



Saltfleet Conservation Area Master Plan

Final - May 2024



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1.0 APPROVAL STATEMENT

We are pleased to approve the Saltfleet Conservation Area Master Plan as the official policy document for the Hamilton Region Conservation Authority (HCA).

This Master Plan supports HCA's current Strategic Plan and reflects our Vision of a healthy watershed for everyone and Mission to lead in the conservation of our watershed and connect people to nature.

Moving forward over the next ten years this plan will help guide the development and operation of this new conservation area in support of these goals.



Lisa Burnside
Chief Administrative Officer
Hamilton Conservation Authority

May 2, 2024

Date



Brad Clark
Chair, Board of Directors
Hamilton Conservation Authority

May 2, 2024

Date

2.0 PREFACE

The Saltfleet Conservation Area Master Plan is the guiding policy document for the development and management of this new conservation area which is owned and administered by the Hamilton Region Conservation Authority (HCA). The recommendations in this Master Plan are intended to help provide direction and guidance for sustainable development, management, and operation of the Saltfleet Conservation Area (SCA) over the next ten years.

This Master Plan was developed in four phases by HCA staff, utilizing in-house staffing expertise and resources, with a public consultation process to receive input from stakeholders and the public as follows:

Phase 1 Background

Background review was initiated January 2022 with the HCA executive team review of the work plan, engagement of staff, collection of mapping information, and gathering information through review of HCA's office files and staff meetings. An information report was presented to the HCA Conservation Advisory Board in April 2022, and Phase 1 was completed by October 2022.

Phase 2 Inventory

Inventory includes the collection and assembly of natural areas field surveys and mapping information, ecological reports, trail counter data, and engagement to gather public comments. HCA staff initiated their inventory review in 2020 and began field work in the spring of 2021. A public engagement site was launched on HCA's website in May 2022 to receive comments and deliver visitor surveys. HCA's social media was used to promote the engagement site. Flyers were posted in the study area giving visitors QR codes and weblinks to the surveys. The survey period ran from May 18th to September 9th, 2022, with 150 surveys submitted. While the site was closed to the public for the wetland construction project, two public information booths were held at the Devil's Punchbowl on July 16 and August 6, 2022. Staff shared information on the plan, responded to questions, and signed up visitors interested in receiving the draft plan for review and comment. Visitors to the public engagement site during this phase were also able to register online to receive and comment on the draft Master Plan in Phase 4.

Phase 3 Concepts

Concepts in this plan were completed in-house by HCA staff and refined with the information in the public surveys and input from stakeholders. A working team of staff were assembled with the necessary expertise and experience to help inform this plan. Five facilitated workshop sessions were held with the staff working team covering: a guided site tour of the wetland construction sites and natural areas; site concept and vision planning; financial sustainability; day use and marketing; and capital project priorities and plans. One facilitated trail and site concept planning meeting was held with HCA's Conservation Advisory Board. All information gathered in this phase was presented internally to HCA staff for review and comment, and then compiled in the draft plans circulated in Phase 4.

Phase 4 Summary

Finalizing the draft Master Plan includes reviews of the compiled draft plan by staff, stakeholders,

board advisory members, and circulation to the public who registered in Phase 2. The final draft document includes all stakeholder and public comments. After receiving final comments, the plan is to be presented to HCA's Conservation Advisory Board and then to the HCA Board of Directors for their endorsement and approval.



3.0 EXECUTIVE SUMMARY

3.1 Introduction

Saltfleet Conservation Area (SCA) is located at 444 First Road East, Stoney Creek, City of Hamilton. There are also five other properties associated with SCA identified in this Master Plan. The six properties total 147 ha (363 acres) in size, in the upper Stoney Creek and Battlefield Creek watersheds, as well as a small portion outside of HCA's watershed. The acquisition of these lands in the study area was made possible through donations from the City of Hamilton and Heritage Green Community Trust. SCA is HCA's newest conservation area in the watershed. See Figure 1. Context Map for more information.

HCA started acquiring land for SCA in 2015 and the development plans for the constructed wetlands were prepared between 2018 to 2020. The conservation area initially opened to the public October 2nd, 2021, and then temporarily closed for the wetland development. The conservation area re-opened to the public on September 23rd, 2022.

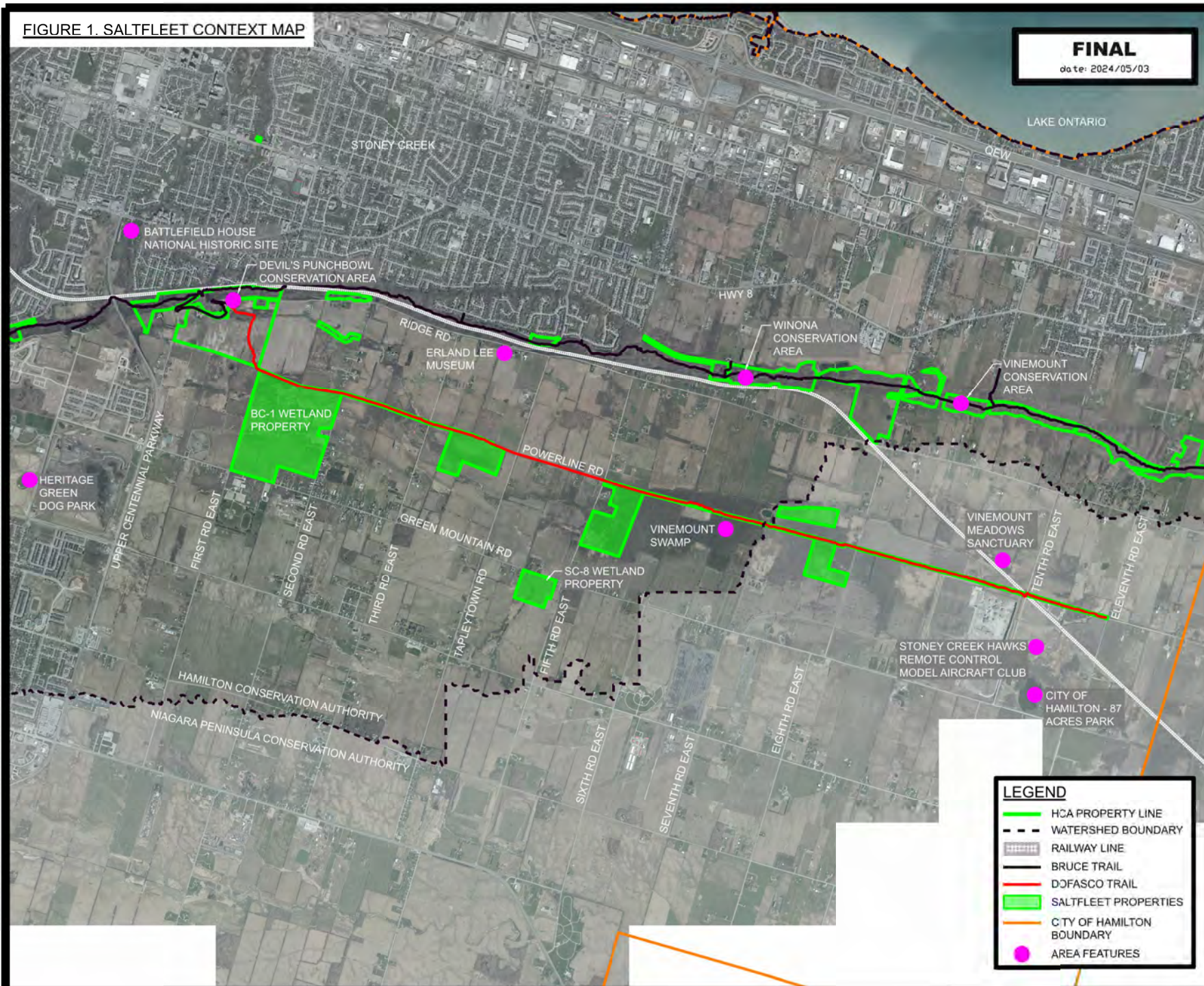
The main SCA property containing the BC-1 constructed wetland, parking, and visitor entrance from First Road East is the focus of this Master Plan

This is HCA's first Master Plan for Saltfleet Conservation Area.



Photo credit: Water's Edge Environmental Solutions Team LTD.

FIGURE 1. SALTFLY CONTEXT MAP



FINAL

date: 2024/05/03



DATE: 2024/05/03

SALTFLY CONTEXT MAP SALTFLY C.A. MASTER PLAN

LEGEND

- HCA PROPERTY LINE
- - - WATERSHED BOUNDARY
- ▨ RAILWAY LINE
- BRUCE TRAIL
- DOFASCO TRAIL
- SALTFLY PROPERTIES
- CITY OF HAMILTON BOUNDARY
- AREA FEATURES



A Healthy Watershed for Everyone

3.2 Goals

This Master Plan outlines the long-term goals for conservation and land management at SCA and is intended to be a living document that will be updated completely in ten years' time.

Land Acknowledgement

The HCA joins in stewardship of lands and waters with Indigenous Peoples who have cared for them since time before memory. We acknowledge that the land on which we gather, and the HCA watershed, is part of the Treaty Lands and Territory of the Mississaugas of the Credit First Nation and traditional territory of the Haudenosaunee.

As an organization, we are committed to learning about the shared history and experiences of Indigenous Peoples in Canada and creating relationships based on respect, trust and friendship. In our shared gratitude for every aspect of the natural world, may we create a lasting legacy now and for future generations.

HCA Strategic Plan

This plan supports the following goals as outlined in HCA's current strategic plan:

Vision

- A healthy watershed for everyone.

Mission

- To lead in the conservation of our watershed and connect people to nature.

Commitment and Corporate Values

- Provide excellent customer service and a solution-oriented approach.
- Be accountable, transparent, and responsible in the use of resources.
- Embrace new technologies to help develop new ways of doing business and foster innovation.
- Promote teamwork internally and externally to achieve common goals, support existing relationships and build new partnerships.
- Maintain trust, act with integrity, and treat others with respect.
- Value knowledge to continually learn and improve, in an effort to achieve best solutions.

Organizational Excellence

- Ensure corporate and financial viability and the HCA's relevance in the community.
- Identify opportunities to engage the community, adjacent landowners, and Indigenous Peoples.

Water Management

- Protect the watershed for people, property, flora and fauna, and natural resources through flood and erosion control, water quality programs, low flow augmentation and adaptation strategies to adapt to changing climatic conditions.

Natural Heritage Conservation

- Conservation, restoration and enhancement of watershed natural areas and ecology.
- Continue on-going ecological restoration projects and monitoring programs.
- Identify invasive species strategies and natural heritage plans in the Master plan.

Conservation Area Experience

- Provide high quality, diverse conservation areas that promote outdoor recreation, health, and well-being and strengthen public awareness of the importance of being in or near our conservation areas.
- Update and develop master and management plans and implement priorities to further enhance conservation areas for current and future generations.

Education and Environmental Awareness

Provide outdoor learning experiences for students, teachers, and the community, increasing knowledge and awareness of the value of our environment and heritage.



In addition to the above strategic goals, HCA acquired the SCA properties with these three land management goals in mind:

1. To address flooding and erosion downstream within the Stoney Creek urban area.
2. To support biodiversity by creating new natural areas and connective corridors within the watershed.
3. To support community well-being by creating new recreational opportunities and connections to other conservation lands utilizing the Dofasco 2000 Trail.

HCA Climate Change Strategy

The goal of HCA's Climate Change Strategy is to work towards achieving net zero status across HCA's operations through the reduction of greenhouse gases (GHG's), while also working to increase our overall adaptive capacity to changing climatic conditions

Key Areas of Focus

Environment and Natural Heritage

- Water Management
 - Reduce water runoff, contamination, soil erosion, and other impacts of climate change on water systems
 - Reduce flooding and its impacts on lands, communities, and infrastructure
- Wetland Management
 - Identify threats to wetlands and make it easier for ecosystems to adapt to climate change
- Carbon Sequestration
 - Increase natural carbon stores which help remove excess CO₂ from the atmosphere
- Invasive Species
 - Research and monitor invasive species
 - Implement best practices in preventing the spread of invasive species
 - Communicate trends and impacts of invasive species locally
- Protection of Wildlife
 - Mitigate threats to biodiversity
- Monitoring Programs
 - Expand long-term monitoring programs
 - Maintain HCA's planning program as it relates to natural hazards and climate change implications

Experience, Education and Awareness

- Education and Awareness
 - Increase awareness of individual roles in addressing climate change
 - Protect staff and visitor safety

Partnerships

- Strengthen community approach and build systems for collaboration
- Learn from the work of others
- Collaboratively address threats and identify opportunities for climate adaptation and GHG reductions
- Strengthen relationships with Indigenous communities

3.3 Objectives

The goals and objectives that emerged for the constructed wetland project have been assessed, and through further consultation and analysis during this Master Plan process, HCA supports the following long-term objectives for Saltfleet:

1. To conserve, restore, and manage natural heritage features and natural areas in the conservation area.
2. To provide visitors with access to natural areas for passive recreation and education.

3.4 Site Concept

From our background work, consultation, and comments received, these key items were identified for Saltfleet Conservation Area to be addressed in this plan. See maps in Appendix 1 for more information.

.1 Natural Areas

1. To monitor, manage and sustain the wetlands.
2. To fast-track the naturalization of agricultural fields and resource management areas.

.2 Conservation Area

1. To provide access and work areas for site operations.
2. To manage visitation and deter unauthorized access and vandalism.
3. To ensure adequate staffing and resources are provided as visitation increases.
4. To provide a trail system for passive recreation, education, and nature appreciation.
5. To provide educational and interpretive elements focused on the site wetlands, natural areas, natural features (karst) and cultural heritage.



3.5 Policy and By-Law Framework

Conservation areas owned and operated by the HCA are diverse in nature and spread across the watershed. The SCA properties are located at the easterly boundary of HCA's watershed and extend into the Niagara Peninsula Conservation Authority (NPCA) watershed. The properties are also within the Greenbelt Plan and urban boundary of the City of Hamilton. See Section 4.3 for more information.

HCA has approached this Master Plan with the mind-set that other conservation areas in the HCA portfolio requiring Master Plans or updates to Master Plans will follow a consistent

methodology. Although SCA is not located within the jurisdiction of the Niagara Escarpment Commission, the policies of the Niagara Escarpment Plan and guidelines of the Niagara Escarpment Parks and Open Space System (NEPOSS) 2021 planning manual have been observed in the preparation of this Master Plan.

HCA recognizes that certain public infrastructure such as utility corridors, trails, or transportation links may be required to cross conservation area lands. HCA policy for planning review and regulation of these features adheres to the Conservation Authorities Act, R.S.O.1990, C.27. See Section 7.1 for more information.

The Saltfleet Conservation Area Master Plan adheres to policies of the Hamilton Conservation Authority, Niagara Peninsula Conservation Authority, City of Hamilton, and the Province. HCA will consult with outside agencies and obtain the required approvals and permits when implementing projects flowing from this Master Plan.

3.6 Master Plan Zones

HCA has a 10 Year Masterplan Update Strategy that was recently updated by staff and approved by HCA's Board of Directors in 2022. This Strategy applies to all properties that HCA owns and manages. As per this document, guidelines are set out for the completion of HCA Master Plans including Management Plans and Study Areas. This strategy notes that HCA lands that lie within the boundary of the Niagara Escarpment Plan will need Master Plan approval from the Niagara Escarpment Commission (NEC) for HCA to formally ratify them. Consequently, HCA strategically decided to develop all HCA Master Plans within the guidelines of the Niagara Escarpment Parks and Open Spaces System (NEPOSS), which is a requirement of the NEC for any public agency NEPOSS park Master Plans. The NEPOSS policy framework ensures HCA follows a consistent methodology for all plans, and the plans are developed to an appropriate level of detail with sufficient public consultation for all proposed land improvements and uses.

This Master Plan follows the NEPOSS planning manual and identifies six land use zones for SCA. These zones are intended to help guide future planning, development, and management of the conservation area. The zone boundaries are shown in detail in Appendix 1 - Zone Map.

Zones are intended to fulfill a variety of functions in the conservation area, including the following as outlined in the current NEPOSS manual.

- Identification and recognition of the features and attributes (values).
- Protection of key natural heritage and cultural heritage resources.
- Confirmation of the appropriate locations for activities (i.e. directing activities with higher impacts to the least sensitive areas and low impact activities to areas that are more sensitive, if appropriate).
- Delineation of areas based on their requirements for management (e.g. management plan objectives).
- Standardization to support management objectives and actions, based on values (e.g.

Nature Reserve Zones supports protection of sensitive natural heritage features and cultural heritage resources).

- Balancing of public use with the preservation of the natural environment.

There are six types of zones as follows:

- Nature Reserve Zone
- Access Zone
- Development Zone
- Natural Environment Zone
- Cultural Heritage Zone
- Resource Management Zone

The following sections briefly describe each zone. The tables in each section provide a zone description, management direction, and permitted uses, including types of development in each zone. All resource, recreational, and facility development uses are subject to Canadian legislation and policies governing public lands and conservation areas, as well as the resource management policies identified in Section 7.

Appendix 6 contains the natural inventory species lists from background research and field work completed for the preparation of the Master Plan. In this Master Plan, “species at risk” means species listed by the MECP or Government of Canada as threatened, endangered, extirpated or extinct in Ontario including:

- Species designated as endangered, threatened or special concern by the Species at Risk Act (federal) via the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and listed in Section 5.14.
- Species designated as endangered threatened, or special concern by the Endangered Species Act (provincial) via the Committee on the Status of Species at Risk in Ontario (COSSARO).



Nature Reserve Zone

Nature reserve zones include significant earth and life science features which require management distinct from that in adjacent zones, as well as a protective buffer with an absolute minimum of development. SCA's nature reserve zones contain the existing watercourse and new wetlands.

Table 1. Nature Reserve Zone

Zone	Description	Management Direction	Permitted Uses (subject to management planning)
Nature Reserve (wetland)	<p>Includes the most sensitive natural heritage features and areas that require careful management to ensure long-term protection.</p> <p>Intended to protect in perpetuity features and values of selected life and earth science areas such as:</p> <ul style="list-style-type: none"> ➤ Habitat of endangered, threatened, and rare species or species of special concern. ➤ Significant Wildlife and fish habitat. ➤ Hydrological systems (e.g. streams, wetlands, ponds) ➤ Significant Woodlands ➤ Areas of Natural and Scientific Interest (ANSI) ➤ Significant landforms or escarpment features 	<p>These areas are predominantly natural and should contain naturally functioning ecosystems.</p> <p>This zone is intended to protect and where possible enhance the natural heritage and hydrological systems within the zone.</p>	<p>Sustainable recreational activities that are supported by a detailed environmental review and that are identified as compatible with the natural heritage features and areas of the park or open space.</p> <p>Examples include:</p> <ul style="list-style-type: none"> ➤ Trails ➤ Necessary wayfinding signs ➤ Temporary scientific research ➤ Conservation practices (e.g. tree maintenance, erosion control) ➤ Minimal interpretive facilities (where justified)

Natural Environment Zone

Natural environment zones include natural, cultural, and aesthetic landscapes in which minimum development is permitted to support low-intensity recreational activities. SCA's natural zones are primarily the undisturbed wooded areas and areas buffering the wetlands.

Table 2. Natural Environment Zone

Zone	Description	Management Direction	Permitted Uses (subject to management planning)
Natural	Includes scenic landscapes in which minimum development is permitted to support recreational activities that have minimal impacts on the Escarpment environment.	<p>This zone may function as a buffer between Nature Reserve Zones and Development Zones, Cultural Heritage, or Access Zones.</p> <p>Management guidance should maintain and enhance the scenic resources and open landscape character of the environment.</p>	<p>Sustainable recreational activities that have minimal impact on the environment may be permitted.</p> <p>Examples include:</p> <ul style="list-style-type: none">➤ Trails➤ Wayfinding signs➤ Scientific research and supporting facilities➤ Background campsites➤ Conservation practices➤ Interpretive facilities <p>Infrastructure required for safety or accessibility may be permitted where there is no feasible alternative.</p>

Access Zone

Access zones serve as staging areas to support adjacent zones. SCA's access zones are at the main entrance to the parking lot, at the Dofasco Trail, at the gated service entrance on Second Road, and at the wetlands.

Table 3. Access Zone

Zone	Description	Management Direction	Permitted Uses (subject to management planning)
Access	Serve as staging areas (e.g. trailheads, parking lots) where minimal facilities support the use of Nature Reserve Zones and relatively undeveloped Natural Environment and Cultural Heritage Zones.	Access zones are intended to support the use of and access to adjacent zones.	<p>Infrastructure may be permitted to support the Nature Reserve, Natural Environment, and Cultural Heritage Zone.</p> <p>Examples include:</p> <ul style="list-style-type: none">➤ Roads➤ Wayfinding signs➤ Interpretive signs➤ Trailheads➤ Parking lots➤ Visitor amenities➤ Toilets➤ Waste receptacles

Cultural Heritage Zone

Cultural heritage zones are intended to protect significant built heritage resources, archaeological resources, and cultural heritage resources. SCA's cultural heritage zone includes the registered archaeological sites.

Table 4. Cultural Heritage Zone

Zone	Description	Management Direction	Permitted Uses (subject to management planning)
Cultural Heritage	This zone includes cultural heritage resources that require management to ensure long-term conservation.	Management guidance will ensure long-term conservation, enhancement and potentially restoration of cultural heritage resources.	Development will ensure long-term conservation of cultural heritage resources. Examples include: <ul style="list-style-type: none">➤ Education and visitor buildings➤ Trails➤ Interpretive signs or supporting infrastructure➤ Historical restorations, reconstructions, or re-enactments



Development Zone

Development zones provide visitor access, orientation, and operational facilities in the conservation area. SCA's development zones includes the park roads, main parking area, and work areas for conservation area operations.

Table 5. Development Zone

Zone	Description	Management Direction	Permitted Uses (subject to management planning)
Development	<p>Development Zones provide the main visitor access to the conservation area, and facilities and services to support nature appreciation and recreational activities.</p> <p>This zone may include areas designed to provide facilities and supporting infrastructure for recreational purposes.</p>	<p>Management guidance should note that recreational uses and development may be accessory or secondary to the protection of natural heritage features and to the conservation of cultural heritage resources, depending on classification.</p> <p>Retail and visitor facilities should be appropriately scaled for the site.</p> <p>Facility development must be undertaken in a way that will minimize the impact on the Escarpment environment.</p>	<p>Examples of permitted uses that provide access, orientation and operational facilities to support nature appreciation and recreational activities include:</p> <ul style="list-style-type: none">➤ Educational and visitor buildings➤ Recreational infrastructure➤ Commercial/retail service facilities➤ Special purpose buildings➤ Research buildings➤ Maintenance buildings➤ Parking lots➤ Road networks

Resource Management Zone

Resource management zones provide for sustainable resource management of agricultural lands, previously disturbed sites, forest products, and land that has a long-term resource agreement such as a managed forest.

SCA's resource management zones include the former agricultural lands.

Table 6. Resource Management Zone

Zone	Description	Management Direction	Permitted Uses (subject to management planning)
Resource Management	<p>Provides for sustainable resource management of forests, fisheries, watersheds, wildlife, or flood control.</p> <p>Previously disturbed sites (e.g. old farm fields, abandoned quarries) where active measures are being taken to re-establish natural vegetation.</p> <p>May include land that has traditionally been managed under long-term resource agreements (e.g., forest management agreements or agricultural leases)</p>	<p>Management guidance should support:</p> <ul style="list-style-type: none">-Experimenting with alternative resource management practices.- Understanding ecosystem structures and functions.- Activating effective conservation and stewardship practices.	<p>These areas may be used to demonstrate ecologically sustainable resource management practices.</p> <p>Examples may include:</p> <ul style="list-style-type: none">➤ Research monitoring plots➤ Forest management➤ Fisheries management➤ Wildlife management➤ Watershed management➤ Flood control <p>Recreation uses in this zone are subject to HCA policies and management planning.</p>

3.7 Development Priorities

The capital development priorities and estimates of development costs for SCA over the next ten years are listed in Appendix 2 and shown in Appendix 1 – Maps 6 & 7.

All development projects are to be reviewed annually for the life of this Master Plan, and the capital development priority list updated as necessary. Capital projects should not be started until a long-term strategy with timelines and costs for each project are clearly defined and sufficient resources are available to complete them. See Section 8.2 for further information.

Significant capital development for SCA over the next ten years falls within these categories:

.1 Natural Areas:

To conserve, restore, and manage natural heritage features and natural areas in the conservation area:

- Provide additional wetland plantings for the BC-1 and SC-8 sites to support their establishment.
- Complete constructed wetlands for the SC-8 site as per approved studies.
- Provide additional tree and shrub plantings to support natural areas restoration.
- Naturalize the agricultural fields as quickly as possible.
- Manage invasive species.

.2 Conservation Area Improvements:

To manage both the natural areas and public visitation in the conservation area:

- Install perimeter fencing and buffers to restrict unauthorized access.
- Install perimeter service gates for emergency and maintenance access.
- Install site signage.

.3 Site Concept Improvements:

To provide visitors with access to passive recreational opportunities and connect to other conservation lands:

- Provide a new visitor entrance road and parking lot.
- Implement an automated gate system for parking.
- Provide public washrooms.
- Provide for operation areas separate from the main entrance.



- Provide a new multi-use recreational trail system.
- Provide open air structures: trail kiosks, pavilion.
- Install main entrance signage.
- Provide interpretive signage and educational materials.
- Provide lookout stations.
- Provide site furnishings for the main parking area and Dofasco Trail connection.



4.0 BACKGROUND

4.1 Study Area

Saltfleet Conservation Area (SCA) is located at 444 First Road East, Stoney Creek, City of Hamilton. There are also five other properties on top of the Niagara Escarpment in Stoney Creek associated with SCA. All six land parcels total 147 ha (363 acres) in size, two of these parcels are outside of HCA's watershed. The acquisition of these lands was made possible through donations from the City of Hamilton, Heritage Green Community Trust, and the Hamilton Conservation Foundation.

Figure 2 Master Plan Study Area Map, shows the overall study area and HCA landholdings associated with SCA. This Master plan is part of a ten-year strategy for reviewing HCA lands across the watershed. HCA staff are following this strategy to systematically glean valuable scientific data and site information from targeted study areas and using this information in the preparation of master and management plans.

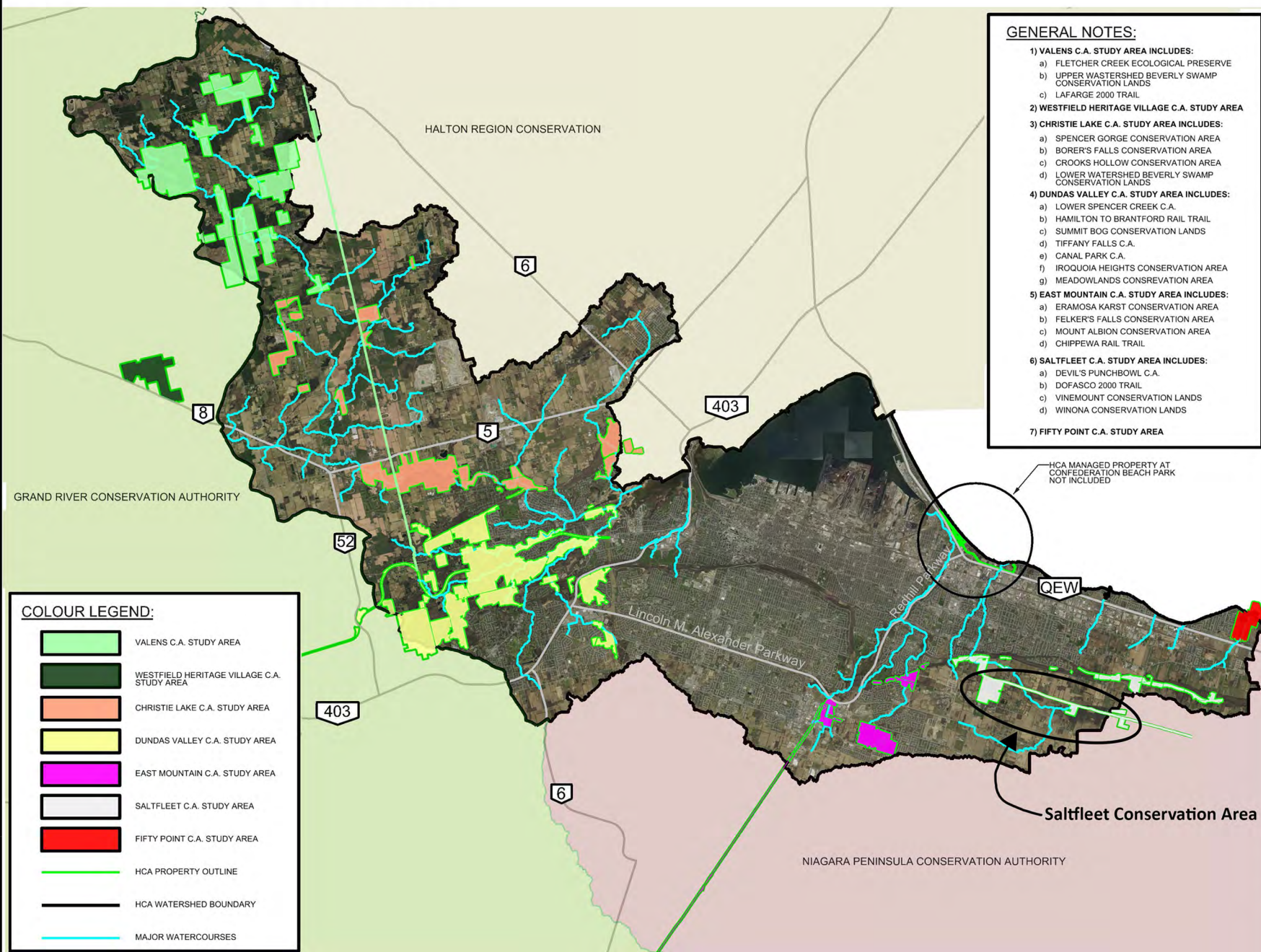
The main focus of this Master Plan is the 73.7 ha (182 acres) SCA property bounded by First Road East, the Dofasco 2000 Trail, Second Road East and Green Mountain Road East. The property was previously farmed and is reverting to natural habitat. Two main features on the property are Battlefield Creek which flows from east to west across the site, and a low escarpment south of the creek which divides the property into a lower and upper portion. The upper portion south of the creek is predominantly composed of fallow fields and hedgerows. The crest of the low escarpment is vegetated with a variety of trees and grasses. The low area near the creek is more varied and contains swamp, thicket, and meadow areas.

New wetland construction (BC-1) started at SCA in February 2022 and was completed by September 2022. The wetlands are designed to hold large volumes of water. A smaller constructed wetland (SC-8) is being planned for the 9 ha (22 acres) parcel at the southwest corner of Green Mountain and Fifth Road east.

The main SCA property currently contains an entrance lane (former farm entrance) to a small day-use parking area. A single trail connects to the Dofasco 2000 Trail and Devil's Punchbowl Conservation Area from this area.



FIGURE 2. HCA 10-YEAR MASTER PLAN STUDY AREA



DATE: 2023/01/27

MASTER PLAN STUDY AREA MAP

4.2 Property History

See Section 4.6 for more information on the cultural heritage study for Saltfleet.

The Battlefield and Stoney Creek Watersheds (see Figure 3 Subwatersheds) drain approximately 3089 ha at the outlet to Lake Ontario. Property development above and below the Niagara Escarpment was typically implemented without stormwater management controls, resulting in increased flow rates within the Battlefield and Stoney Creek watercourses. In recent history (from 1989 onward), flooding and erosion conditions along the lower Stoney Creek and Battlefield Creek impacted private property and municipal infrastructure in the City of Hamilton. Further detailed study was required to properly assess which flood and erosion controls would be effective to address this problem.



In support, HCA completed the 2011 ‘Draft’ Conservation Ontario Class Environmental Assessment (2011 Draft EA) for the Lower Stoney Creek and Lower Battlefield Creek (reference AMEC, 2011). This EA identified a number of properties in the Community of Stoney Creek below the escarpment that were at risk due to flooding, and to a lesser degree erosion. The Class EA concluded that substantial water storage would be required to address the flood risk and additional study would be warranted to determine the efficacy of storage systems (facilities) to address flood and erosion risks.

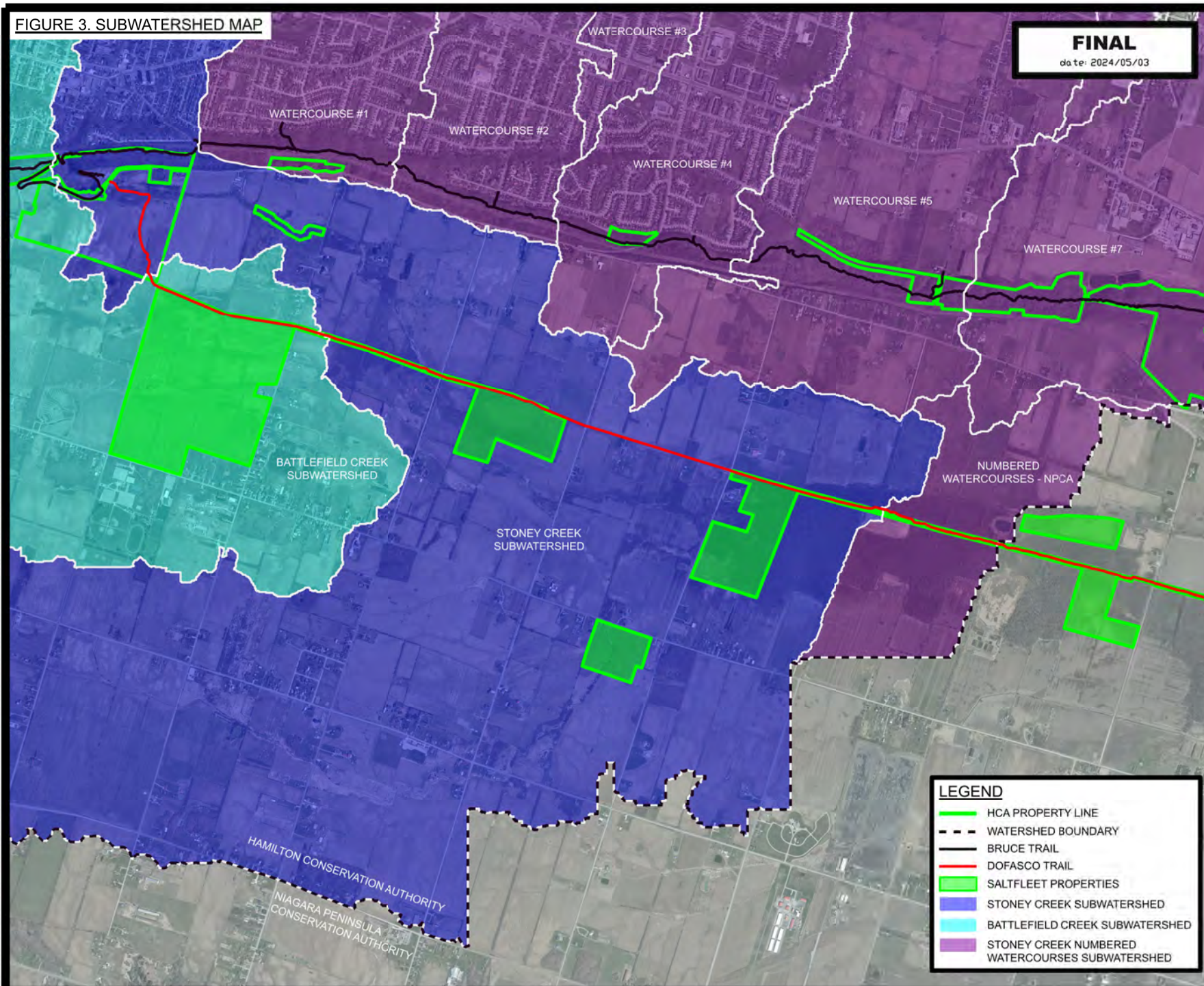
Flowing from the 2011 Draft EA recommendations, HCA staff investigated areas above the Escarpment that could help provide flood attenuation. Through this investigation, as well as reviewing technical studies of this area completed since the 1970’s, staff determined that land acquisition would be required for water storage, and set out the following goal:

“To create a new conservation area in the east end of the City of Hamilton, specifically the Upper Stoney Creek and Upper Battlefield Creek watersheds above the Niagara Escarpment to provide natural hazard attenuation, natural heritage enhancements and recreation opportunities.” (East Escarpment Conservation Area, February 2015).

The study further set out stages that would be required to implement this goal: acquire funding for land securement; acquire land and develop more detailed plans for natural heritage conservation and restoration; and complete natural hazard attenuation studies for the acquired lands to determine how natural hazards (flooding) can be addressed.

In 2014 HCA’s Board of Directors directed staff to pursue potential funding sources for land securement. Staff reported back to the Board in August 2014 that funding totaling \$4.75M was to be secured through the Heritage Green Community Trust, the City of Hamilton, the Hamilton Conservation Foundation, and the HCA Land Acquisition Fund. Board approval was granted for the land acquisition project to proceed.

FIGURE 3. SUBWATERSHED MAP



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SUBWATERSHEDS SALTFLEET C.A. MASTER PLAN



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HCA struck a working committee following the Board meeting, and property acquisition proceeded from 2015 to 2016 to assemble the land parcels noted in this plan.

Building on lands acquired and ongoing land acquisition efforts, in 2018 HCA completed the Flood and Erosion Control Project Class Environmental Assessment (Amec Foster Wheeler). This provided sufficient natural heritage conservation and restoration background information for the SCA constructed wetland project to be developed further.

In 2021 HCA completed the Battlefield Creek Wetland Storage Facility Design Report (BC-1), and the BC-1 wetland detailed design drawings (Water's Edge) for the Saltfleet constructed wetland project. The detailed information compiled in the report and on the design drawings has been reviewed and incorporated into this Master Plan.

HCA staff began site preparations at SCA in 2018 for the future wetland projects. A dedication plaque to Jim Howlett was installed in the parking area in 2019 in recognition of his unprecedented service to HCA, having served on every committee, advisory board and board of directors that HCA has had over the last twenty years. Mr. Howlett was a champion for SCA, having visited the site when it was still a working farm, and a strong proponent of expanding HCA's land holdings in the eastern reaches of the watershed.



The site was officially opened on October 2, 2021, using the existing farm lane as an entrance, to a parking area cleared from the former farm occupation. The site closed in the winter of 2021-22 to prepare for the wetland construction project. Wetland construction commenced in the spring and was completed late summer 2022. The site re-opened again to the public September 23, 2022.

4.3 Planning and Development Controls

SCA is located in the City of Hamilton (Stoney Creek) Ward 9, formerly the Township of Saltfleet.

See Figure 4 City of Hamilton Zoning for the location of the zoning areas as described below.

