Area, this tributary does not offer any angling sport fish opportunities, and thus requires no special regulations. If this tributary is restored in the future, such that native brook trout are re-introduced, special regulations will be considered.
- The other tributary flowing from Muskrat Pond to Wolf Lake is larger and more natural. Angling has been observed at the plunge pool below the perched culvert from Muskrat Pond. To prevent escapement into coldwater habitats downstream, any stocked rainbow trout originating from Muskrat Pond caught in this reach must be harvested and not released. This should be reported to gate staff. Angling pressure and trampling will also be monitored along this stream for consideration of future management options.
- Potential spawning runs of white sucker up from Wolf Lake also needs to be monitored. Angling by rod or dip nets should not be permitted in order to protect and rehabilitate this species. An attempt was made years ago to create a series of vortex weirs immediately

upstream of Wolf Lake where it was believed the gradient of the rock step falls created a barrier. This will be investigated as a white sucker run has not been confirmed.

- Downstream both tributaries eventually rejoin but are characterized by steep gradients and steps down the escarpment face that limits fish life and are not likely to attract anglers. Given the lack of suitable trails and sensitive slopes access for fishing should not be permitted. There is some potential for native brook trout to exist further downstream on lower gradients and pools. Fishing access for these should also be denied until their existence is confirmed and numbers are determined.
- In most cases signage restricting fishing access on these tributaries is not necessary and will not be necessary, unless problems are identified.

Rogers Creek

- The Rogers Creek Valley, stream and waterfalls are one of the most scenic areas attracting people to Terra Cotta Conservation Area. Some brook trout angling may be a traditional use by a limited number of anglers. Populations and angling pressure should be reported and monitored before any special regulations are considered. Rehabilitation efforts for the restoration of Atlantic salmon further downstream will continue.

Silver Creek

- Silver Creek and its tributaries are fairly extensive across a number of the properties. Trout angling may be a traditional use by a limited number of anglers. Populations and angling pressure should be reported and monitored before any special regulations are considered. Known spawning areas will be protected and restoration efforts will continue.

Appendix D

Terra Cotta-Silver Creek Forestry Management Plan

Principles of Forest Management

Forest management objectives and guidelines have been developed for the major forest stand types in the Complex. The Forest Management objectives will guide the implementation of management prescriptions on these properties.

Through collection of quantitative and qualitative forest stand data and its interpretation, CVC staff gain an understanding of the current woodlot conditions and the past management history that has shaped structure and composition of the stand. Current forest stand conditions can then be compared to forest management objectives, and prescriptions will be prepared to address any outstanding concerns.

The greatest impact to the condition and formation of Terra Cotta-Silver Creek forests has been past human activity, including clearing of land for agriculture, cattle grazing in woodlots, importation of disease and insect pests, poor logging practices, and farm practices that supported frequent wildfires. These factors and many more have reduced the quantity and quality of forested land, changed woodland tree species composition, disrupted natural regeneration processes, and changed the natural age and size distribution of trees in the forest. Very few undisturbed or naturally developed forest stands remain today. Forest management objectives and guidelines have been developed to address these and other issues. The guidelines provide management solutions to help mitigate these impacts and help restore natural functions.

The primary objective for forest management at Terra Cotta-Silver Creek is to maintain a healthy forest cover and manage forest stand structure. Management of forests for revenue production will not be considered even if the other management objectives for the stand (e.g. for natural heritage protection or fisheries features) were compatible.

Silvicultural requirements of individual forest stands at the Complex will guide the necessity for forest management. Selection of trees for removal is based on improving woodlot vigour, adjusting age-class distribution, and improving species diversity, as well as any other guidelines regarding wildlife habitat or maintaining old growth features where applicable to the individual forest stand. These activities will only take place where stand structure and forest health will benefit from the removal of growing stock and not exclusively to promote the creation of wildlife habitat or old growth features.

It is implicit that forest management objectives, guidelines and prescriptions need to address resource planning, recreation, education, fisheries and natural heritage concerns. The principles for forest management are similar to those for management of natural areas, with a rigorous focus on promoting ecological objectives such as managing for habitat-specific species, diversity and old growth. Amendments to management prescriptions should be based on an individual forest stand to forest stand basis as issues are presented through the planning process.

In general, the thinning of tolerant hardwoods to adjust stand structure occurs at 10 to 25 year intervals. Intervals of 5, 10 or 15 years are required for conifer plantations depending on average tree diameter and density. The number of thinnings required to adjust stand structure and the number of years

between thinnings varies depending on the specific productivity of the forest site and the management prescription developed for the individual forest stand. At the Complex an interval of 15 to 25 years between thinnings could be expected in hardwood woodlots. Actual forest management thinning operations may take one or two months to complete, depending on the scale of the project.

Forested land in the landscape has now become a finite resource. The forest management objectives presented for the Complex speak to the protection and preservation of this resource and its inherent natural heritage features. It is recommended that low intensity silvicultural management takes place to ensure long term protection.

Forestry objectives are compatible with CVC's Nature Reserve and Natural Heritage Appreciation zones.

The implementation of forestry management practices within the Complex are additionally subject to stewardship and resource management policies within the Terra Cotta – Silver Creek Management Plan (Section 4.4 & 6.4).

Forest Management Objectives and Guidelines

Forest management objectives are dependent upon, and will consider, the overall objectives of CVC. The following management objectives and associated guidelines are to be observed when proposing forest management recommendations.

(1) *To maintain a Healthy Forest Cover*

The primary goals of CVC are soil conservation and water management. A healthy forest cover will contribute to the control of erosion and sedimentation, increase infiltration, improve terrestrial and aquatic habitat. A healthy forest is also more resilient to insect and disease outbreaks and changing weather conditions.

- Use of appropriate management practices for the forest type and site conditions;
- Plan to manage for biodiversity and to promote the retention of old growth forest features;
- Manage for a mixture of tree species and age-classes within woodlots;
- Implement the conversion of plantations to mixed species woodlots;
- Implement improvement and sanitation cuts to promote forest health and vigour;
- Monitor and inventory forest stands after management operations;
- Identify and remove trees infected with pathogenic disease and fungi;
- Adjust forest stand structure as per OMNR guidelines for developing old growth structural characteristics.

(2) *To Protect the Natural Environment*

To protect and maintain the forest stands and ecosystems through appropriate management technique, monitoring and planning, as well as the recognition and preservation of unique and rare features.

- Evaluate management potential of forest stands considering all management objectives and the compartment features before considering the level of active management;
- Manage for a variety of habitat types;

- Schedule operations considering seasonal impacts on the site;
- Schedule operations to consider impacts on wildlife;
- Monitor forest stands for signs of disease, insect outbreak and to assess condition and vigour;
- Assess, improve and establish roads and stream crossings when and where required;
- Plan operations and design roads such that there is minimal damage to the remaining trees, regeneration, stream crossings and erosion prone areas;

(3) *To Manage Wildlife Habitat*

To protect, enhance and maintain natural ecosystems that contribute to the diversity of wildlife habitat.

- Retain a diversity of tree species and age-classes to promote a variety of wildlife habitats;
- Reforest large blocks of land to create more interior forest habitat;
- Reforest to create linkages between woodlots;
- To schedule management operations to avoid seasonal disruptions to wildlife;
- Construct brush piles in conjunction with forest management operations;
- Retain mast producing trees and shrubs and potential den trees;
- Allow for downed, woody material and debris to accumulate on the forest floor;
- Retain natural open space;
- Retain standing dead snags to 20-30 snags per hectare;
- Retain all size classes of cavity trees to a minimum of six trees per hectare;
- Plant or develop or retain 7-8 mast trees per hectare;
- Retain a minimum 10 m2 per hectare of basal area in trees greater then 38 cm DBH for forest area dependant birds;
- Create canopy gaps through single tree selection to stimulate growth of shrub and sapling layer for forest area dependant birds;
- Plant, improve, and maintain an edge buffer to mitigate negative edge effects;
- Manage for and maintain interior forest conditions.

(4) *Develop and Retain Old Growth Features*

The following guidelines will ensure that old growth features will not be lost from existing woodlots and that they may be developed and managed for in woodlots lacking these features.

- Retain old large trees;
- Retain and develop snags of all sizes;
- Create and retain downed woody debris, leave all material from management operations in the woodlot;
- Retain and encourage mast producing species;
- Avoid disturbing the ground and litter layer;
- Restrict risk tree removal to corridors along access routes as per CVC's Risk Tree Management Policy;
- Retain conifers and establish conifer groups;
- Retain healthy, live cavity trees.

Importance of Forest Stand Structure

Forest structure is characterized by several important attributes: type and number of tree species, the age distribution of the trees, the number of trees in the woodlot, basal area/tree density or stocking, tree height, and diameter of the trees. This information is used to describe the forest and to guide silvicultural prescriptions and management activities. Guidelines for managing stand structure of tolerant, upland hardwood forests in southern Ontario have been developed by the Ontario MNR. The hardwood forest guidelines suggest that a forest be structured with trees of all ages, species and size classes, and that openings in the forest ensure that a supply of young trees will be available for replacement.

Analysis of forest stand inventory data indicates whether or not the different size classes that make up the forest are sufficiently represented or stocked in the woodlot. Size classes that are overstocked would indicate that thinning could take place to select for better quality and spacing of residual trees. Removals from overstocked diameter classes will provide growing space and resources for the remaining trees, improve forest health, create space to establish new regeneration and provide an opportunity for the manager to adjust species composition.

Management Prescriptions

Five separate management prescriptions are described for seven broad categories of forest. Prescriptions have many elements in common, particularly regarding the protection, preservation and enhancement of natural heritage features. Generally, an overall objective for forest management is to enhance forest core size, so that reforestation is a common prescription for successional areas. However, it is understood that there are some values associated with successional areas and proposals for reforestation would have to consider management for natural heritage features.

The following management prescriptions do not apply to areas within ANSIs in the Complex as per policy section 4.4 and 6.4 of the Terra Cotta – Silver Creek Complex Management Plan.

Silvicultural System for Upland Hardwood Forests and Mixed Forests

When managing natural, deciduous woodlots the all-aged selection system is recommended. This system removes individual trees or small groups of trees of all sizes to achieve the prescribed forest management objectives. The selection system encourages improved vigour and regeneration through gradual and periodic opening of the canopy while maintaining forest integrity and a high degree of forest cover. Selection of trees for removal is based on improving woodlot vigour, adjusting age-class distribution and improving species diversity, as well as any other prescribed objectives.

This system can be used to recreate the effects of natural disturbances in a controlled manner and minimizing damage to the residual stems, thereby maintaining forest health, enhancing biodiversity and encouraging natural regeneration. This method also allows for adjustment of forest stand structure maintaining a mixed representation of early, mid and late successional stages in the forest landscape.

Forest management operations in general are carried out on a 10 to 20 year cycle dependant on woodlot growth rate; this method is ideally suited to tolerant hardwood species. However, mid-tolerant species can be encouraged to regenerate by creating larger openings in the canopy. Gap creation either through natural processes or selective tree removal has to be carefully balanced towards maintaining continuous canopy conditions within the interior of the woodlot to maintain interior forest habitat conditions. The

gaps should be located more than 50 meters from either another gap or the edge of the woodlot. It is recommended that low intensity silvicultural management take place to adjust forest stand structure and address forest health concerns. This will be achieved by maintaining the basal area per hectare at a level of 21.0 m2/ha or higher after any forest management operation and only 1/3 of the pre-cut basal area should be removed during any one forest management operation. The creation of canopy gaps should be based on single tree removals and placed in the forest interior away from the forest edge. Forest management operations are to be scheduled for the winter months when the ground is frozen and site disturbance can be kept to a minimum.

Silvicultural System for Conifer Plantations

Plantation management is primarily directed toward compartment conversion - the process of changing forest composition from a coniferous monoculture to a mixed deciduous-coniferous stand, ultimately resulting in hardwood forests with scattered super canopy trees of white and red pine.

When managing plantations, CVC may employ selection row thinning, tending, patch cutting or crop tree selection. Both thinning techniques will decrease the number of trees, provide space for other species in which to establish or regenerate, and stimulate residual trees to grow more vigorously. Thinning prevents stagnation of the forest cover, improves snow pack capture and provides increased opportunities for biodiversity.