The Saltfleet Conservation Area BC-1 property is under the City of Hamilton's Rural Official Plan (OP, City of Hamilton 2018) and Stoney Creek Zoning By-law, Ward 9, and is classified as Rural Land Use 'Specialty Crop' and zoned A1 Agricultural and P6 Conservation/Hazard Land. The

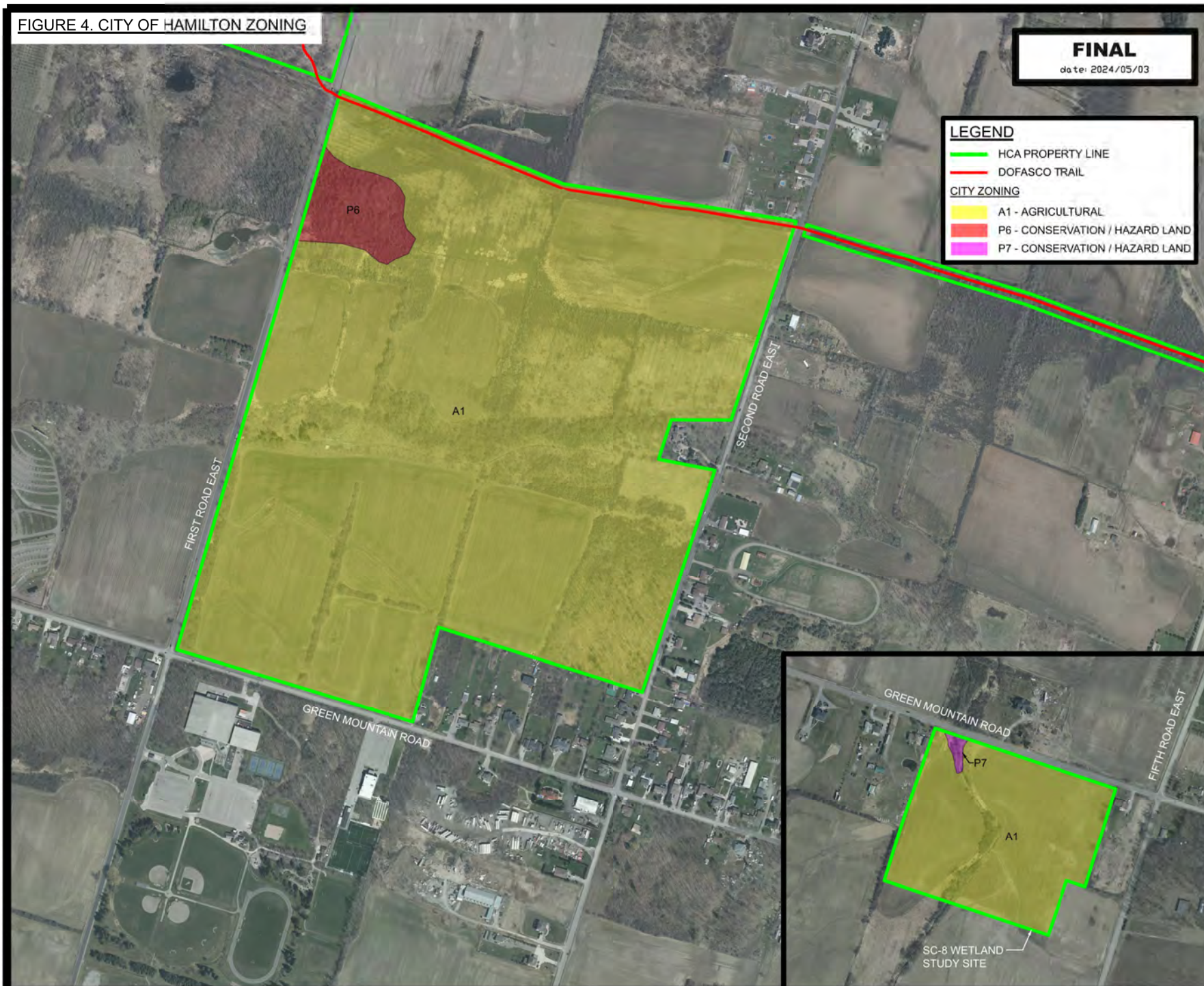
Agricultural Zone (A1) is the major area of the SCA property, formerly farmed. The Conservation/Hazard Land Zone (P6) applies to the wooded area northwest of the creek.

The SC-8 property is also largely zoned as Agricultural (A1), with Conservation/Hazard Land (P7) zoning along a portion of the creek where it crosses Green Mountain Road.

The City zoning regulations prescribe permitted uses, setbacks for buildings and parking areas, and the wetland areas as mapped by the Hamilton Conservation Authority. The City of Hamilton planning department has been consulted and their comments addressed in the preparation of this Master Plan.



FIGURE 4. CITY OF HAMILTON ZONING



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CITY OF HAMILTON ZONING SALTFLEET C.A. MASTER PLAN

In the Rural Hamilton Official Plan several natural heritage designations are identified for the SCA property including:

- The entire property is part of the Greenbelt Protected Countryside.
- HCA staff contributed to the Greenbelt Foundation paper “Investing in the Future: The Economic Case for Natural Infrastructure in Ontario” (reference Anielski Management Inc. 2019) for Saltfleet Conservation Area. This paper concluded that “the Saltfleet Conservation Area and the associated wetland restoration has a strong business case and the benefits this project will provide to the community are likely to extend beyond the 50-year return period used in this analysis.”
- The Niagara Escarpment Plan Area is immediately north of the property adjacent to the Dofasco 2000 Trail.
- The property contains a portion of the headwaters of Battlefield Creek, considered a key hydrologic feature - streams.
- The treed area in the northwest is considered a Natural Heritage Features Core Area, Key Natural Heritage Feature - Significant Woodlands, and is part of the Greenbelt Natural Heritage System.
- The treed area in the southeast near Green Mountain Road is considered a Natural Heritage Feature - Linkages.
- In addition, the following applicable policies, legislation, and planning studies are relevant for any work to be contemplated on the property:
- Provincial Policy Statement (PPS) under the Planning Act which have implications for Significant Woodland, Fish habitat, Significant Wildlife Habitat, habitat for Species at Risk.
- Ontario Endangered Species Act which has implications for endangered and threatened species and their habitat observed on the properties.
- Canada Migratory Birds Convention Act which protects numerous bird species and their breeding season generally extending between late March to August. Timing of construction activities and especially vegetation clearing must take this act into account.
- Ontario Heritage Act governing lands which contain archaeological resources or areas of archaeological potential.
- Canadian Fisheries Act for any work completed in the vicinity of Battlefield Creek.
- Ontario Fish and Wildlife Act.
- Conservation Authorities Act, R.S.O. 1990.
- Rural Hamilton Official Plan.
- City of Hamilton Rural Private Tree By-Law.
- Ministry of Environment, Conservation and Parks Environmental Protection Act.

Representatives from the Niagara Escarpment Commission; Ministry of Natural Resources and Forestry; and the NPCA have been consulted in the preparation of this Master Plan.

As shown in Figure 5 Policy Areas, there are planning and development controls in the area that are restricting development near SCA. These include the Greenbelt Plan and Niagara Escarpment Plan. Accordingly, there are very few active development applications in the study area or near the conservation area of concern.

A review of demographic trends reveal over the lifespan of this Master plan population growth is estimated to add 68 thousand more residents within 15 minutes travel to the conservation area (2022 City of Hamilton Recreation Master Plan). See Section 8 for more information.

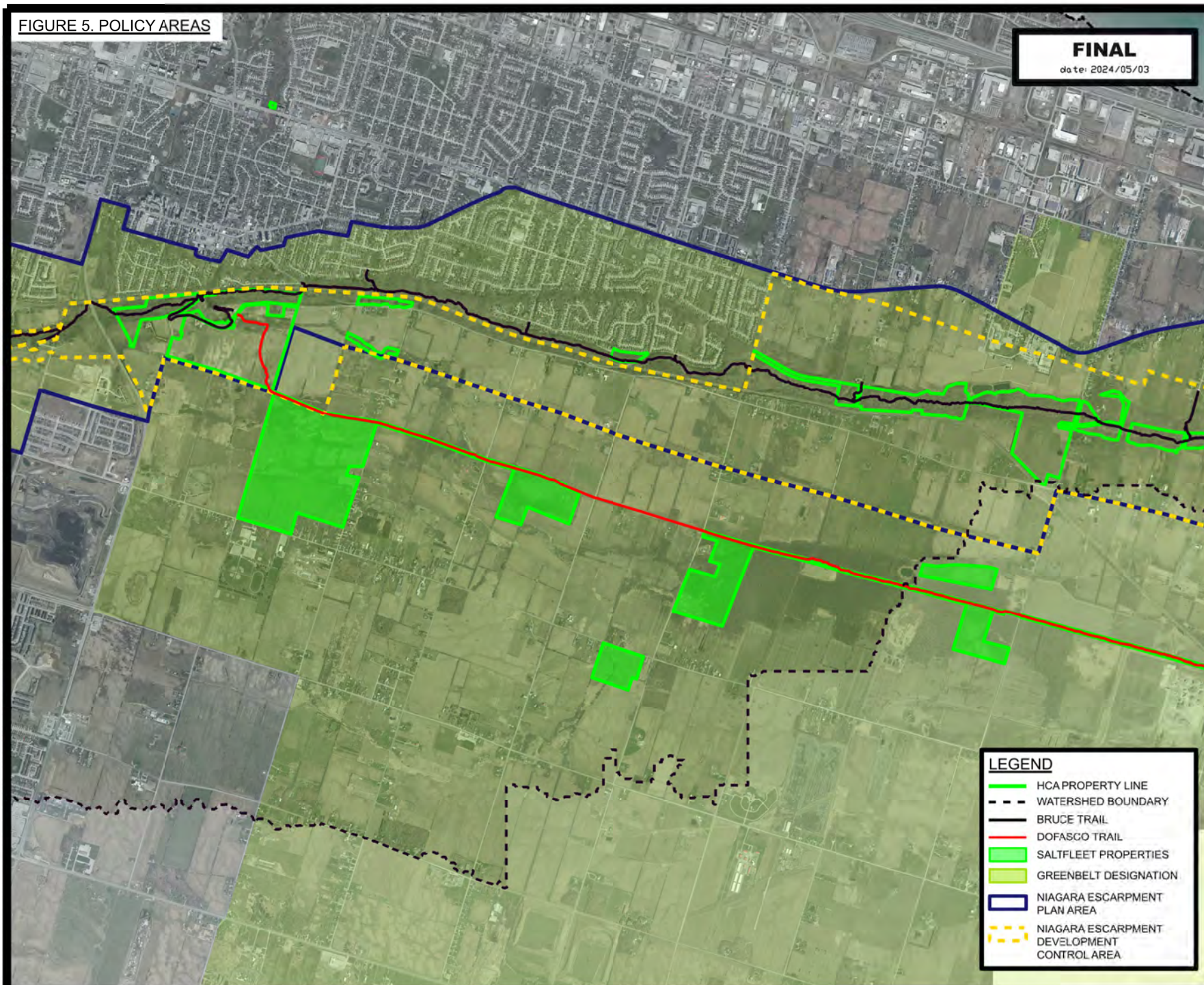
4.4 Buildings

See Sections 4.6 and 4.7 for site historic information and Figure 6 for structures and karst feature locations.

When HCA acquired the SCA property only a few structural items and debris were left from the former farm occupation. Debris piles were found near the entrance gate and parking area which HCA staff removed to open the laneway and parking area to the public. Remnant farm features of interest for further interpretation include the stone silo and stone wall near the karst stream, and the silo and building foundation ruins. Further study of these areas is recommended.



FIGURE 5. POLICY AREAS



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POLICY AREAS
SALTFLEET C.A. MASTER PLAN



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4.5 Physical Features

With the exception of the wooded area in the northwest corner of the SCA property, the land was cleared and in agricultural use in 1943 based on aerial photographs in the McMaster University Air Photo collection. The site is no longer being farmed and is reverting to natural habitat.

The main channel of Battlefield Creek flows from east to west across the northern portion of the property. The south half of the property forms a gently undulating plateau with elevations ranging from about 206 meters above mean sea level (mASL) along Green Mountain Road, to about 201 mASL along the crest of the low escarpment (the Eramosa escarpment or scarp) oriented east-west at about the mid-point of the property.



Vegetation cover in this half of the property is predominantly composed of row crops and hedgerows while the crest of the low escarpment is vegetated with a variety of trees and grasses.

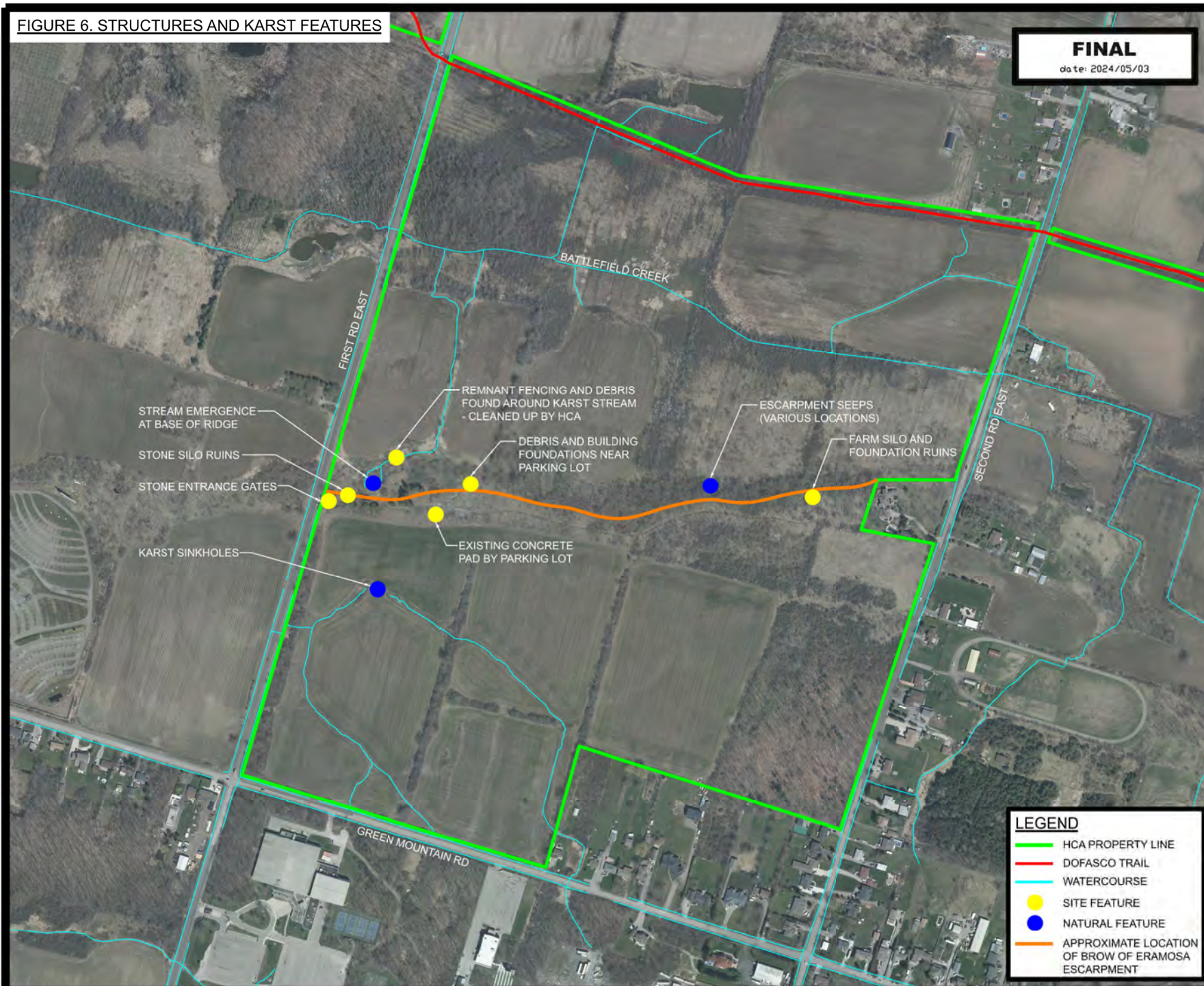
From the low escarpment, the ground surface slopes steeply to a second plateau to the north at about 190 mASL elevation. Vegetation in this north half of the property is more varied and consists of deciduous swamp, cultural thicket, meadow marsh, and cultural meadow. Runoff from the Eramosa scarp follows an intermittent channel to Battlefield Creek.

Within the broader study area, the dominant topographic feature is the Niagara Escarpment which is located between 750 and 800m north of the conservation area. The Escarpment marks the boundary between the resistant dolostone bedrock to the south and the more easily eroded shales which occur at the base of the escarpment and underlie the lake plain north to Lake Ontario. The elevation drops over 100m between the crest of the Escarpment and the shores of Lake Ontario.

The site contains karst topography that affects drainage patterns on site. The most noticeable karst features are the seeps at the base of the Eramosa Escarpment in the middle of the site, the sinkhole in the open field south of the main entrance with a disappearing stream, and the stream that flows from the base of ridge. Infiltration and runoff are difficult to separate, and infiltrated precipitation may break out in springs as secondary runoff. Noticeable karst features are noted on Figure 6 Structures and Karst Features. Further investigation of the karst features is recommended in the capital projects plan, see Section 8.2.



FIGURE 6. STRUCTURES AND KARST FEATURES



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STRUCTURES AND KARST FEATURES SALTFLEET C.A. MASTER PLAN

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LEGEND

- HCA PROPERTY LINE
- DOFASCO TRAIL
- WATERCOURSE
- SITE FEATURE
- NATURAL FEATURE
- APPROXIMATE LOCATION OF BROW OF ERAMOSA ESCARPMENT



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4.6 Cultural Heritage

The information in this section focuses on the main Saltfleet property. Quoted text has been excerpted from the archaeological assessments conducted between 2020 to 2021 by consultants from Detritus Consulting Ltd, Kitchener Ontario. HCA retained the consultants for the environmental assessment for the constructed wetland design project. Modifications and additions have been made following consultation with local First Nations.

4.1 Pre-Contact First Nations Land Use

“This portion of Southwestern Ontario has been demonstrated to have been occupied by people as far back as 11,000 years ago as the glaciers retreated. For the majority of this time, people were practicing hunter gatherer lifestyles with a gradual move towards more extensive farming practices.” (Detritus Consulting Ltd., 2021). Registered archaeological sites within this study area have confirmed pre-contact First Nations land use, as well as post-contact Euro Canadian land use.

The HCA recognizes that these conservation area lands were inhabited by First Nations peoples including the Mississaugas of the Credit First Nation, the Haudenosaunee, and the Huron-Wendat. The HCA also recognizes that this area has been, and continues to be, home to many Indigenous Peoples including the Métis, Inuit and Urban Indigenous communities.

A Stage 2 archaeological assessment of the property discovered Pre-Contact First Nations stone artifacts (projectile points, tools and fragments of tool making). Interpretation of the artifacts by the archaeological consulting team concluded this was a small activity area occupied by unspecified First Nations people during the Pre-Contact period.

A Stage 3 site specific archaeological assessment was completed for one site which could potentially be impacted by future entrance laneway and parking lot improvements. During the Stage 3 assessments, representatives from the Six Nations of the Grand River First Nation, the Mississaugas of the Credit First Nation, and the Haudenosaunee Development Institute participated as monitors, alongside the archaeological team retained by HCA. The following recommendations from the assessment flow from this engagement:

- Assessed archaeological sites are to be documented on all contract drawings for the BC-1 wetland project. The location of these sites is shown on the appended maps for this Master Plan. See Appendix 1 maps noting these locations in the conservation area zoning for this Master Plan.
- That long term protection for the archaeological sites be implemented and mechanisms such as restrictive covenants be placed on the property title to prohibit activities that may alter sites either temporarily or permanently. HCA has placed a restrictive covenant on the SCA property protecting the documented archaeological sites, see Section 4.7.
- That soil disturbance, other than normal agricultural practice, not occur. Minor landscaping activities on or above the surface of the site including the addition of topsoil up to 50cm maximum fill (combined existing and new fills), farming, and grass cutting are permissible. See Section 7.1 for inclusion of this information in the site management.

.2 Post-Contact First Nations Land Use

“The earliest recorded visit to the Niagara region [by a European] was undertaken by Etienne Brûlé, an interpreter and guide for Samuel de Champlain.... The purpose of this endeavour was to establish good relations with [First Nations] communities in advance of future military and colonial enterprises in the area.” (Detritus Consulting Ltd., 2021). Throughout the middle of the 17th century, “a series of bloody conflicts followed known as the Beaver Wars, or the French and Iroquois Wars, contested between the Iroquois confederacy and the Algonkian speaking communities of the Great Lakes region. Many communities were destroyed including the Huron, Neutral, Susquehannock, and Shawnee” (Detritus Consulting Ltd., 2021).

“The late 17th and early 18th centuries represent a turning point in the evolution of the post-contact [First Nations] occupation of Southern Ontario. It was at this time that various Iroquoian-speaking communities began migrating from New York State, followed by the arrival of new Algonkian-speaking [First Nations] from northern Ontario (Konrad 1981; Schmalz 1991). More specifically, this period marks the arrival of the Mississaugas into Southern Ontario” (Detritus Consulting Ltd., 2021). “...at the end of the 17th century, the Mississaugas' settled permanently in Southern Ontario.... Around this same time, members of the Three Fires Confederacy (Chippewa, Ottawa, and Potawatomi) began immigrating from Ohio and Michigan into southwestern Ontario (Feest and Feest 1978:778-79).” (Detritus Consulting Ltd., 2021).

Saltfleet Township is part of the Between the Lakes Purchase (Treaty 3) which was originally signed in 1784 between the Crown and the Mississauga peoples (Ontario Ministry of Indigenous Affairs, 2018). The 'Between the Lakes Purchases' of 1784 and 1792 (Archives of Ontario, 2009) established the formation of Upper Canada in 1792 from Essex in the west to Glengarry in the East. The part of Ontario where Saltfleet is located is also known to be covered under the 1701 Nanfan Treaty or Albany Deed.

.3 Euro-Canadian Land Use

“The Township of Saltfleet was established in Lincoln County in 1791 and became part of Wentworth County in 1816. The name Saltfleet was taken from the village of Saltfleet in Lincolnshire England (Hamilton Public Library 2017). Settlement began to trickle into the region in 1786, with an influx of loyalist immigrants from New York State began immigrating to Upper Canada in the years following the Revolutionary War. The Township of Saltfleet was laid out in eight concessions between Lake Ontario and the Township of Binbrook to the south. After the American Revolutionary War, Crown Patents were granted to United Empire Loyalists who settled at first below the escarpment but soon spread south of the escarpment creating small hamlets such as Albion and Elfrida.” (Detritus Consulting Ltd., 2021).

“The Illustrated Historical Atlas of the County of Wentworth, Ont. (Historical Atlas), demonstrates the extent to which Saltfleet Township had been settled by 1875 (Page & Smith 1875; Figure 2). Landowners are listed for every lot within the township.... Also visible is the community of Stoney Creek, located northwest of the Study Area. To the southwest of the Study Area is the community of Elfrida, to the west Mt. Albion and to the southeast, Tapleytown.” (Detritus Consulting Ltd., 2021). Due to this amount of settlement, the potential for Post-Contact and Euro-Canadian material evident in the study area is deemed to be

moderate to high.

The Historical Atlas does not accurately locate or depict structures on the maps, and landowners were not always listed on the maps. However, cursory review of the historic records indicates farm lands owned by G.R. Davis. It is possible that the remains of the farmstead in the conservation area are from the Davis occupation. Further research is recommended for interpretation of the farmstead artifacts visible on site.



A Stage 1 and Stage 2 archaeological assessment were completed for the entire site, and six sites with First Nations or Euro-Canadian attributes were discovered. At the end of the Stage 2 process, an “avoid and protect” approach was implemented, as no wetland construction work was proposed in these six areas. The areas were surveyed and restrictive covenants with 70m or 10m setbacks were put in place. A Stage 3 assessment was completed for one site which could potentially be impacted by future entrance laneway and parking lot improvements.

All Artifacts collected during these assessments are currently being held by the archaeological consultants pending transfer to Her Majesty the Queen in right of the Province of Ontario, or another suitable public institution acceptable to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) and the site's owners. Artifacts of Euro-Canadian origin discovered include ceramic sherds, bottle glass, window glass, cut nails, brick and personal items. The artifacts date from the mid to late 19th century.

4.7 Heritage Designation and Historic Buildings

The Ontario Heritage Act enables municipalities to protect and manage Ontario's cultural heritage resources. Part IV of the Act provides for municipal designation of individual properties as having cultural heritage value. Properties are designated by a municipal by-law, with reasons for designation or a description of heritage attributes which must be retained to conserve the cultural heritage value. Heritage property designation serves to: recognize the importance of a property to the community; identify and protect the property's cultural heritage value; encourage good stewardship and conservation; and promote knowledge and understanding about the property and the development of the community.



As noted in Section 4.6, archaeological assessments were conducted at SCA for the constructed wetland project. Six archaeological sites of cultural heritage value and interest were recommended by the archaeological consultants for long term protection, these sites are shown on the maps in Appendix 1. HCA agreed with these recommendations and on February 1st, 2022, had a restrictive covenant placed on the property title for the archaeological sites. This covenant states that:

“no person, knowing that this is an archaeological site, shall alter the site. No artifacts or any other physical evidence of past human use or activity shall be removed from the site without a license as provided for under Section 48(1) of the Ontario Heritage Act. Under Section 48(3) of the Ontario Heritage Act, the restriction on alteration or the removal of an artifact or other physical evidence of past human use and activity from the site will no longer apply when a licensee has completed archaeological fieldwork within the meaning of the regulations on the site and an archaeological report has been provided to the Minister stating that the site has no further cultural heritage value or interest and the report is entered into the Ontario Public Register of Archaeological Reports. Any alterations or soil disturbance to an archaeological site prior to having met the requirements of Section 48(3) is an offence subject to penalty under Section 69(1) of the Ontario Heritage Act. For further clarity, minor landscaping activities on or above the surface of the site including the addition of topsoil up to 50cm maximum fill (combined new and existing fills) over the site, farming, and grass cutting are not considered to be alterations for the purpose of this covenant.”

4.8 Natural Areas

SCA's natural areas include Environmentally Significant Areas (ESAs), significant woodlands, Provincially Significant Wetlands, escarpment, karst, and managed forest. SCA contains physical features, flora and fauna of significance along with cultural heritage sites, former agricultural land that is naturalizing and both natural and constructed watercourses and wetlands.

All future development from this Master Plan is to follow the Master Plan zone guidelines outlined in Section 3.6, and the natural areas recommendations noted in Section 5.16.



5.0 NATURAL AREAS INVENTORY

Information in this section focuses on studies conducted on the SCA property bounded by First Road East, the Dofasco 2000 Trail, Second Road East and Green Mountain Road East. Sub-surface investigations were conducted for the wetland project in the spring of 2019, which included nine sampled boreholes and ground monitoring wells. An overview of the investigations is provided in this section for general information and understanding. HCA has the full investigation reports on file, they are referenced in Appendix 7.

5.1 Physiography and Topography

The study area is located on the Waterdown moraine with glacial tills dominating the soil stratigraphy. The tills extend into dolomite bedrock of Amabel Formation.

During the waning stages of the Wisconsin glacial, a series of glacial deposits were laid down over the older strata and bedrock. The surficial geology of the property is dominated by a stratum of glaciolacustrine silty clay with accumulations of organic soils (topsoil and peat) in low lying areas, and exposed bedrock in small areas where water erosion has removed the overburden cover.

The bedrock geology is comprised of Paleozoic sedimentary rocks that were laid down as marine sediments in the Iapetus Ocean (pre-cursor to the Atlantic). The Niagara Escarpment was created by differential erosion within the softer shales of the Queenston Formation, and the hard dolostones of the Lockport Group. Bedrock geology of the study area is shown in Figure 7, Conceptual Geological Section. The Eramosa scarp formation in the conservation area is at the division of the softer and more erodible Vinemount member and the more resistant Reformatory Quarry member.

5.2 Soil Composition

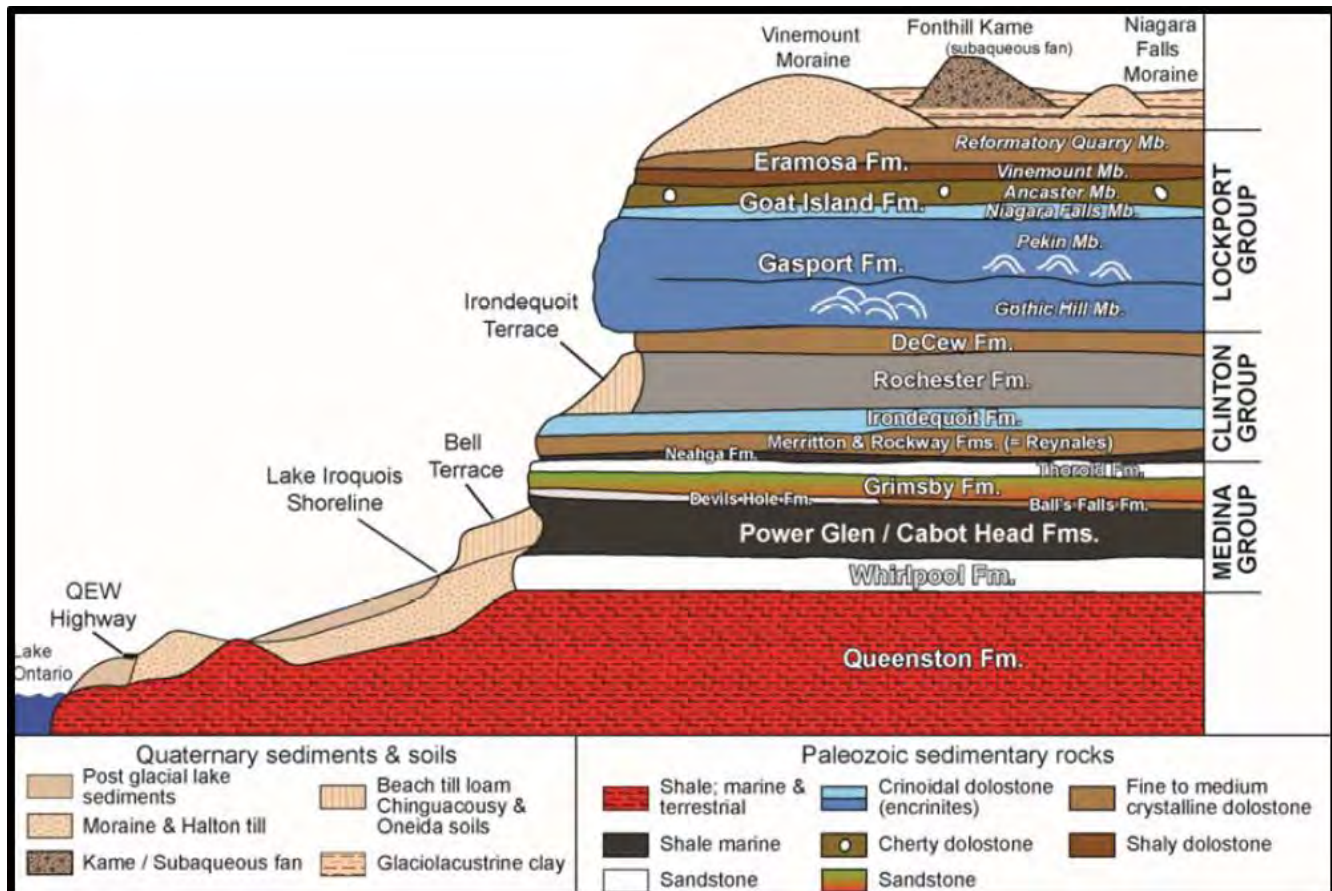
The investigation disclosed that beneath a topsoil veneer or road pavement, with a layer of earth fill in places, the site is underlain by silty clay, overlying dolomite and limestone bedrock. Soil types for all SCA properties are noted on Figure 8 Soil Composition.

Soil samples were analyzed by the engineering consultants for the BC-1 wetland project and the following results reported:

- **Topsoil:** The topsoil layer varied from 15cm to 340cm depth, dark brown in colour with appreciable amounts of roots and humus.
- **Earth Fill:** An earth fill layer was found beneath the pavement structure on First Road East. It consisted of silty clay with sand, gravel and occasional topsoil inclusions. The earth fill extends to a depth of 0.8m to 1.5m below the pavement level. If this fill is to be excavated and re-used on site as structural backfill it must be sorted free of any deleterious materials.

- **Silty Clay:** Silty clay was found in all borehole samples and deemed to be a native stratum. It is a glaciolacustrine deposit, laminated with silt and sand seams. Firm clay was found extending to depths of 0.6m to 0.8m from grade.
- **Bedrock:** Bedrock is encountered at a depth ranging from 0.6m to 5.5m from the ground surface. It is dolomite or limestone, a grey sedimentary rock of Amabel formation, of poor quality. It is difficult to excavate and contains rock fractures. Any excavation within 1m to 1.5m into bedrock will require a heavy-duty excavator equipped with a rock-ripper.

Figure 7. Conceptual Geological Section

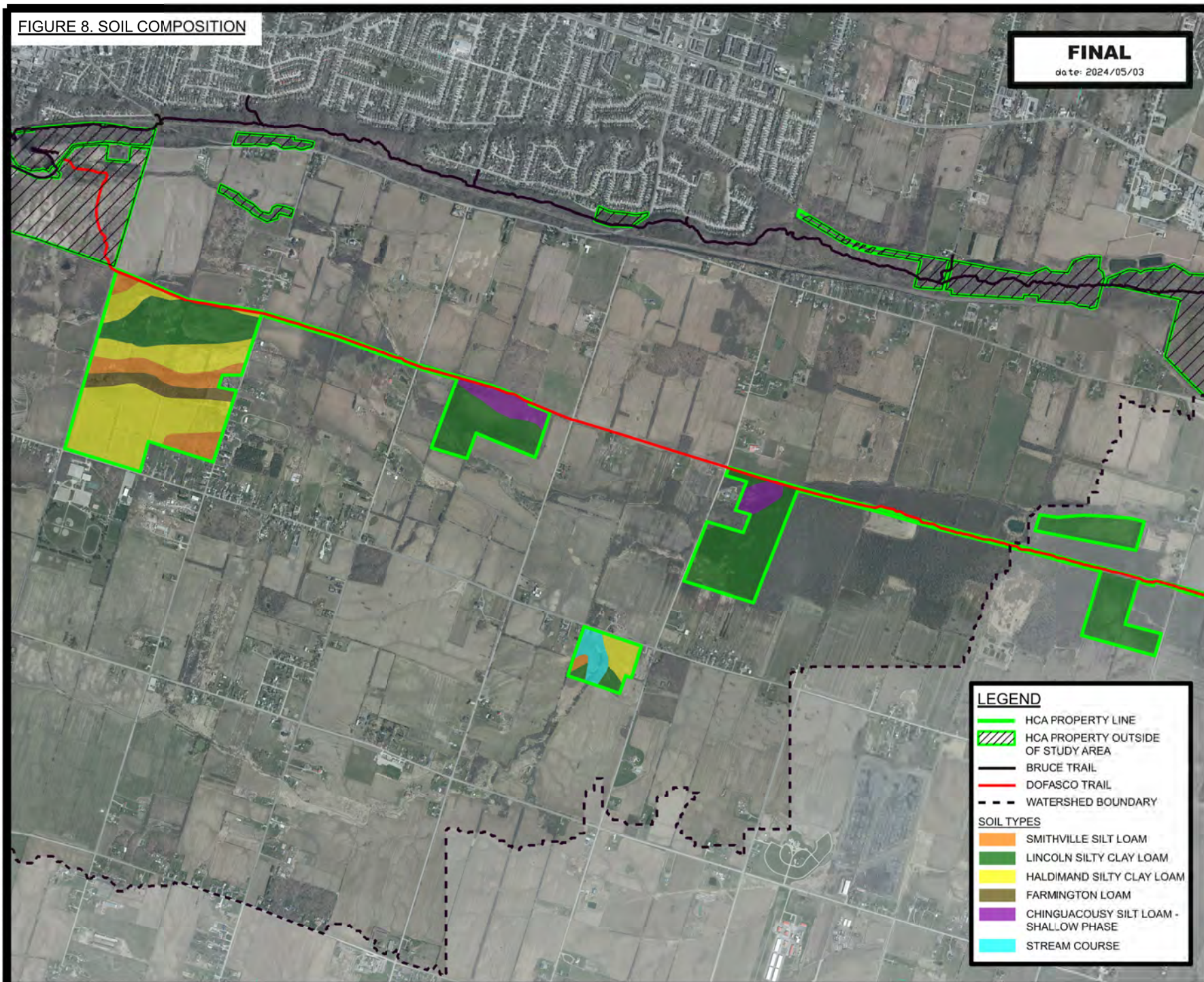


Wetland Storage and Natural Channel Design Study, 2021, Waters Edge (from Brett & Brunton, 2018)

5.3 Hydrology and Surface Drainage

Drainage patterns in the study area have been heavily altered by the agricultural land use, but still hold true to the landscape. This study area is divided between two different subwatersheds of the Stoney Creek watershed. The moraine is split into two lobes which effects the drainage pattern. The main Saltfleet property where the artificial wetlands of BC-1 were created is located in the Battlefield Creek subwatershed while the rest of the properties are found in the Stoney Creek subwatershed.

FIGURE 8. SOIL COMPOSITION



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SOIL COMPOSITION



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.1 Battlefield Creek

The Battlefield Creek headwaters come from the north-western edge of the southern moraine lobe and generally flow in a north-west direction, the Centennial Road cut in the escarpment. There are essentially three branches. the western most one follows Centennial Road. The central one flows northern into BC-1 where it intersects with some karst features, where the surface drainage flows disappear upstream of the Eramosa scarp and reappear at the base of it. The flow from these features are now captured in the southern cells of the BC-1 created wetlands while eastern flows first cross Green Mountain Road before turning west to cross Second Road East and are captured by the larger eastern cell of BC-1. There are some remaining small flows from the north side of the Dofasco trail that flow into the remaining natural swamp and marsh avoiding being captured by the created wetlands. The flows from the site then head west from the flowing through a large road culvert under First Road East. The central branch joins the east one at this point and the western one at Centennial Road before the combined Battlefield Creek flows over the Niagara Escarpment. Battlefield Creek joins Stoney Creek below the escarpment about 4.5 km downstream before Stoney Creek flows directly into Lake Ontario after about another 1.5 km.



.2 Stoney Creek

Stoney Creek has two main source branches, the first begins south of the Battlefield Creek headwaters along the southern side of the southern moraine lobe. It flows east and then turns north entering the gap between the lobes in the area of SC-8. The gap between the lobes is where the Provincially Significant Vinemount Swamp is located. This is where the second branch joins bringing with it the waters of the swamp just upstream of Tapleystown woods. From here, Stoney Creek flows northwest through the lobe gap picking up a small amount of flow from the northern lobe before falling over the Niagara Escarpment at the Devil's Punchbowl. Stoney Creek below the escarpment flows north for about 4.5 km before being joined with Battlefield Creek. Stoney Creek flows directly into Lake Ontario after about another 1.5 km.

All the watercourses are intermittent or ephemeral, and have limited substrate sorting. Much of the length of the creeks has been channelized or exists as well-defined watercourse. For the purpose of the Aquatic inventory, they will be divided into 4 assessment areas BC-1, SC-8, Tapleystown Woods, and Vinemount Swamp.

5.4 Biophysical Inventory Methodology

Biophysical inventories completed at Saltfleet Conservation Area consisted of Ecological Land Classification surveys completed in 2020 and 2021, noted in Table 7. Ecological Land Classification was completed across multiple properties in this Conservation Area and is shown on Map 1. in Appendix 1. Species lists are included in Appendix 6.