Pure stands can be treated in the following manner. The first thinning will remove complete rows to facilitate access to the compartment. Usually every fourth row is removed unless otherwise stated. The second thinning will remove poorly formed and suppressed trees to provide growing space for the dominant (selected) crop trees at five years after the first cut. The third and subsequent thinning will thin from above to remove the trees that meet the size requirements for desired products. Third and subsequent thinning should take place at 10 year intervals.

Mixed plantations present problems in terms of a standard management technique. Stocking within the compartment, potential products and appropriate row removal must be evaluated per forest compartment as to the appropriate method used. In many cases first and second thinning will amount to compartment tending and sanitation operations.

Upon the completion of the second thinning, the following compartment conditions should have been accomplished:

- maintenance of trails;
- removal of all or most poor quality trees;
- release of potential crop and seed trees; and
- relatively easy felling of remaining trees ensured.

Plantations are also managed using a crop tree method. Selection is based on a tree being: in a dominant or co-dominant crown position; healthy with smooth bark; straight with a merchantable stem; and covered with healthy foliage and having a well developed crown.

Plantation tending involves a variety of procedures designed to ensure survival, regulate the growth of the developing compartment and effect health and vigour. Release cuts will regulate the species composition within the compartment and improve growth in young forest stands. Tending operations are non-commercial thinnings that promote forest health.

Silvicultural Systems for Old Field Regeneration / Cultural Field and Thicket

Reforestation plantings can be established to enlarge forest blocks, connect isolated forest stands, create wildlife corridors, increase vegetation around streams, and create contiguous forest cover in priority areas. Planting sites will either be machine planted or prepared before hand planting. A mixture of tree and shrub species suitable to the site will be selected and site characteristics will dictate the composition of the mix, determination of the type of planting, and spacing.

Silvicultural Systems for Successional Woodlands

The successional hardwood, conifer and mixed woodlands have all originated from large scale disturbance. These forests are generally comprised of short-lived pioneer species and form an even-aged forest. These stands should be managed to encourage replacement by mid-tolerant and tolerant species and promoting natural succession. Pre-commercial thinning through patch-cutting and single tree selection would release advanced regeneration and improve the quality of existing successional overstory. Patch cuts would initiate stand conversion to tolerant tree species while maintaining existing stand qualities. Crop tree selection may also be used to release superior individuals or favour specific tree to improve stand diversity. Non-commercial thinnings would comprise the majority of these activities.

Silvicultural Systems for Lowland Woodlands

Hardwood and conifer swamp ecosites are sensitive and are easily disturbed by active forestry operations and therefore will not be managed in this way. These stands are characterized by imperfect drainage, delicate soils, shallow root systems, susceptibility to windthrow and prone to seasonal flooding. Management will allow for natural processes to shape the ecological structure and function of these stands, acknowledging that some management could be required in the interest of public safety.

Appendix E
Definitions

Active recreation: is characterized by higher intensity outdoor recreation opportunities where recreation infrastructure goes beyond trails and access points to visitor control structures, interpretive/ educational facilities, and outfitting or other service facilities including associated infrastructure. Environmental and social impacts from use are more frequent and intense, requiring enhanced, sometimes complex intervention from Conservation Area staff. Types of activities include: motorized boating, cross-country skiing, ice fishing, mountain biking, cycling, picnicking, camping, and educational/interpretive programming.

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

Cycling: is classified as a low intensity activity that is characterized by travelling at a moderate pace on well-defined, low gradient multi-use trails. This activity is inclusive to a broad range of user groups of varying ages and abilities.

Development: the results of a land or resource use change as evidenced by the introduction or alteration of buildings and structures, modification of a landform and/or alteration or removal of vegetation and topsoil (NEPOSS Manual, p.128).

Formal Education: the hierarchically structured, chronologically graded 'education system', running from primary school through the university and including, in addition to general academic studies, a variety of specialized programs and institutions for full-time technical and professional training.

Mountain Biking: is classified as an unsanctioned use within CVC conservation areas. Mountain biking is a high intensity activity, characterized by the use of challenging terrain that generally exceeds that capacity of CVC's trail system. Mountain biking tends to create significant negative impacts to the condition of CVC's sanctioned trails and surrounding ecological features, and notably this activity has caused the creation of numerous ad hoc trails in CVC conservation areas.

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

Non-formal Education: any organized educational activity outside the established formal system (whether operating separately or as an important feature of some broader activity) that is intended to serve identifiable learning clienteles and learning objectives.

Passive recreation: is characterized by low intensity outdoor recreation opportunities where recreation infrastructure is limited to environmentally appropriate trails with appropriate signage and access points, as well as infrastructure associated with essential services only. Limited, negative environmental and social impacts from use are experienced, requiring minimal intervention from Conservation Area staff. Types of activities include: hiking, bird watching, wildlife viewing, and fishing.

Resource Management: A set of actions guided by overall policy that seeks to maintain or achieve a given or desired condition valued by humans to provide specific social, environmental or economic benefits (NEPOSS Manual, p.136).

Valleylands: a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year.

Watershed: an area that is drained by a river and its tributaries.

Wetlands: lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophobic plants or water tolerant plants. The four main types of wetlands are swamps, marshes, bogs, and fens.

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

References

2008 Niagara Escarpment Parks and Open Space System Planning Manual (Draft 2). Ministry of Natural Resources, May 2008.

Why people recreate: An overview of research. Smith, David H. and Therberge, Nancy. Life Enhancement Publications, Champaign, Ill, 1987.

Maps

Map 1 – The Credit River Watershed

Map 2 – Management Plan Area and Subwatershed 11 & 12 Boundaries

Map 3 – Terra Cotta-Silver Creek within Niagara Escarpment Plan Area

Map 4 – ANSIs, ESAs, PSWs of the Terra Cotta-Silver Creek Complex

Map 5 – ELC Communities

Map 6 – Fish Community Management Zones

Map 7 – Forest Types of Terra Cotta-Silver Creek Complex

Map 8 – Terra Cotta Infrastructure

Map 9 – Natural and Social Linkages beyond the Terra Cotta-Silver Creek Plan Boundary

Map 10 – Opportunities and Constraints

Map 11 – Terra Cotta Conservation Area Zoning

Map 12 – Silver Creek Conservation Area Zoning

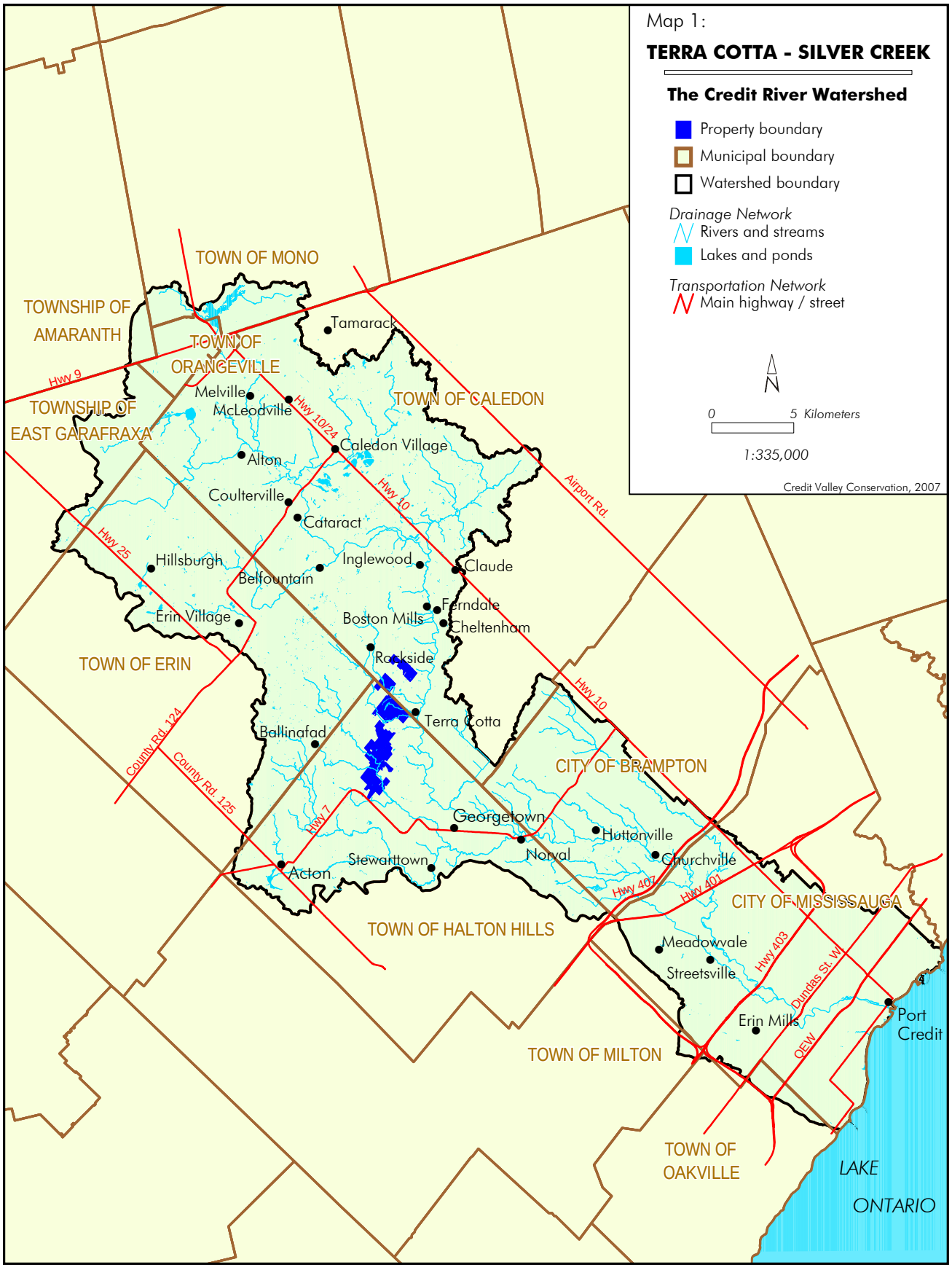
Map 13 – Terra Cotta Forest Conservation Area Zoning

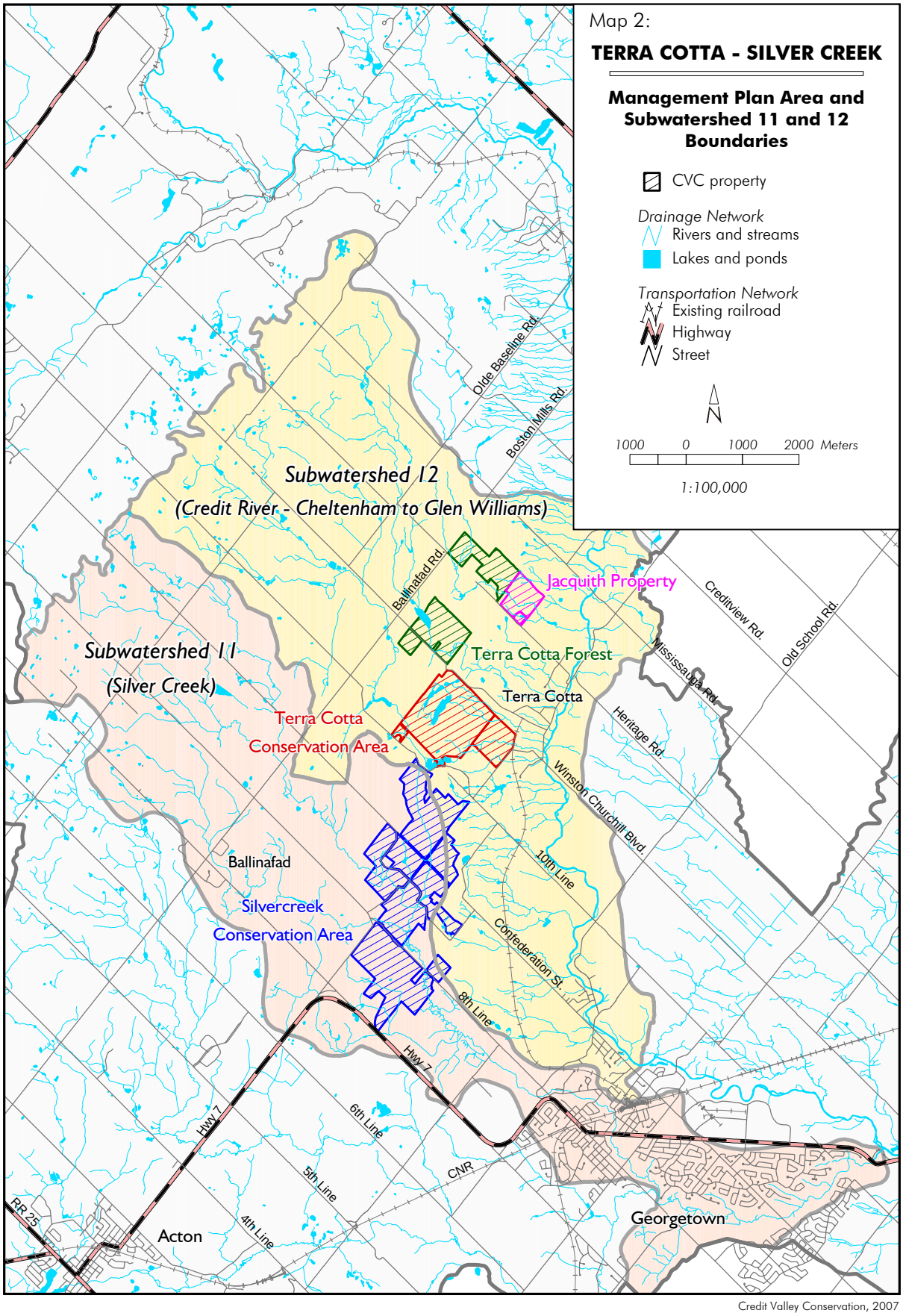
Map 14 – Terra Cotta-Silver Creek Land Securement Project

Map 15 – Terra Cotta Conservation Area Trails System

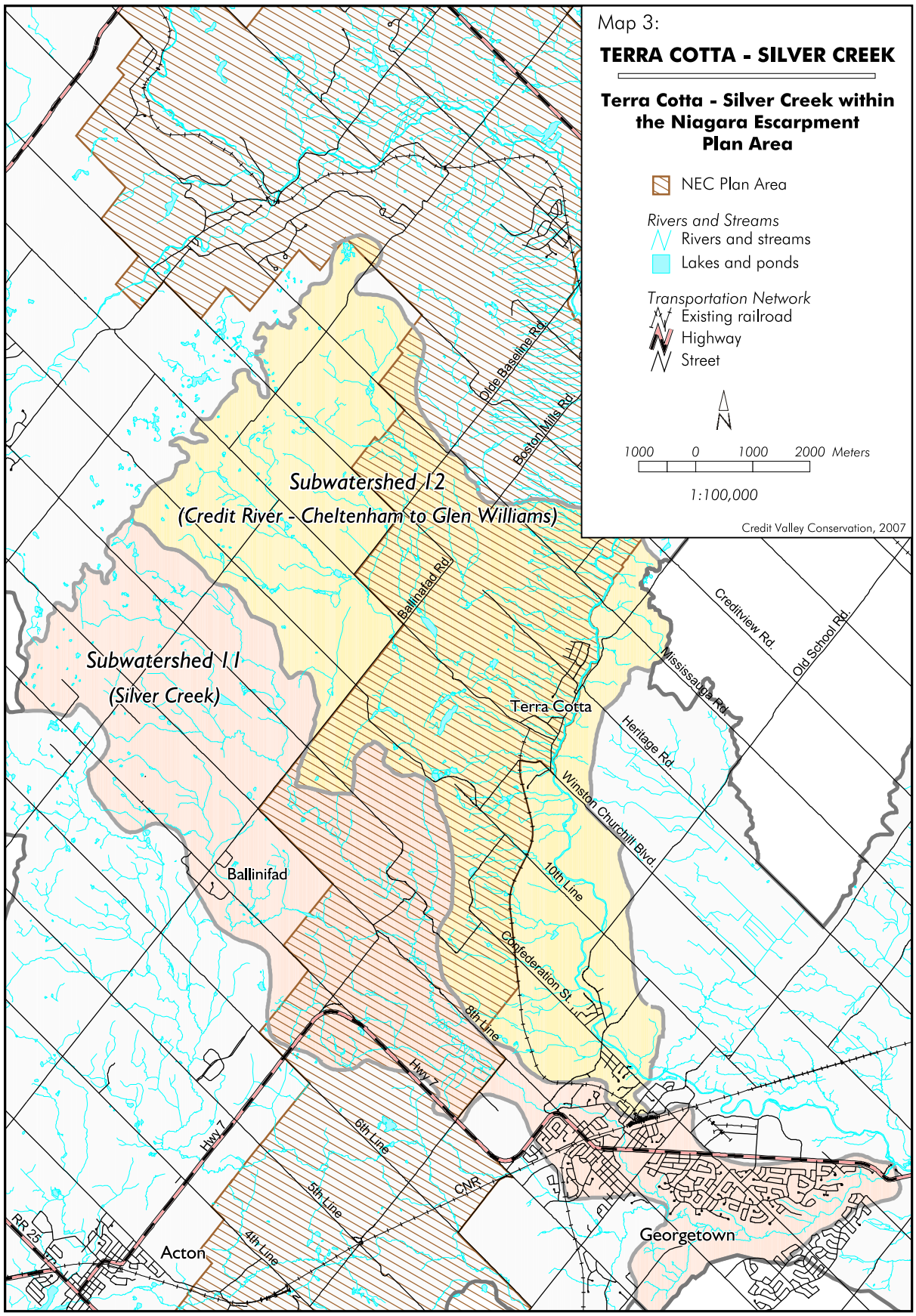
Map 16 – Silver Creek Conservation Area Trails System

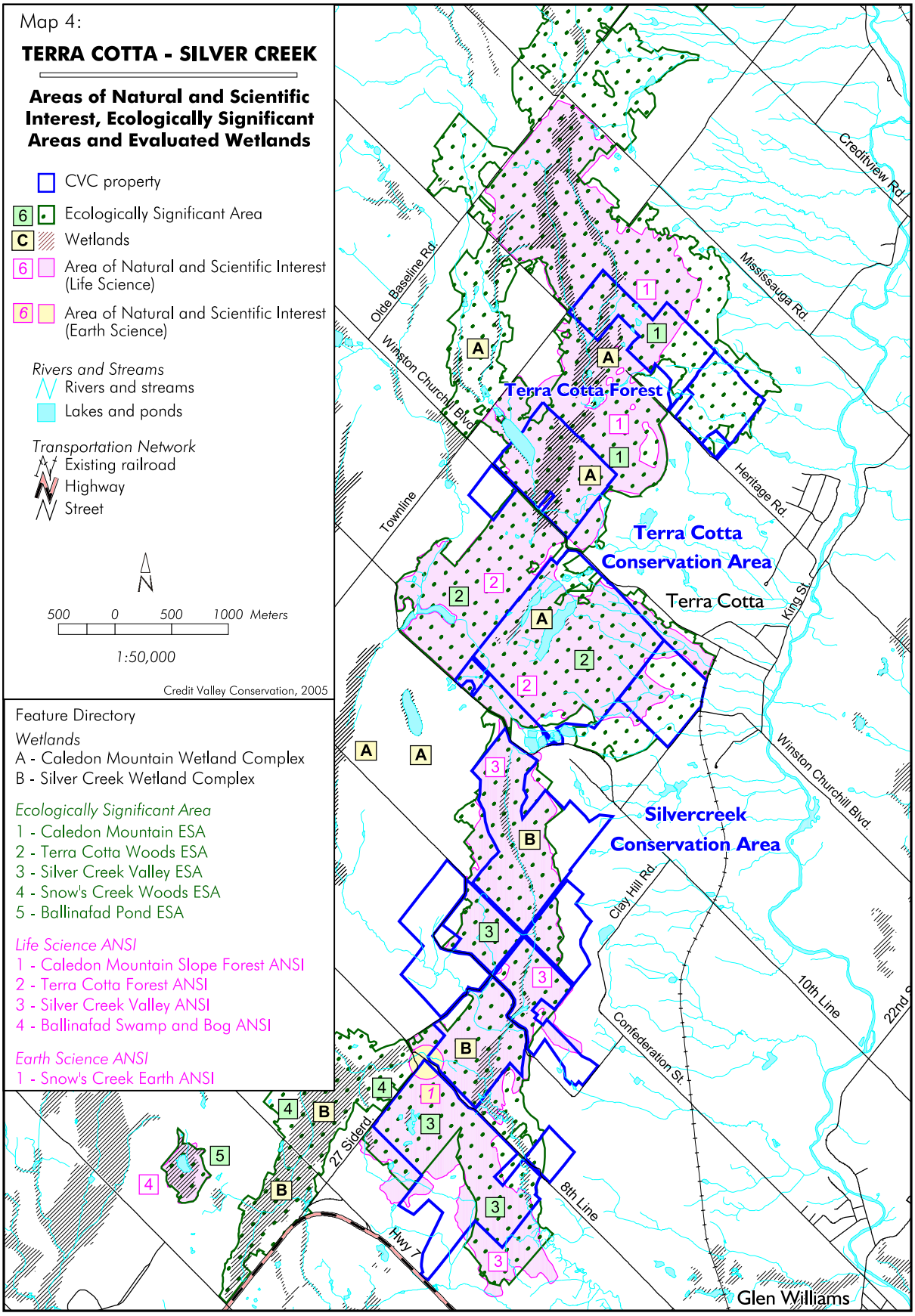
Map 17 – Terra Cotta Forest Conservation Area Trails System


Map 1:
TERRA COTTA - SILVER CREEK
The Credit River Watershed
Property boundary
Municipal boundary
Watershed boundary
Drainage Network
Rivers and streams
Lakes and ponds
Transportation Network
Main highway / street
N
0
5 Kilometers
1:335,000
Credit Valley Conservation, 2007
TOWN OF MONO
TOWNSHIP OF AMARANTH
TOWN OF ORANGEVILLE
TOWNSHIP OF EAST GARAFRAXA
TOWN OF CALEDON
TOWN OF ERIN
TOWN OF HALTON HILLS
CITY OF BRAMPTON
CITY OF MISSISSAUGA
TOWN OF MILTON
TOWN OF OAKVILLE
LAKE ONTARIO
Tamarack
Melville
McLeodville
Caledon Village
Alton
Coulterville
Cataract
Inglewood
Claude
Hillsburgh
Belfountain
Ferndale
Cheltenham
Boston Mills
Erin Village
Rockside
Terra Cotta
Ballinafad
Georgetown
Norval
Huttonville
Churchville
Stewarttown
Acton
Meadowvale
Streetsville
Erin Mills
Port Credit
Hwy 9
Hwy 10/24
Hwy 10
Hwy 25
Airport Rd
County Rd. 124
County Rd. 125
Hwy 7
Hwy 401
Hwy 403
Dundas St. W
QEW
Credit Valley Conservation, 2005



Credit Valley Conservation, 2007


Map 3:
TERRA COTTA - SILVER CREEK
Terra Cotta - Silver Creek within the Niagara Escarpment Plan Area
NEC Plan Area
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
1000 0 1000 2000 Meters
1:100,000
Credit Valley Conservation, 2007
Subwatershed 12
(Credit River - Cheltenham to Glen Williams)
Subwatershed 11
(Silver Creek)
Olde Baseline Rd.
Boston Mills Rd.
Ballinafad Rd.
Creditview Rd.
Old School Rd.
Mississauga Rd.
Heritage Rd.
Terra Cotta
Winston Churchill Blvd.
10th Line
Confederation St.
8th Line
Hwy 7
6th Line
5th Line
4th Line
CNR
Ballinifad
Acton
Georgetown
RR 25