Table 7. Summary of Ecological Field Studies at Saltfleet Conservation Area Properties

Survey Type	Dates	
	Year	Day(s)
Floral Inventory	2019, 2021, 2022	July 9 and August 23, 2019, May, June 19 and Aug 23 2019, May 5, 2021, May 18 2022, Oct 8 2021, others concurrent with ELC surveys
Breeding Bird Surveys	2019, 2021, 2022	June 21 and July 9, 2019, June 19 and July 5 2019, June 2 and July 7 2021, June 3 and 19, 2022
Migratory bird surveys (BC-1 only)	2019	April 12, 29, May 10, 14, Sept 19, 24, Oct 4 and 8.
Waterfowl Surveys (Vinemount swamp only)	2022	March 10, 15, 22, 31 and April 7th
Frog Call Surveys	2019, 2021	June 19, 2019, April 18, May 15, June 19 2019, April 7, May 27, June 7, 2021
Ecological Land Classification (ELC)	2019, 2021, 2022	July 9, 2019, May 14 2019, May 5, Oct 7, Oct 8 2021, May 18, 28, Jul 29, Sep 2, Sep 9, Sep 15 2022
Bat Cavity Habitat Assessment and Acoustic monitoring (BC-1 and SC-8 only)	2019	May 15-16, May 29-June 26 July 9, June 19-17
Incidental wildlife survey	Recorded when encountered during all visits – 2019, 2021 and 2022	

5.5 Ecological Land Classification

The Ecological Land Classification (ELC) system for Ontario was used to describe the vegetation communities at Saltfleet Conservation Area properties. Two of the parcels, BC-1 and SC-8 were surveyed by an environmental consulting firm, Natural Resource Solutions (NRSI) in 2019. The remainder of the properties were surveyed by staff. These were conducted from 2021-2022. Details on the canopy, sub canopy, shrub and ground layers of each vegetation community were recorded. Vegetation community boundaries were determined using air photo analysis and further refined in the field.

5.6 Flora/Botanical Inventory

Botanical inventories were conducted as a part of the Ecological Land Classification surveys of the properties. Specific floristic inventories occurred in the spring of 2021 for spring ephemerals (early spring flowers) and the fall of 2022 to further identify asters and goldenrod species as they bloom late in the season. Species nomenclature is based on the Natural Heritage Information Centre (NHIC) Plant Species list (updated yearly). Species and community ranks are determined provincially by the Ministry of Natural Resources and Forestry Natural Heritage Information Centre Database (S-ranks) and locally via the Hamilton Natural Areas Inventory (Schwetz 2014). Inventories for BC-1 and SC-8 were conducted by NRSI and summarized in this document; see Appendix 6.

5.7 Fauna Inventory

Frog call surveys were conducted on BC-1 and SC-8 in 2019 and on all other properties in 2021. All surveys followed the Marsh Monitoring Program protocol. This includes three nights of surveys from April to June when temperatures at night are 5, 10 and 15 degrees, respectively.

.1 Bat Acoustic monitoring

Passive acoustic monitoring was completed for BC-1 and SC-8. This type of survey is used to identify bats that move past the monitors and may be using the properties. This section is directly from the NRSI report (2020).

Bat acoustic monitoring was completed at four locations within BC-1; the cultural savannah, cultural meadow, meadow marsh, and swamp habitats and at one location on SC-8, in the middle of the riparian corridor. The methodology is the same for both properties. Bat acoustic monitoring methodology followed the guidelines outlined within the MNRF Survey Protocol for Species at Risk Bats within Treed Habitats for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*M. septentrionalis*) and Tri-Colored Bat (*Perimyotis subflavus*) (MNRF 2017) and is described in detail below. Microphones were placed along the edge of the habitat in candidate foraging areas to conceal the microphones from any bats to avoid recording inspection calls. Bat activity was monitored with the use of an omnidirectional SMM-U1 microphone and Song Meter SM4 acoustic recorder (Wildlife Acoustics Inc., Massachusetts, USA).

.1 Acoustic Monitoring Frequency and Timing

Passive acoustic monitoring was conducted between May 29 and June 26, 2019 for a total of 29 nights at all monitoring stations in BC -1 and from June 19 and July 17, 2019 in SC-8. Acoustic detectors were set to record bat passes for a total of 5 hours each night during the monitoring period, commencing at sunset. Upon review of weather conditions during the monitoring period, bat echolocation calls recorded on the 20 evenings with the most ideal weather conditions for bat activity (ambient temperature greater than 10°C, low wind and no precipitation) were selected for further analyses. As per MNRF (2017), at least 10 monitoring nights that align with the above weather conditions where no SAR bat activity is detected are required to confirm their absence from a given habitat

2 Acoustic Data Analysis

The acoustic recorders used for this study employ direct digital recording technology and are designed to collect records from the full spectrum of bat calls (15-120 kHz) for the entire duration of the monitoring period. This allows for a full analysis of activity in the vicinity of each acoustic monitoring station. Identification of call sequences to species level are typically possible with a quality ultrasound microphone (as used in this study) when recordings of bat echolocation calls are made in the open, the bat approaches close to the microphone, the bat produces echolocation calls typical for that species, and there are few things interfering with the passage of ultrasound from the bat to the microphone (wind, proximity to the ground, type and abundance of vegetation, etc.). However, this perfect scenario rarely exists. All of the above factors can influence the ability to identify a call sequence to the species level. In addition to these conditional factors, many of the sounds produced by a particular species of bat are also produced by other species (i.e. they have overlapping ranges of call characteristics). The degree of overlap in call characteristics varies by species. These factors must all be taken into consideration when acoustic bat monitoring is undertaken. Bat echolocation calls recorded during passive acoustic surveys were visualized with the software program SonoBat 4.2.2 for the north/northeastern US, Southern Ontario Region and identified to species with the SonoBat Auto-classifier. Once the required files were manually vetted, the auto-classification program provided an estimated likelihood of presence for each species, also known as a maximum likelihood estimate (MLE). An MLE value provides an indication of the strength of evidence for the presence of a species.

No specific surveys were conducted for other wildlife on the property. All wildlife encounters were incidental while conducting other aspects of field work. These surveys involved general coverage recording all species observations and signs (e.g. tracks/trails, scat, and burrows, dens, browse and vocalizations). Background data including older survey material was used to develop a list of butterflies, mammals and dragonflies that have been recorded by naturalists at SCA over the last 10 years. A summary of the findings can be found in Appendix 6.

5.8 Waterfowl, Migratory and Bird Breeding Surveys

Migratory bird surveys were conducted over eight (April - Oct) visits in order to record species that migrate through BC-1 throughout the spring and fall. Methods outlined in the Significant Wildlife Habitat Technical Guide (MNRF 2012) were used by NRSI. Waterfowl surveys were conducted in flooded fields associated with the Vinemount Swamp. These were conducted weekly between March and April 2022, by HCA staff. Breeding bird surveys were conducted over six visits between 2020 and 2022 following the Ontario Breeding Bird Atlas (Cadman 2010) methodology. These occurred on all properties and were completed for BC-1 and SC-8 by NRSI and at all other properties by HCA staff.

5.9 Ecological Land Classification Results

Field surveys occurred over 11 visits between 2019-2022. This included all properties

throughout the Saltfleet Conservation Area. BC-1 and SC-8 surveys were conducted by NRSI and are summarized in this document. The subject properties were delineated into 28 vegetation communities (BC-1-9, SC-8 -4, Tapleystown - 3, Vinemount - 12). Details on community classifications can be found in Appendix 1 and on Maps 1 and 2.

5.10 Flora/Botanical Inventory Results

Surveys were completed for multiple parcels within the SCA. These surveys were conducted both by HCA staff and NRSI (BC-1 and SC-8 exclusively). The Hamilton NAI (HCA 2014) indicates that there are 1496 species of plants in the Hamilton-Wentworth jurisdiction. Percent of regional flora for each area is presented below. The results for various parcels are detailed in Table 8. below.

Table 8. Floristic Quality Index

	BC-1	SC-8	Tapleystown Woods	Vinemount Swamp
Native Plant species	97	100	83	116
Non-native plant species	53	44	16	32
Total plants recorded	150	56	99	148
% of regional flora	10	7	7	10
Mean CC	3.50	2.15	4.43	4.03
Floristic Quality Assessment	34.42	16.06	40.31	43.46
Value assessment (Quality)	Moderate	Low	Good	Good

The Floristic Quality Index (FQI) and the Native Mean Coefficient of Conservatism (CC) have been calculated for each property. The CC is a measure of the species specificity of habitat requirements, with a coefficient of 0 indicating a plant tolerant of a wide range of conditions and 10 indicating a plant that has the most specific habitat requirements. FQI is a measure of vegetation quality and is based on both the habitat fidelity of each species and species richness. The FQI for SC-8 is low, likely due to its agricultural nature and limited area of native vegetation. Tapleystown Woods and Vinemount Swamp have higher FQI's due to their diversity of habitat types and large size.

5.11 Fauna Inventory Results

.1 Migratory Waterfowl Surveys

There are a number of flooded agricultural fields associated with the HCA properties on the east mountain. Two of the largest flooded fields, one on the east side of Eighth Road and the other on the west side of Fifth Road are not owned by HCA. On the west side of Eighth Road and south of the Vinemount Swamp is a small, flooded field. This field had water from mid-March 2022 – end of May 2022. Species found during waterfowl surveys west of the Eighth Road include Canada Geese, Tundra swan, Mallards, Ring-billed Gulls, American Wigeons, American Black Ducks and Wood Ducks.

.2 Breeding Bird and Migratory Songbird Surveys for BC-1

These surveys were conducted by NRSI at BC-1 in 2019. The data within the report is not segregated into migratory and breeding species. Therefore, these sections have been kept together for reporting purposes. In total 105 bird species were recorded between migrating and breeding birds. For the migratory bird species more than 35 species of birds were identified in portions of the BC-1 property. These included 19 Wood Warblers, 9 Emberizid Sparrows, 7 thrushes, 5 woodpeckers, 5 Flycatchers and 4 Vireos. There were more than 10 migratory birds noted at each of the 8 targeted surveys and greater than 200 birds per day. This type of survey was not conducted at the other properties within this Conservation Area. The migratory and breeding bird surveys resulted in 105 species of birds recorded on the property. As for breeding bird surveys on the property the following paragraph was taken from the NRSI report (2020).

A number of locally rare bird species (HCA 2014) were observed during both the migration and breeding seasons; Yellow-billed Cuckoo, Common Nighthawk, Wilsons Snipe, Yellow-bellied Sapsucker, Merlin, Blue-headed Vireo, Common Raven, Carolina Wren, Golden-crowned Kinglet, Magnolia Warbler, Blackburnian Warbler, Black-throated Blue Warbler, Yellow-rumped Warbler, Black-throated Green Warbler. During the migration surveys, an exceptional diversity of species, including most warbler observations, was noted from the cultural savannah and swamp feature along the mini escarpment. No other background data is available for this property.

.3 Breeding Bird Surveys

Breeding bird surveys on the other properties were conducted in the spring and summer of 2019, 2021 and 2022. The number of species identified on the different parcels and species of note are discussed below.

.1 SC-8

Thirty-one species of birds were identified from SC-8 during breeding bird surveys. From the NRSI report: A number of locally significant bird species (HCA 2014) were observed during the breeding season, Species which are uncommon in Hamilton were observed including Brown Thrasher– a pair (probable breeding evidence), and Northern Mockingbird – perched on hydro wires along Green Mountain Road in suitable habitat (possible breeding evidence). No other background data is available for this property.

.2 Tapleystown Woods

Breeding bird surveys identified 27 species of birds including the Bobolink, Eastern Wood-Pewee, and Wood Thrush, all of which are at risk provincially and federally. Other notable species include the Yellow-Billed Cuckoo and Brown Thrasher which are uncommon in the City of Hamilton. Incidental sightings by staff identified an additional 3 species including Great Horned Owl, Eastern Screech Owl (uncommon to the area) and Red-Headed Woodpecker on migration, which is endangered provincially and federally.

Data was also collected from the Natural Areas Inventory and eBird as historical data. This data has identified 14 additional species in the area including the Great Blue Heron, flying

overhead, Red-Bellied woodpecker, Red-Tailed Hawk, Scarlet Tanager and Vesper Sparrow, all of which are uncommon to the City of Hamilton.

.3 Vinemount Swamp

Breeding bird surveys identified 20 species of birds including the Barn Swallow, which is threatened provincially and federally. This species was noted foraging above the meadow marsh on the southern portion of the property east of Fifth Road and south of the Dofasco Trail.

Historical data from the Natural Areas Inventory as well as incidental sightings by staff identified an additional 34 species of birds in this area. This includes the Eastern Wood-Pewee and Wood Thrush, provincially special concern and threatened, respectively.

.4 Butterflies and Dragonflies

No dedicated surveys were conducted for these two taxa. There is background information from the NAI and there are also surveys done by NRSI for SC-8 and BC-1.

Tapleystown Woods had 16 butterflies and no dragonflies were observed on this property. The Vinemount Swamp group of properties had 4 dragonflies and 26 butterflies. The surveys on BC-1 counted 5 dragonflies and 14 butterflies and finally SC-8 recorded one dragonfly and four butterflies. Monarch butterflies a federally endangered species were found on BC-1, SC-8 and Vinemount. These were mainly observed nectaring along open trails and within the wet meadows in Vinemount. The Wild Indigo Duskywing (BC-1) and Bronze Copper (Vinemount) are locally uncommon.



Twelve-Spotted Skimmer

.5 Mammals

All incidental wildlife encounters were recorded while conducting other aspects of field work. Mammal sightings were also recorded during historical surveys conducted for the Natural Areas Inventory and by NRSI prior to wetland construction. These surveys involved general coverage recording all species observations and signs (e.g. tracks/trails, scat, burrows, dens, browse, and vocalizations).

.1 BC-1

Surveys by NRSI in 2019 identified 14 species of mammals from the property. Details on bat surveys that occurred at BC-1 are detailed below, directly from the NRSI Report:

“Four bat species were documented as present within the subject property during passive acoustic monitoring. All of the confirmed species are relatively common throughout Ontario. In addition to the confirmed species, bat pass sequences were

also identified to the *Myotis* species grouping, which includes Little Brown Myotis, Eastern Small-footed Myotis (*M. leibii*) and Northern Myotis, as well as the 40 kHz species grouping which includes the *Myotis* species, Tricolored Bat and Eastern Red Bat (*Lasiurus borealis*). All *Myotis* species which occur in Ontario and the Tri-colored Bat are listed as Species at Risk.”

“A total of 6,775 bat pass sequences were recorded throughout the acoustic monitoring period that were of high enough quality that they could be classified to either the species level or a species grouping. The majority of these bat pass sequences that were classified to the species level were identified as Big Brown Bat (*Eptesicus fuscus*) (35.92%). Several sequences were classified to Hoary Bat (*Lasiurus cinereus*) (11.66%) and Silver-haired Bat (*Lasionycteris noctivagans*) (7.82%). A small proportion of calls were classified to Eastern Red Bat (*Lasiurus borealis*) (2.37%)”.

.2 SC-8

Surveys by NRSI in 2019 identified 12 species of mammals from the property. Details on bat surveys that occurred at SC-8 are detailed below, directly from the NRSI Report:

“Four bat species were documented as present during passive acoustic monitoring conducted within the subject property. All of these species are considered common throughout Ontario”.

“A total of 868 bat pass sequences were recorded throughout the acoustic monitoring period that were of high enough quality that they could be classified to either the species level or a species grouping. The majority of these bat pass sequences that were classified to the species level were identified as Big Brown Bat (*Eptesicus fuscus*) (52.65%). Several sequences were classified to Eastern Red Bat (*Lasiurus borealis*) (6.34%), Hoary Bat (*L. cinereus*) (4.49%) and Silver-haired Bat (*Lasionycteris noctivagans*) (4.03%)”.

Species at risk bats and significant wildlife habitat related to bats are discussed in Section 5.14

.3 Tapleystown woods and Vinemount

Between these two areas six species of mammals were identified including White-tailed deer, Gray squirrel, Virginia opossum, Coyote, Eastern cottontail, Northern racoon. These species are typical of these types of properties, with meadows, forests and houses. These species are all common in Ontario and in the City of Hamilton. Bat surveys were not conducted at these properties.

.6 Herpetofauna

.1 BC-1

Surveys for this property were conducted by NRSI. Their report states that:

“NRSI field investigations confirmed the presence of 8 species of reptiles and amphibians within the subject property. No Species at Risk or Species of Conservation

Concern were documented from the site. None of the reptile and amphibian species observed are considered locally rare (HCA 2014). Calling anuran surveys documented 5 species of anurans (frogs and toads) within the subject property. Northern Leopard Frog (*Lithobates pipiens*) was observed incidentally, on several occasions, during other surveys.”

.2 SC-8

Surveys for this property were conducted by NRSI. Their report states that:

“NRSI field investigations confirmed the presence of 2 species of anuran; Gray treefrog (*Hyla versicolor*) and Green Frog (*Lithobates clamitans melanota*) within the subject property. Neither species is considered a Species at Risk or Species of Conservation Concern or locally significant (HCA 2014). Calling anuran surveys commenced in June and therefore survey data for the months of April and May was not collected. June surveys documented 2 species of anurans within the subject property.”

.3 Tapleystown Woods

One frog call survey location was completed at Tapleystown Woods. This was focused on a small woodland pool along the southeastern edge of this property. Over the course of three surveys only Western Chorus frogs were detected from this woodland pond.

.4 Vinemount

Roadside surveys along Fifth and Eighth Road East were conducted adjacent to property owned by HCA in the Vinemount Swamp. A full chorus of Western Chorus frogs was heard calling from the road side ditches along Fifth and Eighth Road East. This species was also heard calling within the meadow marsh (MAMM 2-4) community on the southern portion of this property. Pickerel frogs were also heard in the early spring in the ditches along Eighth Road East. American toads were also heard further onto the properties within the existing deciduous swamps and thicket swamps. Adult snapping turtles were also found in the deciduous swamps of the properties within the Vinemount Swamp.

5.12 Aquatic Inventory

.1 BC-1

BC-1 contains two intermittent branches of Battlefield Creek one comes in from the south draining through karst features above the Eramosa Scarp and then out letting at its base. Below the scarp the watercourse was direct fish habitat before the southern cells of the created wetland were installed. The water control structure will act as a barrier to fish movement. The new feature is being monitored and if HCA Ecologists determine it is ecologically valid and the ponds will support native fish populations stocking could be explored at a later date.



Brown Bullhead

The second branch enters the BC-1 property from the east crossing Second Rd. East below the Eramosa Scarp. Here it enters the large eastern wetland cell. The watercourse is direct fish habitat, but the wetland control structure is a barrier to fish movement. The remaining watercourse branch as well as the new deeper cell feature will be monitored to understand how these changes may affect the fish populations. If ecological concerns are noted solutions will be investigated. The current fishery is indicative of a warmwater environment which should be maintained on the property by the created wetland feature and will likely be enhanced. The proposed monitoring will help provide this information as time progresses. See Table 9 for fish recorded by NRSI, as part of the BC-1 Wetland Design project.

Table 9. Fish Recorded by NRSI. BC-1

Common Name	Scientific Name
Pumpkinseed	<i>Lepomis gibbosus</i>
Brook Stickleback	<i>Culaea inconstans</i>
Fathead Minnow	<i>Pimephales promelas</i>
Brown Bullhead	<i>Ameiurus nebulosus</i>

.2 SC-8

SC-8 contains the mainstem of Stoney Creek and based on the fish species present is a coolwater stream. However, they also represent tolerant to intermediately tolerant species likely reflecting the intermittent nature of the creeks flows. The channel is a narrow corridor between two agricultural fields at the time of writing this, however. In the near future this will be the site of the next wetland project. The design maintains the mainstem corridor and the control structure is being designed in such a way fish passage should still occur through it. Several deeper floodplain pools are being created in a widened floodplain environment. Depending on the realized drawdown time these future conditions should not alter the fish community but may enhance them both with the additional floodplain access and improved flow conditions downstream. See Table 10 for record of fish collected by NRSI at SC-8, as part of the wetland design project.

Table 10. Fish recorded by NRSI, SC-8

Common Name	Scientific Name
Pumpkinseed	<i>Lepomis gibbosus</i>
Brook Stickleback	<i>Culaea inconstans</i>
Fathead Minnow	<i>Pimephales promelas</i>
Central Mudminnow	<i>Umbra lima</i>
Northern Pearl Dace	<i>Margariscus nachtriebi</i>
Northern Redbelly Dace	<i>Chrosomus eos</i>

.3 Vinemount Swamp

The Vinemount Swamp represents the poorly drained lowlands between the two moraine features. Its drainage is enhanced by the channels dug though it which represent the

watercourses in this area. This watercourse flows west out of the swamp, outletting into the main channel of Stoney Creek just east of Tapleystown Road. The fish species present indicate it is a coolwater environment but also reflect the intermittent nature of the swamp as the species represent “tolerant” to “intermediately tolerant” species.

The Aquatic Resource Monitoring Plan monitors the Vinemount Swamp branch of Stoney Creek. See Table 11 for fish recorded.

Table 11. Fish Recorded Vinemount Swamp

Common Name	Scientific Name
Brook Stickleback	<i>Culaea inconstans</i>
Central Mudminnow	<i>Umbra lima</i>

.4 Tapleystown Woods

Stoney Creek bisects the south west corner of this HCA property. Like many of the watercourses in the area, it is an artificial channel cut through the swamp forest on site. No fish sampling was conducted on this property but the fishery is expected to remain the same as is found upstream at SC-8 and Vinemount Swamp. An intermittent coolwater stream with a tolerant to intermediately tolerant fishery. See Table 12.

Table 12. Records for the Mainstem of Stoney Creek

Common Name	Scientific Name
Pumpkinseed	<i>Lepomis gibbosus</i>
Brook Stickleback	<i>Culaea inconstans</i>
Fathead Minnow	<i>Pimephales promelas</i>
Creek Chub	<i>Semotilus atromaculatus</i>
Central Mudminnow	<i>Umbra lima</i>
Northern Pearl Dace	<i>Margariscus nachtriebi</i>
Northern Redbelly Dace	<i>Chrosomus eos</i>

5.13 Significant Ecological Features

.1 Significant Woodlands

The following properties or portion of properties are considered significant woodland by the City of Hamilton:

- Northwest corner of BC-1 (SWDM 2-2)
- All of Tapleystown Woods
- Central portion of Vinemount Swamp off of Fifth Road East
- The majority of parcels to the west of Eighth Road East in the Vinemount Swamp

Significant woodlands for the City of Hamilton mean an area which is ecologically important in terms of features (species composition, age of trees and stand history) and function (contributes to the broader landscape because of its location, size or the amount of forest cover in the planning area) (City of Hamilton, 2019).

.2 Environmentally Sensitive Area

There is one Environmentally Significant Area within the properties in the Master Plan. The Vinemount Swamp properties are part of STCK-77 – Vinemount South Swamp and this ESA covers the majority of properties owned by HCA between Fifth and Eighth Road East.

This ESA was designated because it meets two of the 2003 ESA criteria including:

1. Significant Ecological Function

- the area contains interior forest habitat (100-200m from forest edge)
- the area provides habitat for significant species
- the area provides migratory stopover habitat and a colonial nesting site
- the area contains rare biotic communities

2. Significant Hydrological Function

- the large headwaters wetland is a groundwater recharge area and helps to moderate surface water flow

The ESA area is protected within the Rural Official Plan for the City of Hamilton. No new development or site alterations are permitted within or adjacent to ESA's, unless it can be shown, through an Environmental Impact Statement (EIS) that there will be no negative impacts on the ecological features or functions of the ESA.

.3 Provincially Significant Wetland

The Vinemount South Swamp forest is the biggest natural forest area south of the Escarpment in the Hamilton area. It also serves as a stopover for many species of migratory waterfowl. The Vinemount Swamp is a headwaters swamp, it serves an important purpose in regulating the stream flow in Forty Mile Creek and Stoney Creek.

5.14 Biophysical Inventory – Analysis

1 Species at Risk and Locally Rare Species

.1 Significant Flora

Of the plant species recorded on the subject lands through the 2019, 2020 and 2021 field surveys, six plant species were found to be locally uncommon, one locally rare and one provincially rare. The Butternut is mainly found along the unopened road allowance on the south side of Tapleystown Woods. These are presented in Table 13. below. The majority of the other uncommon and rare species are found within the wood and field sections of these properties.

Table 13. Significant Flora

	BC-1	SC-8	Tapleystown Woods	Vinemount swamp
Provincially rare				
Butternut			x	
Locally rare				
Bristly Black Currant			x	
Locally uncommon				
Grays Sedge	x		x	x
Dropping Sedge				x
Maple-leaved Goosefoot		x	x	
Hairy goldenrod			x	
False Mermaidweed	x		x	
Woolly Sedge	x			
Total	3	1	6	2

Of particular interest is False Mermaidweed. This plant species is only visible in early spring when it can form a carpet of plants along the forest floor. It has a coefficient of conservatism of 10 which means it has a lower tolerance to environmental degradation. As it is naturally restricted to undisturbed, remnant habitats, it indicates that the two forest patches it was found in, the south portion of the Tapleystown Woods and the south-east forest at the BC-1 property, are likely very old and have had little disturbance in the past.

2 Significant Fauna

The following six species were recorded at various parcels of the Conservation Area and are at risk either federally (SARA) or provincially (ESA). These species were recorded at Saltfleet at different life stages from migration to breeding as indicated in Table 14.



Table 14. Federal and Provincial Species at Risk

Common name	Scientific name	SARA status (Schedule 1)	ESA status	BC-1	SC-8	Tapleytown	Vinemount
Barn Swallow (B)	<i>Hirundo rustica</i>	THR	THR	x	x		
Bobolink (B)	<i>Dolichonyx oryzivorus</i>	THR	THR	x		x	
Common Nighthawk (M)	<i>Chordeiles minor</i>	THR	SC	x			
Eastern Meadowlark (B)	<i>Sturnella magna</i>	THR	THR	x			
Red-headed Woodpecker (M)	<i>Melanerpes erythrocephalus</i>	END	END			x	
Wood Thrush (B)	<i>Hylocichla mustelina</i>	THR	SC	x		x	x
Myotis Bats (B)	<i>Myotis Sp</i>	END	END	x	x		

The Barn Swallow (2020) and Common Nighthawk (2018) have been reassessed recently by the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to Special Concern. Neither status has been changed on Schedule 1 of SARA as of the writing of this Master Plan so they will be treated as SAR in this document. At SC-8, Barn Swallow (*Hirundo rustica*) was observed foraging above the watercourse (marsh and swamp thicket areas) and over the fields on several surveys in June and July. As many as 6 birds were present at one time. At BC-1 this species was noted foraging over the marsh areas and fallow agricultural fields during the bird surveys. No appropriate nesting locations were noted on either SC-8 or BC-1 and these birds are likely nesting nearby. Bobolink were noted in the agricultural field adjacent to the Tapleytown woods during the breeding bird surveys. At BC-1 this species was noted as a fly over, but suitable habitat is present in the fallow fields on the property. Eastern Meadowlark was recorded at BC-1 in ebird and suitable habitat is present on site. Common Nighthawk was noted at BC-1 on May 15, 2019. It was observed foraging and performing aerial displays. This date is within the migration period for this species in the Hamilton area, so this could have been a bird on migration. But Common Nighthawk is a cryptic, nocturnal species and observation of breeding evidence is difficult to confirm and this bird was noted in suitable habitat. Therefore, this species is considered an unconfirmed breeder within the thickets and cultural savanna. A Red-headed woodpecker was seen during migration in the spring at Tapleytown woods within the Sugar Maple forest. Wood thrush was noted on all properties except SC-8. It was heard during breeding bird surveys within the deciduous forests and swamps on these properties. The surveys by NRSI at both SC-8 and BC-1 identified the potential for species at risk bats to be using BC-1 for foraging and breeding and SC-8 for foraging. Due to the nature of acoustic monitoring, it is difficult to determine exactly which Myotis species is using these properties. They are therefore just listed as Myotis sp. in the chart above.

Threatened and endangered species habitat is protected under the Endangered Species Act (provincially) and the Species at Risk Act (federally). Permits may be required for

development within the habitat for threatened and endangered species.

There were also a large number of locally rare and uncommon species recorded during field surveys and found in the background research. BC-1 had the largest majority of locally uncommon 42 species, SC-8 had 3, Tapleystown 13, Vinemount 15. These include birds and butterflies and are mostly concentrated within the forest, swamps, and thicket sections of these properties. See Table 15.

Table 15. Locally Rare and Uncommon Species

Common Name	Scientific name	City of Hamilton Status	BC-1	SC-8	Tapleystown	Vinemount
Blackburnian Warbler	<i>Setophaga fusca</i>	Rare	x			
Black-throated Green Warbler	<i>Setophaga virens</i>	Rare	x			
Blue-headed Vireo	<i>Vireo solitarius</i>	Rare	x			
Carolina Wren	<i>Thryothorus ludovicianus</i>	Rare	x			
Common Nighthawk	<i>Chordeiles minor</i>	Rare	x			
Common Raven	<i>Corvus corax</i>	Rare	x			
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Rare	x			
Magnolia Warbler	<i>Setophaga magnolia</i>	Rare	x			
Merlin	<i>Falco columbarius</i>	Rare	x			
Northern Pintail	<i>Anas acuta</i>	Rare			x	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Rare			x	
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Rare	x			
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Rare	x		x	
Yellow-rumped Warbler	<i>Setophaga coronata</i>	Rare	x			
Alder Flycatcher	<i>Empidonax alnorum</i>	Uncommon				x
American Kestrel	<i>Falco sparverius</i>	Uncommon	x			
American Redstart	<i>Setophaga ruticilla</i>	Uncommon	x			x
Belted Kingfisher	<i>Megascops alcyon</i>	Uncommon	x			
Black-and-white Warbler	<i>Mniotilta varia</i>	Uncommon	x			
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Uncommon	x			
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	Uncommon	x			

Common Name	Scientific name	City of Hamilton Status	BC-1	SC-8	Tapleystown	Vinemount
Bobolink	<i>Dolichonyx oryzivorus</i>	Uncommon	x		x	
Bronze Copper	<i>Lycaena hyllus</i>	Uncommon				x
Brown Creeper	<i>Certhia americana</i>	Uncommon	x			
Brown Thrasher	<i>Corvus brachyrhynchos</i>	Uncommon	x	x	x	x
Cooper's Hawk	<i>Accipiter cooperii</i>	Uncommon	x			
Eastern Bluebird	<i>Sialia sialis</i>	Uncommon	x			
Eastern Meadowlark	<i>Sturnella magna</i>	Uncommon	x			
Eastern Phoebe	<i>Sayornis phoebe</i>	Uncommon	x			x
Eastern Screech-Owl	<i>Megascops asio</i>	Uncommon			x	
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	Uncommon	x			
Great Blue Heron	<i>Ardea herodias</i>	Uncommon	x		x	x
Hairy Woodpecker	<i>Dryobates villosus</i>	Uncommon	x			x
Herring Gull	<i>Larus argentatus</i>	Uncommon	x	x		
Marsh Wren	<i>Cistothorus palustris</i>	Uncommon				x
Nashville Warbler	<i>Oreothlypis ruficapilla</i>	Uncommon	x			
Northern Mockingbird	<i>Mimus polyglottos</i>	Uncommon	x	x		
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Uncommon	x			
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Uncommon	x		x	x
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Uncommon	x			
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Uncommon	x		x	x
Scarlet Tanager	<i>Piranga olivacea</i>	Uncommon			x	
Sora	<i>Porzana carolina</i>	Uncommon				x
Turkey Vulture	<i>Cathartes aura</i>	Uncommon	x			x
Vesper Sparrow	<i>Pooecetes gramineus</i>	Uncommon	x		x	x
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Uncommon	x			x
Wild Indigo Duskywing	<i>Erynnis baptisiae</i>	uncommon	x			
Winter Wren	<i>Troglodytes hiemalis</i>	Uncommon	x			
Wood Duck	<i>Aix sponsa</i>	Uncommon	x		x	
Wood Thrush	<i>Hylocichla mustelina</i>	Uncommon	x		x	x

.2 Significant Wildlife Habitat

The Significant Wildlife Habitat Technical manual (Ontario 2000) along with the Ecoregional criteria tables for Ecoregion 7E (OMNR 2015) were used to determine and define significant wildlife habitat (SWH) on the SCA properties. Significant wildlife habitat includes broad categories of habitats for flora and fauna. SWH has been identified under the provincial policy statement for Ontario. No new development is allowed within identified portions of significant wildlife habitat unless there will be no negative impact to the form and function of this habitat type. The broad categories for significant wildlife habitat include seasonal concentration areas of animals, rare vegetation communities or specialized habitat for wildlife, habitats for species of conservation concern and animal movement corridors.

.1 Seasonal Concentration Areas of Animals

Seasonal concentration areas of animals are areas where wildlife species occur annually in aggregations (groups) at certain times of the year (Ontario 2015). This can include single species concentrations or aggregations of multiple species.

.1 Land bird Migratory Stopover Areas

These are areas with woodlots or forests within 5 km of either Lake Ontario or Lake Erie that migratory birds, especially song birds, use as rest stops before or after crossing the great lakes during migration. Land Bird Migration should be studied in woodlots 2-5 Ha in size where woodlots are rare in the area of shoreline (Ontario 2015). Studies are needed to confirm the use of the habitat by > 200 birds/day and with > 35 species with at least 10 bird species recorded on at least 5 different survey dates (Ontario 2015). Surveys by NRSI found:

“well over the 35 species required for this SWH type including 19 Wood Warblers, 9 Emberizid Sparrows, 7 Thrushes, 5 Woodpeckers, 5 Flycatchers and 4 Vireos. All 8 targeted surveys documented greater than 10 migratory species and numbers greater than 200 birds per day. Surveyors noted that bird diversity was very high within the cultural savannah and swamp located along the karst formation. It is inferred that the combination of upland and wetland habitat at this groundwater seepage location may result in higher numbers of insects during bird migration and provides a diversity of habitat which is desirable for migratory birds.”

Migratory bird surveys were not conducted on the other properties within this Master plan.

2. Bat Maternity Colonies

NRSI completed acoustic monitoring to survey for bat species at BC-1. From the NRSI report:

“Big Brown Bat and Silver-haired Bat were detected in relatively high numbers at all monitoring stations during every night of the monitoring period. The majority of these recordings were documented during the first and second monitoring hours, indicating that these species are potentially using woodlands throughout the subject property for roosting habitat, including for maternity roost colonies, or at the very least foraging

shortly after leaving nearby roosts. Big Brown Bats primarily form maternity colonies in buildings and other man-made structures but will also roost in tree cavities, although less frequently (Agosta 2002, Gerson 1984). Therefore, given the presence of several farm houses and barn structures in the area, this species is likely not using the woodlands as maternity roost colony habitat. Silver-haired Bats are solitary or may form small maternity colonies under loose bark and in cavities of trees and snags (van Zyll de Jong 1985). It is likely that Silver-haired Bat are using the treed features within the subject property for roosting and potentially as maternity colony roost habitat. Sites are considered SWH if greater than 10 Big Brown Bats and/or greater than 5 female Silver-haired Bats are using the site as maternity roost habitat. Based on the results of the acoustic monitoring, all SWDM and FODM vegetation communities within the subject property are considered Candidate Bat Maternity Colony SWH. Targeted exit surveys at potential roost trees within the woodlands would be required to confirm the presence of this SWH type within BC-1. The candidate bat roost tree(s) which appear to be within the cultural savannah (SVD) associated with the karst ridge Swamp (SWDM) features in the northern portion of the property were also identified as candidate bat roost habitat.

Bat acoustic surveys were also conducted at SC-8, but no SWH maternity colonies were found. These surveys were not conducted at Tapleystown Woods or Vinemount.

.3 Reptile Hibernaculum

This is a difficult type of significant wildlife habitat to survey due to the cryptic nature of snakes. From the NRSI report for BC-1:

“The observation of 3 snake species in the vicinity of the old residence and karst feature during the emergence period suggests that SWH for snake hibernacula may be present. Observations of snake diversity and numbers which were made by NRSI biologists approach the defining criteria for SWH and given the difficulty in surveying steep portions of the karst slope, this report assumes that a hibernacula is present. This feature may exist within one of the field stone foundations, or within rock crevices along the slope. The potential snake hibernacula is very likely located along the karst slope or in the vicinity of the old residence and out-building foundations accessed from First Road East. There were no indications of potential habitat within the low-lying northern portion of the site.

No Rocky outcrops or karst features were noted on the other properties.

4. Waterfowl Stopover and Staging area (Terrestrial)

Waterfowl stopover surveys were completed between March and April 2022. Sheetwater on agricultural fields is present in close proximity to the east and west extent of Vinemount. The agricultural fields to the west of Fifty Road and those to the east of 8th concession both had aggregations of Tundra swans, American Black Duck, Blue-winged teal, Green-winged teal, Northern Pintail, and Northern Shoveler. On some survey dates there were greater than 100 birds of these and other species using these fields. Although not on the Vinemount property, the buffer prescribed in the SWH Criterion Tables would

extend onto the property as it is 100-300 m from the edge of the agricultural field.

.2 Specialized Habitats of Wildlife

This is a community or diversity-based category as many wildlife require large areas of suitable habitat for successful breeding. The largest and least fragmented habitats within the planning area will support the most significant wildlife populations.

1. Seeps and Springs

These are areas where groundwater comes to the surface and are often found within forested areas. The criteria include the presence of 2 or more seeps or springs. There are numerous seepage areas recorded at BC-1. Surveys by NRSI in April and May noted water running out of karst features at the base of the small escarpment through the property. Evidence of use by Wild Turkey and White-tailed deer in the winter would confirm this as SWH, despite a lack of indicator plant species.

.3 Habitat for Species of Conservation Concern

Habitat for species of conservation concern includes wildlife that are listed provincially as species concern or are rare and declining.

.1 Shrub/Early Successional Bird Breeding Habitat

BC-1 contains multiple areas of thicket and cultural savanna. The breeding bird surveys documented the indicator species, Brown Thrasher and all four of the indicator species, Field Sparrow, Black-billed Cuckoo, Eastern Towhee and Willow Flycatcher. Thicket areas and the savanna should be maintained for these species.

.4 Special Concern and Wildlife Species

Table 16 provides a list of the four species located within the various properties that are of Conservation Concern. This list includes migratory species such as the Rusty blackbird and Snapping turtles in suitable nesting habitat. Eastern Wood Pewee was noted in several locations within the forested section of the properties while the Monarch was seen in open fields, marches and canopy gaps of small forest openings.

Table 16. Species of Conservation Concern

Common Name	Scientific name	SARA status (Schedule 1)	ESA status	BC-1	SC-8	Tapleystown	Vinemount
Eastern Wood-Pewee	<i>Contopus virens</i>	SC	SC	x		x	x
Monarch	<i>Danaus plexippus</i>	SC	SC	x	x		x
Rusty Blackbird	<i>Euphagus carolinus</i>	SC	SC	x			
Snapping turtle	<i>Chelydra serpentina</i>	SC	SC				x

5 Animal Movement Corridors

These are generally linear features that are used by wildlife to move from one habitat to another. Ensuring they are maintained on the landscape is important to ensure genetic diversity in populations, to allow for seasonal migration and for wildlife to move in their home ranges from feeding to cover areas.

.1 Amphibian movement corridors

NRSI identified possible amphibian movement corridor on SC-8. Their report states that:

“An assessment of air photography in the vicinity of the subject property indicates that the corridor of natural vegetation may play an important role in wildlife movement through the headwaters of Stoney Creek and toward the Vinemount Swamp PSW to the northeast. Lands to the south of Tapleystown are largely agricultural and are limited in hedgerows, watercourses and forest parcels that would allow for a natural corridor connecting with Twenty Mile Creek which is approximately 5 km south of the property.” This corridor should be maintained as the site is developed into a wetland.

5.15 Managed Forest

A Managed Forest Plan was completed for HCA properties owned within the watershed in 2018. This is a 20-year plan that covers 1,018 hectares of HCA owned lands. In this plan the managed forest land parcels are at SCA and one land parcel at the Vinemount Swamp. These areas are identified for forest conservation and no harvesting is planned for the areas identified in the Managed Forest Plan A restoration plan is recommended for natural regeneration in all forest areas at SCA, and to control invasive species. See Appendix 5 for more information from the Managed Forest Plan.