Map 4:
TERRA COTTA - SILVER CREEK
Areas of Natural and Scientific Interest, Ecologically Significant Areas and Evaluated Wetlands
CVC property
Ecologically Significant Area
Wetlands
Area of Natural and Scientific Interest (Life Science)
Area of Natural and Scientific Interest (Earth Science)
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
N
500 0 500 1000 Meters
1:50,000
Credit Valley Conservation, 2005
Feature Directory
Wetlands
A - Caledon Mountain Wetland Complex
B - Silver Creek Wetland Complex
Ecologically Significant Area
1 - Caledon Mountain ESA
2 - Terra Cotta Woods ESA
3 - Silver Creek Valley ESA
4 - Snow's Creek Woods ESA
5 - Ballinafad Pond ESA
Life Science ANSI
1 - Caledon Mountain Slope Forest ANSI
2 - Terra Cotta Forest ANSI
3 - Silver Creek Valley ANSI
4 - Ballinafad Swamp and Bog ANSI
Earth Science ANSI
1 - Snow's Creek Earth ANSI
Creditview Rd.
Olde Baseline Rd.
Mississauga Rd.
Winston Churchill Blvd.
Terra Cotta Forest
Townline
Heritage Rd.
Terra Cotta Conservation Area
Terra Cotta
King St.
Winston Churchill Blvd.
Silvercreek Conservation Area
Clay Hill Rd.
10th Line
Confederation St.
22nd
27 Sideroad
8th Line
Hwy 7
Glen Williams

Map 5:

TERRA COTTA - SILVER CREEK

Ecological Land Classification and Existing Land Use for the Terra Cotta - Silver Creek Management Plan Area

Community Type

- Coniferous forest
- Coniferous plantation
- Coniferous swamp
- Deciduous forest
- Deciduous plantation
- Deciduous swamp
- Mixed forest
- Mixed plantation
- Mixed swamp
- Cultural meadow
- Cultural savanna
- Cultural thicket
- Cultural woodland
- Marsh
- Thicket swamp
- Thicket bog
- Treed bog
- Treed beach/bar
- Open beach/bar
- Shrub bluff
- Open bluff

Land Use

- Active aggregate
- Inactive aggregate
- Intensive agriculture
- Non-intensive agriculture
- Rural development
- Wet meadow
- Urban
- Manicured open space
- Landfill

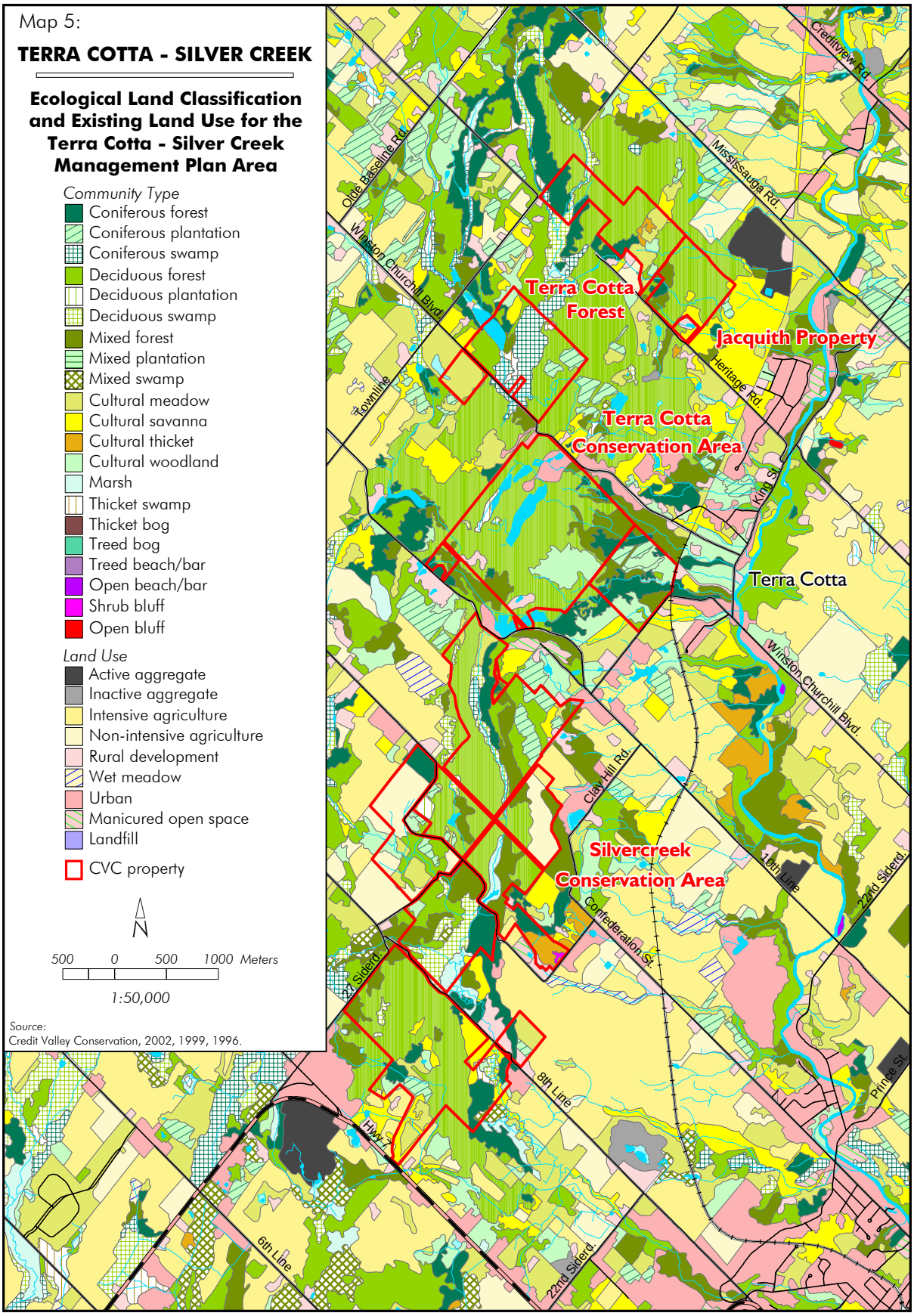
- CVC property

N

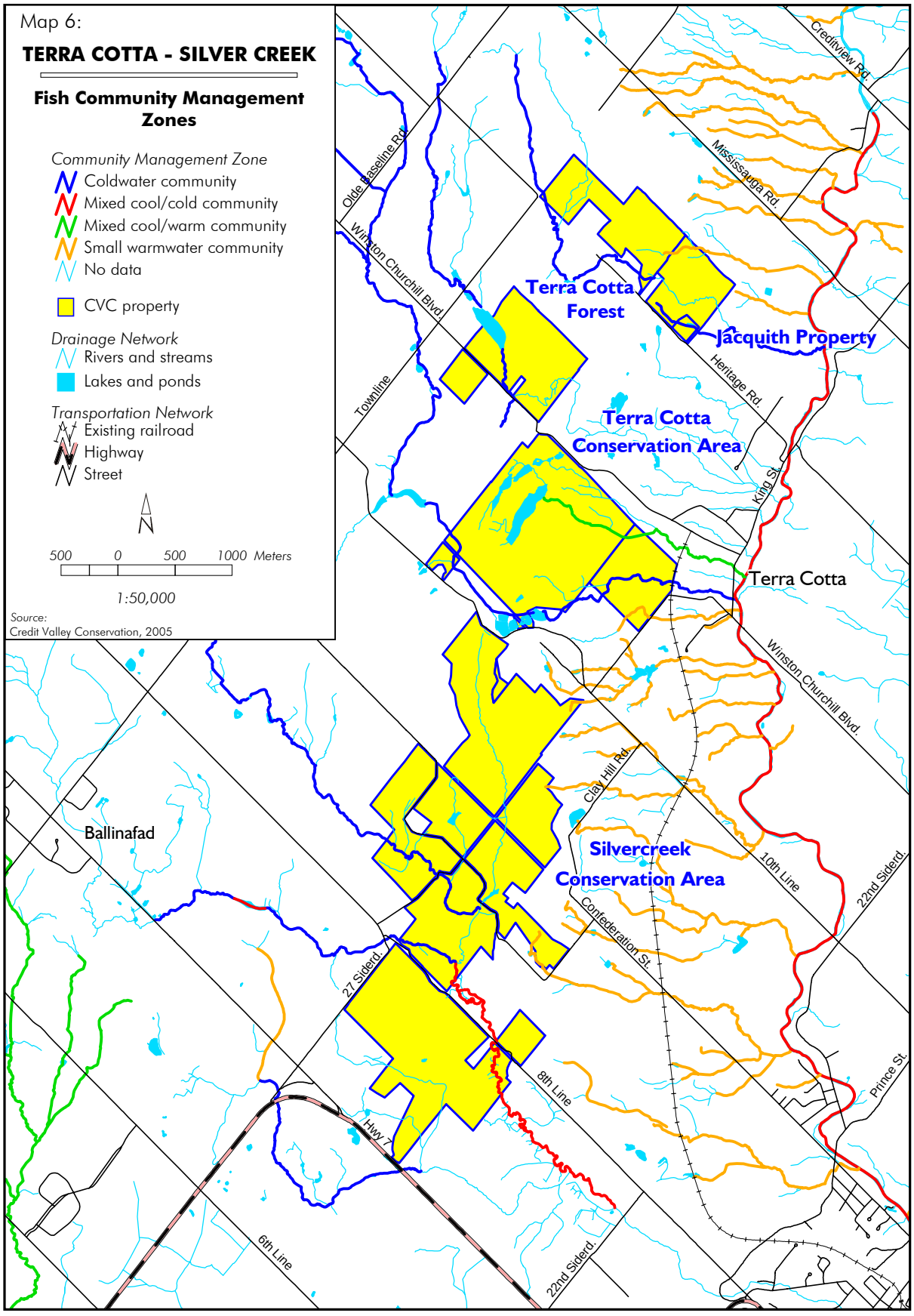
500 0 500 1000 Meters

1:50,000

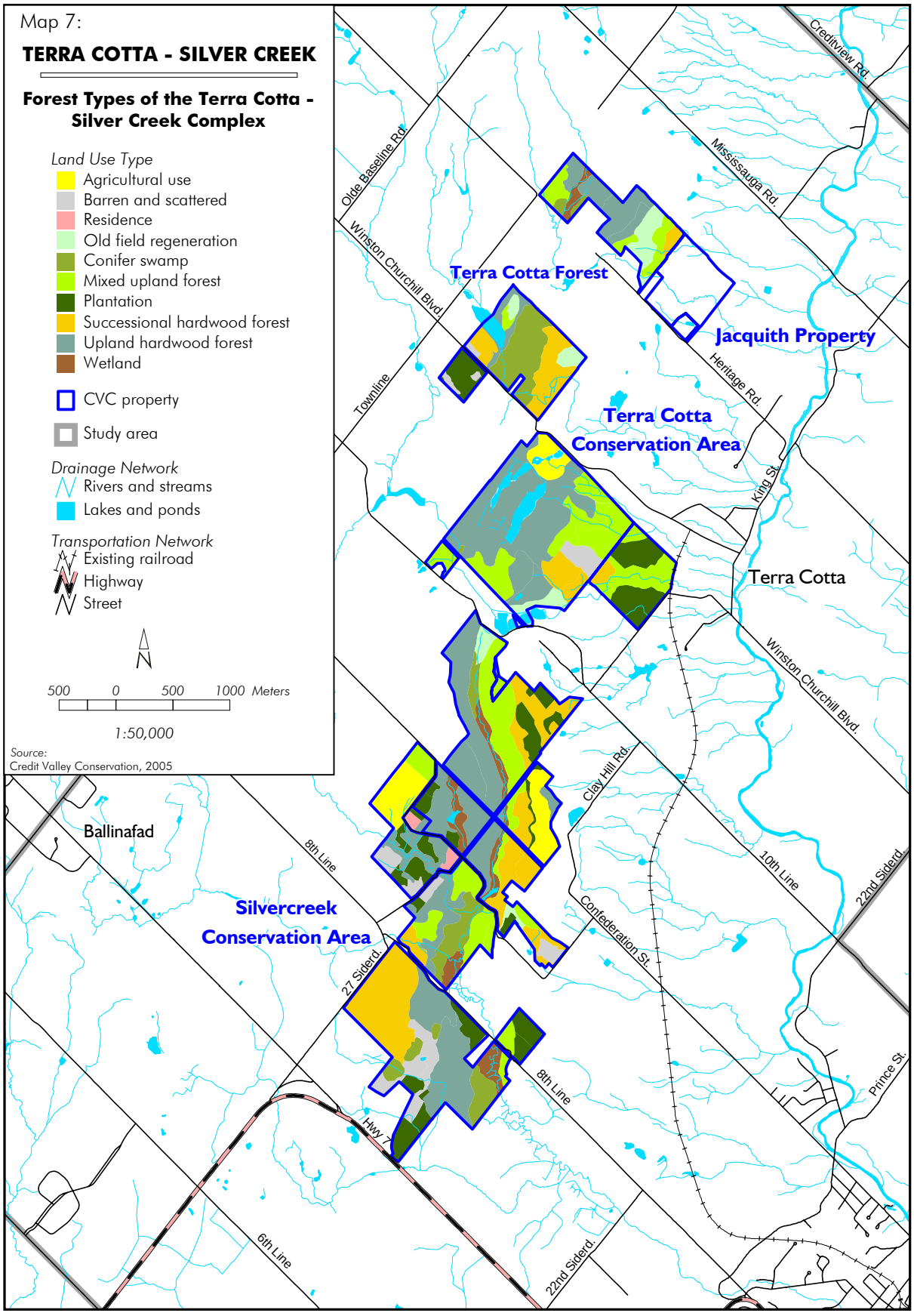
Source:
Credit Valley Conservation, 2002, 1999, 1996.