5.16 Natural Areas Recommendations

The natural habitat features at SCA have been evaluated for restoration opportunities and invasive species removals. Priorities for natural areas conservation and restoration in this Master Plan are as follows:

.1 Conservation Targets for Saltfleet Conservation Area

Biodiversity conservation targets are a limited number of species or ecological communities that ecologists select to represent the biodiversity of a protected area, and that therefore serve as the focus for conservation investment. Thus, conservation targets are simply those ecosystems, communities, or species upon which we focus planning and management efforts. Because we use only a handful of targets to plan for biodiversity conservation, selecting the appropriate suite of targets is crucial to successful conservation planning and adaptive management. A coarse filter/fine filter approach was used when analyzing and describing conservation targets for SCA. For BC-1, the conservation target should be migratory bird and bat maternity colonies; SC-8 is migration corridors for animals and for Tapleystown and Vinemount Swamp, it is conservation of treed swamp/forests. These are important features for

each of these properties and their conservation will ensure that species and significant wildlife habitats are conserved over the 10 years of this Master Plan. It will also be important to monitor the created wetlands on both BC-1 and SC-8 and the impact their development had on existing natural heritage features (wetlands and creek corridors).

The savanna, escarpment (karst) and forested/swamp were identified as important areas for migratory land birds and bat maternity colonies at BC-1. These areas are primarily north of the Development Zone shown on the appended Master Plan Zones map. Trail development shown on the appended Trails Master Plan map is intended to steer clear of standing snag trees for bat maternity colonies. Trails development should be focused outside these zones to ensure snag trees remain standing for bat maternity colonies.

The overarching conservation target for SC-8 will likely be removed for the development of the wetland features on this property. As restoration will occur post wetland creation, it will be important to recreate the animal movement corridor along the creek edge and enhance this creek corridor.

The existing natural habitat features at all of the properties with the Saltfleet Conservation Area have been evaluated for restoration opportunities. In order to provide a clear overview of recommended restoration/enhancements the properties have been broken down into four distinct areas.

.1 BC-1

As stated above, the cultural thicket and savannas on this property are important for migratory birds and bat maternity roosts. The natural escarpment through this property is an important feature for wildlife, providing a variety of cover from thicket to savanna and open water seeps for a year-round water supply. Wetland cells have been created in the northern half of this property. These areas have been planted in a diversity of trees, shrubs and herbaceous plants. A Green-



ash swamp remains on the northern portion of the property. These trees are dying leaving a reduced canopy cover of mostly Bur Oak, with an understory of Common and Glossy buckthorn. Control of the Common and Glossy buckthorns in this area is recommended to improve the biodiversity of this wetland and limit the ability of buckthorn to move to the created wetland cells. As these removals occur, a diversity of tree species should be

planted to add stability and resilience to this remnant wetland. Common buckthorn removal should also occur along the hedgerows and forests within this property. It is recommended that the two western fallow fields remain open and allowed to transition to meadow and thicket habitat. This will enhance the habitat for Barn Swallow and Common Nighthawk, while not filling in the area of savanna. The eastern field should be restored to forest to allow for a larger upland forest tract on this property in the south-east corner. Remnant fences also occur on this property near the escarpment and seeps. It is recommended that these be removed to allow for wildlife movement. A monitoring program is also being developed for the created wetland to track how they change over time; what species start to use them and as an early warning for invasive species control. Planting within the created wetlands may be necessary depending how the area changes over time.

.2 SC-8

This location will be transitioned into wetland ponds over the next few years. It will be important that the plantings be re-established along the creek corridor to ensure the animal movement corridor is maintained. Invasive species such as Common buckthorn and Phragmites should be controlled pre and post wetland creation.

.3 Tapleystown Woods

Enhance biodiversity and long-term forest resiliency. The forest in the northern portion of this property is dominated by Sugar Maple. It was used for maple syrup production and appears as though species other than sugar maple were removed from this section. There is a very low diversity of other species within these forested areas. In order to ensure this forest is resilient and stable in the long term it is recommended that a diversity of trees and shrubs be planted in these forests. Recommendations would include diseases resistant butternut, shagbark and bitternut hickory, basswood and black walnut. Removal of invasive species is a high priority here as there is a large population of Dog Strangling Vine along the trail which is slowly moving into the forest. Common buckthorn is also present in portion of the property. It may be difficult to control as it occurs in the poison ivy thicket mostly.

.4 Vinemount Swamp

Portions of this large swamp were once dominated by Green Ash with some Swamp White and Bur Oak. Unfortunately, over time the Green Ash have died and the area has transitioned to a non-native shrub thicket of mainly Glossy and Common buckthorn. These are large areas of non-native species and specific strategies will be required to transition this difficult site back to native swamp. The appended capital budgets have accounted for increased cost for this work, but may need to be amended when specific restoration plans are available. Reed Canary Grass is beginning to grow in the meadow marsh adjacent to Fifth Road. This species should be controlled and removed from the meadow to ensure the existing biodiversity is maintained. Phragmites should be removed from along the Dofasco trail through the swamp, as it is currently confined to this narrow trail.

.2 Invasive Species in Saltfleet Conservation Area

The species detailed below are a threat to the biodiversity and conservation values in SCA. The following section details the invasive species that occur within the conservation area. Recommendations for prioritization for each species are detailed here.

.1 Common Buckthorn

Common buckthorn (*Rhamnus cathartica*) is a small tree or shrub that was introduced to Ontario from Eurasia. It was widely planted in farm hedgerows and fencerows as a wind break. It can survive in a wide range of conditions making it very good at invading a variety of habitats (Anderson, 2012a). Birds and small mammals feed on the berries of this plant, which has caused it to spread. Common buckthorn is widespread throughout the Saltfleet properties. The focus should begin on all fruiting female trees. These fruiting females can be treated with herbicides and the remaining smaller stems removed through volunteer events and work days. In areas where a large number of Common buckthorn are removed, or in areas of large ash die-off, native trees and shrubs should be planted to prevent invasion by another invasive species.

.2 Phragmites

This species of common reed from Eurasia is a perennial grass. It is not clear how it was transported to North America. Phragmites (*Phragmites australis*) is an aggressive plant that spreads quickly and out competes other native species in wetland habitats (Nichols, 2020). It forms large monocultures that decrease plant biodiversity and create poor habitat for wildlife.

Phragmites can be found on the property bordering Eighth Road East south of the Dofasco 2000 Trail. A large patch can also be found bordering the new constructed wetlands BC-1. This population bordering the wetland is being prioritized so it does not counteract efforts to create a functioning and biodiverse wetland ecosystem. A small population also occurs at SC-8. Both of these populations were treated for the first time in September 2022. It is likely eradication will take several years.

.3 Honeysuckle sp.

There are four main species of invasive honeysuckle (*Lonicera*) in Ontario which can be difficult to identify due to their tendency towards hybridization, and the lack of identifying characteristics (flowers and fruits) throughout much of the field season (Tassie and Sherman, 2014). These plants have been brought to North America for three centuries from Europe and Asia as an ornamental. Invasive honeysuckles can rapidly reproduce, grow quickly, and outcompete beneficial vegetation including our native honeysuckles. Their fruits are attractive to birds and mammals, which aid their spread. Background studies have identified the native honeysuckle *Lonicera dioica*, and the invasive honeysuckle *Lonicera tatarica* growing on all properties in SCA. While identification is easiest in the spring during bloom, hand pulling and weed wrenching smaller shrubs should be conducted in the fall as not to disturb the growth of any nearby spring ephemerals. Cutting and girdling larger shrubs should always be paired with the

application of herbicide to newly exposed woody material to prevent excessive suckering come next season. The first step will be to identify and map the honeysuckle populations in the spring to ensure only the invasive honeysuckles will receive treatment.

.4 Canada Thistle

Another perennial plant of waste places and fields, the Canada thistle (*Cirsium arvense*) has been in North America since the early settlers (MDA, n.d.a). It is mostly a pest to crops but can invade and take over other nearby meadows. The plant is a prolific seeder producing up to 5000 seeds a season, however the seeds don't spread very far. It is through vegetative cloning of the root that allows this plant to spread and push out other species. It is very important to follow clean equipment protocol as even the smallest piece of root can regrow. There is currently a large population of Canada thistle within BC-1 in the fields bordering the constructed wetlands. The most common control method is tilling prior to flower bud break, to deplete the root reserves (MDA, n.d.a).

.5 Dame's Rocket

This Eurasian biennial wildflower was introduced to North America in the 1600s and has since invaded many moist woodlands and open spaces (Johnson, 2010). The plant spreads through abundant seed production during its three month long blooming period. There is currently a small population of dame's rocket (*Hesperis matronalis*) in BC-1. The plants can be pulled relatively easily from moist soil before the seeds mature in the spring. Depletion of the seed bank can take many years.

.6 Erect Hedge Parsley

Erect hedge parsley (*Torilis japonica*) was introduced from Eurasia in 1917 for reasons unknown (Kendall, 2021). It is a small biennial plant with parsley or carrot like leaves and small clusters of white flowers. The seeds of this plant have a hooked coat, which allows them to stick onto passing people or wildlife and spread to new areas. Erect hedge parsley can grow in almost any habitat, and produces up to 7000 seeds per plant, making it a threat to numerous native ecosystems.

A small population of erect hedge parsley can be found in the Tapleytown Woods. Hand pulling of sporadic plants can be performed between April and July before seeds start to develop and mature. For smaller patches, covering the plants with a black tarp to cook them in the sun and prevent photosynthesis is an effective strategy.

.7 Dog Strangling Vine

Dog strangling vine (*Vincetoxicum rossicum*) is an extremely invasive perennial which forms thick mats of vines crowding out all other vegetation (Anderson, 2012b). It is unclear how the European native arrived in Canada, but the first record is from Toronto in 1899. Dog strangling vine is a successful invader through altering the chemical composition of the soil, growing so densely it dominates ground cover, and producing many seeds which are readily carried by the wind.

Small pockets of dog strangling vine creep into the Tapleystown Woods from the population bordering the Dofasco 2000 Trail. Individual plants can be dug up so that all parts of the root are removed from the soil. Alternatively, herbicides can be applied to plants before their seed pods fully develop (May to August). Tarping to desiccate plants is not a viable solution for this population due to the lack of sunlight reaching the forest floor in this area. It is likely multiple years of treatment will be required until the seedbank is depleted. If staff cannot meet this timeline, the seed pods should be removed from all plants before maturity in order to control the spread (Anderson, 2012b).

.8 Glossy Buckthorn

Glossy buckthorn (*Rhamnus frangula*) is a member of the buckthorn family that mainly grows in wet areas, but can be found growing alongside common buckthorn in other habitats (Anderson, 2012a). This is a non-native tree species introduced from Eurasia about 100 years ago (NCC, n.d.). This species forms dense thickets that shade out native species. They produce a dark berry that ripens in late summer and is eaten by birds. The birds disperse the seeds. It is very invasive due to its high seed production and tolerance for varied growing conditions. Glossy buckthorn is growing among common buckthorn across the all Saltfleet properties. Glossy buckthorn is not as established as common buckthorn, but it is spreading rapidly. It will be important to begin the removal process for this species. It tends to be a weak plant and is easily pulled when small. Herbicide treatment can follow the same methodology as common buckthorn since they are closely related and will likely be treated concurrently.

.9 Reed Canary Grass

The Reed Canary Grass (*Phalaris arundinacea*) that has become invasive in Ontario is thought to be a Eurasian cultivar brought to Ontario as forage for cattle (Anderson 2012c). It displaces native wetland plants and can decrease biodiversity. This plant can grow in a range of habitats and spreads quickly in wetlands. It spreads by both seeds and rhizomes. This species can be shaded out through the addition of trees and shrubs to invaded areas. Mulch can also be used to suppress the growth of Reed Canary Grass. Areas invaded with Reed Canary Grass in Saltfleet Conservation Area (BC-1 and Vinemount Swamp) can be planted with trees and shrubs. These plantings will need to be monitored a few times during the growing season to remove any grass that grows onto them to prevent smothering. Wood chips could be used in conjunction with planting to suppress the Reed Canary Grass and giving the trees and shrubs space to grow. Alternatively, herbicide can be applied in the early growing season (Anderson, 2012c). A large population of Reed Canary Grass can be found at the Fifth Road East wetland property, as well as SCA (BC-1) near the newly constructed wetlands. Controlling the population of Reed Canary Grass bordering the constructed wetlands should be prioritized so it does not counteract efforts to create a functioning and biodiverse wetland ecosystem.

.10 Sweet Cherry

Sweet cherry (*Prunus avium*) is a widely grown ornamental tree which is native to Europe and Asia (Invasive Plant Atlas, n.d.). It is often found growing in fields or other open areas as well as forest edges (King County, 2018). While it has the potential to crowd out native

plants, it does not pose a serious threat to most ecosystems but should be controlled when it may threaten a particularly desirable plant community (Ontario Invasive Plant Council, 2013). There is currently some Sweet cherry bordering HCA property at Tapleystown Woods. This population should be monitored for spread and effects on the surrounding ecosystem.

.11 Winged Euonymus

Winged euonymus (*Euonymus alatus*) is an Asian ornamental shrub coveted for its stunning bright red fall foliage. However, this plant can create dense thickets in both forests and fields which outcompete native species (NRCS, n.d.). It tolerates a variety of environmental conditions, can reproduce vegetatively, and grows many seeds which can be spread by wildlife to colonize new areas. There is currently one Winged euonymus plant in Saltfleet at Tapleystown Woods just off Powerline Road. This is a non-fruiting tree, which means it will not grow seeds to spread, however it should still be controlled to prevent vegetative reproduction. Winged euonymus can be dug out so all the roots are removed, or it can be treated with chemical herbicides (NRCS, n.d.).

.12 Cut – leaved Teasel

A perennial plant that occurs in a variety of habitats including meadows, waste areas and roadsides. Cut-leaved teasel (*Dipsacus laciniatus*) has high seed production and can spread and take over areas. In its first year it is a large rosette and by its second year can grow up to 2m high, shading out other meadow species (MDA, n.d.b).

It can be found in the Fifth Road East wetland property in low numbers. Annual cutting of these plants can occur in the spring to damage the taproot since its full removal can be difficult (MDA, n.d.b). Alternatively, the plant responds well to annual herbicide treatment during the main growing season. Eradication can be achieved in 3-5 years when the seed bank is depleted.

.13 European Privet

European privet (*Ligustrum vulgare*) is a highly invasive ornamental shrub or small tree that is native to Europe, Western Asia and Northern Africa. It was introduced in the early 1800s, and has since colonized a range of different habitats due to its tolerance for a variety of soil types and environmental conditions (CABI, 2021). Plants may produce 10,000 fruits per tree, which are then spread by wildlife to seed in different areas. European privet also reproduces vegetatively by its roots, so care must be taken not to spread root fragments during control efforts (CABI, 2021).

European Privet can be found in small numbers at the Fifth Road East wetland property. Small shrubs in newly established populations can be pulled or dug up and properly disposed of. Larger populations require foliar sprays of herbicide mixed with a surfactant between August and December. Larger trees which are difficult to foliar spray can receive a basal spray (Miller, 2003).

.14 Garlic mustard

This species was introduced in the 1800's from Europe as an edible herb for early pioneers in the spring. It is a biennial plant that produces seed in its second year (Anderson, 2012d). It can grow in a variety of conditions making it a very good invader in a variety of habitats. It easily outcompetes other native ground cover and can change the soil environments to favour its growth over others. Garlic Mustard (*Alliaria petiolata*) can be found growing in low numbers at the Fifth Road East wetland property. A slightly more established population can be found at Tapleystown Woods. Removal of this species is fairly straight forward with hand picking between April and June, before the plant goes to seed. With a dedicated effort over 5 years removal of this species can be achieved.

.15 Multiflora Rose

Multiflora rose (*Rosa multiflora*) is a large perennial shrub that was introduced to North America in the late 1700s for horticultural purposes, and was widely promoted in the 20th century for a variety of uses (Warne, 2018). This plant grows quickly, can self-pollinate, produce up to 500,000 seeds a year or more, and forms dense thorny thickets rapidly crowding out native biodiversity. Seeds are widely spread through animal's consumption of the plant's fruits, and can be viable in the seed bank for up to 20 years (Warne, 2018).

There is a small population growing in the Tapleystown Woods. Hand pulling is an effective control method for seedlings, however larger shrubs will aggressively re-sprout if cut without removing the roots. Therefore, a weed wrench and/or shovels should be used to fully remove the plant. This is a labour-intensive solution and should prioritize small populations and sensitive areas. Alternatively, glyphosate-based chemical herbicide can be applied in late summer or early fall. A follow up-treatment may be required the following year, with ongoing monitoring to eliminate new seedlings (Warne, 2018).



6.0 OVERALL SITE CONCEPT

This Master Plan for SCA balances the need to conserve the natural environment and wetland areas while accommodating visitors and generating day-use revenue.

As noted in Section 4.1 Study Area, the main focus of this plan is the Saltfleet Conservation Area property (182 acres) as this is the visitor entrance. This section outlines the key concepts for this Master Plan that have come out of staff workshops, meetings, detailed design sessions, site inventory. Public and stakeholder comments have also been considered in developing these concepts. See Appendix 1 for more information.

6.1 Natural Areas Development

The priority of this plan is to conserve and protect the natural areas and environmentally significant natural areas of the Escarpment. Accordingly, Nature Reserve and Natural Area Conservation Zones have been identified in this plan with management guidelines as outlined in Section 3.6. The ecological mapping and species documented within this plan are also provided as a baseline inventory to help guide future land management decisions and project planning. See Section 5.16 for more on the natural area recommendations.



Development in the natural areas will be limited by HCA. HCA's development focus in the natural areas will be securing the perimeter from unauthorized access; management of the recreational trail system; forest management, hazard tree removals and tree planting; invasive species management; and the design and construction of wetlands. With the creation of new wetlands will come the restoration of natural areas affected by the wetland construction; supplementary wetland plantings; and monitoring of the wetland functions and wildlife.

The wetland complex on the BC-1 property was constructed during the writing of this plan. Future wetland projects are in the planning phase for the SC-8 property (Fifth Road East and Green Mountain Road) and SC-5 property (see 2022 Devil's Punchbowl Master Plan for more information). There is also potential for additional wetland construction projects on lands yet to be acquired.

Naturalization of a portion of the former agricultural lands is recommended as a priority item in this plan, with action taken annually on invasive species control, tree planting, and stewardship to move this forward.

Site monitoring, annual maintenance and restoration programs, and ongoing visitor education will also be necessary to support the goals of these initiatives.

6.2 Conservation Area Development

The priority of this plan is the opening of the conservation area to the public, with visitor amenities for passive recreation and education. The main development focus will be to provide an improved main entrance, parking area, washrooms, trailhead orientation, and recreational trails on site and connecting to the Dofasco Trail. The secondary development focus will be to provide for conservation area operations with a separate service entrance off Second Road. Maintenance and equipment access will also be required for the wetland areas.

6.3 Day Use Activity Areas

Saltfleet's day use activity areas include the visitor main entrance and parking area, recreational trail system, access to the Dofasco Trail, and access to the constructed wetlands. Amenities to be provided with the recreational trail system are to include trail head kiosks or map boards, wayfinding and interpretive signage, lookout stations, and rest areas.

Passive recreation will be the focus for nature appreciation, hiking, dog-walking, and cycling. Open air structures and site furnishings are to be provided at the parking area for visitors arriving from the Dofasco Trail and First Road. Public washrooms are to be provided.

Visitor education on permitted activities will need to be provided to help conserve and protect the natural areas and wetlands. For example, cycling is not recommended on any seasonally flooded wetland trails, dogs are to be kept on leash, and recreational activities such as swimming and winter skating are not permitted in the wetland ponds.



6.4 Marketing

Marketing and communications activities for SCA provided by HCA include promotion through print, the HCA website, and on various social media platforms. During public engagement for this plan, three visitor surveys were conducted to gather information on SCA, Devil's Punchbowl, and the market lands with the Punchbowl. From May 18 to September 9, 2022, a total of 282 surveys were submitted by the public, of these 150 surveys were submitted for the

conservation area.

See Appendix 5 for key highlights from the visitor surveys. These surveys will help inform future marketing materials for SCA.

Key marketing items from the surveys and staff workshops to be addressed in the lifespan of this Master Plan include the following:

- Provide safe and accessible visitor amenities: parking, public washrooms, and recreational trails.
- Provide educational information for Saltfleet Conservation Area focused on: nature, flora and fauna identification, bird migration and bird species, wetlands, geology, land history, cultural history of this area.
- Provide guided tours: the wetlands, birdwatching, natural and cultural history of the area.
- Provide self-guided tours by means of interpretive materials, signage, and wayfinding signage
- Provide information on the importance of preserving nature and protecting it from damage.
- Help connect people to nature by promoting SCA's amenities for community recreation, health and well-being.



7.0 CONSERVATION AREA MANAGEMENT

7.1 Land and Water Management

1 Management Planning

Land and water management planning will be accomplished through adherence to the guidelines of the Conservation Area Zones noted in this Master Plan, and through additional resource management plans developed by HCA as necessary during the life of this Master Plan. The overall intent will be to ensure protection and conservation of the significant natural areas at Saltfleet noted as Nature Reserve (Wetland) and Natural Zones, and the Cultural Heritage Zones noted on the maps in Appendix 1, as well as implementation of the Natural Areas Recommendations noted in Section 5.16.

Significant natural heritage features identified at SCA include Environmentally Significant Areas (ESA) and wetlands. These areas are identified in the City of Hamilton Official Plan as Core Areas and part of the Natural Heritage System. The Official Plan provides for the protection of such features, and no new development or site alterations are permitted within or adjacent to ESA's unless it can be shown, through an Environmental Impact Statement (EIS) that there will be no negative impacts on the ecological features or functions of the ESA. The floodplain associated with Battlefield Creek is also protected from development under both provincial and HCA policies. Significant wildlife habitat is also protected under provincial policy.

Significant cultural heritage features at SCA include the registered archaeological sites documented for the BC-1 wetland project. With their cultural significance and covenant on title noted in Section 4.7, future capital projects will need to include archaeological investigations in their scope of works. In the absence of archaeological investigations, soil disturbance for site operations and maintenance is not permitted. However, minor landscaping activities on or above the surface of the site including the addition of topsoil up to 50cm maximum fill (combined existing and new fills) and grass cutting are permissible.

Waste consisting of natural materials will be reused or composted inside the conservation area where feasible and appropriate. Otherwise, all solid waste will be removed from the conservation area for recycling or disposal.

Wherever possible, new development or redevelopment will be undertaken so as not to disrupt natural drainage. Zone resource management plans will seek to restore natural drainage where it has been disrupted by past or present development.

2 Public Infrastructure – Utilities, Trails and Transportation

Public infrastructure such as utility corridors (watermains, storm and sanitary sewers, natural gas or oil pipelines, hydro and communication corridors), trails (footpaths, boardwalks) and transportation links may cross conservation area lands. These uses may also have associated rights-of-way, land use agreements, licenses of occupation, permits etc. that are to be considered in the management of the conservation area and when implementing items from

this Master Plan.

When new public infrastructure projects are proposed within conservation area owned lands, such uses will be subject, but not limited to the following criteria:

- The need for the project, area of construction disturbance, and potential site disruption such as soil erosion, flooding, and vegetation loss.
- To maintain or where possible improve or restore key ecological linkages, habitat, and wildlife movement corridors.
- The potential public benefits of the project for research, education, or recreation in the conservation area.

HCA may require detailed environmental assessments, studies, and resource management plans in order to support such land uses.

7.2 Vegetation Management

This section supplements the natural areas recommendations noted in Section 5.16.

Where active management is required for a particular plant or animal species, it will be accomplished through an acceptable HCA resource management strategy considering the guidelines outlined in this Master Plan, and in accordance with policies of all governing agencies.

Forests will be managed in accordance with the MNRF approved HCA Managed Forest Plan 2018 - 2037. Forest plantations and treed areas will also be managed to remove hazard trees and fallen logs in areas of public use such as recreational trails and picnic areas. Forest management is to be carried out with generally accepted sustainable forestry practices. See Appendix 5 for more information from the HCA Managed Forest Plan.

Invasive species in the conservation area are a high priority for management to maintain biodiversity and conservation values. See Section 5.16 for more information on invasive species vegetation management.

Additional non-native plant species will not be deliberately introduced into the conservation area. Introduction of any new plant species by HCA will consider the biodiversity of this site and contiguous surroundings, historical data of species present in the area, native species research findings, and additional relevant species inventories, within an approved restoration and stewardship strategy. In this Master Plan “non-native” means species not native to Ontario as well as species native to Ontario but not to SCA. If established non-native plant species threaten natural heritage values, a program for their eradication will be developed subject to specific guidelines noted in the natural heritage inventory of this Master Plan.

Vegetation may be mowed only:

- Along the conservation area boundary, where mowing would assist in clearer

boundary identification.

- In the development zone of this Master Plan to support public use of the open space, and only to the extent necessary.
- As required along roadways and recreational trails for safety.
- To assist in the control of invasive species, trees and brush may be cut and pruned only.
- To enable resource management or facility development specifically authorized by this Master Plan or an HCA approved resource management or other implementation plan.
- To ensure public safety.
- In service easements i.e., Utility corridors, subject to specific service agreements.

Trees may not be cut for the sole purpose of providing firewood. Trees and brush cut in nature reserve and natural zones outside of the forest plantations will be left to deteriorate naturally as close as possible to where they have been felled, or if that is not feasible, may be used for firewood or wood chips in the conservation area.

Native insects and diseases affecting vegetation will be allowed to progress naturally, except where they threaten significant natural heritage values in nature reserve and natural zones, or significant aesthetic and infrastructure values in development zones. Non-native insects and diseases will be controlled where feasible. Where controls are undertaken, it will be directed as narrowly as possible to the specific insect or disease so as to have minimal effects on the surrounding environment. Biological controls will be used whenever possible.

Fires in the day use area are not permitted.

Chemical fertilizers, herbicides, pesticides and suppressants will not be used for any vegetation management purpose except:

- Insect and disease control under the conditions set out in this section of the Master Plan.
- Eradication of non-native species where it has been demonstrated other methods are not feasible.
- Control of poison ivy in development zones.

7.3 Fish and Wildlife Management

Where applicable on the conservation area property, fisheries management will seek to maintain and enhance native, self-sustaining fish populations. Where applicable, waters in nature reserve zones may be closed to angling temporarily or permanently for fisheries or wildlife research or management purposes.

Currently no fishery exists on the property as the species present are mainly not game fish. These populations are stressed from the intermittent nature of the creek and the local agricultural drainage impacts. Thus, no commercial or recreational fishing/harvest will be allowed on the properties. See Section 5.2 for more information.

For Terrestrial Flora and Fauna there is no harvest allowed within the conservation area to protect the populations with an exception for Research (see Section 7.7)

For wildlife/human conflict HCA has developed the Hamilton Conservation Authority Wildlife Conflict Management Strategy (WCMS) this strategy outlines the process and methods staff are to follow when dealing with any animal related issues in the Saltfleet Conservation Area. This document was produced by the Hamilton Conservation Authority Wildlife Management Committee (WMC). The WMC was a special committee of the Hamilton Conservation Authority (HCA) that was established in May 2014 based on HCA staff recommendation and at the direction of the HCA Board of Directors. The purpose of the WMC was to develop best management protocols and practices for the management of wildlife on HCA lands.

See Section 5.0 for more information on wildlife populations inventoried and to be considered in this plan. All capital assets proposed for the conservation area are to be evaluated for wildlife impacts, and best management practices and strategies developed that address both wildlife management and capital asset protection.

Additional non-native animal species will not be deliberately introduced to the conservation area. If already established non-native species threaten the conservation area values, a program for their eradication may be developed if feasible and practical. Missing native species may be re-introduced, and existing populations replenished if feasible and acceptable to HCA.

7.4 Cultural Heritage Management

Significant cultural heritage features, such as the registered archaeological sites, will be protected from incompatible development in the conservation area. Incompatible resource uses and recreational activities will be restricted or prohibited where necessary to protect cultural heritage resources. The cultural heritage zone set out in this plan is intended to define the area on site where this protection is to be enforced by HCA.

See Sections 4.6 and 4.7 for more information on the cultural heritage features and restrictive covenant placed on the documented archaeological sites.

Archaeological and historical artifacts may not be removed or heritage landscapes altered. Management strategies for any archaeological sites found in the future may range from allowing the sites to remain without interference, to research, excavation, and rehabilitation in accordance with the Ontario Heritage Act and associated governing agencies. Protection and management will be undertaken in consultation with all governing agencies and First Nations.

7.5 Conservation Area Operations

HCA will provide staff with information and resources as required to operate the conservation area on a day-to-day basis. This will include specific direction for the management and operation of all facilities and activities and address such topics as budgets, staffing, maintenance, enforcement and emergency services. The operation plan will be reviewed annually and updated as required to ensure adequate resources and staffing are available to manage the property and level of visitation.

Self-serve facilities may be developed, and individual volunteers and partner organizations may be involved in conservation area programs as approved by the HCA.

HCA has the right to suspend operations of any facilities or services due to funding limitations, but in so doing will ensure that heritage values are not impaired and customer service standards are affected as little as possible.

New business practices may be introduced into the conservation area operations in accordance with HCA policy such as:

- Improving operating efficiency and controlling costs
- Contracting out some operating functions.
- Improving customer service standards.

7.6 Education

Education in the conservation area is intended to develop visitors' awareness and appreciation of Ontario's natural and cultural heritage, fostering a commitment to protect that heritage for all generations. Education opportunities are meant to be educational and recreational, formal and informal, and accessible to all. Information, education, and outdoor recreation are the three main components of education in the conservation area. The level of service provided at the conservation area will be determined by its significance and visitation.

See Section 6.4 and Appendix 5 survey highlights, for more information on education and interpretive items obtained through public consultation and surveys.

7.7 Research

Saltfleet, like all of HCA's properties, provide in essence an opportunity for living laboratories. HCA Ecologists monitor the health of lands using established protocols as well when needed can develop special research programs to answer resource related questions.

Outside Research by qualified individuals that contributes to the knowledge of natural and cultural history and to environmental and recreational management will be encouraged by HCA staff.

All research projects will require authorization from HCA and authorization is obtained by contacting the staff ecologists who administer the process and issue letters of permission.

7.8 Recreation

From consultation and surveys for this plan, both hiking and cycling were noted as key recreational activities for SCA. Cyclists are interested in trail riding in the study area, on the Dofasco 2000 Trail, and connecting to the City of Hamilton recreational trail network. Safe and accessible trails for all age groups and abilities are also desired.



The conservation area is to operate as a day-use area open from sunrise to sunset, year-round.

Entry to SCA will be controlled year-round, and HCA will enforce the collection of entrance fees from visitors. Day use parking spaces are provided on a first come, first serve basis and visitors may be restricted from entering the conservation area when the parking areas are full.

The following motorized recreational activities will not be permitted in the conservation area:

- All-terrain vehicle use
- Motor bikes on trails
- Snowmobiling
- Unmanned aerial vehicle (UAV)
- All motor-powered watercraft in the constructed ponds/wetlands

In order to sustain the wetland functions for flood control and protect the wetland ecosystem, all water-based recreational activities including fishing, swimming, personal watercraft (canoe, kayak, SUP) and winter skating are not permitted.

The following recreational activities are permitted in the conservation area:

- Hiking
- Dog Walking
- Cycling (on designated trails)

- Nature Appreciation: Wetlands, karst Features, Wildlife, Birdwatching
- Picnicking
- Geocaching
- Winter Activities: Snowshoeing, Cross Country Skiing

A long-term goal of this Master Plan is to provide visitors with appropriate, high quality sustainable recreational experiences. Recreational opportunities are to be provided that are appropriate to the conservation area and Master Plan zones outlined in Section 3.6.

7.9 Partnerships

HCA values the community support from area residents and landowners, businesses, service clubs, interested First Nations, volunteers, and volunteer organizations that currently or could contribute in a variety of ways at SCA. The HCA will continue to nurture support and will seek out new opportunities for partnerships. Collaborative partnerships are welcomed to help HCA efficiently achieve its goals and objectives at the conservation area.

HCA also values the relationships with neighbouring landowners and working cooperatively to manage natural areas and the species that utilize and inhabit Saltfleet's natural areas. HCA Stewardship Action Plans, public consultation, and stewardship work are examples of this and are to be encouraged for the life of this Master Plan.

Volunteers are governed by volunteer policies set by HCA. Volunteer programs shall be maintained and developed to provide for recruitment, orientation, training, supervision, health and safety instruction, evaluation and recognition. Volunteer programs shall be considered in all business decisions made by HCA in the operation of this conservation area.

7.10 Paid Staff

A supplemental operations plan is recommended to be developed for SCA by HCA staff once this Master Plan is adopted.

SCA, similar to staffing at other conservation areas, includes full time permanent employees and part time casual employees to undertake its operations.

In addition, staff from other departments at HCA are involved in varying capacities with the management and operation of the conservation area. Staff may also be involved in supervising the activities of outside consultants, partners, or contractors retained by HCA.

8.0 FINANCIAL

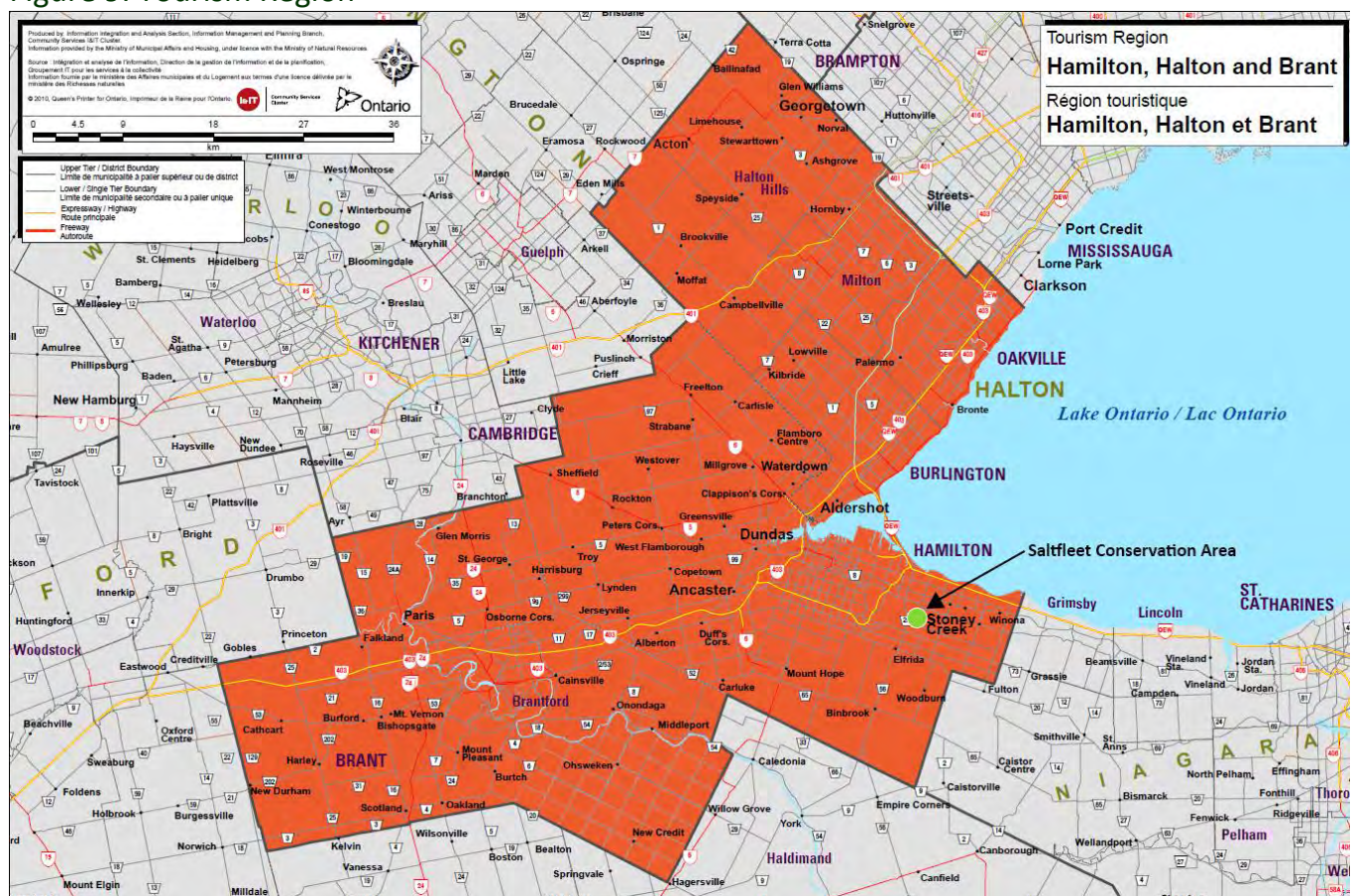
8.1 Attendance and Revenue Forecasts

Visitor attendance data, and operating revenue and expenses for SCA is appended. Further analysis of the visitor data is in Section 8.4.

Visitation is anticipated to grow steadily during the life of this plan, as day-use facilities are provided by HCA and visitors experience SCA and the Devil's Punchbowl. The parking lot and trails will help support overflow of visitors seeking to park at Devil's Punchbowl. Day use visitation offers opportunities for revenue generation for HCA's East Mountain business unit. Marketing of the HCA membership pass program, as well as special events and programs hosted at the conservation area may also help to attract and retain repeat visitors.

With the newly constructed wetlands completed and the site now opened to the public, more detailed design is recommended to improve the main entrance, parking, trail access, washroom facilities, and passive recreational amenities. See Section 8.2 for more information.

Figure 9. Tourism Region



Source: Ontario Ministry of Tourism, Culture and Sport.

8.2 Capital Projects

The capital development priorities list in Appendix 2 provides preliminary estimates for the development envisioned in the Master Plan. As noted in Section 3.7, the following capital development priorities are proposed for the next ten years at SCA.

1 Natural Areas Development

For conservation and protection of the natural environment, establishment of the new wetland areas, and naturalization of the former agricultural lands. Key items include:

- Design and construction of new wetland on SC-8 property.
- Wetland naturalization plantings and management: invasive species control, restoration, berms.
- Provide equipment access and turn-around areas for the wetland berms.
- Install perimeter fencing to restrict unauthorized access.
- Install wetland trail system and interpretive signage.
- Conversion of the agricultural lands (resource management zones) to naturalized areas.
- Forest management and natural areas stewardship.
- Further investigation of the karst features for their management and interpretation.



2 Conservation Area Development

To support the opening of the conservation area to the public, with visitor amenities for recreation and education. Key items include:

- Improved main visitor entrance: roadways, signage, automated gates, lighting, parking.
- Permanent washroom facilities.
- Site furnishings: picnic tables, trash cans, rest areas (natural stone seating), bike racks.

3 Day Use Activity Areas

To support passive recreation for visitors arriving from the Dofasco Trail and First Road. Key items include:

- Recreational trail system: Trail kiosks and wayfinding signage; new trails to the wetlands, Dofasco Trail, and karst features.
- Lookout Areas: for the wetlands and the karst features on the property.
- Education: Interpretive signage, digital information, mobile information applications.

8.3 Funding Sources

Funding totaling \$4.75M was secured through the Heritage Green Community Trust, the City of Hamilton, the Hamilton Conservation Foundation and the HCA Land Acquisition Fund for the acquisition of Saltfleet Conservation Area. The Heritage Green Community Trust donated \$2 million towards the acquisition and development of SCA and has pledged an additional \$2 million by 2026 for further wetland development. The first wetland trail that opened to the public in September 2022 was named the Heritage Green Community Trust Trail. The City of Hamilton is also a key partner and donor to the wetland project.

Grants from various sources including the Greenbelt Foundation, RBC Foundation and Green Municipal Fund have also been received and staff will continue to apply for grants and funding as sources are identified.

HCA's operation of SCA is to be primarily self-funded. User and membership fees generated by the properties in the East Mountain business unit are anticipated to be the primary funding source for the operation of the conservation area. Automated gates are to be installed at SCA to help add to the revenue of the business unit.