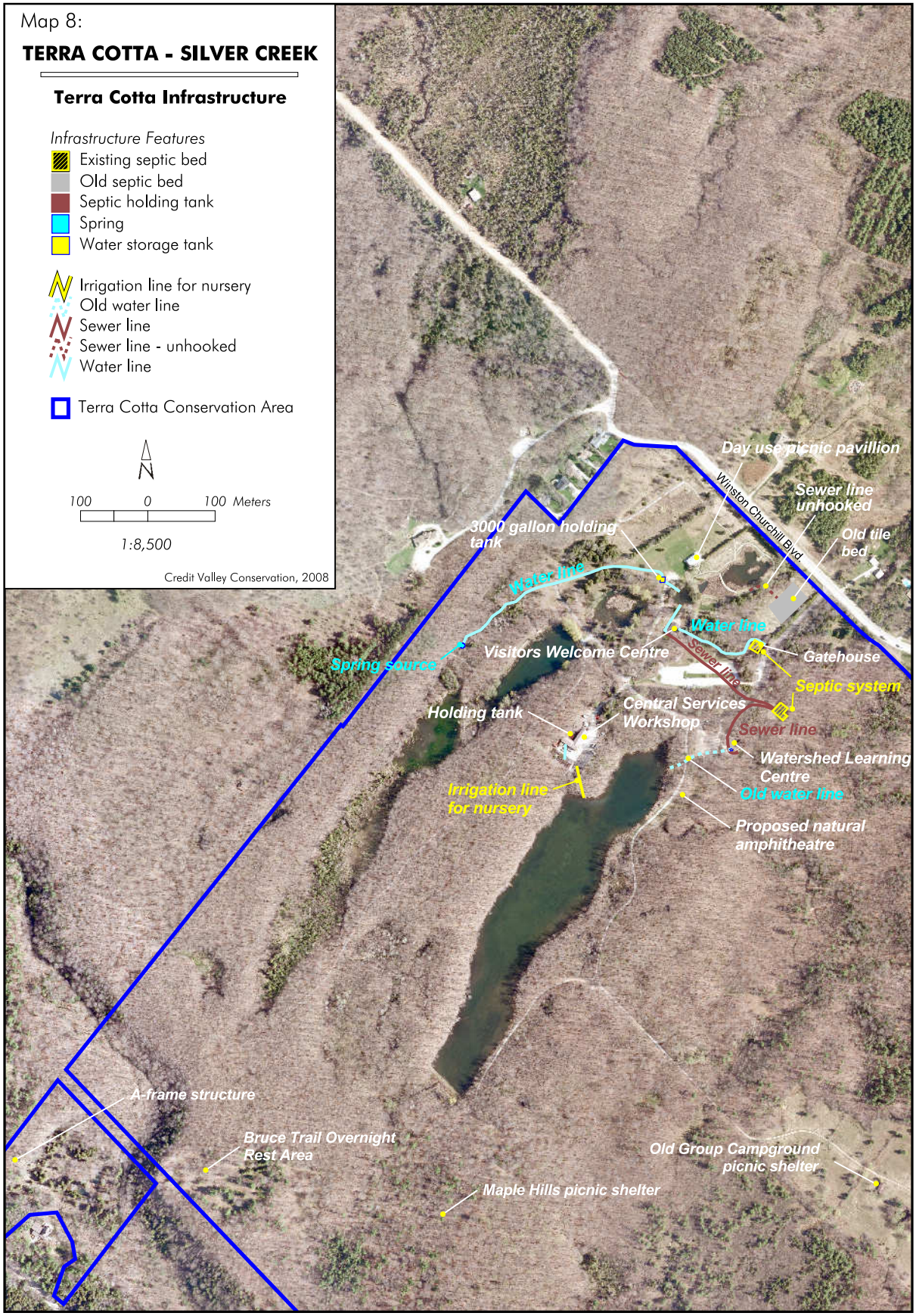


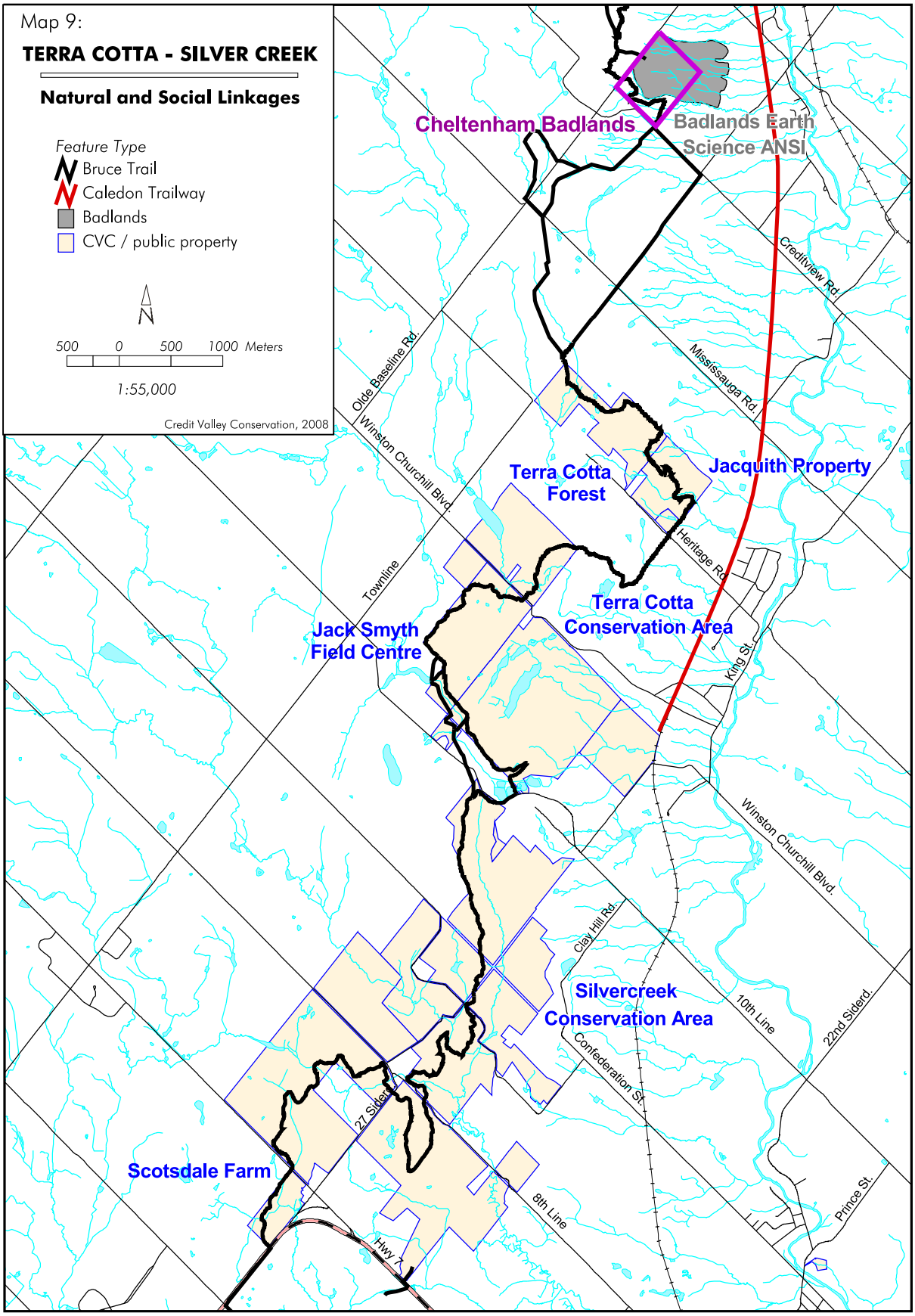
Credit Valley Conservation, 2007

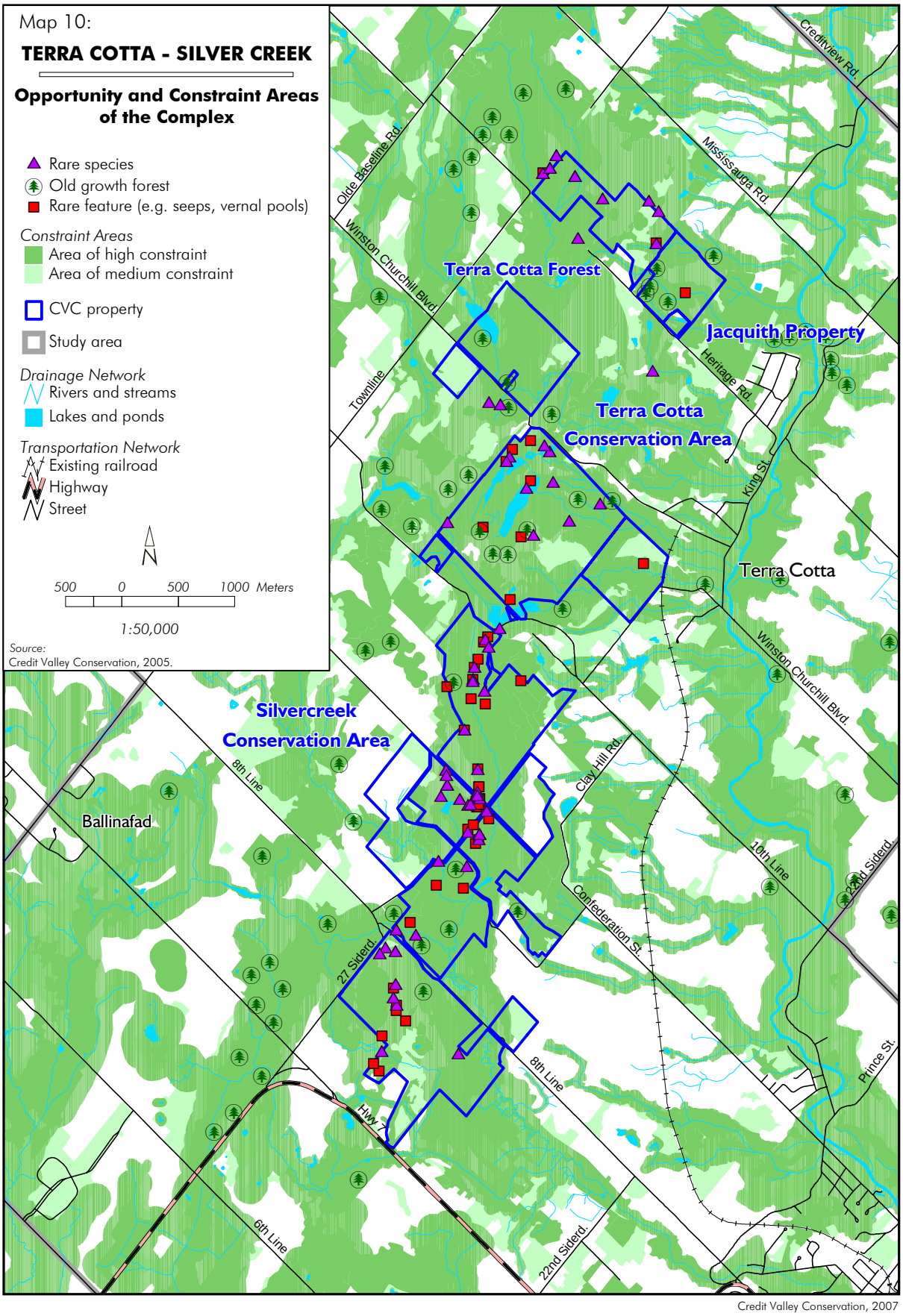


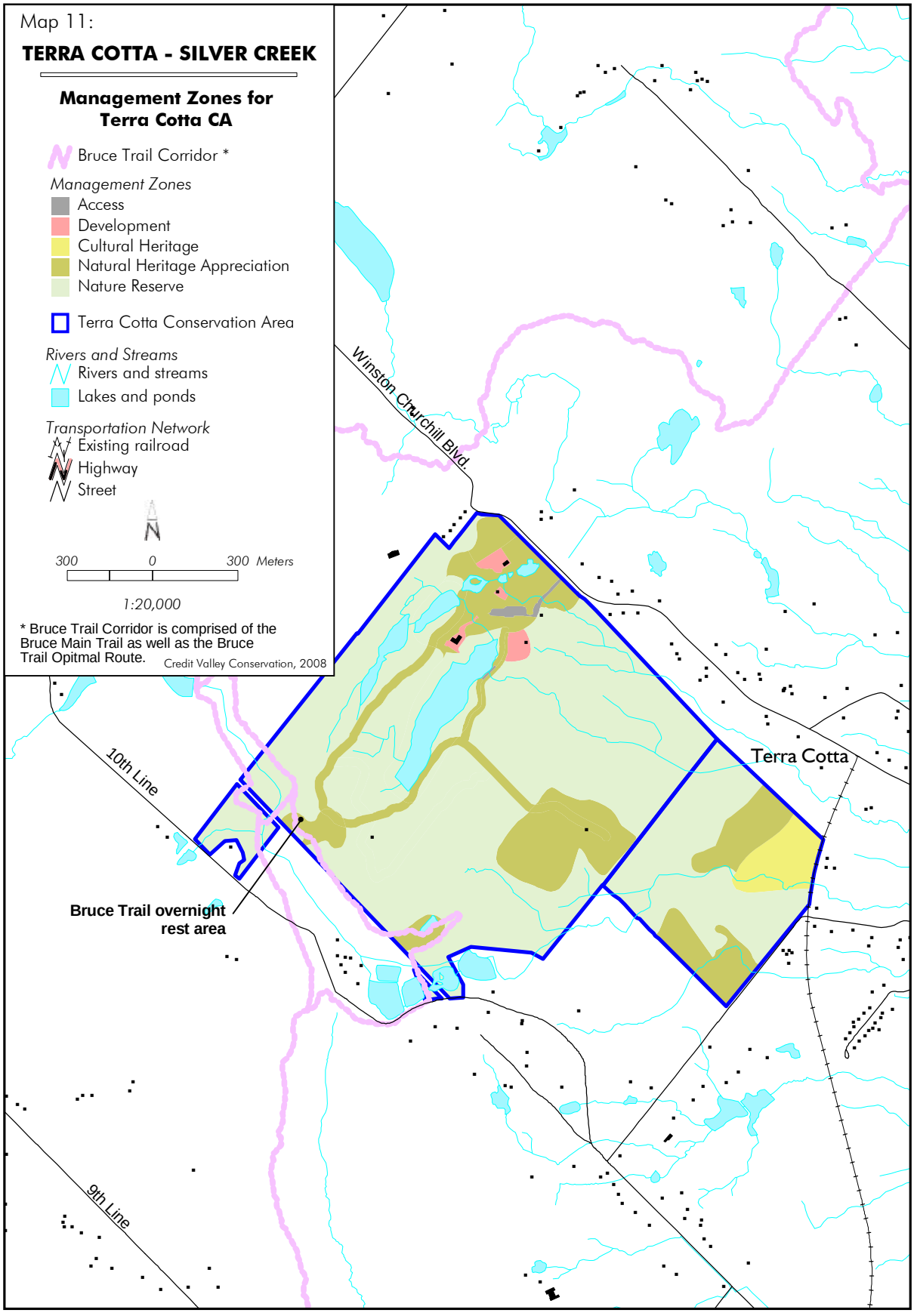
Credit Valley Conservation, 2007

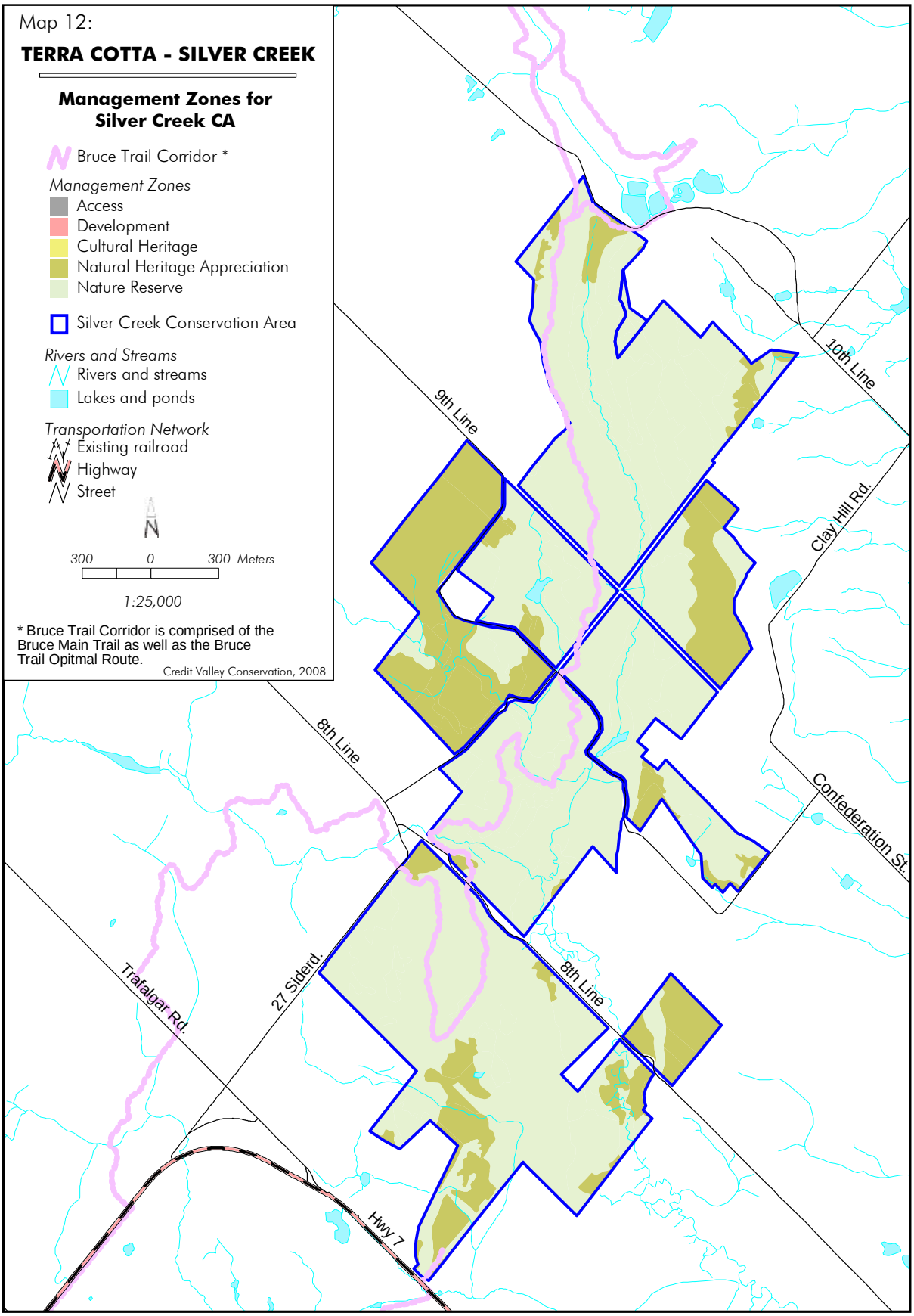

Map 7:
TERRA COTTA - SILVER CREEK
Forest Types of the Terra Cotta - Silver Creek Complex
Land Use Type
Agricultural use
Barren and scattered
Residence
Old field regeneration
Conifer swamp
Mixed upland forest
Plantation
Successional hardwood forest
Upland hardwood forest
Wetland
CVC property
Study area
Drainage Network
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
N
500 0 500 1000 Meters
1:50,000
Source:
Credit Valley Conservation, 2005
Terra Cotta Forest
Jacquith Property
Terra Cotta Conservation Area
Silvercreek Conservation Area
Terra Cotta
Ballinafad
Crediview Rd.
Olde Baseline Rd.
Mississauga Rd.
Winston Churchill Blvd.
Townline
Heritage Rd.
King St.
Winston Churchill Blvd.
Clay Hill Rd.
8th Line
10th Line
22nd Siderd.
27 Sideroad
Confederation St.
8th Line
Prince St.
Hwy 7
6th Line
22nd Sideroad
Credit Valley Conservation, 2007

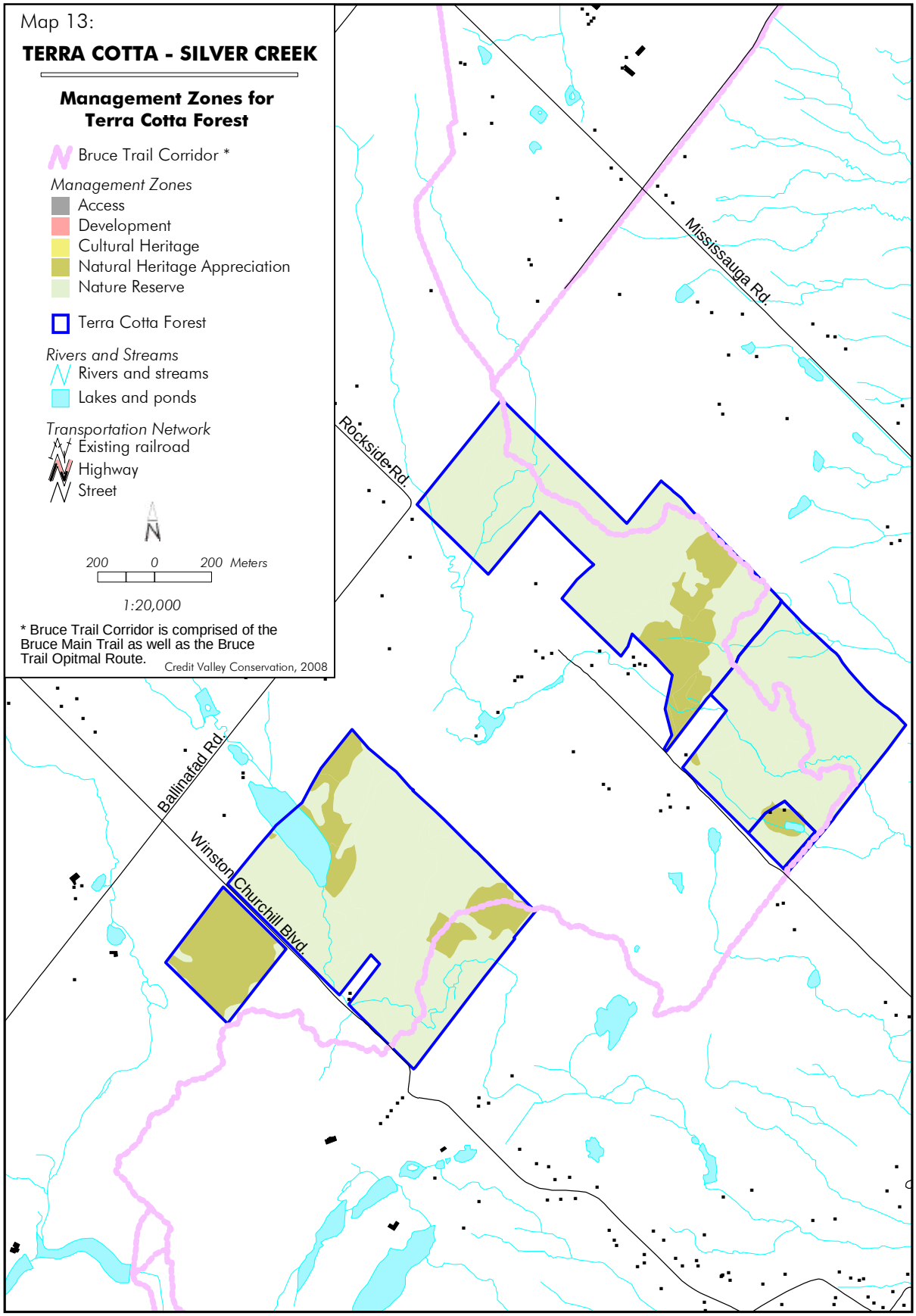

Map 8:
TERRA COTTA - SILVER CREEK
Terra Cotta Infrastructure
Infrastructure Features
Existing septic bed
Old septic bed
Septic holding tank
Spring
Water storage tank
Irrigation line for nursery
Old water line
Sewer line
Sewer line - unhooked
Water line
Terra Cotta Conservation Area
N
100 0 100 Meters
1:8,500
Credit Valley Conservation, 2008
Day use picnic pavillion
Winston Churchill Blvd.
Sewer line unhooked
Old tile bed
3000 gallon holding tank
Water line
Water line
Spring source
Visitors Welcome Centre
Sewer line
Gatehouse
Septic system
Holding tank
Central Services Workshop
Sewer line
Watershed Learning Centre
Old water line
Irrigation line for nursery
Proposed natural amphitheatre
A-frame structure
Bruce Trail Overnight Rest Area
Old Group Campground picnic shelter
Maple Hills picnic shelter

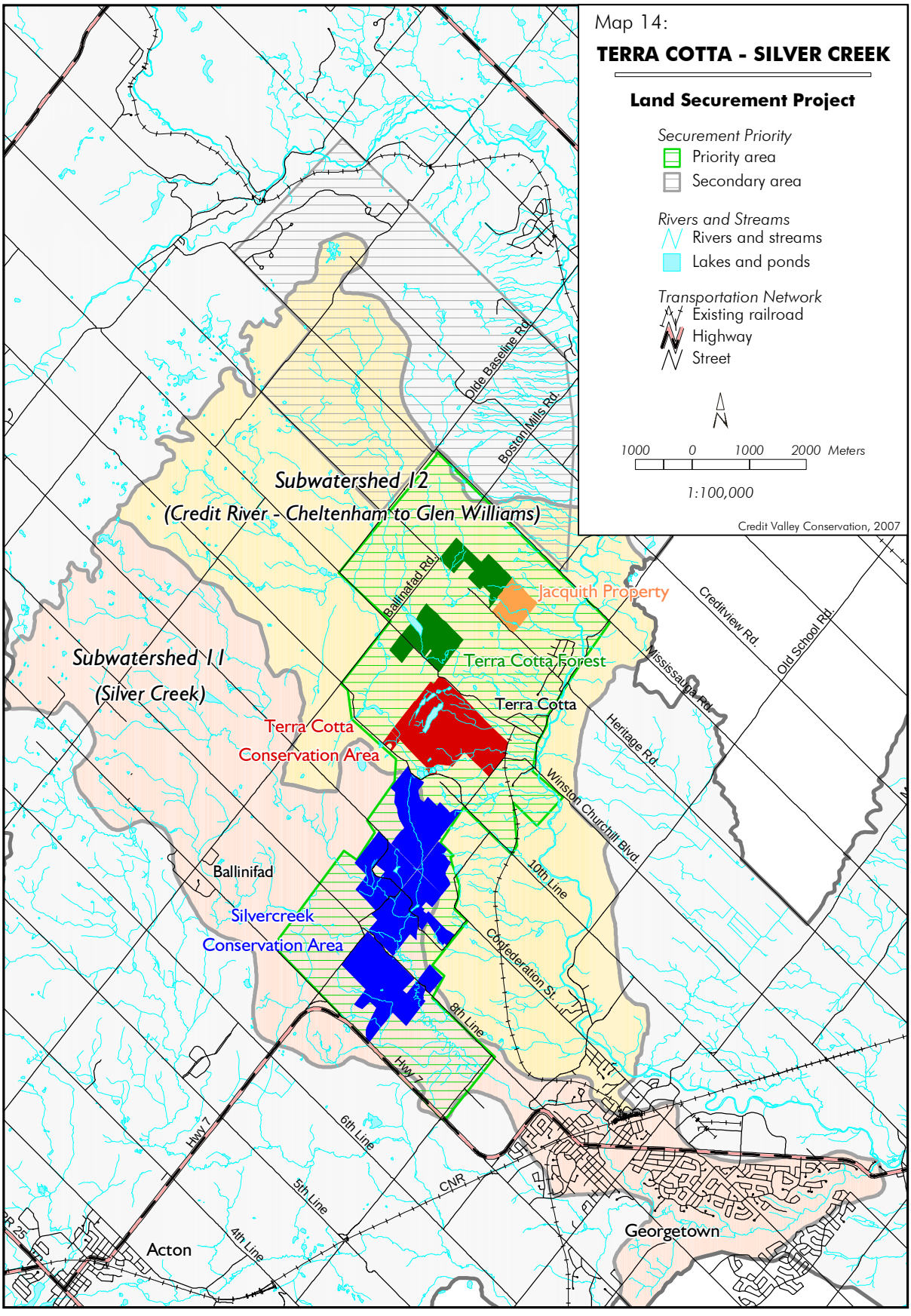

Map 9:
TERRA COTTA - SILVER CREEK
Natural and Social Linkages
Feature Type
Bruce Trail
Caledon Trailway
Badlands
CVC / public property
500 0 500 1000 Meters
1:55,000
Credit Valley Conservation, 2008
Cheltenham Badlands
Badlands Earth Science ANSI
Creditview Rd.
Mississauga Rd.
Olde Baseline Rd.
Winston Churchill Blvd.
Terra Cotta Forest
Jacquith Property
Heritage Rd.
Townline
Jack Smyth Field Centre
Terra Cotta Conservation Area
King St.
Winston Churchill Blvd.
Clay Hill Rd.
Silvercreek Conservation Area
10th Line
22nd Siderd.
Confederation St.
27 Sideroad
Scotsdale Farm
8th Line
Hwy 7
Prince St.

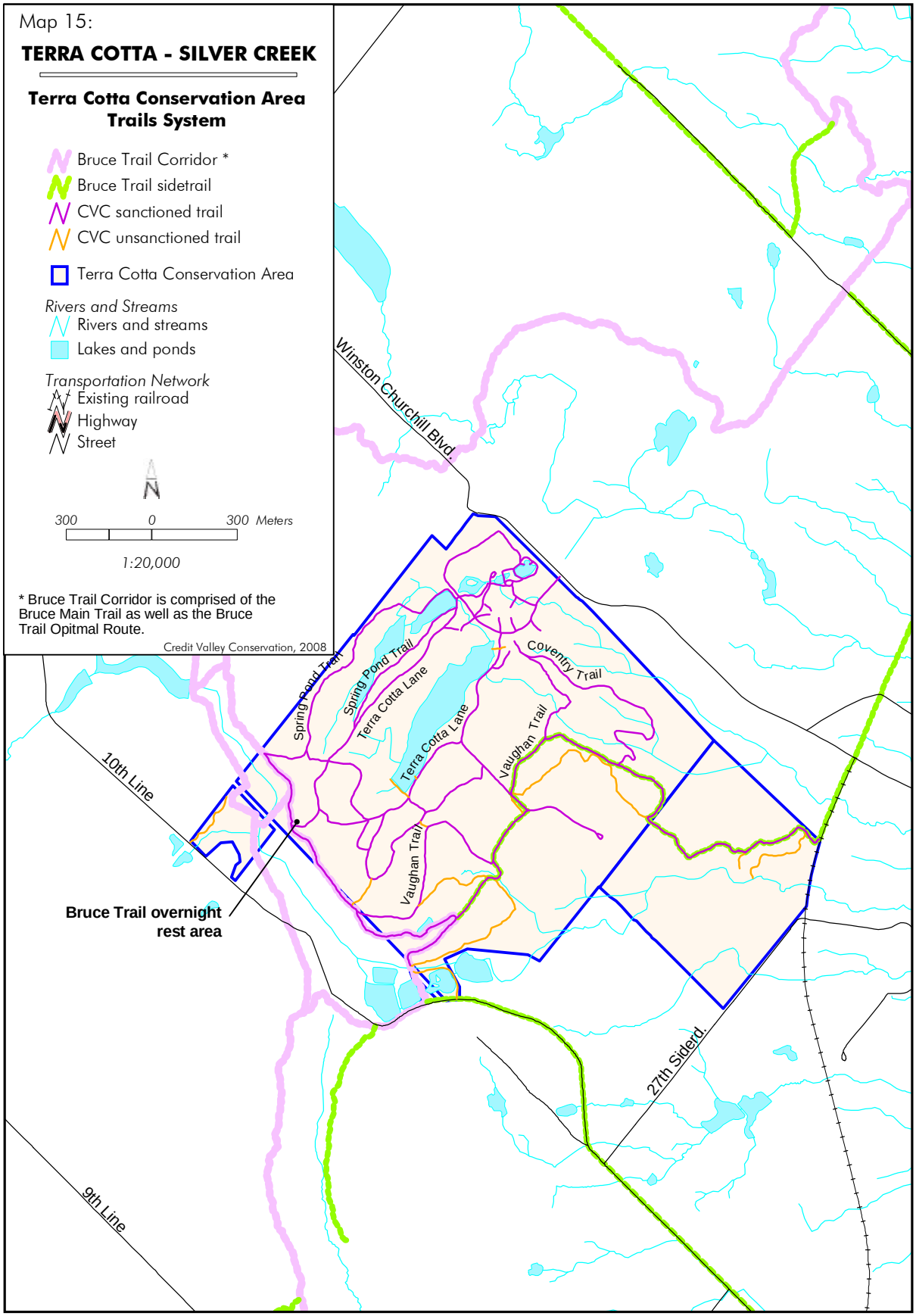

Map 10:
TERRA COTTA - SILVER CREEK
Opportunity and Constraint Areas of the Complex
Rare species
Old growth forest
Rare feature (e.g. seeps, vernal pools)
Constraint Areas
Area of high constraint
Area of medium constraint
CVC property
Study area
Drainage Network
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
N
500 0 500 1000 Meters
1:50,000
Source:
Credit Valley Conservation, 2005.
Terra Cotta Forest
Jacquith Property
Terra Cotta
Conservation Area
Silvercreek
Conservation Area
Terra Cotta
Ballinafad
Creditview Rd.
Olde Baseline Rd.
Mississauga Rd.
Winston Churchill Blvd.
Townline
Heritage Rd.
King St.
Winston Churchill Blvd.
8th Line
Clay Hill Rd.
10th Line
22nd Siderd.
Confederation St.
27 Siderd.
8th Line
Prince St.
HWY
6th Line
22nd Siderd.
Credit Valley Conservation, 2007