Revenue is anticipated to be generated through gate admissions (gate and pre-sold tickets), and vehicle passes to the parking area. Special events and programs may provide a source of additional revenue, provided they do not disrupt the daily activities in the conservation area. Financing for special projects and annual capital development will continue to be provided through grants, sponsorship, corporate donations, and private donations. The Hamilton Conservation Foundation also provides funding for specific projects. There is good potential for increasing donor funding, donor recognition is also a key element that needs to be nurtured and sustained.

8.4 Business Model

See Appendix 4 for the estimated operating revenue and expenses for this new conservation area. These estimates are based on current operating revenues from HCA's East Mountain business unit, and revenues anticipated from the installation of a gated 40 to 50 car parking lot as noted on the Site Concept Maps in Appendix 1. A supplemental operations plan is recommended to be developed for SCA by HCA staff once this Master Plan is adopted.

HCA receives a levy from the City of Hamilton and the Township of Puslinch that forms part of the operating budget. The remainder of the budget is funded through user fees, membership fees, grants, and donations. These dollars directly contribute to conservation work throughout HCA's watershed and preserve heritage sites on HCA lands. Financial statements are audited annually and available to the public once approved by HCA's Board of Directors.

User and membership fees help pay for items such as trail maintenance, emergency services and procedures, and all the items required to keep the conservation area open to the public.

Sustaining revenue at Saltfleet will require HCA to refine their marketing, business, and development strategies to:

- Continue to attract day use visitors and provide quality recreational facilities and services so they will be encouraged to return.
- Continue to market the HCA visitor pass card for repeat visitors and provide card swipe access to capture revenue from visitors entering the conservation area.
- Diligently sustain the natural resource value of the conservation area by limiting activities to the zones prescribed in this Master Plan.
- Continually monitor day use visitation and conduct on-site and market research campaigns as necessary to measure visitor satisfaction.
- Continue to explore pilot projects and best management practices as means of operating efficiently and growing revenue.
- Continue to leverage municipal tourism industry partnerships, public relations, community outreach, and corporate sponsorship.

Cost recovery is a prime requirement for all services and programs delivered at SCA. In the development of programs, the following factors will be considered: anticipated attendance, income sources, market, volunteer resources, HCA staffing requirements, advertising, insurance, administration, operation costs and maintenance expenses.

Concepts embodied in this Master Plan are to be weighed against the marketing demands for increased performance, attendance, programming, market penetration, awareness, and ultimately financial return.



9.0 PROGRAMMING

9.1 Special Events and Programming

Parking, trail access, and washroom facilities are essential for hosting special events and programs in the conservation area. Temporary accessible washrooms (portable toilet) are to be provided until permanent washroom facilities can be implemented.

SCA may be used as a filming location to generate revenue, with strict procedures in place so the integrity of the site is not sacrificed.

Community and school groups and organizations are welcomed to book visits to the property for educational programs, site tours, day-use activity programs etc. with strict procedures in place so the integrity of the site is not sacrificed.

9.2 Education and Interpretive Programs

Education and interpretive programs provide an opportunity to entice new visitors and provide variety for repeat visitors. Opportunities range from self-guided tours with interpretive signs or mobile device story spots along the trail system, to hands-on activities, educational demonstrations, live shows, workshops, and more. Some potential themes that could be explored include:

- Water management and flood control
- Constructed wetlands
- Bird watching
- Local history and the archaeology of this site
- Karst topography
- The Niagara Escarpment
- Role of Conservation Authorities
- Climate Change

All programs should relate to HCA's strategic value of providing outdoor learning experiences and increasing knowledge and awareness of the value of our environment and heritage.

10. SUMMARY

Saltfleet Conservation Area is HCA's newest area to explore and boasts nearly 147 ha (363 acres) of unique natural features. The acquisition of land for this conservation area was made possible through donations from the City of Hamilton and Heritage Green Community Trust.

SCA is part of a larger long-term plan to reduce downstream flood risk and erosion to residential and commercial properties below the Escarpment in Stoney Creek. The Upper Stoney Creek and Battlefield watershed was selected for the creation of four new wetlands in support of this plan. The wetlands at SCA are the first to be constructed. The second wetland is planned upstream on the SC-8 land parcel. The third wetland is targeted for installation near the Devil's Punchbowl, on lands recently acquired by HCA. A new management plan for Devil's Punchbowl is being developed with this plan in mind. The fourth wetland is expected to be developed as additional land is acquired.

The conservation area wetlands, marshy fields and woodlots provide habitat for waterfowl, migratory and breeding birds, as well as bats and other significant species. There are also natural and cultural history features on site to be interpreted with further trail development.

During the writing of this plan SCA re-opened to the public on September 23, 2022. The Heritage Green Community Trust Trail is the first trail installed for visitors to view one wetland area and access the Dofasco 2000 Trail. Further trails are outlined in this plan to enhance public access, nature appreciation, and educational opportunities.



This Master Plan identifies the natural features of the property to be protected, natural area management recommendations, and land use zones intended to help guide future planning, development, and management of the conservation area. Moving forward over the next ten years this plan will help guide the development and operation of this new conservation area in support of these goals.

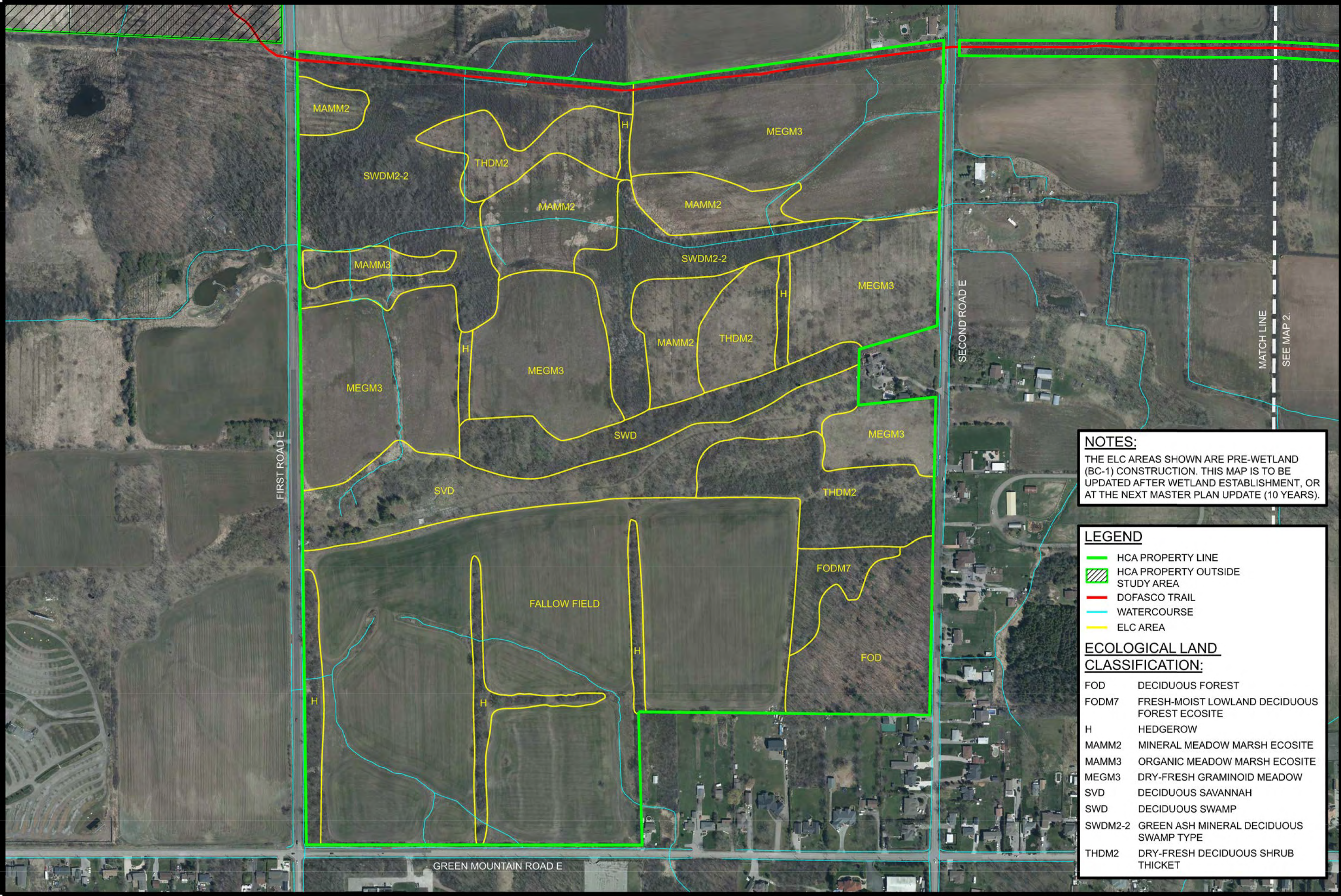
11.0 APPENDIX CONTENTS

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APPENDIX 3	Operating Revenue and Expenses
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APPENDIX 5	Managed Forest Plan Recommendations 2018 – 2037
APPENDIX 6	Natural Inventory – Species Lists, References
APPENDIX 7	References

APPENDIX 1

Mapping

Map 1	Ecological Land Classification 1
Map 2	Ecological Land Classification 2
Map 3	Master Plan Zones
Map 4	Master Plan Zones
Map 5	Trails Master Plan
Map 6	Site Concept – Main Site
Map 7	Site Concept – Satellite Sites



NOTES:
THE ELC AREAS SHOWN ARE PRE-WETLAND (BC-1) CONSTRUCTION. THIS MAP IS TO BE UPDATED AFTER WETLAND ESTABLISHMENT, OR AT THE NEXT MASTER PLAN UPDATE (10 YEARS).

- LEGEND**
- HCA PROPERTY LINE
 - HCA PROPERTY OUTSIDE STUDY AREA
 - DOFASCO TRAIL
 - WATERCOURSE
 - ELC AREA

ECOLOGICAL LAND CLASSIFICATION:

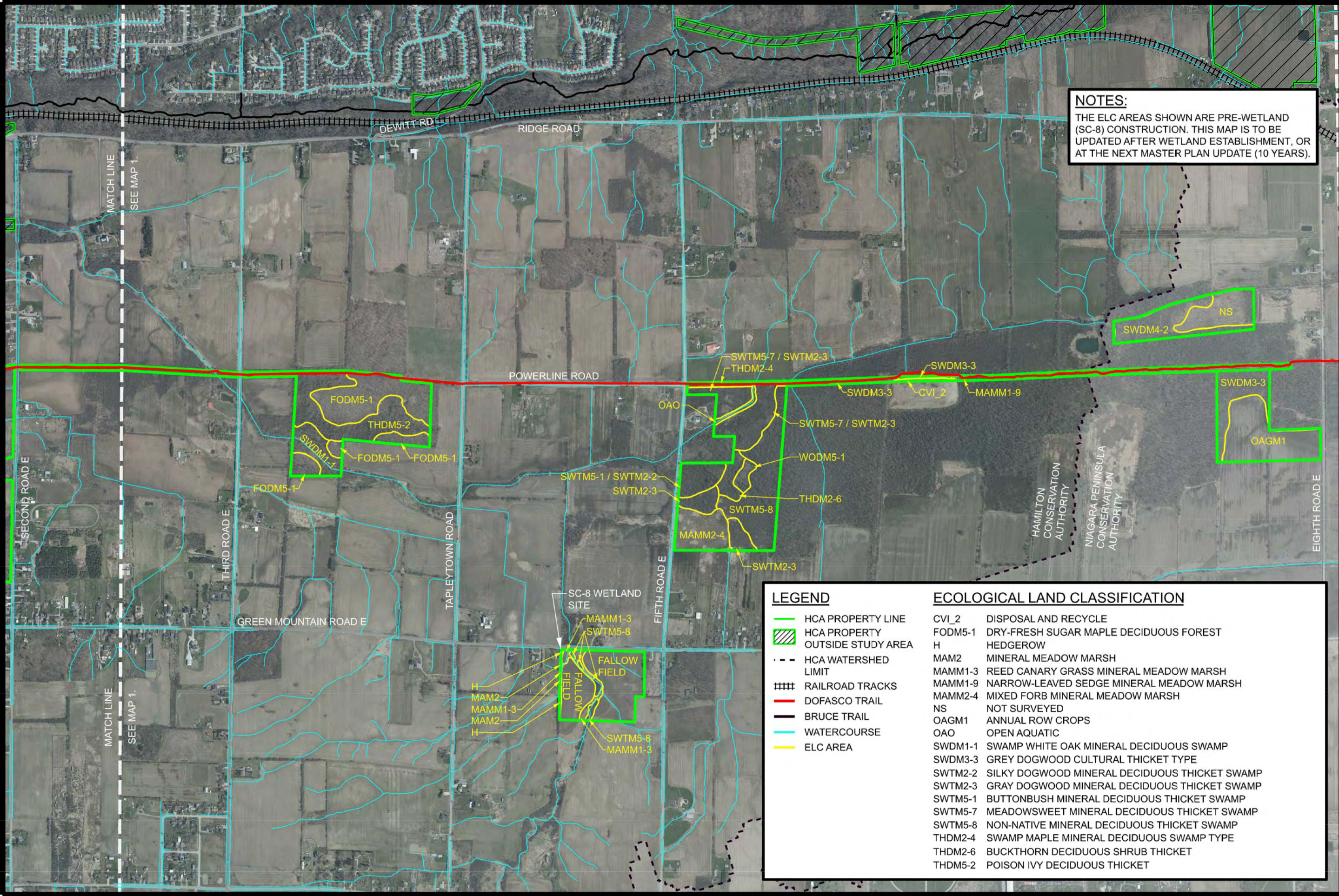
- | | |
|---------|--|
| FOD | DECIDUOUS FOREST |
| FODM7 | FRESH-MOIST LOWLAND DECIDUOUS FOREST ECOSITE |
| H | HEDGEROW |
| MAMM2 | MINERAL MEADOW MARSH ECOSITE |
| MAMM3 | ORGANIC MEADOW MARSH ECOSITE |
| MEGM3 | DRY-FRESH GRAMINOID MEADOW |
| SVD | DECIDUOUS SAVANNAH |
| SWD | DECIDUOUS SWAMP |
| SWDM2-2 | GREEN ASH MINERAL DECIDUOUS SWAMP TYPE |
| THDM2 | DRY-FRESH DECIDUOUS SHRUB THICKET |



DATE: 2023/02/06

**ECOLOGICAL LAND CLASSIFICATION
SALTFLEET C.A. MASTER PLAN**

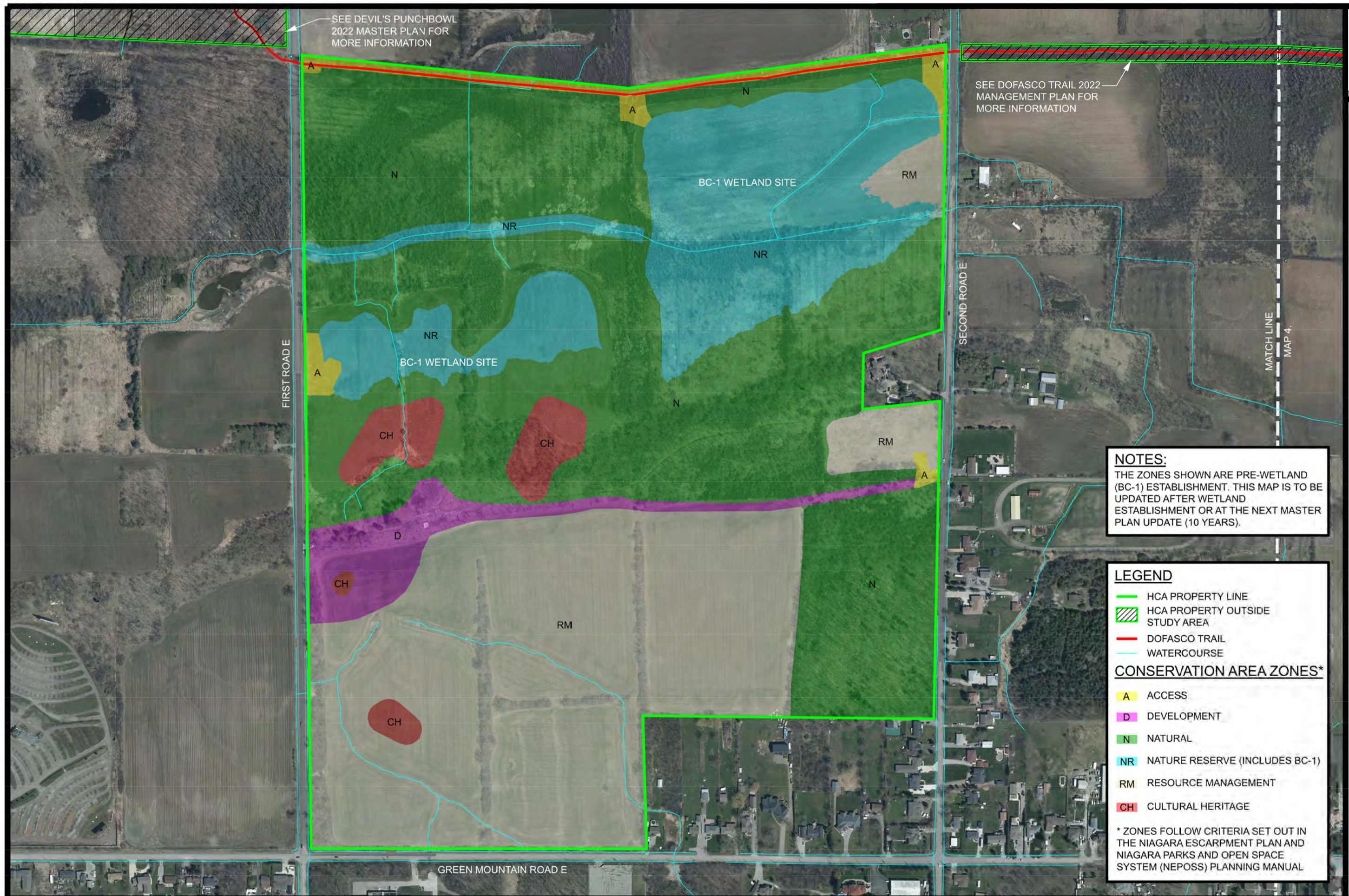


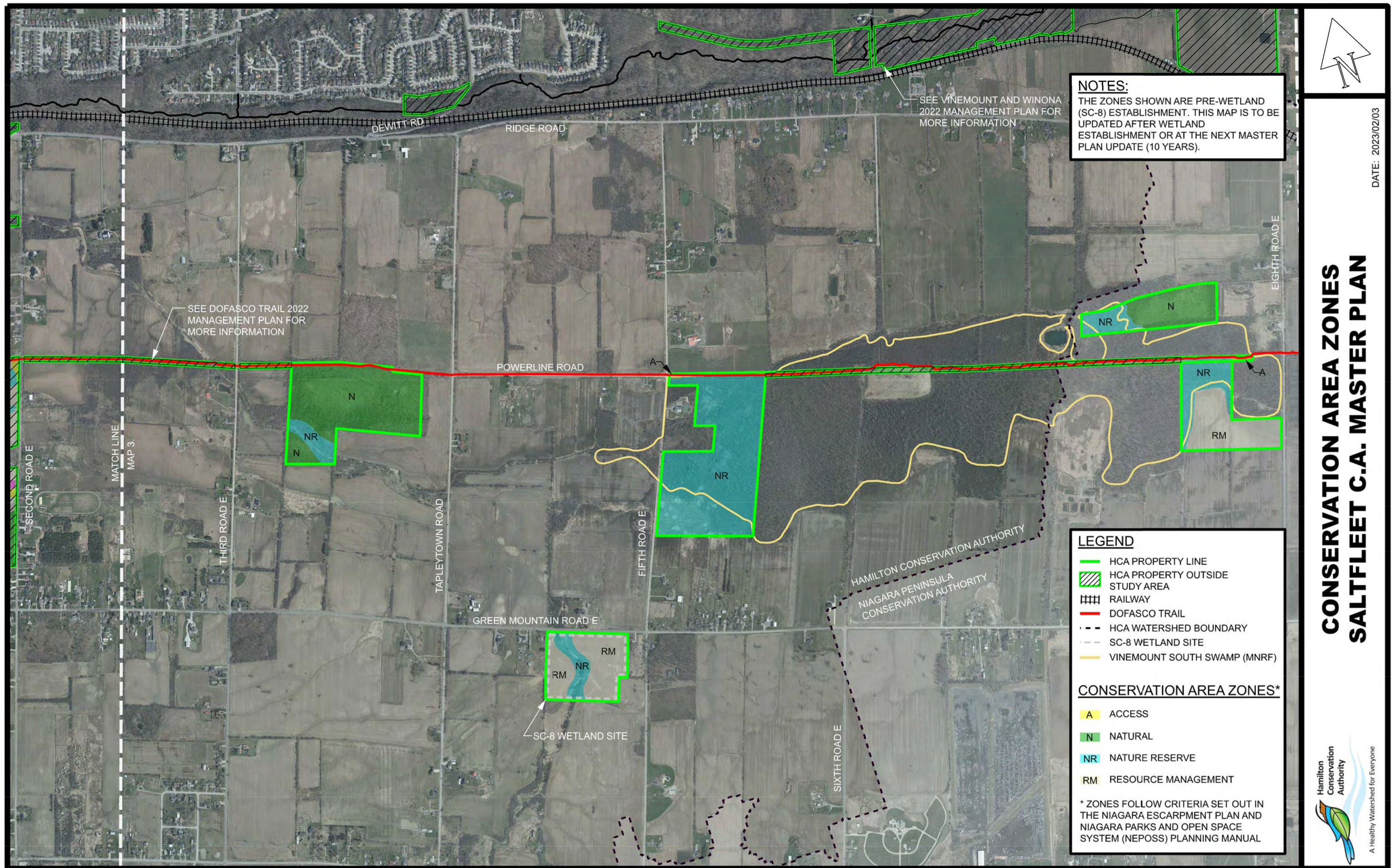


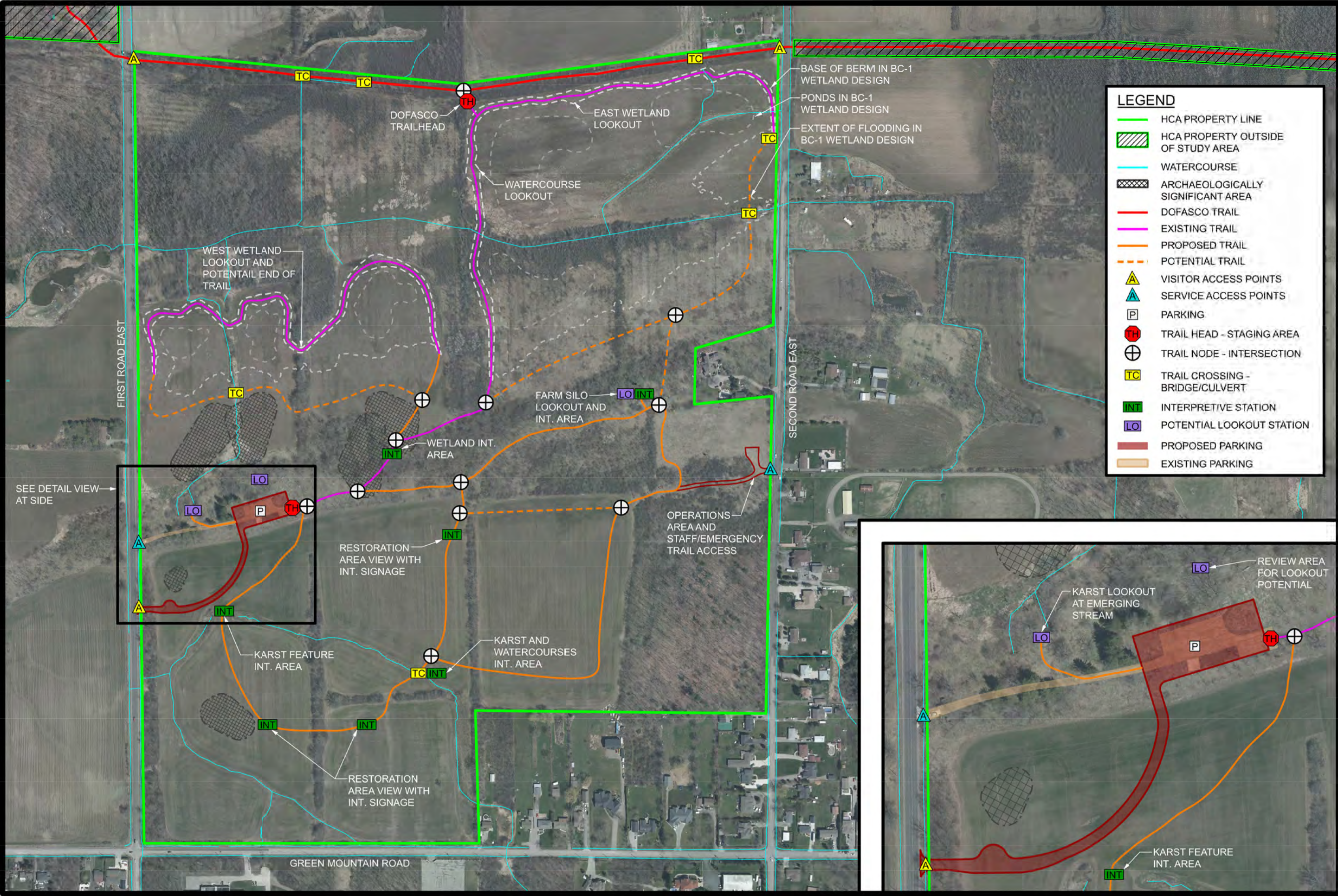
ECOLOGICAL LAND CLASSIFICATION
SALTFLEET C.A. MASTER PLAN

DATE: 2023/02/03









LEGEND

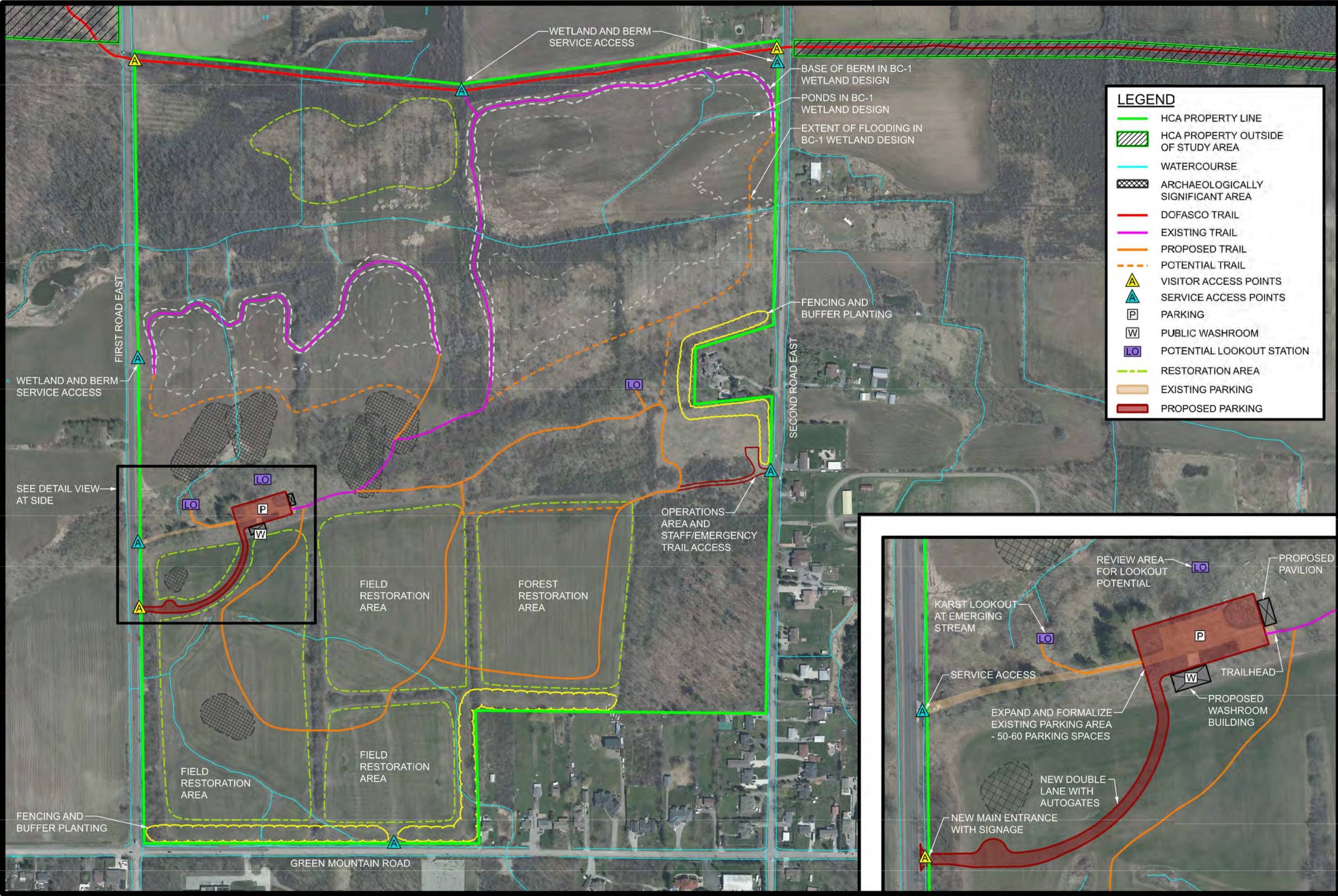
- HCA PROPERTY LINE
- HCA PROPERTY OUTSIDE OF STUDY AREA
- WATERCOURSE
- ARCHAEOLOGICALLY SIGNIFICANT AREA
- DOFASCO TRAIL
- EXISTING TRAIL
- PROPOSED TRAIL
- PCTENTIAL TRAIL
- VISITOR ACCESS POINTS
- SERVICE ACCESS POINTS
- PARKING
- TRAIL HEAD - STAGING AREA
- TRAIL NODE - INTERSECTION
- TRAIL CROSSING - BRIDGE/CULVERT
- INTERPRETIVE STATION
- POTENTIAL LOOKOUT STATION
- PROPOSED PARKING
- EXISTING PARKING

TRAILS MASTER PLAN
SALTFLEET C.A. MASTER PLAN

DATE: 2024/02/07

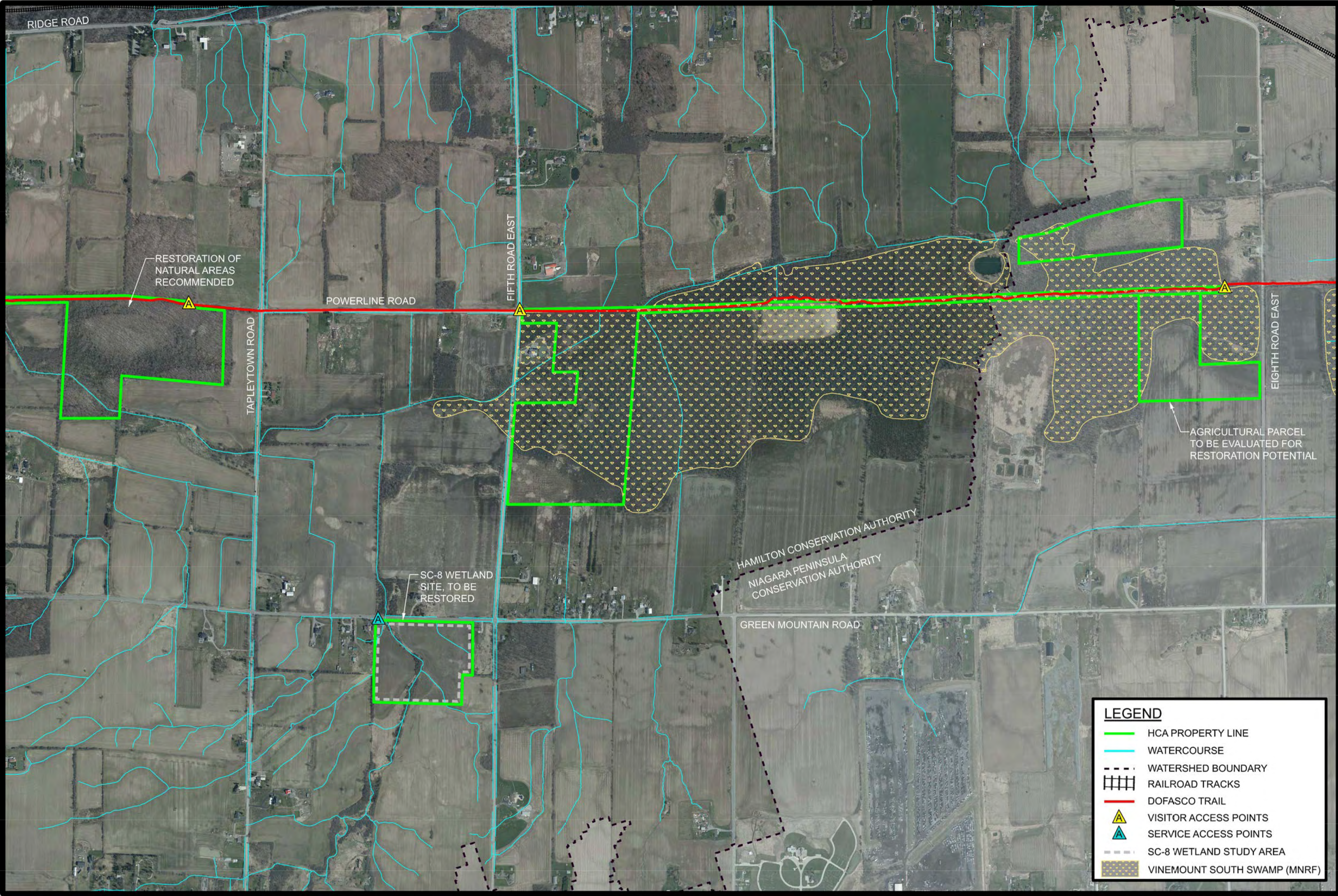


A Healthy Watershed for Everyone



SITE CONCEPT - MAIN SITE
SALTFLEET C.A. MASTER PLAN

DATE: 2024/02/07



LEGEND

- HCA PROPERTY LINE
- WATERCOURSE
- WATERSHED BOUNDARY
- RAILROAD TRACKS
- DOFASCO TRAIL
- VISITOR ACCESS POINTS
- SERVICE ACCESS POINTS
- SC-8 WETLAND STUDY AREA
- VINEMOUNT SOUTH SWAMP (MNRF)



DATE: 2023/02/06

SITE CONCEPT - SATELLITE SITES
SALTFLEET C.A. MASTER PLAN



APPENDIX 2

Capital Development Priorities

SALTFLEET CAPITAL DEVELOPMENT PRIORITIES: 2022 - 2032

A. Site Concept Improvements ***Budget (1.81M)**

A1	New Entrance Road and Parking Lot	\$ 100,000
A2	Parking Lot Automated Gates	\$ 50,000
A3**	Public Washrooms	\$ 750,000
A4	Service Access and Operation Areas	\$ 25,000
A5	Multi-Use Trails & Wayfinding Signage	\$ 400,000
A6	Open Air Structures – Trail Kiosks, Pavilion	\$ 300,000
A7	Entrance Signage	\$ 15,000
A8	Interpretive Signage	\$ 15,000
A9	Lookout Stations	\$ 150,000

B. Conservation Area Improvements ***Budget (890K)**

B1	Perimeter Fencing	\$ 25,000
B2	Perimeter Service Gates	\$ 10,000
B3	Vegetated Buffers	\$ 200,000
B4+	Agricultural Fields Naturalization	\$ 250,000
B5+	Natural Areas Restoration	\$ 100,000
B6+	BC-1 Wetland Establishment	\$ 50,000
B7+	Invasive Species Management	\$ 200,000
B8	Site Signage	\$ 15,000
B9	Site Furnishings	\$ 40,000

C. Outside Funding Dependent Improvements ***Budget (2.10M)**

C1	SC-8 Wetland Development	\$2,100,000
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* Budget costs are in 2022 dollars, projects and budgets to be reviewed annually.

** Dependent on site servicing studies.

+ Costs subject to ecological findings and recommendations.

APPENDIX 3

Estimated Revenue and Expenses

Saltfleet Conservation Area Annual Operation: Estimated Revenues and Expenses*

Operation Revenues	Amount	% of Revenues
Admissions (Auto Gate, Passes)	\$ 55,000	92 %
Miscellaneous+	\$ 5,000	8 %
Total Revenues	\$ 60,000	100%

Operation Expenses	Amount	% of Expenses
Salaries – Wages and Benefits	\$ 26,400	44 %
Equipment	\$ 12,600	21 %
Taxes	\$ 7,800	13 %
Office	\$ 6,000	10 %
Materials and Supplies	\$ 2,400	4 %
Maintenance	\$ 1,800	3 %
Contracts	\$ 1,800	3 %
Utilities	\$ 1,200	2%
Total Expenses	\$ 60,000	100%

*Based on East Hamilton Mountain Operation Revenue and Expenses for 2020 and 2021. Average annual revenue and costs estimated for the life of this Master plan, with a 40 to 50-car paid parking lot.

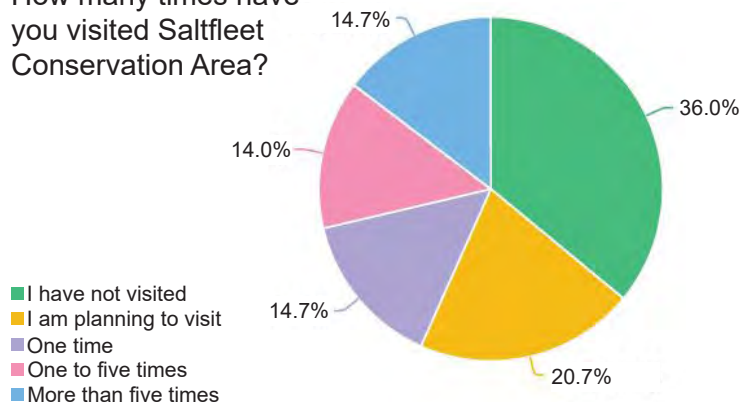
+ Miscellaneous revenues include ticketed events and tours.

APPENDIX 4

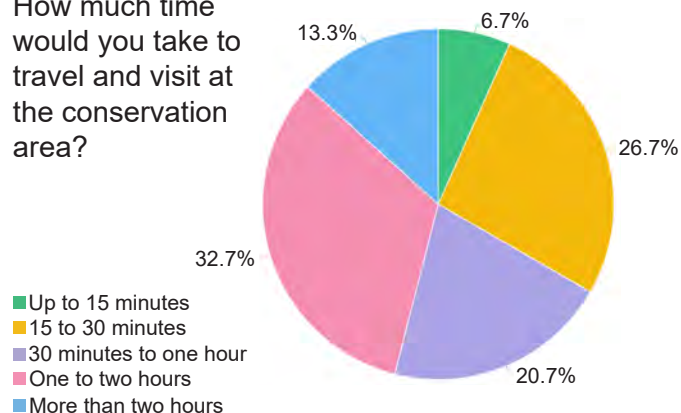
Public Survey Results

Saltfleet Survey Results Summary

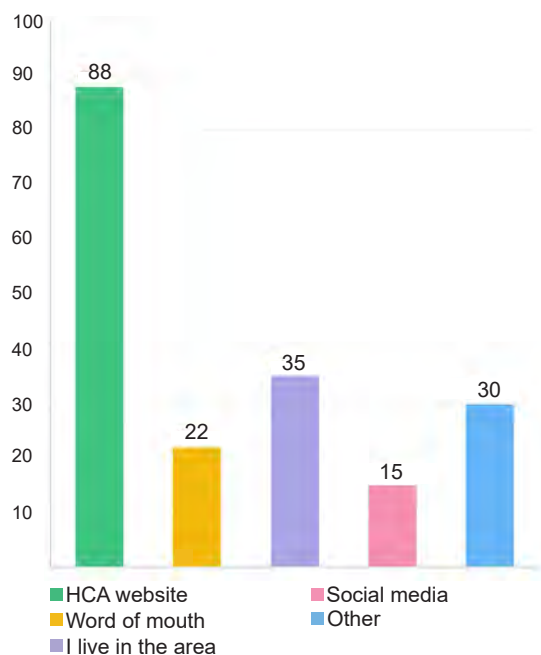
How many times have you visited Saltfleet Conservation Area?