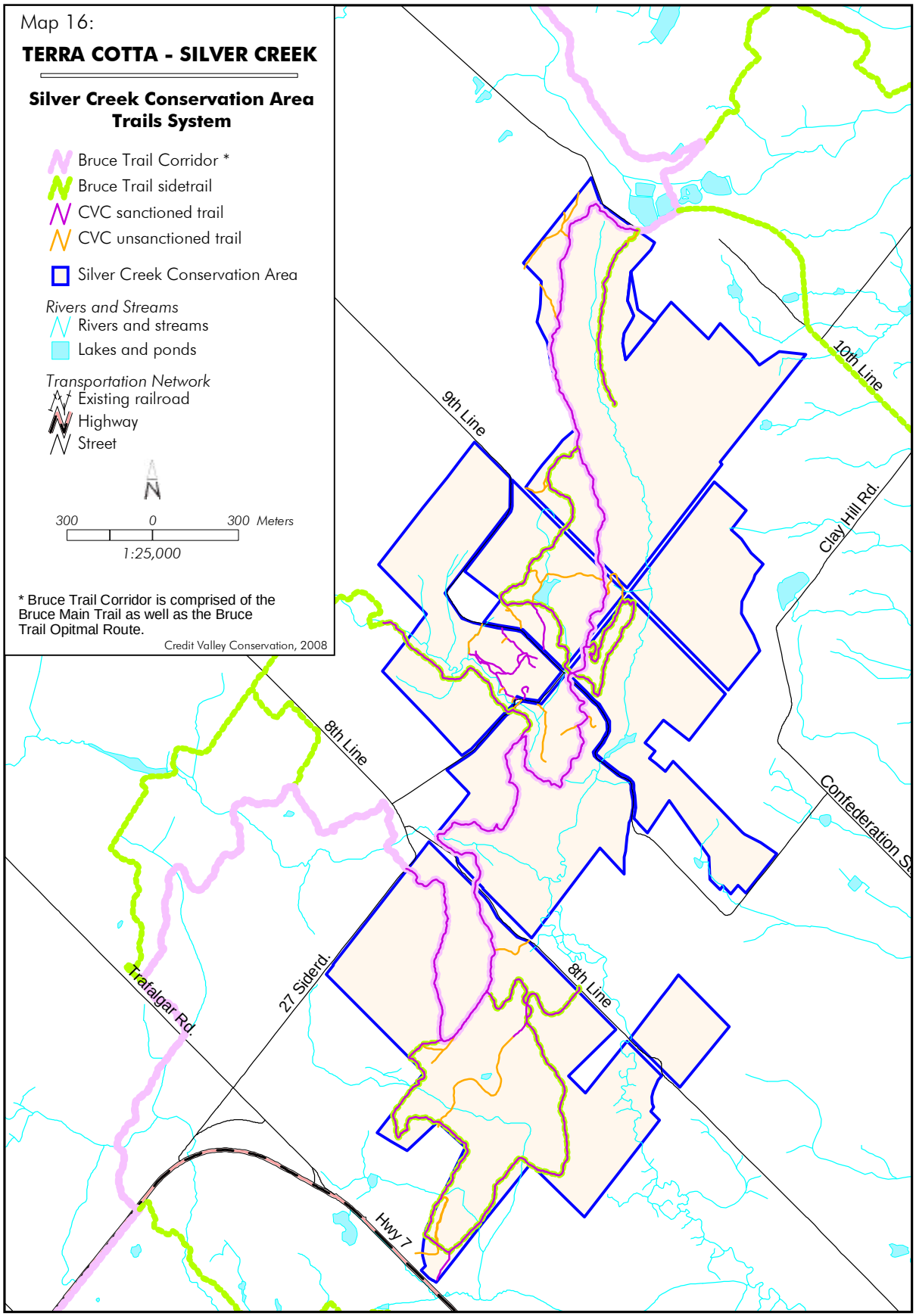

Map 11:
TERRA COTTA - SILVER CREEK
Management Zones for Terra Cotta CA
Bruce Trail Corridor *
Management Zones
Access
Development
Cultural Heritage
Natural Heritage Appreciation
Nature Reserve
Terra Cotta Conservation Area
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
N
300 0 300 Meters
1:20,000
* Bruce Trail Corridor is comprised of the Bruce Main Trail as well as the Bruce Trail Opitmal Route.
Credit Valley Conservation, 2008
Winston Churchill Blvd.
10th Line
9th Line
Terra Cotta
Bruce Trail overnight rest area

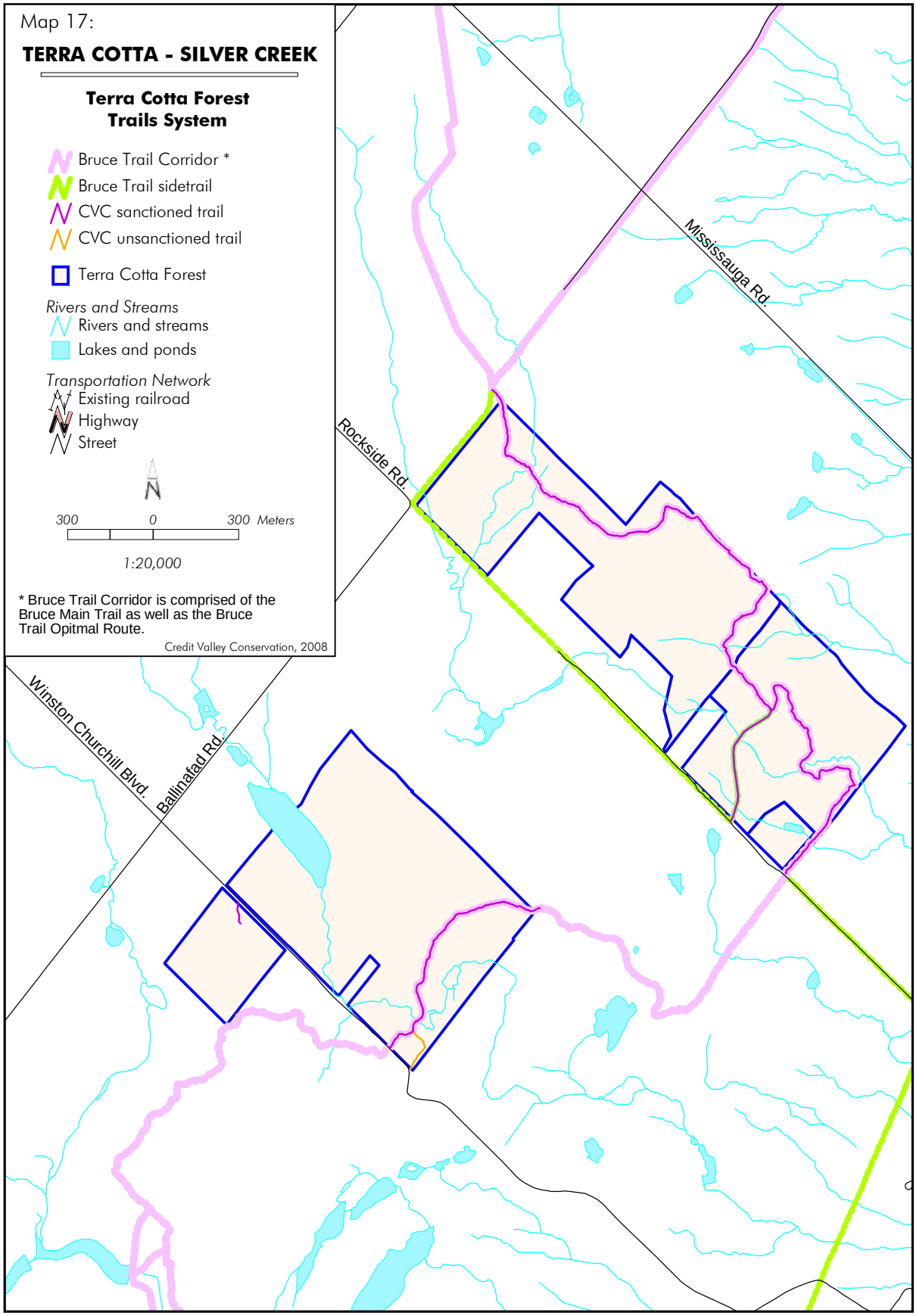

Map 12:
TERRA COTTA - SILVER CREEK
Management Zones for Silver Creek CA
Bruce Trail Corridor *
Management Zones
Access
Development
Cultural Heritage
Natural Heritage Appreciation
Nature Reserve
Silver Creek Conservation Area
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
300 0 300 Meters
1:25,000
* Bruce Trail Corridor is comprised of the Bruce Main Trail as well as the Bruce Trail Opitmal Route.
Credit Valley Conservation, 2008
9th Line
10th Line
Clay Hill Rd.
8th Line
Confederation St.
Trafalgar Rd.
27 Siderd.
8th Line
Hwy 7


Map 13:
TERRA COTTA - SILVER CREEK
Management Zones for Terra Cotta Forest
Bruce Trail Corridor *
Management Zones
Access
Development
Cultural Heritage
Natural Heritage Appreciation
Nature Reserve
Terra Cotta Forest
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
N
200 0 200 Meters
1:20,000
* Bruce Trail Corridor is comprised of the Bruce Main Trail as well as the Bruce Trail Opitmal Route.
Credit Valley Conservation, 2008
Mississauga Rd.
Rockside Rd.
Ballinafad Rd.
Winston Churchill Blvd.


Map 14:
TERRA COTTA - SILVER CREEK
Land Securement Project
Securement Priority
Priority area
Secondary area
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
1000 0 1000 2000 Meters
1:100,000
Credit Valley Conservation, 2007
Subwatershed 12
(Credit River - Cheltenham to Glen Williams)
Subwatershed 11
(Silver Creek)
Jacquith Property
Terra Cotta Forest
Terra Cotta
Terra Cotta
Conservation Area
Ballinifad
Silvercreek
Conservation Area
Olde Baseline Rd.
Boston Mills Rd.
Ballinafad Rd.
Creditview Rd.
Old School Rd.
Mississauga Rd.
Heritage Rd.
Winston Churchill Blvd.
10th Line
Confederation St.
8th Line
Hwy 7
6th Line
5th Line
4th Line
CNR
Acton
Georgetown
Credit Valley Conservation, 2007


Map 15:
TERRA COTTA - SILVER CREEK
Terra Cotta Conservation Area Trails System
Bruce Trail Corridor *
Bruce Trail sidetrail
CVC sanctioned trail
CVC unsanctioned trail
Terra Cotta Conservation Area
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
300 0 300 Meters
1:20,000
* Bruce Trail Corridor is comprised of the Bruce Main Trail as well as the Bruce Trail Opitmal Route.
Credit Valley Conservation, 2008
Winston Churchill Blvd.
Spring Pond Trail
Spring Pond Trail
Terra Cotta Lane
Terra Cotta Lane
Coventry Trail
Vaughan Trail
Vaughan Trail
10th Line
Bruce Trail overnight rest area
27th Siderd.
9th Line


Map 16:
TERRA COTTA - SILVER CREEK
Silver Creek Conservation Area Trails System
Bruce Trail Corridor *
Bruce Trail sidetrail
CVC sanctioned trail
CVC unsanctioned trail
Silver Creek Conservation Area
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
300 0 300 Meters
1:25,000
* Bruce Trail Corridor is comprised of the Bruce Main Trail as well as the Bruce Trail Opitmal Route.
Credit Valley Conservation, 2008
9th Line
10th Line
Clay Hill Rd.
8th Line
Confederation St
27 Siderd.
8th Line
Trafalgar Rd.
Hwy 7


Map 17:
TERRA COTTA - SILVER CREEK
Terra Cotta Forest
Trails System
Bruce Trail Corridor *
Bruce Trail sidetrail
CVC sanctioned trail
CVC unsanctioned trail
Terra Cotta Forest
Rivers and Streams
Rivers and streams
Lakes and ponds
Transportation Network
Existing railroad
Highway
Street
300 0 300 Meters
1:20,000
* Bruce Trail Corridor is comprised of the Bruce Main Trail as well as the Bruce Trail Opitmal Route.
Credit Valley Conservation, 2008
Mississauga Rd.
Rockside Rd.
Winston Churchill Blvd.
Ballinafad Rd.

CVC
CREDIT VALLEY
CONSERVATION