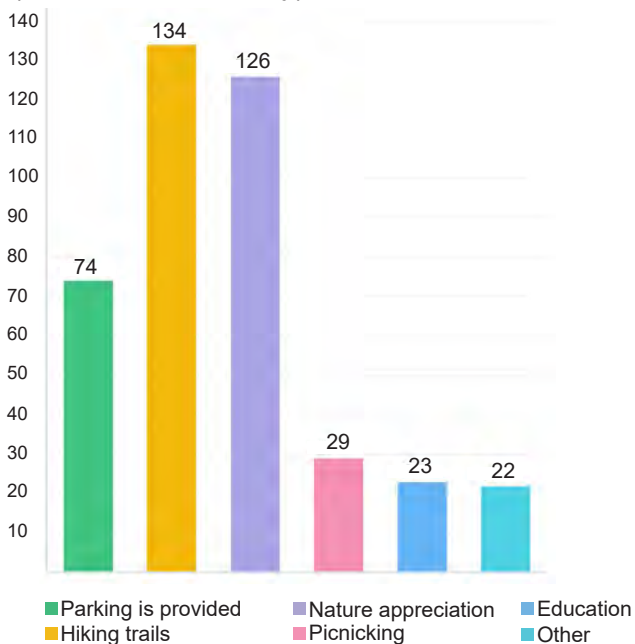
How much time would you take to travel and visit at the conservation area?



How did you learn about Saltfleet Conservation Area? (Choose all that apply)



Why do you visit conservation areas like Saltfleet? (Choose all that apply)



How else did you hear about Saltfleet Conservation Area?

- Signs along the Dofasco Trail
- Coverage in local newspaper
- Through this survey
- HCA email list

What topics would you like to see addressed with interpretive signage?

- The new wetlands
- Geological features
- Local plants and wildlife
- History of the area
- Hydrology and watercourses
- Archaeological features

Do you have any comments or suggestions for us for Saltfleet Conservation Area?

- Provide more trails
- Bird watching events
- Cycling tours
- Educational events
- Community plantings
- Seasonal events
- Bicycle racks
- Electric vehicle charging stations
- Washrooms
- Stroller friendly/accessible trails
- Garbage and recycling facilities
- Educational tours for families
- Rest stops, benches and tables

APPENDIX 5

Managed Forest Plan

6.5 Vinemount Swamp

This swamp forest is the biggest natural forest area south of the Escarpment in the City of Hamilton. Because the Vinemount Swamp is a headwaters swamp, it serves an important purpose in regulating the stream flow in Forty Mile Creek and Stoney Creek. It is home to several locally rare bird species including the Northern Harrier, Sedge Wren and Upland Sandpiper. It also serves as a stopover for many species of migratory waterfowl and supports numerous locally rare plant species. The Vinemount Swamp is visible from the current on-road section of the Dofasco 2000 Trail and its boardwalk through the swamp. *Source: <https://conservationhamilton.ca/vinemount-wetland/>*

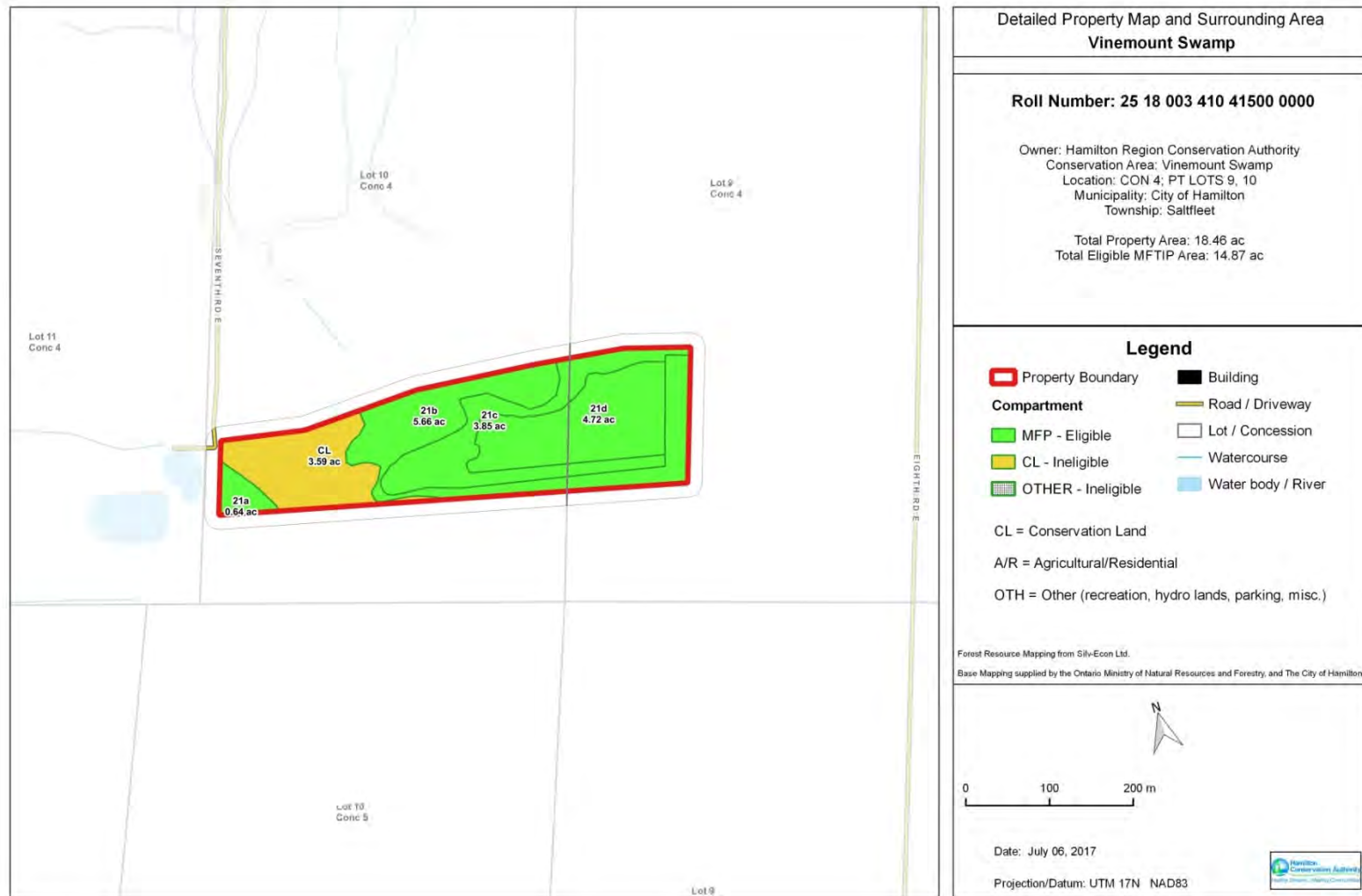
Managed Forest Summary

Roll Number (5-digit)	Forest Type 1	Area 1 (ac)	Total Area (ac)
41500	Lowland Hardwoods	14.87	14.87

Other Vegetation Observed	Invasive Species Observed	Wildlife Habitat Features			
Red osier dogwood	European honeysuckle	Snags	Cavities	Coarse Woody Debris	Mast Species
		Abundant	None observed	Few	White oak

Forest Inventory										
			Trees ≥ 10 cm DBH						Regeneration (advanced > 1m)	
Comp	Area (ac)	Forest Type	Species Composition ¹	Age (yrs)	Height (m)	Avg. DBH ² (cm)	Density (stems/ha)	Basal Area ³ (m2/ha)	Species Composition	Density (stems/ha)
21a	0.64	Lowland Hardwoods	Ag4 Ab3 Ms2	45	17	17	833	18	none	0
21b	5.66	Lowland Hardwoods	Ag4 Ms2 Ow2 Ab1 (El)1	42	21	20	654	23	Bt8 Ag2	2500
21c	3.85	Lowland Hardwoods	Ab10	20	12	10	739	8	Sng8 Ab2	4000
21d	4.72	Lowland Hardwoods	Ab10	8	14	6	65	1	Ab7 Sng3	1500

Detailed Property Maps



6.9 East Mountain Conservation Area

The East Mountain Conservation Area is predominately comprised of green ash and bur oak lowland forest, shrub habitat and vacant agricultural land. The managed forest is drained by Battlefield and Stoney Creeks, which are connected to the Provincially Significant Vinemount Swamp Wetland. Significant species include Eastern wood pewee, Wood thrush and Barn swallow. Other records include Snapping turtle, Eastern milksnake and Monarch butterfly. The property is located within a broader, landscape scale natural heritage system identified by the City of Hamilton that extends from the headwaters of Stoney and Battlefield Creeks to the Escarpment and downstream to Lake Ontario. Over the years the project area has been impacted through agricultural practices and residential development. These impacts have led to the loss of wetland habitat, species biodiversity and habitat fragmentation. *Source: Communication with HCA staff.*

Managed Forest Summary

Roll Number (5-digit)	Forest Type 1	Area 1 (ac)	Forest Type 2	Area 2 (ac)	Total Area (ac)
71800	Lowland Hardwoods	41.40			41.40
72000	Lowland Hardwoods	18.78	Upland Hardwoods	23.49	42.27

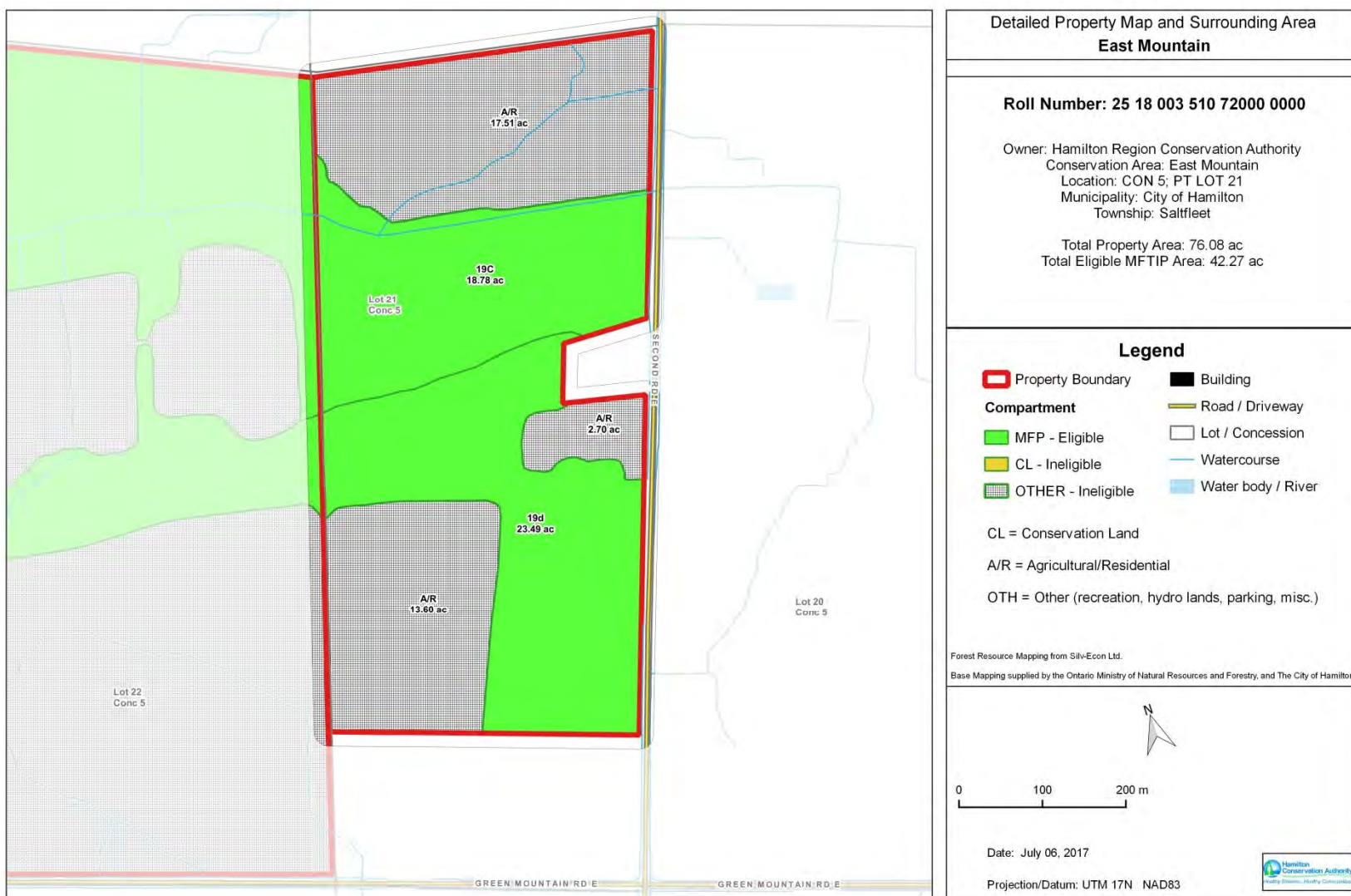
Other Vegetation Observed	Invasive Species Observed	Wildlife Habitat Features			
Speckled alder Wild rose	European honeysuckle Buckthorn	Snags	Cavities	Coarse Woody Debris	Mast Species
		Few	Few	Few	Hickory Walnut Red oak White oak

Forest Inventory										
			Trees ≥ 10 cm DBH						Regeneration (advanced > 1m)	
Comp	Area (ac)	Forest Type	Species Composition ¹	Age (yrs)	Height (m)	Avg. DBH ² (cm)	Density (stems/ha)	Basal Area ³ (m ² /ha)	Species Composition	Density (stems/ha)
19a	28.10	Lowland Hardwoods	Ag4 Ab3 Haw1 Ow1 Wn1	32	14	11	799	12.4	Bt6 Ab2 Ag1	1600
19b	13.30	Lowland Hardwoods	Ag3 Wn3 Haw2 Mh2 (Ow)	90	19	17	753	22	none	0
19c	18.78	Lowland Hardwoods	Ab5 Hi5	28	14	8	138	2	Bt10	3000
19d	23.49	Upland Hardwoods	Mh2 Wn2 Ag1 Ap1 Cb1 lw1 Pw1 (Bd Be Haw Hi Or)1	34	21	12	493	16.5	Bt8 Mh2	1250

Detailed Property Maps



HAMILTON CONSERVATION AUTHORITY MANAGED FOREST PLAN



Section 7 : Ten Year Activity Summary 2018-2027

The following management activities are recommended for the 2018-2027 operating period.

Forest Health & Ecological Diversity

Control Invasive plants

- The Ontario Invasive Plant Council recommends creating a feasible, long-term strategy for managing invasive species. Many of the managed forest compartments have been colonized by buckthorn and other invasive plant species. Buckthorn is particularly problematic because it is the dominant species in the regeneration of a number of the compartments. Managing the buckthorn is an important silvicultural objective in maintaining a healthy and productive forest.

Manage Red Pine Decline

- A number of the red pine plantations are declining as a result of root diseases. The HCA has been thinning these plantations to mitigate the effects of the decline in the overstory and promote natural regeneration. Many of the plantations also lack desirable regeneration and some are heavily colonized by buckthorn. Controlling the buckthorn and restoring regeneration through underplanting is highly recommended.

Monitor Invasive Insects

- Many, if not all, of the mature ash in the managed forest have been affected by Emerald Ash Borer. Fortunately ash is commonly found in the regeneration of many stands and it is unlikely that ash species will disappear from the managed forest.
- Hemlock stands are at risk from Hemlock woolly adelgid (HWA). Hemlock is dominant/co-dominant in Fletcher compartment 1f and Beverly Swamp compartment 4b and is a minor species in several other compartments. These stands should be monitored for signs of HWA and report infected stands to the Canadian Food Inspection Agency (CFIA). Silv-Econ is coordinating a working group of forest managers/owners who have hemlock stands on their properties. The HCA may wish to participate in this working group.

Wildlife & Nature Appreciation

Conserve Habitat Features

- Wildlife habitats can be conserved or enhanced by retaining snags, fallen trees and logs, and trees with cavities.
- Mitigating the impacts from management activities on Species At Risk and other wildlife may require modifications to conventional silvicultural activities, establishing buffers around critical habitat, and seasonal restrictions for undertaking management activities, among other mitigation measures.

Recreation

- There is an extensive network of recreational trails throughout most of the managed forest. Maintaining the trails by trimming vegetation, removing fallen logs and hazard trees, and making repairs when required is recommended.

Forest Products

- A second thinning of the conifer plantations at Christie, Dundas Valley, Mt. Albion, Valens, and Westfield Heritage Village can be considered during the 2018-2027 operating period.
- There are approximately 115 acres of conifer plantations at Fletcher Creek that could also be considered for thinning during the 2018-2027 operating period.

Section 11 : Tree Species & Species Abbreviations

Abbreviation	Species	Abbreviation	Species
Ag	green ash	Mst	Striped maple
Ap	apple	Nb	Nannyberry
Aw	white ash	Ob	bur oak
Bd	basswood	OC	other conifers
Be	American beech	OH	other hardwood
Bf	balsam fir	Or	red oak
Bn	butternut	Ow	white oak
Bt	European buckthorn	Pa	Austrian pine
Bw	white birch	Pb	balsam poplar
By	yellow birch	Pg	large tooth aspen
Cb	black cherry	Ph	hybrid poplar
Cc	choke cherry	Pj	jack pine
Ce	white cedar	Po	poplar species
El	elm	Pr	red pine
Ha	hawthorn	Ps	Scots pine
Hac	hackberry	Pt	trembling aspen
He	eastern hemlock	Pw	white pine
Hi	bitternut hickory	Sas	sassafras
Hs	shagbark hickory	Sb	black spruce
Iw	ironwood	Sc	blue spruce
La	European larch	Sn	Norway spruce
Lb	black locust	Sw	white spruce
Lh	Honey locust	Syc	American sycamore
Mash	mountain ash	Ta	tamarack
Mb	black maple	Tu	tulip tree
Mh	sugar maple	Wi	willow
Mm	Manitoba maple	Wn	black walnut
Mr	red maple		
Ms	silver maple		

APPENDIX 6

Natural Areas Inventory – Species List and References

Species, BC-1 Property

Appendix 6.1 Vascular Plants

Appendix 6.2 Birds

Appendix 6.3 Mammals

Appendix 6.4 Butterflies

Appendix 6.5 Dragonflies and Damselflies

Appendix 6.6 Reptiles and Amphibians

Appendix 6.7 Fish

Species, SC-8 Property

Appendix 6.8 Vascular Plants

Appendix 6.9 Birds

Appendix 6.10 Mammals

Appendix 6.11 Butterflies

Appendix 6.12 Dragonflies and Damselflies

Appendix 6.13 Reptiles and Amphibians

Appendix 6.14 Fish

Species, Vinemount Swamp

Appendix 6.15 Plants

Appendix 6.16 Birds

Appendix 6.17 Mammals

Appendix 6.18 Butterflies and Dragonflies

Species, Tapleystown Woods

Appendix 6.19 Plants

Appendix 6.20 Birds

Appendix 6.21 Mammals

Appendix 6.22 Butterflies

Vascular Plant Species Reported From the Study Area, BC-1

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	MNRF SAR List ⁵	NHIC Data ⁶	NRSI Observed
Pteridophytes	Ferns & Allies											
Dryopteridaceae	Wood Fern Family											
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	5	-2		S5				X			X
<i>Onoclea sensibilis</i>	Sensitive Fern	4	-3		S5				X			X
Equisetaceae	Horsetail Family											
<i>Equisetum arvense</i>	Field Horsetail	0	0		S5				X			X
Thelypteridaceae	Beech Fern Family											
<i>Phegopteris hexagonoptera</i>	Broadbeech Fern	9	1		S3	SC	SC	Schedule 3	R5	X		
Gymnosperms	Conifers											
Cupressaceae	Cypress Family											
<i>Juniperus virginiana</i>	Eastern Red Cedar	4	3		S5				X			X
Pinaceae	Pine Family											
<i>Picea abies</i>	Norway Spruce		5	-1	SE3				I			X
<i>Picea glauca</i>	White Spruce	6	3		S5				X			X
<i>Pinus resinosa</i>	Red Pine	8	3		S5				X			X
Dicotyledons	Dicots											
Aceraceae	Maple Family											
<i>Acer negundo</i>	Manitoba Maple	0	-2		S5				X			X
<i>Acer rubrum</i>	Red Maple	4	0		S5				X			X
<i>Acer saccharum</i> ssp. <i>saccharum</i>	Sugar Maple	4	3		S5				X			X
<i>Acer saccharum</i> ssp. <i>nigrum</i>	Black Maple	7	3		S4?				X			X
Anacardiaceae	Sumac or Cashew Family											
<i>Rhus hirta</i>	Staghorn Sumac	1	5		S5				X			X
<i>Toxicodendron rydbergii</i>	Poison-ivy	0	0		S5				X			X
Apiaceae	Carrot or Parsley Family											
<i>Anthriscus sylvestris</i>	Woodland Chervil		5	-2	SE4?							X
<i>Daucus carota</i>	Wild Carrot		5	-2	SE5				I			X
Araliaceae	Ginseng Family											
<i>Panax quinquefolius</i>	Ginseng	9	5		S3	END	E	Schedule 1	R2	X		
Asclepiadaceae	Milkweed Family											
<i>Asclepias incarnata</i> ssp. <i>incarnata</i>	Swamp Milkweed	6	-5		S5				X			X
<i>Asclepias syriaca</i>	Common Milkweed	0	5		S5				X			X
Asteraceae	Composite or Aster Family											
<i>Ambrosia artemisiifolia</i>	Common Ragweed	0	3		S5				X			X

Vascular Plant Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	MNRF SAR List ⁵	NHIC Data ⁶	NRSI Observed
<i>Arctium minus</i> ssp. <i>minus</i>	Common Burdock		5	-2	SE5				I			X
<i>Cirsium arvense</i>	Canada Thistle		3	-1	SE5				I			X
<i>Cirsium vulgare</i>	Bull Thistle		4	-1	SE5				I			X
<i>Erigeron annuus</i>	Daisy Fleabane	0	1		S5				X			X
<i>Erigeron philadelphicus</i> ssp. <i>philadelphicus</i>	Philadelphia Fleabane	1	-3		S5				X			X
<i>Eurybia divaricata</i>	White Wood Aster	10	5		S2	THR	T	Schedule 1	R1	X		
<i>Euthamia graminifolia</i>	Flat-topped Bushy Goldenrod	2	-2		S5				X			X
<i>Hieracium caespitosum</i> ssp. <i>caespitosum</i>	Field Hawkweed		5	-2	SE5				I			X
<i>Hymenoxys herbacea</i>	Lakeside Daisy	10	5		S3	THR	T	Schedule 1		X		
<i>Leucanthemum vulgare</i>	Ox-eye Daisy		5	-1	SE5				I			X
<i>Matricaria discoidea</i>	Pineapple-weed				SE5				I			X
<i>Rudbeckia triloba</i>	Brown-eyed Coneflower		1	-1	SE4				I			X
<i>Solidago altissima</i> var. <i>altissima</i>	Tall Goldenrod	1	3		S5				X			X
<i>Solidago canadensis</i>	Canada Goldenrod	1	3		S5				X			X
<i>Solidago juncea</i>	Early Goldenrod	3	5		S5				X			X
<i>Solidago nemoralis</i> ssp. <i>nemoralis</i>	Gray Goldenrod	2	5		S5				X			X
<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Field Sow-thistle				SE5				I			X
<i>Symphotrichum ericoides</i> var. <i>ericoides</i>	White Heath Aster				S5				X			X
<i>Symphotrichum novae-angliae</i>	New England Aster	2	-3		S5				X			X
<i>Symphotrichum pilosum</i> var. <i>pilosum</i>	Hairy Aster	4	2		S5				X			X
<i>Symphotrichum urophyllum</i>	Arrow-leaved Aster	6	5		S4				X			X
<i>Taraxacum officinale</i>	Common Dandelion		3	-2	SE5				I			X
Balsaminaceae Touch-me-not Family												
<i>Impatiens capensis</i>	Spotted Touch-me-not	4	-3		S5				X			X
Berberidaceae Barberry Family												
<i>Podophyllum peltatum</i>	May-apple	5	3		S5				X			X
Betulaceae Birch Family												
<i>Betula lenta</i>	Cherry Birch	9	3		S1	END	E	Schedule 1		X		
<i>Carpinus caroliniana</i> ssp. <i>virginiana</i>	Blue Beech	6	0		S5				X			X
<i>Ostrya virginiana</i>	Hop Hornbeam	4	4		S5				X			X
Brassicaceae Mustard Family												
<i>Alliaria petiolata</i>	Garlic Mustard		0	-3	SE5				I			X
<i>Hesperis matronalis</i>	Dame's Rocket		5	-3	SE5				I			X
Caprifoliaceae Honeysuckle Family												
<i>Lonicera dioica</i>	Glaucous Honeysuckle	5	3		S5				X			X
<i>Lonicera tatarica</i>	Tartarian Honeysuckle		3	-3	SE5				I			X
<i>Viburnum lentago</i>	Nannyberry	4	-1		S5				X			X
Celastraceae Staff-tree Family												
<i>Euonymus obovata</i>	Running Strawberry-bush	6	5		S5				X			X

Vascular Plant Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	MNRF SAR List ⁵	NHIC Data ⁶	NRSI Observed
Cornaceae	Dogwood Family											
<i>Cornus florida</i>	Eastern Flowering Dogwood	7	4		S2?	END	E	Schedule 1	X	X	X	
<i>Cornus foemina</i> ssp. <i>racemosa</i>	Red Panicked Dogwood	2	-2		S5				X			X
Dipsacaceae	Teasel Family											
<i>Dipsacus fullonum</i> ssp. <i>sylvestris</i>	Wild Teasel		5	-1	SE5				I			X
Elaeagnaceae	Oleaster Family											
<i>Elaeagnus umbellata</i>	Autumn Olive		3	-3	SE3				I			X
Euphorbiaceae	Spurge Family											
<i>Acalypha virginica</i> var. <i>rhomboidea</i>	Three-seeded Mercury	0	3		S5				X			X
Fabaceae	Pea Family											
<i>Gymnocladus dioica</i>	Kentucky Coffee-tree	6	5		S2	THR	T	Schedule 1	I	X		
<i>Lotus corniculatus</i>	Bird's-foot Trefoil		1	-2	SE5				I			X
<i>Medicago lupulina</i>	Black Medick		1	-1	SE5				I			X
<i>Melilotus officinalis</i>	Yellow Sweet-clover		3	-1	SE5				I			X
<i>Trifolium pratense</i>	Red Clover		2	-2	SE5				I			X
<i>Trifolium repens</i>	White Clover		2	-1	SE5				I			X
<i>Vicia cracca</i>	Tufted Vetch		5	-1	SE5				I			X
Fagaceae	Beech Family											
<i>Castanea dentata</i>	American Chestnut	8	5		S2	END	E	Schedule 1	U	X		
<i>Fagus grandifolia</i>	American Beech	6	3		S5				X			X
<i>Quercus alba</i>	White Oak	6	3		S5				X			X
<i>Quercus macrocarpa</i>	Bur Oak	5	1		S5				X			X
<i>Quercus rubra</i>	Red Oak	6	3		S5				X			X
Gentianaceae	Gentian Family											
<i>Frasera caroliniensis</i>	American Columbo	10	5		S2	END	E	Schedule 1	R1	X		
Geraniaceae	Geranium Family											
<i>Geranium maculatum</i>	Spotted Crane's-bill	6	3		S5				X			X
<i>Geranium robertianum</i>	Herb Robert		5	-2	SE5				I			X
Guttiferae	St. John's-wort Family											
<i>Hypericum perforatum</i>	Common St. John's-wort		5	-3	SE5				I			X
Hydrophyllaceae	Water-leaf Family											
<i>Hydrophyllum virginianum</i>	Virginia Water-leaf	6	-2		S5				X			X
Juglandaceae	Walnut Family											
<i>Carya cordiformis</i>	Bitternut Hickory	6	0		S5				X			X
<i>Carya ovata</i> var. <i>ovata</i>	Shagbark Hickory	6	3		S5				X			X
<i>Juglans cinerea</i>	Butternut	6	2		S2?	END	E	Schedule 1	X	X		

Vascular Plant Species Reported From the Study Area, BC-1 (cont.)

[illegible]

Vascular Plant Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	MNRF SAR List ⁵	NHIC Data ⁶	NRSI Observed
<i>Ranunculus abortivus</i>	Kidney-leaf Buttercup	2	-2		S5				X			X
Rhamnaceae	Buckthorn Family											
<i>Rhamnus cathartica</i>	European Buckthorn		3	-3	SE5				I			X
<i>Frangula alnus</i>	Glossy Buckthorn		-1	-3	SE5				I			X
Rosaceae	Rose Family											
<i>Agrimonia gryposepala</i>	Tall Hairy Agrimony	2	2		S5							X
<i>Amelanchier arborea</i>	Downy Juneberry		3		S5				X			X
<i>Crataegus species</i>	Hawthorn species											X
<i>Fragaria virginiana</i>	Wild Strawberry				S5							X
<i>Geum laciniatum</i>	Rough Avens		-3		S4				X			X
<i>Malus domestica</i>	Apple											X
<i>Potentilla recta</i>	Rough-fruited Cinquefoil		5	-2	SE5				I			X
<i>Prunus avium</i>	Cherry Plum		5	-2	SE4				I			X
<i>Prunus virginiana ssp. virginiana</i>	Choke Cherry	2	1		S5				X			X
<i>Pyrus communis</i>	Common Pear		5	-1	SE4				I			X
<i>Rosa multiflora</i>	Multiflora Rose		3	-3	SE4				I			X
<i>Rubus occidentalis</i>	Black Raspberry	2	5		S5				X			X
Rubiaceae	Madder Family											
<i>Galium aparine</i>	Cleavers	4	3		S5				X			X
Rutaceae	Rue Family											
<i>Ptelea trifoliata</i>	Common Hop-tree	9	2		S3	SC	T	Schedule 1	I	X		
<i>Zanthoxylum americanum</i>	American Prickly-ash	3	5		S5				X			X
Scrophulariaceae	Figwort Family											
<i>Verbascum thapsus</i>	Common Mullein		5	-2	SE5				I			X
<i>Veronica officinalis</i>	Common Speedwell		5	-2	SE5				I			X
Solanaceae	Nightshade Family											
<i>Solanum dulcamara</i>	Bitter Nightshade		0	-2	SE5				I			X
Tiliaceae	Linden Family											
<i>Tilia americana</i>	American Basswood	4	3		S5				X			X
Ulmaceae	Elm Family											
<i>Ulmus americana</i>	White Elm	3	-2		S5				X			X
<i>Ulmus rubra</i>	Slippery Elm	6	0		S5				X			X
Verbenaceae	Vervain Family											
<i>Verbena urticifolia</i>	White Vervain	4	-1		S5				X			X
Violaceae	Violet Family											
<i>Viola sororia</i>	Woolly Blue Violet	4	1		S5				X			X

Vascular Plant Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	MNRF SAR List ⁵	NHIC Data ⁶	NRSI Observed
Vitaceae		Grape Family										
<i>Parthenocissus vitacea</i>	Woodbine	3	3		S5				X			X
<i>Vitis riparia</i>	Riverbank Grape	0	-2		S5				X			X
Monocotyledons		Monocots										
Araceae		Arum Family										
<i>Arisaema dracontium</i>	Green Dragon	9	-3		S3	SC	SC	Schedule 3	R5	X		
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	5	-2		S5				X			X
<i>Calla palustris</i>	Wild Calla	8	-5		S5				X			X
Cyperaceae		Sedge Family										
<i>Carex cristatella</i>	Crested Sedge	3	-4		S5				X			X
<i>Carex grisea</i>	Narrow-leaved Sedge	8	1		S4				U			X
<i>Carex lupulina</i>	Hop Sedge	6	-5		S5				X			X
<i>Carex normalis</i>	Larger Straw Sedge	6	-3		S4				X			X
<i>Carex pellita</i>	Woolly Sedge	4	-5		S5				X			X
<i>Carex pensylvanica</i>	Pennsylvania Sedge	5	5		S5				X			X
<i>Carex retrorsa</i>	Retrorsed Sedge	5	-5		S5				X			X
<i>Carex stipata</i>	Awl-fruited Sedge	3	-5		S5				X			X
<i>Carex vulpinoidea</i>	Fox Sedge	3	-5		S5				X			X
<i>Scirpus cyperinus</i>	Wool-grass	4	-5		S5				X			X
<i>Trichophorum planifolium</i>	Bashful Bulrush	10	5		S1	END	E	Schedule 1		X		
Juncaceae		Rush Family										
<i>Juncus articulatus</i>	Jointed Rush	5	-5		S5				X			X
<i>Juncus tenuis</i>	Path Rush	0	0		S5				X			X
Liliaceae		Lily Family										
<i>Erythronium americanum ssp. americanum</i>	Yellow Dog's-tooth Violet	5	5		S5				X			X
<i>Hemerocallis fulva</i>	Orange Day-lily		5	-3	SE5				I			X
<i>Lilium michiganense</i>	Michigan Lily	7	-1		S5				X			X
<i>Maianthemum racemosum ssp. racemosum</i>	False Solomon's Seal	4	3		S5				X			X
<i>Narcissus pseudonarcissus</i>	Daffodil				SE2							X
<i>Scilla siberica</i>	Squill		5	-1	SE2				I			X
<i>Trillium grandiflorum</i>	White Trillium	5	5		S5				X			X
Orchidaceae		Orchid Family										
<i>Liparis loeselii</i>	Fen Twayblade	5	-4		S4S5				X			X
Poaceae		Grass Family										
<i>Agrostis stolonifera</i>	Redtop		-3		S5				X			X
<i>Bromus inermis ssp. inermis</i>	Awnless Brome		5	-3	SE5				I			X
<i>Bromus secalinus ssp. secalinus</i>	Cheat Chess		5	-1	SE4				I			X
<i>Cinna arundinacea</i>	Wood Reed Grass	7	-3		S4				X			X
<i>Dactylis glomerata</i>	Orchard Grass		3	-1	SE5				I			X

Vascular Plant Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	MNRF SAR List ⁵	NHIC Data ⁶	NRSI Observed
<i>Elymus repens</i>	Quack Grass		3	-3	SE5				I			X
<i>Glyceria striata</i>	Fowl Meadow Grass	3	-5		S5				X			X
<i>Leersia virginica</i>	White Cut Grass	6	-3		S4				X			X
<i>Phalaris arundinacea</i>	Reed Canary Grass	0	-4		S5				X			X
<i>Phleum pratense</i>	Timothy		3	-1	SE5				I			X
<i>Phragmites australis ssp. australis</i>	European Common Reed				SNA				I			X
<i>Poa pratensis ssp. pratensis</i>	Kentucky Bluegrass	0	1		S5				I			X
<i>Setaria pumila</i>	Yellow Foxtail		0	-1	SE5				I			X
Typhaceae	Cattail Family											
<i>Typha angustifolia</i>	Narrow-leaved Cattail	3	-5		S5				X			X
									Total	16	1	150

¹MNRF 2019a, ²MNRF 2019b, ³Gov. of Canada 2019, ⁴HCA 2014, ⁵NHIC 2019, ⁶MNRF 2019c

Bird Species Reported From the Study Area, BC-1

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	OBBA (17PH08) ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
Anatidae		Ducks, Geese & Swans								
<i>Branta canadensis</i>	Canada Goose	S5				C	CO			X
<i>Cygnus olor</i>	Mute Swan	SNA				R (I)	CO			
<i>Aix sponsa</i>	Wood Duck	S5				U	CO			X
<i>Anas platyrhynchos</i>	Mallard	S5				C	CO			X
Phasianidae		Partridges, Grouse & Turkeys								
<i>Phasianus colchicus</i>	Ring-necked Pheasant	SNA				R (I)	PR			
<i>Meleagris gallopavo</i>	Wild Turkey	S5				C	CO			X
Podicipediformes		Grebes								
<i>Podiceps auritus</i>	Horned Grebe	S1B, S4N	SC	SC	No Schedule				X	
Columbidae		Pigeons & Doves								
<i>Columba livia</i>	Rock Pigeon	SNA				A	CO			X
<i>Zenaidura macroura</i>	Mourning Dove	S5				A	CO			X
Cuculiformes		Cuckoos & Anis								
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	S4B				R	PR			X
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S5B				U	PO			X
Caprimulgidae		Goatsuckers								
<i>Chordeiles minor</i>	Common Nighthawk	S4B	SC	SC	Schedule 1	R			X	X
<i>Caprimulgus vociferus</i>	Eastern Whip-poor-will	S4B	THR	T	Schedule 1	R			X	
Apodidae		Swifts								
<i>Chaetura pelagica</i>	Chimney Swift	S4B, S4N	THR	T	Schedule 1	U	PR		X	
Trochilidae		Hummingbirds								
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B				U	PR			
Rallidae		Rails, Gallinules & Coots								
<i>Rallus elegans</i>	King Rail	S2B	END	E	Schedule 1	EX			X	
<i>Rallus limicola</i>	Virginia Rail	S5B				U	PR			
<i>Porzana carolina</i>	Sora	S4B				U	PR			
Charadriidae		Plovers								
<i>Charadrius melodus</i>	Piping Plover	S1B	END	E	Schedule 1	EX			X	
<i>Charadrius vociferus</i>	Killdeer	S5B, S5N				A	CO			X
Scolopacidae		Waders								
<i>Bartramia longicauda</i>	Upland Sandpiper	S4B				R	CO			
<i>Calidris canutus rufa</i>	Red Knot (<i>rufa</i> subspecies)		END	E	No Schedule				X	
<i>Gallinago delicata</i>	Wilson's Snipe	S5B				R				X
<i>Scolopax minor</i>	American Woodcock	S4B				C	CO			X
<i>Actitis macularia</i>	Spotted Sandpiper	S5				C	CO			X
<i>Phalaropus lobatus</i>	Red-necked Phalarope	S3S4B	SC						X	

Bird Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	OBBA (17PH08) ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
Laridae		Gulls, Terns & Skimmers								
<i>Larus delawarensis</i>	Ring-billed Gull	S5B, S4N				A	CO			X
<i>Larus argentatus</i>	Herring Gull	S5B, S5N				C				X
<i>Chlidonias niger</i>	Black Tern	S3B	SC	NAR		EX			X	
Phalacrocoracidae		Cormorants								
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	S5B	NAR	NAR		A				X
Pelecanidae		Pelicans								
<i>Pelecanus erythrorhynchos</i>	American White Pelican	S2B	THR	NAR					X	
Ardeidae		Hérons & Bitterns								
<i>Ixobrychus exilis</i>	Least Bittern	S4B	THR	T	Schedule 1	R			X	
<i>Ardea herodias</i>	Great Blue Heron	S4B				U	PR			X
<i>Butorides virescens</i>	Green Heron	S4B				U	CO			
Cathartidae		Vultures								
<i>Cathartes aura</i>	Turkey Vulture	S5B				U	PR			X
Accipitridae		Hawks, Kites, Eagles & Allies								
<i>Haliaeetus leucocephalus</i>	Bald Eagle	S2N, S4B	SC	NAR		R			X	
<i>Circus cyaneus</i>	Northern Harrier	S4B	NAR	NAR		R	PR			
<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5	NAR			R	PO			
<i>Accipiter cooperii</i>	Cooper's Hawk	S4	NAR	NAR		U	CO			X
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR		C	CO			X
Tytonidae		Barn Owls								
<i>Tyto alba</i>	Barn Owl	S1	END	E	Schedule 1	EX			X	
Strigidae		Typical Owls								
<i>Megascops asio</i>	Eastern Screech-Owl	S4	NAR	NAR		U	PO			
<i>Bubo virginianus</i>	Great Horned Owl	S4				C	CO			X
<i>Asio flammeus</i>	Short-eared Owl	S2N, S4B	SC	SC	Schedule 3	R	PR		X	
Alcedinidae		Kingfishers								
<i>Megasceryle alcyon</i>	Belted Kingfisher	S4B				U	PO			X
Picidae		Woodpeckers								
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S4B	SC	END	Schedule 1	R	CO		X	
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	S4				U	CO			X
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	S5B				R				X
<i>Picoides pubescens</i>	Downy Woodpecker	S5				C	CO			X
<i>Picoides villosus</i>	Hairy Woodpecker	S5				U	PR			X
<i>Colaptes auratus</i>	Northern Flicker	S4B				C	CO			X
Falconidae		Caracaras & Falcons								
<i>Falco sparverius</i>	American Kestrel	S4				U	CO			X
<i>Falco columbarius</i>	Merlin	S5B	NAR	NAR		R				X
<i>Falco peregrinus anatum/tundrius</i>	Peregrine Falcon	S3B	SC	SC	Schedule 1	R			X	

Bird Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	OBBA (17PH08) ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
Tyrannidae		Tyrant Flycatchers								
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC		C	PR		X	X
<i>Empidonax virescens</i>	Acadian Flycatcher	S2S3B	END	E	Schedule 1	R			X	
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B				U	PR			
<i>Empidonax traillii</i>	Willow Flycatcher	S5B				C	CO			X
<i>Empidonax minimus</i>	Least Flycatcher	S4B				U	PO			
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B				U	CO			X
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S4B				C	CO			X
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B				A	CO			X
Laniidae		Shrikes								
<i>Lanius ludovicianus</i>	Loggerhead Shrike	S2B	END	E (ssp. <i>migrans</i>)	Schedule 1	EX			X	
Vireonidae		Vireos								
<i>Vireo solitarius</i>	Blue-headed Vireo	S5B				R				X
<i>Vireo philadelphicus</i>	Philadelphia Vireo	S5B								X
<i>Vireo gilvus</i>	Warbling Vireo	S5B				C	PR			X
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B				C	CO			X
Corvidae		Crows & Jays								
<i>Cyanocitta cristata</i>	Blue Jay	S5				A	CO			X
<i>Corvus brachyrhynchos</i>	American Crow	S5B				C	CO			X
<i>Corvus corax</i>	Common Raven	S5				R				X
Alaudidae		Larks								
<i>Eremophila alpestris</i>	Horned Lark	S5B				C	CO			
Hirundinidae		Swallows								
<i>Progne subis</i>	Purple Martin	S4B				U	CO			
<i>Tachycineta bicolor</i>	Tree Swallow	S4B				A	CO			X
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B				C	CO			X
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T		U	PO		X	
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T		C	CO		X	X
Paridae		Chickadees & Titmice								
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5				A	CO			X
<i>Baeolophus bicolor</i>	Tufted Titmouse	S4				R	PO			
Sittidae		Nuthatches								
<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5				U	CO			X
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5				C	PR			X
Certhiidae		Creepers								
<i>Certhia americana</i>	Brown Creeper	S5B				U				X
Troglodytidae		Wrens								
<i>Troglodytes aedon</i>	House Wren	S5B				C	CO			X
<i>Troglodytes hiemalis</i>	Winter Wren	S5B				U	PO			X
<i>Cistothorus platensis</i>	Sedge Wren	S4B	NAR	NAR		R	PO			
<i>Cistothorus palustris</i>	Marsh Wren	S4B				U	PO			
<i>Thryothorus ludovicianus</i>	Carolina Wren	S4				R	PR			X

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	OBBA (17PH08) ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
Poliptilidae		Gnatcatchers								
<i>Poliptila caerulea</i>	Blue-gray Gnatcatcher	S4B				U	PR			
Regulidae		Kinglets								
<i>Regulus satrapa</i>	Golden-crowned Kinglet	S5B				R				X
<i>Regulus calendula</i>	Ruby-crowned Kinglet	S4B								X
Turdidae		Thrushes								
<i>Sialia sialis</i>	Eastern Bluebird	S5B	NAR	NAR		U	CO			X
<i>Catharus fuscescens</i>	Veery	S4B				C	PR			X
<i>Catharus minimus</i>	Gray-cheeked Thrush	S2S4B								X
<i>Catharus ustulatus</i>	Swainson's Thrush	S4B								X
<i>Catharus guttatus</i>	Hermit Thrush	S5B								X
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T		C	PR		X	X
<i>Turdus migratorius</i>	American Robin	S5B				A	CO			X
Mimidae		Mockingbirds, Thrashers & Allies								
<i>Dumetella carolinensis</i>	Gray Catbird	S4B				A	CO			X
<i>Toxostoma rufum</i>	Brown Thrasher	S4B				U	CO			X
<i>Mimus polyglottos</i>	Northern Mockingbird	S4				U	CO			
Sturnidae		Starlings								
<i>Sturnus vulgaris</i>	European Starling	SNA				A (I)	CO			X
Bombycillidae		Waxwings								
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B				C	CO			X
Passeridae		Old World Sparrows								
<i>Passer domesticus</i>	House Sparrow	SNA				A (I)	CO			X
Motacillidae		Pipits								
<i>Anthus rubescens</i>	American Pipit	S4								X
Fringillidae		Finches & Allies								
<i>Carpodacus mexicanus</i>	House Finch	SNA				A (I)	CO			X
<i>Spinus tristis</i>	American Goldfinch	S5B				A	CO			X
Parulidae		Wood Warblers								
<i>Seiurus aurocapillus</i>	Ovenbird	S4B				C	PO			X
<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B				C				X
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	S4B	SC	T	Schedule 1	R			X	
<i>Mniotilta varia</i>	Black-and-white Warbler	S5B				U				X
<i>Protonotaria citrea</i>	Prothonotary Warbler	S1B	END	E	Schedule 1	R	PO		X	
<i>Oreothlypis peregrina</i>	Tennessee Warbler	S5B								X
<i>Oreothlypis ruficapilla</i>	Nashville Warbler	S5B				U				X
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B				C	PR			X
<i>Setophaga ruticilla</i>	American Redstart	S5B				U	PO			X
<i>Setophaga tigrina</i>	Cape May Warbler	S5B								X
<i>Setophaga cerulea</i>	Cerulean Warbler	S3B	THR	E	Schedule 1	R			X	
<i>Setophaga americana</i>	Northern Parula	S4B								X
<i>Setophaga magnolia</i>	Magnolia Warbler	S5B				R				X
<i>Setophaga castanea</i>	Bay-breasted Warbler	S5B								X

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	OBBA (17PH08) ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
<i>Setophaga fusca</i>	Blackburnian Warbler	S5B				R				X
<i>Setophaga petechia</i>	Yellow Warbler	S5B				A	CO			X
<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	S5B				U	PO			
<i>Setophaga striata</i>	Blackpoll Warbler	S4B								X
<i>Setophaga caerulescens</i>	Black-throated Blue Warbler	S5B				R				X
<i>Setophaga palmarum</i>	Palm Warbler	SNRB								X
<i>Setophaga coronata</i>	Yellow-rumped Warbler	S5B				R				X
<i>Setophaga virens</i>	Black-throated Green Warbler	S5B				R				X
<i>Cardellina canadensis</i>	Canada Warbler	S4B	SC	T	Schedule 1	R	PO		X	
<i>Cardellina pusilla</i>	Wilson's Warbler	S4B								X
<i>Icteria virens</i>	Yellow-breasted Chat	S2B	END	E	Schedule 1	R			X	
Emberizidae New World Sparrows & Allies										
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	S4B				U	PO			X
<i>Spizella arborea</i>	American Tree Sparrow	S4B								X
<i>Spizella passerina</i>	Chipping Sparrow	S5B				A	CO			X
<i>Spizella pusilla</i>	Field Sparrow	S4B				C	CO			X
<i>Pooecetes gramineus</i>	Vesper Sparrow	S4B				U	PR			
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S4B				A	CO			X
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	SC	SC		U	PO		X	
<i>Ammodramus henslowii</i>	Henslow's Sparrow	SHB	END	E	Schedule 1	EX			X	
<i>Melospiza melodia</i>	Song Sparrow	S5B				A	CO			X
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B				C	PR			X
<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5B				U				X
<i>Junco hyemalis</i>	Dark-eyed Junco	S5B								X
Cardinalidae Cardinals, Grosbeaks & Allies										
<i>Piranga olivacea</i>	Scarlet Tanager	S4B				U	PO			
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5				A	CO			X
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S4B				C	CO			X
<i>Passerina cyanea</i>	Indigo Bunting	S4B				C	CO			X
Icteridae Blackbirds										
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	T	No Schedule	U	CO		X	X
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S4				A	CO			X
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	T	No Schedule	U	CO	X	X	
<i>Euphagus carolinus</i>	Rusty Blackbird	S4B	NAR	SC	Schedule 1					X
<i>Quiscalus quiscula</i>	Common Grackle	S5B				A	CO			X
<i>Molothrus ater</i>	Brown-headed Cowbird	S4B				A	CO			X
<i>Icterus spurius</i>	Orchard Oriole	S4B				U	PR			
<i>Icterus galbula</i>	Baltimore Oriole	S4B				C	CO			X
Total							101	1	31	105

¹MNRF 2019a, ²MNRF 2019b, ³Gov. of Canada 2019, ⁴HCA 2014, ⁵BSC et al. 2006, ⁶NHIC 2019; ⁷MNRF 2019c

Mammal Species Reported From the Study Area, BC-1

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Ontario Mammal Atlas ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
Didelphimorphia	Opossums								
<i>Didelphis virginiana</i>	Virginia Opossum	S4				X			X
Insectivora	Shrews and Moles								
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5				X			X
<i>Condylura cristata</i>	Star-nosed Mole	S5				X			
<i>Parascalops breweri</i>	Hairy-tailed Mole	S4				X			
<i>Sorex cinereus</i>	Masked Shrew	S5				X			
<i>Sorex fumeus</i>	Smoky Shrew	S5				X			
Chiroptera	Bats								
<i>Eptesicus fuscus</i>	Big Brown Bat	S4				X			X
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S4				X			X
<i>Lasiurus borealis</i>	Eastern Red Bat	S4				X			X
<i>Lasiurus cinereus</i>	Hoary Bat	S4				X			X
<i>Myotis</i> sp.	Unidentified <i>Myotis</i> species*								X*
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3	END					X	*
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	E	Schedule 1	X		X	*
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	Schedule 1			X	*
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	Schedule 1	X		X	*
Lagomorpha	Rabbits and Hares								
<i>Lepus europaeus</i>	European Hare	SNA				X			
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5				X			X
Rodentia	Rodents								
<i>Castor canadensis</i>	Beaver	S5				X			
<i>Erethizon dorsatum</i>	Porcupine	S5				X			
<i>Glaucomys volans</i>	Southern Flying Squirrel	S4	NAR	NAR		X			
<i>Marmota monax</i>	Woodchuck	S5				X			
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5				X			
<i>Microtus pinetorum</i>	Woodland Vole	S3?	SC	SC	Schedule 1	X		X	
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	S5				X			
<i>Ondatra zibethicus</i>	Muskrat	S5				X			
<i>Peromyscus leucopus</i>	White-footed Mouse	S5				X			
<i>Peromyscus maniculatus</i>	Deer Mouse	S5				X			
<i>Rattus norvegicus</i>	Norway Rat	SNA				X			

Mammal Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Ontario Mammal Atlas ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5				X			X
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5				X			
<i>Tamias striatus</i>	Eastern Chipmunk	S5				X			X
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5				X			
Carnivora		Carnivores							
<i>Canis latrans</i>	Coyote	S5				X			X
<i>Mephitis mephitis</i>	Striped Skunk	S5				X			
<i>Mustela erminea</i>	Ermine	S5				X			
<i>Mustela frenata</i>	Long-tailed Weasel	S4				X			
<i>Mustela vison</i>	American Mink	S4				X			X
<i>Procyon lotor</i>	Northern Raccoon	S5				X			X
<i>Taxidea taxus jacksoni</i>	American Badger	S2	END	E	Schedule 1			X	
<i>Urocyon cinereoargenteus</i>	Grey Fox	S1	THR	T	Schedule 1	X		X	
<i>Vulpes vulpes</i>	Red Fox	S5				X			X
Artiodactyla		Deer and Bison							
<i>Odocoileus virginianus</i>	White-tailed Deer	S5				X			X
					Total	38	0	7	15

¹MNRF 2019a, ²MNRF 2019b, ³Gov. of Canada 2019, ⁴HCA 2014, ⁵Dobbyn 1994, ⁶NHIC 2019, ⁷MNRF 2019c

*See discussion of bat survey results.

Butterfly Species Reported From the Study Area, BC-1

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁵	TEA Atlas ⁶ (17PH08)	NHIC Data ¹	MNRF SAR List ⁷	NRSI Observed
Hesperiidae		Skippers								
<i>Anatrytone logan</i>	Delaware Skipper	S4				C	X			
<i>Ancyloxypha numitor</i>	Least Skipper	S5				C	X			
<i>Epargyreus clarus</i>	Silver-spotted Skipper	S4				C	X			
<i>Erynnis baptisiae</i>	Wild Indigo Duskywing	S4				U	X			X
<i>Erynnis martialis</i>	Mottled Duskywing	S2	END	E		R			X	
<i>Euphyes conspicua</i>	Black Dash	S3				C	X			
<i>Euphyes dion</i>	Dion Skipper	S4				U	X			
<i>Pholisora catullus</i>	Common Sootywing	S4				U	X			
<i>Poanes viator</i>	Broad-winged Skipper	S4				C	X			
<i>Polites peckius</i>	Peck's Skipper	S5				C	X			
<i>Polites themistocles</i>	Tawny-edged Skipper	S5				C	X			
<i>Thymelicus lineola</i>	European Skipper	SNA				C	X			X
Papilionidae		Swallowtails								
<i>Papilio glaucus</i>	Eastern Tiger Swallowtail	S5				C	X			X
<i>Papilio polyxenes</i>	Black Swallowtail	S5				C	X			
<i>Papilio troilus</i>	Spicebush Swallowtail	S4				R	X			
Pieridae		Whites and Sulphurs								
<i>Colias eurytheme</i>	Orange Sulphur	S5				C	X			
<i>Colias philodice</i>	Clouded Sulphur	S5					X			X
<i>Pieris rapae</i>	Cabbage White	SNA				C	X			X
<i>Pieris virginianensis</i>	West Virginia White	S3		SC		U			X	
<i>Zerene cesonia</i>	Southern Dogface	SNA					X			
Lycaenidae		Harvesters, Coppers, Hairstreaks, Blues								
<i>Celastrina neglecta</i>	Summer Azure	S5				C				X
<i>Cupido comyntas</i>	Eastern Tailed Blue	S5				C	X			
<i>Satyrrium calanus</i>	Banded Hairstreak	S4				C	X			
<i>Satyrrium caryaevorus</i>	Hickory Hairstreak	S4				U	X			
<i>Satyrrium edwardsii</i>	Edwards' Hairstreak	S4				R	X			
<i>Satyrrium liparops</i>	Striped Hairstreak	S5				C	X			

Butterfly Species Reported From the Study Area, BC-1 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁵	TEA Atlas ⁶ (17PH08)	NHIC Data ¹	MNRF SAR List ⁷	NRSI Observed
Nymphalidae	Brush-footed Butterflies									
<i>Cercyonis pegala</i>	Common Wood-Nymph	S5				C	X			
<i>Coenonympha tullia</i>	Common Ringlet	S5				C	X			X
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	E	Schedule 1	C	X		X	X
<i>Junonia coenia</i>	Common Buckeye	SNA				U	X			
<i>Lethe anthedon</i>	Northern Pearly-Eye	S5				C	X			
<i>Lethe appalachia</i>	Appalachian Brown	S4				C	X			X
<i>Lethe eurydice</i>	Northern Eyed Brown	S5				C	X			
<i>Limenitis archippus</i>	Viceroy	S5				C	X			
<i>Limenitis arthemis astyanax</i>	Red-spotted Purple	S5				C	X			
<i>Megisto cymela</i>	Little Wood-Satyr	S5				C				X
<i>Nymphalis antiopa</i>	Mourning Cloak	S5				C	X			
<i>Phyciodes cocyta</i>	Northern Crescent	S5					X			
<i>Phyciodes tharos</i>	Pearl Crescent	S4				C				X
<i>Polygonia comma</i>	Eastern Comma	S5				C	X			
<i>Polygonia comma</i>	Eastern Comma/Hop	S5					X			
<i>Polygonia interrogationis</i>	Question Mark	S5				C	X			X
<i>Speyeria cybele</i>	Great Spangled Fritillary	S5				C	X			
<i>Vanessa atalanta</i>	Red Admiral	S5				C	X			X
<i>Vanessa cardui</i>	Painted Lady	S5				C	X			X
<i>Vanessa virginiensis</i>	American Lady	S5				C	X			
¹ MNRF 2019a, ² MNRF 2018a, ³ Gov. of Canada 2018, ⁴ HCA 2014, ⁵ MacNaughton et al. 2018, ⁶ MNRF 2019c						Total	41	0	3	14

Dragonfly and Damselfly Species Reported From the Study Area, BC-1

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	Odonate Atlas ⁵	NHIC ⁶	MNRF SAR List ⁷	NRSI Observed
Coenagrionidae		Narrow-winged Damselflies								
<i>Enallagma anna</i>	River Bluet	S2				U	X			
<i>Ischnura verticalis</i>	Eastern Forktail	S5				C	X			
Aeshnidae		Darners								
<i>Anax junius</i>	Common Green Darner	S5				C	X			X
Libellulidae		Skimmers								
<i>Celithemis elisa</i>	Calico Pennant	S5				C				X
<i>Erythemis simplicicollis</i>	Eastern Pondhawk	S5				C	X			X
<i>Libellula luctuosa</i>	Widow Skimmer	S5				C	X			X
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	S5				C	X			
<i>Plathemis lydia</i>	Common Whitetail	S5				C	X			
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk	S5				C				X
Total							7	0	0	5

¹MNRF 2019a, ²MNRF 2019b, ³Gov. of Canada 2019, ⁴HCA 2014, ⁵MNRF 2019d, ⁶NHIC 2019, ⁷MNRF 2019c

Reptile and Amphibian Species Reported From the Study Area, BC-1

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	Hamilton Status ⁴	ORAA ⁵	NHIC Data ⁶	MNRF SAR List ⁷	NRSI Observed
Turtles										
<i>Apalone spinifera spinifera</i>	Spiny Softshell	S3	THR	E	Schedule 1	R			X	
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	Schedule 1	C	X		X	
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S5		SC		C	X			
<i>Emydoidea blandingii</i>	Blanding's Turtle (<i>GLSL pop.</i>)	S3	THR	T	Schedule 1	R	X		X	
<i>Graptemys geographica</i>	Northern Map Turtle	S3	SC	SC	Schedule 1	R			X	
<i>Sternotherus odoratus</i>	Eastern Musk Turtle	S3	SC	SC	Schedule 1	R	X		X	
Snakes										
<i>Crotalus horridus</i>	Timber Rattlesnake	SX	EXP	XT	Schedule 1	EX		X		
<i>Pantherophis spiloides pop. 2</i>	Gray Ratsnake (<i>Carolinian pop.</i>)	S1	END	E	Schedule 1				X	
<i>Heterodon platirhinos</i>	Eastern Hog-nosed Snake	S3	THR	T	Schedule 1				X	
<i>Lampropeltis triangulum</i>	Eastern Milksnake	S4	NAR	SC	Schedule 1	U	X			
<i>Opheodrys vernalis</i>	Smooth Greensnake	S4				R	X			
<i>Nerodia sipedon sipedon</i>	Northern Watersnake	S5	NAR	NAR		R	X			
<i>Storeria dekayi dekayi</i>	Northern Brownsnake	S5	NAR	NAR		U	X			X
<i>Storeria occipitomaculata occipitomaculata</i>	Northern Red-bellied Snake	S5				R	X			X
<i>Thamnophis sauritus septentrionalis</i>	Eastern Ribbonsnake	S3	SC	SC	Schedule 1	R			X	
<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5				C	X			X
Salamanders										
<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	S2	END	E	Schedule 1	R	X	X	X	
<i>Ambystoma laterale - (2) jeffersonianum</i>	Unisexual Ambystoma Jefferson Salamander	S2	END	E					X	
<i>Ambystoma sp.</i>	Jefferson/Blue-spotted Salamander Comp.	S2					X			
<i>Ambystoma laterale</i>	Blue-spotted Salamander	S4				R	X			
<i>Notophthalmus viridescens viridescens</i>	Red-spotted Newt	S5				R	X			
<i>Plethodon cinereus</i>	Eastern Red-backed Salamander	S5				C	X			
Toads and Frogs										
<i>Anaxyrus americanus</i>	American Toad	S5				C	X			X
<i>Hyla versicolor</i>	Tetraploid Gray Treefrog	S5				C	X			X
<i>Pseudacris triseriata pop. 1</i>	Western Chorus Frog (<i>Carolinian pop.</i>)	S4	NAR	NAR		C				X
<i>Pseudacris crucifer</i>	Spring Peeper	S5				C	X			X
<i>Lithobates catesbeiana</i>	American Bullfrog	S4				U	X			
<i>Lithobates clamitans melanota</i>	Northern Green Frog	S5				C	X			
<i>Lithobates pipiens</i>	Northern Leopard Frog	S5	NAR	NAR		C	X			X
<i>Lithobates sylvaticus</i>	Wood Frog	S5				C	X			
Total							22	2	10	8

¹MNRF 2019a; ²MNRF 2019b; ³Gov. of Canada 2019; ⁴HCA 2014; ⁵Ontario Nature 2018; ⁶NHIC 2019; ⁷MNRF 2019c

Fish Species Reported from the Study Area, BC-1

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ³	NHIC Data ⁴	MNRF SAR List ⁵	NRSI Observed
Petromyzontidae		Lampreys						
<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey (GL-USL Pop.)	S3	SC	SC	Schedule 1		X	
<i>Ichthyomyzon unicuspis</i>	Silver Lamprey (GL-USL Pop.)	S3	SC	SC			X	
Acipenseridae		Sturgeons						
<i>Acipenser fulvescens</i>	Lake Sturgeon (GL-USL Pop.)	S2	THR	Non-active	NONE		X	
Anguillidae		Freshwater Eels						
<i>Anguilla rostrata</i>	American Eel	S1?	END	THR	NONE		X	
Cyprinidae		Carps and Minnows						
<i>Clinostomus elongatus</i>	Redside Dace	S2	END	E	Schedule 1		X	
<i>Notropis photogenis</i>	Silver Shiner	S2S3	THR	T	Schedule 3		X	
<i>Pimephales promelas</i>	Fathead Minnow	S5						X
Catostomidae		Suckers						
<i>Moxostoma duquesnei</i>	Black Redhorse	S2	THR	T			X	
Ictaluridae		North American Catfishes						
<i>Ameiurus nebulosus</i>	Brown Bullhead	S5						X
Esocidae		Pikes						
<i>Esox americanus vermiculatus</i>	Grass Pickerel	S3	SC	SC	Schedule 1		X	
Gasterosteidae		Sticklebacks						
<i>Culaea inconstans</i>	Brook Stickleback	S5						X
Centrarchidae		Sunfishes and Basses						
<i>Lepomis gibbosus</i>	Pumpkinseed	S5						X
					Total	0	8	4

¹MNRF 2019a, ²MNRF 2019b, ³Gov. of Canada 2019, ⁴NHIC 2019, ⁵MNRF 2019c

Vascular Plant Species Reported From the Study Area, SC-8

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	NHIC ¹	NRSI Observations			
										Fallow Field	MAM2-2	SWT2-13	Hedgerow
Gymnosperms	Conifers												
Cupressaceae	Cypress Family												
<i>Juniperus virginiana</i>	Red Cedar	4	3		S5								X
Dicotyledons	Dicots												
Aceraceae	Maple Family												
<i>Acer negundo</i>	Manitoba Maple	0	-2		S5			X				X	
Anacardiaceae	Sumac or Cashew Family												
<i>Rhus typhina</i>	Staghorn Sumac	1	5		S5			X					X
Apiaceae	Carrot or Parsley Family												
<i>Cicuta maculata</i>	Spotted Water-hemlock	6	-5		S5			X		X			
<i>Daucus carota</i>	Wild Carrot		5	-2	SE5			I			X	X	X
Asclepiadaceae	Milkweed Family												
<i>Asclepias syriaca</i>	Common Milkweed	0	5		S5			X			X	X	
Asteraceae	Composite or Aster Family												
<i>Ambrosia artemisiifolia</i>	Common Ragweed	0	3		S5			X		X	X		
<i>Arctium minus</i>	Common Burdock		5	-2	SE5			I		X	X		
<i>Bidens frondosa</i>	Devil's Beggar-ticks	3	-3		S5			X			X		
<i>Cichorium intybus</i>	Chicory		5	-1	SE5			I		X	X		
<i>Cirsium arvense</i>	Canada Thistle		3	-1	SE5			I		X	X	X	
<i>Cirsium vulgare</i>	Bull Thistle		4	-1	SE5			I		X	X		
<i>Conyza canadensis</i>	Horseweed	0	1		S5			X		X			
<i>Erigeron annuus</i>	Daisy Fleabane	0	1		S5			X		X	X	X	
<i>Erigeron philadelphicus</i>	Philadelphia Fleabane	1	-3		S5			X		X			
<i>Eurybia macrophylla</i>	Large-leaved Aster	5	5		S5			X			X		
<i>Euthamia graminifolia</i>	Flat-topped Bushy Goldenrod	2	-2		S5			X			X	X	
<i>Gnaphalium uliginosum</i>	Low Cudweed		0	-1	SE5			I		X			
<i>Lactuca serriola</i>	Prickly Lettuce		0	-1	SE5			I		X			
<i>Leucanthemum vulgare</i>	Ox-eye Daisy		5	-1	SE5			I		X	X		X
<i>Matricaria discoidea</i>	Pineapple-weed				SE5			I		X			
<i>Solidago canadensis</i>	Canada Goldenrod	1	3		S5			X		X	X	X	X
<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Field Sow-thistle				SE5			I		X	X		
<i>Sonchus asper</i> ssp. <i>asper</i>	Spiny-leaved Sow-thistle		0	-1	SE5			I			X		
<i>Sonchus oleraceus</i>	Common Sow-thistle		3	-1	SE5			I		X			X
<i>Symphotrichum lanceolatum</i> var. <i>lanceolatum</i>	Tall White Aster	3	-3		S5			X			X		
<i>Symphotrichum novae-angliae</i>	New England Aster	2	-3		S5			X		X	X	X	
<i>Symphotrichum pilosum</i> var. <i>pilosum</i>	Hairy Aster	4	2		S5			X			X		
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster				S5						X		
<i>Xanthium spinosum</i>	Spiny Cocklebur		3	-1	SE2?					X	X	X	
Balsaminaceae	Touch-me-not Family												
<i>Impatiens capensis</i>	Spotted Touch-me-not	4	-3		S5			X		X	X		
Brassicaceae	Mustard Family												
<i>Alliaria petiolata</i>	Garlic Mustard		0	-3	SE5			I				X	
<i>Hesperis matronalis</i>	Dame's Rocket		5	-3	SE5			I				X	
<i>Raphanus raphanistrum</i>	Wild Radish		5	-1	SE3					X		X	
Caprifoliaceae	Honeysuckle Family												
<i>Lonicera tatarica</i>	Tartarian Honeysuckle		3	-3	SE5			I				X	
Caryophyllaceae	Pink Family												
<i>Dianthus armeria</i>	Deptford Pink		5	-1	SE5			I					X

Vascular Plant Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	NHIC ¹	NRSI Observations			
										Fallow Field	MAM2-2	SWT2-13	Hedgerow
Chenopodiaceae	Goosefoot Family												
<i>Chenopodium simplex</i>	Maple-leaved Goosefoot	0	-5		S5			U			X		
Cornaceae	Dogwood Family												
<i>Cornus foemina</i> ssp. <i>racemosa</i>	Red Panicked Dogwood	2	-2		S5			X		X		X	X
<i>Cornus stolonifera</i>	Red-osier Dogwood	2	-3		S5			X				X	
Dipsacaceae	Teasel Family												
<i>Dipsacus fullonum</i> ssp. <i>sylvestris</i>	Wild Teasel		5	-1	SE5			I		X	X		
Euphorbiaceae	Spurge Family												
<i>Acalypha virginica</i> var. <i>rhomboidea</i>	Three-seeded Mercury	0	3		S5			X		X			
Fabaceae	Pea Family												
<i>Glycine max</i>	Soya Bean		5	-1	SE2					X			
<i>Lotus corniculatus</i>	Bird's-foot Trefoil		1	-2	SE5			I		X	X		
<i>Medicago lupulina</i>	Black Medick		1	-1	SE5			I		X			
<i>Trifolium pratense</i>	Red Clover		2	-2	SE5			I		X	X		
<i>Vicia cracca</i>	Tufted Vetch		5	-1	SE5			I		X	X	X	
Fagaceae	Beech Family												
<i>Quercus macrocarpa</i>	Bur Oak	5	1		S5			X				X	X
Guttiferae	St. John's-wort Family												
<i>Hypericum perforatum</i>	Common St. John's-wort		5	-3	SE5			I			X		
Juglandaceae	Walnut Family												
<i>Carya ovata</i>	Shagbark Hickory	6	3		S5			X					X
Lamiaceae	Mint Family												
<i>Lycopus americanus</i>	Cut-leaved Water-horehound	4	-5		S5			X			X		
<i>Lycopus europaeus</i>	European Water-horehound		-5	-2	SE5			I			X	X	
Lythraceae	Loosestrife Family												
<i>Lythrum salicaria</i>	Purple Loosestrife		-5	-3	SE5			I			X	X	
Oleaceae	Olive Family												
<i>Fraxinus americana</i>	White Ash	4	3		S5			X			X		X
<i>Fraxinus pennsylvanica</i>	Green Ash	3	-3		S5			X				X	
<i>Ligustrum vulgare</i>	Common Privet		1	-2	SE5			I				X	
Onagraceae	Evening-primrose Family												
<i>Ludwigia palustris</i>	Marsh Purslane	5	-5		S5			X		X			
Oxalidaceae	Wood Sorrel Family												
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel	0	3		S5			X		X		X	
Plantaginaceae	Plantain Family												
<i>Plantago major</i>	Common Plantain		-1	-1	SE5			I		X			
Polygonaceae	Smartweed Family												
<i>Polygonum aviculare</i>	Prostrate Knotweed		1	-1	SNA			X		X			
<i>Polygonum persicaria</i>	Lady's-thumb		-3	-1	SE5			I		X			
<i>Rumex acetosella</i>	Sheep Sorrel		0		SNA			I			X		
<i>Rumex crispus</i>	Curly-leaf Dock		-1	-2	SE5			I		X	X	X	
Ranunculaceae	Buttercup Family												
<i>Ranunculus acris</i>	Tall Buttercup		-2	-2	SE5			I				X	

Vascular Plant Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	HRCNA IAI ⁴	NHIC ¹	NRSI Observations			
										Fallow Field	MAM2-2	SWT2-13	Hedgerow
<i>Ranunculus pensylvanicus</i>	Bristly Buttercup	3	-5		S5			X			X		
<i>Ranunculus sceleratus</i>	Cursed Buttercup	2	-5		S5			X		X			
Rhamnaceae	Buckthorn Family												
<i>Rhamnus cathartica</i>	European Buckthorn		3	-3	SE5			I				X	X
Rosaceae	Rose Family												
<i>Crataegus species</i>	Hawthorn species											X	X
<i>Fragaria virginiana</i>	Wild Strawberry				S5			X		X		X	
<i>Geum aleppicum</i>	Yellow Avens	2	-1		S5			X		X	X	X	
<i>Malus domestica</i>	Apple												X
<i>Potentilla norvegica</i>	Rough Cinquefoil				S5			I		X			
<i>Potentilla recta</i>	Rough-fruited Cinquefoil		5	-2	SE5			I				X	
<i>Prunus avium</i>	Cherry Plum		5	-2	SE4			I					X
<i>Prunus serotina</i>	Black Cherry	3	3		S5			X					X
<i>Pyrus communis</i>	Common Pear		5	-1	SE4			I				X	X
<i>Rosa rubiginosa</i>	Sweetbrier Rose		5	-1	SE4			I					X
<i>Rubus occidentalis</i>	Black Raspberry	2	5		S5			X					X
Salicaceae	Willow Family												
<i>Populus deltoides</i> ssp. <i>deltoides</i>	Eastern Cottonwood	4	-1		S5			X			X		
<i>Populus tremuloides</i>	Trembling Aspen	2	0		S5			X					X
<i>Salix species</i>	Willow species												X
<i>Salix fragilis</i>	Crack Willow		-1	-3	SE5			I				X	
Simaroubaceae	Ailanthus Family												
<i>Ailanthus altissima</i>	Tree-of-heaven		5	-1	SE5			I					X
Ulmaceae	Elm Family												
<i>Ulmus americana</i>	White Elm	3	-2		S5			X				X	X
Urticaceae	Nettle Family												
<i>Urtica dioica</i> ssp. <i>dioica</i>	European Stinging Nettle		-1	-1	SE2			I				X	
Verbenaceae	Vervain Family												
<i>Verbena hastata</i>	Blue Vervain	4	-4		S5			X			X		
<i>Verbena urticifolia</i>	White Vervain	4	-1		S5			X			X		
Vitaceae	Grape Family												
<i>Vitis riparia</i>	Riverbank Grape	0	-2		S5			X				X	X
Monocotyledons	Monocots												
Alismataceae	Water-plantain Family												
<i>Alisma plantago-aquatica</i>	Common Water-plantain	3	-5		S5			X		X	X	X	
Cyperaceae	Sedge Family												
<i>Carex vulpinoidea</i>	Fox Sedge	3	-5		S5			X			X		
<i>Eleocharis obtusa</i>	Blunt Spike-rush	5	-5		S5			X		X	X		
<i>Schoenoplectus tabernaemontani</i>	American Great Bulrush	5	-5		S5						X		
Juncaceae	Rush Family												
<i>Juncus tenuis</i>	Path Rush	0	0		S5			X			X		
Lemnaceae	Duckweed Family												
<i>Lemna minor</i>	Lesser Duckweed	2	-5		S5			X			X		
Liliaceae	Lily Family												
<i>Allium canadense</i> var. <i>canadense</i>	Wild Garlic	8	3		S5			X			X		

Vascular Plant Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	CC	CW	Weed	SRANK ¹	SARO ²	COSEWIC ³	HRCA NA ⁴	NHIC ¹	NRSI Observations			
										Fallow Field	MAM2-2	SWT2-13	Hedgerow
Poaceae	Grass Family												
<i>Echinochloa crusgalli</i>	Common Barnyard Grass		-3	-1	SE5			I			X		
<i>Hordeum jubatum</i>	Squirrel-tail Grass		-1	-1	SE5			I		X	X		
<i>Leersia oryzoides</i>	Rice Cut Grass	3	-5		S5			X			X		
<i>Panicum capillare</i>	Witch Grass	0	0		S5			X		X			
<i>Phalaris arundinacea</i>	Reed Canary Grass	0	-4		S5			X			X	X	
<i>Phleum pratense</i>	Timothy		3	-1	SE5			I		X	X		
<i>Phragmites australis</i> ssp. <i>australis</i>	European Common Reed				SNA			I					X
<i>Poa pratensis</i>	Kentucky Bluegrass	0	1		S5			I		X	X		
Typhaceae	Cattail Family												
<i>Typha angustifolia</i>	Narrow-leaved Cattail	3	-5		S5			X		X		X	
<i>Typha latifolia</i>	Broad-leaved Cattail	3	-5		S5			X			X	X	
								Total	0	48	54	38	24
										104			

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴HRCA 2014

Bird Species Reported From the Study Area, SC-8

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ⁴	HRCA NAI ⁴	OBBA ⁵	NRSI Observations
Anatidae	Ducks, Geese & Swans							
<i>Branta canadensis</i>	Canada Goose	S5				C	CO	
<i>Cygnus olor</i>	Mute Swan	SNA				R (I)	CO	
<i>Cygnus buccinator</i>	Trumpeter Swan	S4	NAR	NAR		R		X
<i>Aix sponsa</i>	Wood Duck	S5				U	CO	
<i>Anas platyrhynchos</i>	Mallard	S5				C	CO	
Phasianidae	Partridges, Grouse & Turkeys							
<i>Phasianus colchicus</i>	Ring-necked Pheasant	SNA				R (I)	PR	
<i>Meleagris gallopavo</i>	Wild Turkey	S5				C	CO	
Columbidae	Pigeons & Doves							
<i>Columba livia</i>	Rock Pigeon	SNA				A	CO	
<i>Zenaidura macroura</i>	Mourning Dove	S5				A	CO	PO
Cuculiformes	Cuckoos & Anis							
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	S4B				R	PR	
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S5B				U	PO	
Apodidae	Swifts							
<i>Chaetura pelagica</i>	Chimney Swift	S4B, S4N	THR	T	Schedule 1	U	PR	
Trochilidae	Hummingbirds							
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B				U	PR	
Rallidae	Rails, Gallinules & Coots							
<i>Rallus limicola</i>	Virginia Rail	S5B				U	PR	
<i>Porzana carolina</i>	Sora	S4B				U	PR	
Charadriidae	Plovers							
<i>Charadrius vociferus</i>	Killdeer	S5B, S5N				A	CO	PO
Scolopacidae	Waders							
<i>Bartramia longicauda</i>	Upland Sandpiper	S4B				R	CO	
<i>Scolopax minor</i>	American Woodcock	S4B				C	CO	
<i>Actitis macularia</i>	Spotted Sandpiper	S5				C	CO	PR
Laridae	Gulls, Terns & Skimmers							
<i>Larus delawarensis</i>	Ring-billed Gull	S5B, S4N				A	CO	X
<i>Larus argentatus</i>	Herring Gull	S5B, S5N				C		X
Ardeidae	Hérons & Bitterns							
<i>Ardea herodias</i>	Great Blue Heron	S4B				U	PR	
<i>Butorides virescens</i>	Green Heron	S4B				U	CO	
Cathartidae	Vultures							
<i>Cathartes aura</i>	Turkey Vulture	S5B				U	PR	

Bird Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ⁴	HRCA NAI ⁴	OBBA ⁵	NRSI Observations
Accipitridae		Hawks, Kites, Eagles & Allies						
<i>Circus cyaneus</i>	Northern Harrier	S4B	NAR	NAR		R	PR	
<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5	NAR			R	PO	
<i>Accipiter cooperii</i>	Cooper's Hawk	S4	NAR	NAR		U	CO	
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR		C	CO	
Strigidae		Typical Owls						
<i>Megascops asio</i>	Eastern Screech-Owl	S4	NAR	NAR		U	PO	
<i>Bubo virginianus</i>	Great Horned Owl	S4				C	CO	
<i>Asio flammeus</i>	Short-eared Owl	S2N, S4B	SC	SC	Schedule 3	R	PR	
Alcedinidae		Kingfishers						
<i>Megaceryle alcyon</i>	Belted Kingfisher	S4B				U	PO	
Picidae		Woodpeckers						
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S4B	SC	END	Schedule 1	R	CO	
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	S4				U	CO	
<i>Dryobates pubescens</i>	Downy Woodpecker	S5				C	CO	
<i>Dryobates villosus</i>	Hairy Woodpecker	S5				U	PR	
<i>Colaptes auratus</i>	Northern Flicker	S4B				C	CO	PR
Falconidae		Caracaras & Falcons						
<i>Falco sparverius</i>	American Kestrel	S4				U	CO	
Tyrannidae		Tyrant Flycatchers						
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC		C	PR	
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B				U	PR	
<i>Empidonax traillii</i>	Willow Flycatcher	S5B				C	CO	PO
<i>Empidonax minimus</i>	Least Flycatcher	S4B				U	PO	
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B				U	CO	
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S4B				C	CO	
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B				A	CO	PO
Vireonidae		Vireos						
<i>Vireo gilvus</i>	Warbling Vireo	S5B				C	PR	
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B				C	CO	
Corvidae		Crows & Jays						
<i>Cyanocitta cristata</i>	Blue Jay	S5				A	CO	
<i>Corvus brachyrhynchos</i>	American Crow	S5B				C	CO	PO
Alaudidae		Larks						
<i>Eremophila alpestris</i>	Horned Lark	S5B				C	CO	PO
Hirundinidae		Swallows						
<i>Progne subis</i>	Purple Martin	S4B				U	CO	
<i>Tachycineta bicolor</i>	Tree Swallow	S4B				A	CO	PR
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B				C	CO	
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T		U	PO	
<i>Hirundo rustica</i>	Barn Swallow	S4B	THR	T		C	CO	PO

Bird Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ⁴	HRCA NAI ⁴	OBBA ⁵	NRSI Observations
Paridae	Chickadees & Titmice							
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5				A	CO	
<i>Baeolophus bicolor</i>	Tufted Titmouse	S4				R	PO	
Sittidae	Nuthatches							
<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5				U	CO	
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5				C	PR	
Troglodytidae	Wrens							
<i>Troglodytes aedon</i>	House Wren	S5B				C	CO	
<i>Troglodytes hiemalis</i>	Winter Wren	S5B				U	PO	
<i>Cistothorus platensis</i>	Sedge Wren	S4B	NAR	NAR		R	PO	
<i>Cistothorus palustris</i>	Marsh Wren	S4B				U	PO	
<i>Thryothorus ludovicianus</i>	Carolina Wren	S4				R	PR	
Polioptilidae	Gnatcatchers							
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher	S4B				U	PR	
Turdidae	Thrushes							
<i>Sialia sialis</i>	Eastern Bluebird	S5B	NAR	NAR		U	CO	
<i>Catharus fuscescens</i>	Veery	S4B				C	PR	
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T		C	PR	
<i>Turdus migratorius</i>	American Robin	S5B				A	CO	CO
Mimidae	Mockingbirds, Thrashers & Allies							
<i>Dumetella carolinensis</i>	Gray Catbird	S4B				A	CO	PR
<i>Toxostoma rufum</i>	Brown Thrasher	S4B				U	CO	PR
<i>Mimus polyglottos</i>	Northern Mockingbird	S4				U	CO	PO
Sturnidae	Starlings							
<i>Sturnus vulgaris</i>	European Starling	SNA				A (I)	CO	CO
Bombycillidae	Waxwings							
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B				C	CO	PO
Passeridae	Old World Sparrows							
<i>Passer domesticus</i>	House Sparrow	SNA				A (I)	CO	PO
Fringillidae	Finches & Allies							
<i>Carpodacus mexicanus</i>	House Finch	SNA				A (I)	CO	
<i>Spinus tristis</i>	American Goldfinch	S5B				A	CO	PR
Parulidae	Wood Warblers							
<i>Seiurus aurocapillus</i>	Ovenbird	S4B				C	PO	
<i>Protonotaria citrea</i>	Prothonotary Warbler	S1B	END	E	Schedule 1	R	PO	
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B				C	PR	PO
<i>Setophaga ruticilla</i>	American Redstart	S5B				U	PO	
<i>Setophaga petechia</i>	Yellow Warbler	S5B				A	CO	PO
<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	S5B				U	PO	
<i>Cardellina canadensis</i>	Canada Warbler	S4B	SC	T	Schedule 1	R	PO	

Bird Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ⁴	HRCA NAI ⁴	OBBA ⁵	NRSI Observations
Emberizidae		New World Sparrows & Allies						
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	S4B				U	PO	
<i>Spizella passerina</i>	Chipping Sparrow	S5B				A	CO	PO
<i>Spizella pusilla</i>	Field Sparrow	S4B				C	CO	
<i>Poocetes gramineus</i>	Vesper Sparrow	S4B				U	PR	
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S4B				A	CO	PO
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	SC	SC		U	PO	
<i>Melospiza melodia</i>	Song Sparrow	S5B				A	CO	CO
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B				C	PR	
Cardinalidae		Cardinals, Grosbeaks & Allies						
<i>Piranga olivacea</i>	Scarlet Tanager	S4B				U	PO	
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5				A	CO	PO
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S4B				C	CO	
<i>Passerina cyanea</i>	Indigo Bunting	S4B				C	CO	PO
Icteridae		Blackbirds						
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	T	No Schedule	U	CO	
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S4				A	CO	PR
<i>Sturnella magna</i>	Eastern Meadowlark	S4B	THR	T	No Schedule	U	CO	
<i>Quiscalus quiscula</i>	Common Grackle	S5B				A	CO	PO
<i>Molothrus ater</i>	Brown-headed Cowbird	S4B				A	CO	PR
<i>Icterus spurius</i>	Orchard Oriole	S4B				U	PR	
<i>Icterus galbula</i>	Baltimore Oriole	S4B				C	CO	
						Total	101	31

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴HRCA 2014; ⁵BSC et al. 2006

Mammal Species Reported From the Study Area, SC-8

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	Ontario Mammal Atlas ⁵	NHIC ¹	NRSI Observations
Didelphimorphia	Opossums							
<i>Didelphis virginiana</i>	Virginia Opossum	S4			C	X		
Insectivora	Shrews and Moles							
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5			C	X		
<i>Condylura cristata</i>	Star-nosed Mole	S5			C	X		
<i>Parascalops breweri</i>	Hairy-tailed Mole	S4			U	X		
<i>Sorex cinereus</i>	Masked Shrew	S5			C	X		
Chiroptera	Bats							
<i>Eptesicus fuscus</i>	Big Brown Bat	S4			UNK	X		X
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S4			UNK	X		X
<i>Lasiurus borealis</i>	Eastern Red Bat	S4			UNK	X		X
<i>Lasiurus cinereus</i>	Hoary Bat	S4			UNK	X		X
<i>Myotis lucifugus</i>	Little Brown Myotis	S4	END	E	UNK	X		
Lagomorpha	Rabbits and Hares							
<i>Lepus europaeus</i>	European Hare	SNA			CI	X		
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5			C	X		X
Rodentia	Rodents							
<i>Castor canadensis</i>	Beaver	S5			C	X		
<i>Glaucomys volans</i>	Southern Flying Squirrel	S4	NAR	NAR	C	X		
<i>Marmota monax</i>	Woodchuck	S5			C	X		
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5			C	X		
<i>Microtus pinetorum</i>	Woodland Vole	S3?	SC	SC	R	X		
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	S5			U	X		
<i>Ondatra zibethicus</i>	Muskrat	S5			C	X		X
<i>Peromyscus leucopus</i>	White-footed Mouse	S5			C	X		
<i>Rattus norvegicus</i>	Norway Rat	SNA			CI	X		
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5			C	X		
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5			C	X		X
<i>Tamias striatus</i>	Eastern Chipmunk	S5			C	X		X
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5			C	X		
N/A	Mouse Species	-			-			X

Mammal Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	Ontario Mammal Atlas ⁵	NHIC ¹	NRSI Observations
Carnivora		Carnivores						
<i>Canis latrans</i>	Coyote	S5			C	X		X
<i>Mephitis mephitis</i>	Striped Skunk	S5			C	X		
<i>Mustela erminea</i>	Ermine	S5			U	X		
<i>Mustela frenata</i>	Long-tailed Weasel	S4			C	X		
<i>Mustela vison</i>	American Mink	S4			C	X		
<i>Procyon lotor</i>	Northern Raccoon	S5			C	X		X
<i>Vulpes vulpes</i>	Red Fox	S5			C	X		
Artiodactyla		Deer and Bison						
<i>Odocoileus virginianus</i>	White-tailed Deer	S5			C	X		X
					Total	33	0	12

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴HRCA 2014; ⁵Dobbyn 1994

Butterfly Species Reported From the Study Area, SC-8

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	TEA Atlas ⁵	NHIC ¹	NRSI Observations
Hesperiidae		Skippers						
<i>Anatrytone logan</i>	Delaware Skipper	S4			C	X		
<i>Ancyloxypha numitor</i>	Least Skipper	S5			C	X		
<i>Epargyreus clarus</i>	Silver-spotted Skipper	S4			C	X		
<i>Erynnis baptisiae</i>	Wild Indigo Duskywing	S4			U	X		
<i>Euphyes conspicua</i>	Black Dash	S3			C	X		
<i>Euphyes dion</i>	Dion Skipper	S4			U	X		
<i>Pholisora catullus</i>	Common Sootywing	S4			U	X		
<i>Poanes viator</i>	Broad-winged Skipper	S4			C	X		
<i>Polites peckius</i>	Peck's Skipper	S5			C	X		
<i>Polites themistocles</i>	Tawny-edged Skipper	S5			C	X		
<i>Thymelicus lineola</i>	European Skipper	SNA			C	X		
	Skipper sp.	-			-			X
Papilionidae		Swallowtails						
<i>Papilio glaucus</i>	Eastern Tiger Swallowtail	S5			C	X		
<i>Papilio polyxenes</i>	Black Swallowtail	S5			C	X		
<i>Papilio troilus</i>	Spicebush Swallowtail	S4			R	X		
Pieridae		Whites and Sulphurs						
<i>Colias eurytheme</i>	Orange Sulphur	S5			C	X		X
<i>Colias philodice</i>	Clouded Sulphur	S5				X		
<i>Pieris rapae</i>	Cabbage White	SNA			C	X		X
<i>Zerene cesonia</i>	Southern Dogface	SNA				X		
Lycaenidae		Harvesters, Coppers,						
<i>Celastrina ssp.</i>	Azure Species	-			-			X
<i>Cupido comyntas</i>	Eastern Tailed Blue	S5			C	X		
<i>Satyrrium calanus</i>	Banded Hairstreak	S4			C	X		
<i>Satyrrium caryaevorus</i>	Hickory Hairstreak	S4			U	X		
<i>Satyrrium edwardsii</i>	Edwards' Hairstreak	S4			R	X		
<i>Satyrrium liparops</i>	Striped Hairstreak	S5			C	X		

Butterfly Species Reported From the Study Area, SC-8 (cont.)

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	TEA Atlas ⁵	NHIC ¹	NRSI Observations
Nymphalidae		Brush-footed Butterflies						
<i>Cercyonis pegala</i>	Common Wood-Nymph	S5			C	X		
<i>Coenonympha tullia</i>	Common Ringlet	S5			C	X		
<i>Danaus plexippus</i>	Monarch	S2N, S4B	SC	E	C	X		X
<i>Junonia coenia</i>	Common Buckeye	SNA			U	X		
<i>Lethe anthedon</i>	Northern Pearly-Eye	S5			C	X		
<i>Lethe appalachia</i>	Appalachian Brown	S4			C	X		
<i>Lethe eurydice</i>	Northern Eyed Brown	S5			C	X		
<i>Limenitis archippus</i>	Viceroy	S5			C	X		
<i>Limenitis arthemis astyanax</i>	Red-spotted Purple	S5			C	X		
<i>Nymphalis antiopa</i>	Mourning Cloak	S5			C	X		
<i>Phyciodes cocyta</i>	Northern Crescent	S5				X		
<i>Polygonia comma</i>	Eastern Comma	S5			C	X		
<i>Polygonia comma</i>	Hop Merchant	S5				X		
<i>Polygonia interrogationis</i>	Question Mark	S5			C	X		
<i>Speyeria cybele</i>	Great Spangled Fritillary	S5			C	X		
<i>Vanessa atalanta</i>	Red Admiral	S5			C	X		
<i>Vanessa cardui</i>	Painted Lady	S5			C	X		X
<i>Vanessa virginiensis</i>	American Lady	S5			C	X		
					Total	41	0	6

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴HRCA 2014; ⁵Macnaughton et al. 2019

Dragonfly and Damselfly Species Reported From the Study Area, SC-8

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	Odonate Atlas ⁵	NHIC ¹	NRSI Observations
Coenagrionidae		Narrow-winged Damselflies						
<i>Enallagma anna</i>	River Bluet	S2			U	X		
<i>Ischnura verticalis</i>	Eastern Forktail	S5			C	X		
Aeshnidae		Darners						
<i>Anax junius</i>	Common Green Darner	S5			C	X		
Libellulidae		Skimmers						
<i>Erythemis simplicicollis</i>	Eastern Pondhawk	S5			C	X		
<i>Libellula luctuosa</i>	Widow Skimmer	S5			C	X		
<i>Libellula pulchella</i>	Twelve-spotted Skimmer	S5			C	X		X
<i>Plathemis lydia</i>	Common Whitetail	S5			C	X		
					Total	7	0	1

¹MNRF 2019a, ²MNRF 2019b, ³COSEWIC 2019, ⁴HRCA 2014, ⁵MNRF 2019c

Reptile and Amphibian Species Reported From the Study Area, SC-8

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	HRCA NAI ⁴	ORAA ⁵	NHIC ¹	NRSI Observations
Turtles								
<i>Chelydra serpentina serpentina</i>	Snapping Turtle	S3	SC	SC	C	X		
<i>Chrysemys picta marginata</i>	Midland Painted Turtle	S5		SC	C	X		
<i>Sternotherus odoratus</i>	Eastern Musk Turtle	S3	SC	SC	R	X		
Snakes								
<i>Opheodrys vernalis</i>	Smooth Greensnake	S4			R	X		
<i>Nerodia sipedon sipedon</i>	Northern Watersnake	S5	NAR	NAR	R	X		
<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake	S5			C	X		
Salamanders								
<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	S2	END	E	R	X		
<i>Ambystoma sp.</i>	Jefferson/Blue-spotted Salamander	S2				X		
<i>Ambystoma laterale</i>	Blue-spotted Salamander	S4			R	X		
<i>Notophthalmus viridescens viridescens</i>	Red-spotted Newt	S5			R	X		
<i>Plethodon cinereus</i>	Eastern Red-backed Salamander	S5			C	X		
Toads and Frogs								
<i>Anaxyrus americanus</i>	American Toad	S5			C	X		
<i>Hyla versicolor</i>	Tetraploid Gray Treefrog	S5			C	X		X
<i>Pseudacris crucifer</i>	Spring Peeper	S5			C	X		
<i>Lithobates catesbeiana</i>	American Bullfrog	S4			U	X		
<i>Lithobates clamitans melanota</i>	Northern Green Frog	S5			C	X		X
<i>Lithobates pipiens</i>	Northern Leopard Frog	S5	NAR	NAR	C	X		
<i>Lithobates sylvaticus</i>	Wood Frog	S5			C	X		
					Total	18	0	2

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴HRCA 2014; ⁵Ontario Nature 2018

Fish Species Reported from the Study Area, SC-8

Scientific Name	Common Name	SRANK ¹	SARO ²	COSEWIC ³	SARA Schedule ⁴	HRCA NAI ⁵	Amec ⁶	NRSI Observations
Cyprinidae		Carps and Minnows						
<i>Chrosomus eos</i>	Northern Redbelly Dace	S5				C	X	
<i>Margariscus nachtriebi</i>	Northern Pearl Dace	S5				C	X	
<i>Pimephales promelas</i>	Fathead Minnow	S5				C	X	
Umbridae		Mudminnows						
<i>Umbra limi</i>	Central Mudminnow	S5				C	X	
Gasterosteidae		Sticklebacks						
<i>Culaea inconstans</i>	Brook Stickleback	S5				C	X	
Centrarchidae		Sunfishes and Basses						
<i>Lepomis gibbosus</i>	Pumpkinseed	S5				C	X	
						Total	6	0

¹MNRF 2019a; ²MNRF 2019b; ³COSEWIC 2019; ⁴Government of Canada 2019; ⁵HRCA 2014; ⁶Amec 2018

Plant Species Inventoried, Vinemount Swamp

SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
P-ACERUBR	Acer rubrum	Red Maple
P-ACESACC	Acer saccharinum	Silver Maple
P-ACESASA	Acer saccharum	Sugar Maple
P-ACEXFRE	Acer x freemanii	(Acer rubrum X Acer saccharinum)
P-ACHMILL	Achillea millefolium	Common Yarrow
P-ACT_SP	Actaea sp.	Baneberry Species
P-AGRSTRI	Agrimonia striata	Woodland Agrimony
P-ALIPLAN	Alisma triviale	Northern Water-plantain
P-ALLPETI	Alliaria petiolata	Garlic Mustard
P-AME_SP	Amelanchier sp.	Serviceberry Species
P-AMPBRAC	Amphicarpaea bracteata	American Hog-peanut
P-APOANAN	Apocynum androsaemifolium	Spreading Dogbane
P-ARCMINU	Arctium minus	Common Burdock
P-ARITRTR	Arisaema triphyllum ssp. triphyllum	Jack-in-the-pulpit
P-ASCININ	Asclepias incarnata ssp. incarnata	Swamp Milkweed
P-ASCSYRI	Asclepias syriaca	Common Milkweed
P-BIDFRON	Bidens frondosa	Devil's Beggarticks
P-BOECYLI	Boehmeria cylindrica	False Nettle
P-CALPALS	Calla palustris	Wild Calla
P-CALPALU	Caltha palustris	Yellow Marsh Marigold
P-CARBULB	Cardamine bulbosa	Bulbous Bittercress
P-CARCRIN	Carex crinita	Fringed Sedge
P-CARGRAY	Carex grayi	Gray's Sedge
P-CARINTU	Carex intumescens	Bladder Sedge
P-CARLACU	Carex lacustris	Lake Sedge
P-CARLUPU	Carex lupulina	Hop Sedge
P-CARPRAS	Carex prasina	Drooping Sedge
P-CARROSE	Carex rosea	Rosy Sedge
P-CARCARO	Carpinus caroliniana	Blue-beech
P-CARCORD	Carya cordiformis	Bitternut Hickory
P-CAROVAT	Carya ovata	Shagbark Hickory
P-CENJACE	Centaurea jacea	Brown Knapweed
P-CEPOCCI	Cephalanthus occidentalis	Eastern Buttonbush
P-CERDEME	Ceratophyllum demersum	Common Hornwort
P-CICMACU	Cicuta maculata	Spotted Water-hemlock
P-CIRLUCA	Circaea canadensis ssp. canadensis	Canada Enchanter's Nightshade
P-CLIVULG	Clinopodium vulgare	Field Basil
P-CORFORA	Cornus racemosa	Gray Dogwood
P-CORRUGO	Cornus rugosa	Round-leaved Dogwood
P-CORSTOL	Cornus sericea	Red-osier Dogwood
P-CRA_SP	Crataegus sp.	Hawthorn Species
P-DAUCARO	Daucus carota	Wild Carrot
P-DIAARME	Dianthus armeria	Deptford Pink
P-DIPFUSY	Dipsacus fullonum	Common Teasel

Plant Species Inventoried, Vinemount Swamp (cont.)

SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
P-EQUHYAF	Equisetum hyemale ssp. affine	Common Scouring-rush
P-ERIANNU	Erigeron annuus	Annual Fleabane
P-ERYAMAM	Erythronium americanum ssp. americanum	Yellow Trout-lily
P-EUOOBOV	Euonymus obovatus	Running Strawberry Bush
P-EUPPERF	Eupatorium perfoliatum	Common Boneset
P-EUTGRAM	Euthamia graminifolia	Grass-leaved Goldenrod
P-FAGGRAN	Fagus grandifolia	American Beech
P-FRAVIVI	Fragaria virginiana ssp. virginiana	Wild Strawberry
P-RHAFRAN	Frangula alnus	Glossy Buckthorn
P-FRAAMER	Fraxinus americana	White Ash
P-FRAPENN	Fraxinus pennsylvanica	Green Ash
P-GALAPAR	Galium aparine	Cleavers
P-GALPALU	Galium palustre	Marsh Bedstraw
P-GERMACU	Geranium maculatum	Spotted Geranium
P-GEUCANA	Geum canadense	White Avens
P-GEULACI	Geum laciniatum	Rough Avens
P-HAMVIRG	Hamamelis virginiana	American Witch-hazel
P-HYPPERF	Hypericum perforatum	Common St. John's-wort
P-ILEVERT	Ilex verticillata	Black Holly
P-IMPCAPE	Impatiens capensis	Spotted Jewelweed
P-IRIVERS	Iris versicolor	Harlequin Blue Flag
P-JUGNIGR	Juglans nigra	Black Walnut
P-JUNEFSSO	Juncus effusus ssp. solutus	Soft Rush
P-JUNTENU	Juncus tenuis	Path Rush
P-LEM_SP	Lemna sp.	Duckweed Species
P-CHRLEUC	Leucanthemum vulgare	Oxeye Daisy
P-LIGVULG	Ligustrum vulgare	European Privet
P-LON_SP	Lonicera sp.	Honeysuckle Species
P-LYCAMER	Lycopus americanus	American Water-horehound
P-LYCUNIF	Lycopus uniflorus	Northern Water-horehound
P-LYSCILI	Lysimachia ciliata	Fringed Loosestrife
P-LYTSALI	Lythrum salicaria	Purple Loosestrife
P-MALPUMI	Malus pumila	Common Apple
P-MEDLUPU	Medicago lupulina	Black Medic
P-MELOFFI	Melilotus officinalis	Yellow Sweet-clover
P-MENARBO	Mentha canadensis	Canada Mint
P-MIMRING	Mimulus ringens	Square-stemmed Monkeyflower
P-MYOLAXA	Myosotis laxa	Small Forget-me-not
P-ONOLENS	Onoclea sensibilis	Sensitive Fern
P-OSTVIRG	Ostrya virginiana	Eastern Hop-hornbeam
P-OXA_SP	Oxalis sp.	Wood-sorrel Species
P-PARINSE	Parthenocissus vitacea	Thicket Creeper
P-POLPENS	Persicaria pensylvanica	Pennsylvania Smartweed
P-POLPUNC	Persicaria punctata	Dotted Smartweed

Plant Species Inventoried, Vinemount Swamp (cont.)

SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
P-PHAARUN	Phalaris arundinacea	Reed Canary Grass
P-PHLPRAT	Phleum pratense	Common Timothy
P-PHRAUST	Phragmites australis	Common Reed
P-PHRLEPT	Phryma leptostachya	Lopseed
P-HIECACA	Pilosella caespitosa	Meadow Hawkweed
P-PLAMAJO	Plantago major	Common Plantain
P-PODPELT	Podophyllum peltatum	May-apple
P-POL_SP	Polygonum sp.	Smartweed Species
P-POPGRAN	Populus grandidentata	Large-toothed Aspen
P-POPTREM	Populus tremuloides	Trembling Aspen
P-POTNORV	Potentilla norvegica	Norwegian Cinquefoil
P-PRUVULG	Prunella vulgaris	Self-heal
P-PRUVUVU	Prunella vulgaris ssp. vulgaris	Common Self-heal
P-PRUSERO	Prunus serotina	Black Cherry
P-PRUVIVI	Prunus virginiana	Choke Cherry
P-QUEBICO	Quercus bicolor	Swamp White Oak
P-QUEMACR	Quercus macrocarpa	Bur Oak
P-RANABOR	Ranunculus abortivus	Kidney-leaved Buttercup
P-RANHISP	Ranunculus hispidus	Bristly Buttercup
P-RHACATH	Rhamnus cathartica	Common Buckthorn
P-RHUTYPH	Rhus typhina	Staghorn Sumac
P-RIB_SP	Ribes sp.	Currant Species
P-RORPAPA	Rorippa palustris ssp. palustris	Marsh Yellowcress
P-ROSMULT	Rosa multiflora	Multiflora Rose
P-ROSPALU	Rosa palustris	Swamp Rose
P-RUBALLE	Rubus allegheniensis	Allegheny Blackberry
P-RUBIDID	Rubus idaeus ssp. idaeus	Common Red Raspberry
P-RUBIDME	Rubus idaeus ssp. strigosus	Wild Red Raspberry
P-RUBOCCI	Rubus occidentalis	Black Raspberry
P-RUBPUBE	Rubus pubescens	Dewberry
P-RUB_SP	Rubus sp.	Rubus Species
P-RUMCRIS	Rumex crispus	Curly Dock
P-SAL_SP	Salix sp.	Willow Species
P-SCIACUT	Schoenoplectus acutus var. acutus	Hard-stemmed Bulrush
P-SCIVALI	Schoenoplectus tabernaemontani	Soft-stemmed Bulrush
P-SCIMICR	Scirpus microcarpus	Red-tinged Bulrush
P-SMIHISP	Smilax tamnoides	Hispid Greenbrier
P-SOLDULC	Solanum dulcamara	Bittersweet Nightshade
P-SOLALAL	Solidago altissima var. altissima	Eastern Tall Goldenrod
P-SOLCANA	Solidago canadensis	Canada Goldenrod
P-SOLJUNC	Solidago juncea	Early Goldenrod
P-SOLPATU	Solidago patula	Round-leaved Goldenrod
P-SPIALBA	Spiraea alba	White Meadowsweet
P-STEMEDI	Stellaria media	Common Chickweed

Plant Species Inventoried, Vinemount Swamp (cont.)

SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
P-ASTLALN	Symphyotrichum lanceolatum ssp. lanceolatum	Panicked Aster
P-ASTNOVA	Symphyotrichum novae-angliae	New England Aster
P-ASTONON	Symphyotrichum ontarionis	Ontario Aster
P-ASTPUPU	Symphyotrichum puniceum var. puniceum	Swamp Aster
P-ASTUROP	Symphyotrichum urophyllum	Arrow-leaved Aster
P-SYR_SP	Syringa sp.	Lilac Species
P-TAROFFI	Taraxacum officinale	Common Dandelion
P-THADIOI	Thalictrum dioicum	Early Meadow-rue
P-THAPUBE	Thalictrum pubescens	Tall Meadow-rue
P-TILAMER	Tilia americana	American Basswood
P-RHURADI	Toxicodendron radicans	Poison Ivy
P-RHURANE	Toxicodendron radicans var. radicans	Eastern Poison Ivy
P-RHURARY	Toxicodendron radicans var. rydbergii	Western Poison Ivy
P-TRIPRAT	Trifolium pratense	Red Clover
P-TUSFARF	Tussilago farfara	Colt's-foot
P-TYPANGU	Typha angustifolia	Narrow-leaved Cattail
P-ULMAMER	Ulmus americana	American Elm
P-ULMRUBR	Ulmus rubra	Slippery Elm
P-URTDIDI	Urtica dioica ssp. dioica	European Stinging Nettle
P-VALOFFI	Valeriana officinalis	Common Valerian
P-VERHAST	Verbena hastata	Blue Vervain
P-VERARVE	Veronica arvensis	Corn Speedwell
P-VIBLENT	Viburnum lentago	Nannyberry
P-VIBRECO	Viburnum recognitum	Smooth Arrowwood
P-VICCRAC	Vicia cracca	Tufted Vetch
P-VIO_SP	Viola sp.	Violet Species
P-VITRIPA	Vitis riparia	Riverbank Grape
P-ZANAMER	Zanthoxylum americanum	Common Prickly-ash

Bird Species Inventoried, Vinemount Swamp

HCA Staff	HCA Staff	NAI	Incidental	Species Code	OFO_Scientific_Name	OFO_Common_Name
		x		B-SPSA	Actitis macularius	Spotted Sandpiper
x		x		B-RWBL	Agelaius phoeniceus	Red-winged Blackbird
		x		B-MALL	Anas platyrhynchos	Mallard
		CO		B-GBHE	Ardea herodias	Great Blue Heron
	x	x		B-CEDW	Bombycilla cedrorum	Cedar Waxwing
		FY		B-RTHA	Buteo jamaicensis	Red-tailed Hawk
x		x		B-NOCA	Cardinalis cardinalis	Northern Cardinal
		x		B-TUVU	Cathartes aura	Turkey Vulture
		x		B-VEER	Catharus fuscescens	Veery
	x	x		B-KILL	Charadrius vociferus	Killdeer
		x		B-MAWR	Cistothorus palustris	Marsh Wren
		x		B-NOFL	Colaptes auratus	Northern Flicker
		x		B-EAWP	Contopus virens	Eastern Wood-Pewee
		x		B-AMCR	Corvus brachyrhynchos	American Crow
		x	x	B-BLJA	Cyanocitta cristata	Blue Jay
		x		B-DOWO	Dryobates pubescens	Downy Woodpecker
		x		B-HAWO	Dryobates villosus	Hairy Woodpecker
	x	x		B-GRCA	Dumetella carolinensis	Gray Catbird
		x		B-ALFL	Empidonax alnorum	Alder Flycatcher
x		x		B-WIFL	Empidonax traillii	Willow Flycatcher
x	x	x		B-COYE	Geothlypis trichas	Common Yellowthroat
x		x		B-BARS	Hirundo rustica	Barn Swallow
		x		B-WOTH	Hylocichla mustelina	Wood Thrush
		x		B-BAOR	Icterus galbula	Baltimore Oriole
		x		B-RBWO	Melanerpes carolinus	Red-bellied Woodpecker
			x	B-WITU	Meleagris gallopavo	Wild Turkey
x	x	x		B-SWSP	Melospiza georgiana	Swamp Sparrow
	x	x		B-SOSP	Melospiza melodia	Song Sparrow
x		x		B-BHCO	Molothrus ater	Brown-headed Cowbird
		x		B-GCFL	Myiarchus crinitus	Great Crested Flycatcher
	x	PO		B-SAVS	Passerculus sandwichensis	Savannah Sparrow
	x	x		B-INBU	Passerina cyanea	Indigo Bunting
		x		B-RBGR	Pheucticus ludovicianus	Rose-breasted Grosbeak
		x		B-BCCH	Poecile atricapillus	Black-capped Chickadee
		SM		B-VESP	Poocetes gramineus	Vesper Sparrow
		x		B-SORA	Porzana carolina	Sora
	x	x		B-COGR	Quiscalus quiscula	Common Grackle
		PO		B-EAPH	Sayornis phoebe	Eastern Phoebe
		x		B-AMWO	Scolopax minor	American Woodcock
x		x		B-YWAR	Setophaga petechia	Yellow Warbler
		x		B-AMRE	Setophaga ruticilla	American Redstart
		x		B-WBNU	Sitta carolinensis	White-breasted Nuthatch
	x	x		B-AMGO	Spinus tristis	American Goldfinch
	x			B-FISP	Spizella pusilla	Field Sparrow
x		x		B-EUST	Sturnus vulgaris	European Starling

Bird Species Inventoried, Vinemount Swamp (cont.)

HCA Staff	HCA Staff	NAI	Incidental	Species_ Code	OFO_Scientific_Name	OFO_Common_Name
		FY		B-TRES	Tachycineta bicolor	Tree Swallow
		x		B-BRTH	Toxostoma rufum	Brown Thrasher
	x	x		B-HOWR	Troglodytes aedon	House Wren
	x	x	x	B-AMRO	Turdus migratorius	American Robin
		x		B-EAKI	Tyrannus tyrannus	Eastern Kingbird
		x		B-WAVI	Vireo gilvus	Warbling Vireo
		x		B-REVI	Vireo olivaceus	Red-eyed Vireo
		P		B-MODO	Zenaida macroura	Mourning Dove
			x	B-WTSP	Zonotrichia albicollis	White-throated Sparrow

Mammal Species Inventoried, Vinemount Swamp			
NAI	Species_Code	Scientific_Name_NHIC	Common_Name_NHIC
x	M-COYO	Canis latrans	Coyote
x	M-VIOP	Didelphis virginiana	Virginia Opossum
x	M-WTDE	Odocoileus virginianus	White-tailed Deer
x	M-RACC	Procyon lotor	Northern Raccoon
x	M-EACO	Sylvilagus floridanus	Eastern Cottontail

Butterflies and Dragonflies Inventoried, Vinemount Swamp

NAI	Species_Code	NHIC_Scientific_Name	NHIC_Common_Name
x	L-LESK	Ancyloxypha numitor	Least Skipper
x	L-SUAZ	Celastrina neglecta	Summer Azure
x	L-WONY	Cercyonis pegala	Common Wood-Nymph
x	L-CORI	Coenonympha tullia	Common Ringlet
x	L-ORSU	Colias eurytheme	Orange Sulphur
x	L-COSU	Colias philodice	Clouded Sulphur
x	L-VICT	Ctenucha virginica	Virginia Ctenucha
x	L-MONA	Danaus plexippus	Monarch
x	L-BLDA	Euphyes conspicua	Black Dash
x	L-DUSK	Euphyes vestris	Dun Skipper
x	O-COSW	Lestes disjunctus	Northern Spreadwing
x	O-SLSP	Lestes rectangularis	Slender Spreadwing
x	L-AEBR	Lethe appalachia	Appalachian Brown
x	L-VICE	Limenitis archippus	Viceroy
x	L-BRCO	Lycaena hyllus	Bronze Copper
x	L-MOCL	Nymphalis antiopa	Mourning Cloak
x	L-BLSP	Paonias excaecata	Blinded Sphinx
x	L-BLSW	Papilio polyxenes	Black Swallowtail
x	L-PHYPAS	Phyciodes cocyta	Northern Crescent
x	L-CAWH	Pieris rapae	Cabbage White
x	O-COWH	Plathemis lydia	Common Whitetail
x	L-HOSK	Poanes hobomok	Hobomok Skipper
x	L-BWSK	Poanes viator	Broad-winged Skipper
x	L-COMM	Polygonia comma	Eastern Comma
x	L-BAHA	Satyrium calanus	Banded Hairstreak
x	L-GSFR	Speyeria cybele	Great Spangled Fritillary
x	O-WFME	Sympetrum obtrusum	White-faced Meadowhawk
x	L-EUSK	Thymelicus lineola	European Skipper
x	L-READ	Vanessa atalanta	Red Admiral
x	L-AMLA	Vanessa virginiensis	American Lady

Plant Species Inventoried, Tapleystown Woods

SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
P-ACENEGU	<i>Acer negundo</i>	Manitoba Maple
P-ACESANI	<i>Acer nigrum</i>	Black Maple
P-ACERUBR	<i>Acer rubrum</i>	Red Maple
P-ACESASA	<i>Acer saccharum</i>	Sugar Maple
P-ACEXFRE	<i>Acer x freemanii</i>	(<i>Acer rubrum</i> X <i>Acer saccharinum</i>)
P-ALLPETI	<i>Alliaria petiolata</i>	Garlic Mustard
P-AMELAEV	<i>Amelanchier laevis</i>	Smooth Serviceberry
P-ANEQUIN	<i>Anemone quinquefolia</i>	Wood Anemone
P-ARITRTR	<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit
P-BIDFRON	<i>Bidens frondosa</i>	Devil's Beggarticks
P-CARCONC	<i>Cardamine concatenata</i>	Cut-leaved Toothwort
P-CARDIPH	<i>Cardamine diphylla</i>	Two-leaved Toothwort
P-CARGRAY	<i>Carex grayi</i>	Gray's Sedge
P-CARCARO	<i>Carpinus caroliniana</i>	Blue-beech
P-CARCORD	<i>Carya cordiformis</i>	Bitternut Hickory
P-CAROVAT	<i>Carya ovata</i>	Shagbark Hickory
P-CAUGIGA	<i>Caulophyllum giganteum</i>	Giant Blue Cohosh
P-CHEMAJU	<i>Chelidonium majus</i>	Greater Celandine
P-CHESIMP	<i>Chenopodium simplex</i>	Maple-leaved Goosefoot
P-CIRLUCA	<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Canada Enchanter's Nightshade
P-CLAVIRG	<i>Claytonia virginica</i>	Narrow-leaved Spring Beauty
P-CORFORA	<i>Cornus racemosa</i>	Gray Dogwood
P-CRA_SP	<i>Crataegus</i> sp.	Hawthorn Species
P-ERIPHPH	<i>Erigeron philadelphicus</i> var. <i>philadelphicus</i>	Philadelphia Fleabane
P-ERYAMAM	<i>Erythronium americanum</i> ssp. <i>americanum</i>	Yellow Trout-lily
P-EUOOBOV	<i>Euonymus obovatus</i>	Running Strawberry Bush
P-FAGGRAN	<i>Fagus grandifolia</i>	American Beech
P-FLOPROS	<i>Floerkea proserpinacoides</i>	False Mermaidweed
P-FRAVEAM	<i>Fragaria vesca</i> ssp. <i>americana</i>	American Woodland Strawberry
P-FRAVIRG	<i>Fragaria virginiana</i>	Wild Strawberry
P-RHAFRAN	<i>Frangula alnus</i>	Glossy Buckthorn
P-FRAAMER	<i>Fraxinus americana</i>	White Ash
P-FRANIGR	<i>Fraxinus nigra</i>	Black Ash
P-FRAPENN	<i>Fraxinus pennsylvanica</i>	Green Ash
P-GERMACU	<i>Geranium maculatum</i>	Spotted Geranium
P-GERROBE	<i>Geranium robertianum</i>	Herb-Robert
P-GEULACI	<i>Geum laciniatum</i>	Rough Avens
P-HESMATR	<i>Hesperis matronalis</i>	Dame's Rocket
P-HYDVIRG	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
P-IMPCAPE	<i>Impatiens capensis</i>	Spotted Jewelweed
P-IMPPALL	<i>Impatiens pallida</i>	Pale Jewelweed
P-JUGCINE	<i>Juglans cinerea</i>	Butternut
P-LEOCACA	<i>Leonurus cardiaca</i> ssp. <i>cardiaca</i>	Common Motherwort
P-LIGVULG	<i>Ligustrum vulgare</i>	European Privet
P-MAIRARA	<i>Maianthemum racemosum</i>	Large False Solomon's Seal
P-MATSTPE	<i>Matteuccia struthiopteris</i> var. <i>pennsylvanica</i>	Ostrich Fern
P-MENARBO	<i>Mentha canadensis</i>	Canada Mint
P-OSTVIRG	<i>Ostrya virginiana</i>	Eastern Hop-hornbeam

Plant Species Inventoried, Tapleystown Woods (cont.)

SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
P-OXAACMO	Oxalis montana	Common Wood-sorrel
P-PARQUIN	Parthenocissus quinquefolia	Virginia Creeper
P-PHRLEPT	Phryma leptostachya	Lopseed
P-PILFONT	Pilea fontana	Lesser Clearweed
P-PILPUMI	Pilea pumila	Dwarf Clearweed
P-PINSTRO	Pinus strobus	Eastern White Pine
P-PLAMAJO	Plantago major	Common Plantain
P-PODPELT	Podophyllum peltatum	May-apple
P-POPGRAN	Populus grandidentata	Large-toothed Aspen
P-PRUAVIU	Prunus avium	Sweet Cherry
P-PRUSERO	Prunus serotina	Black Cherry
P-QUEALBA	Quercus alba	White Oak
P-QUEBICO	Quercus bicolor	Swamp White Oak
P-QUEMACR	Quercus macrocarpa	Bur Oak
P-QUERUBR	Quercus rubra	Northern Red Oak
P-RANRECU	Ranunculus recurvatus	Hooked Buttercup
P-RHACATH	Rhamnus cathartica	Common Buckthorn
P-RIBCYNO	Ribes cynosbati	Prickly Gooseberry
P-RIBLACU	Ribes lacustre	Bristly Black Currant
P-RORPALU	Rorippa palustris	Marsh Yellowcress
P-ROSMULT	Rosa multiflora	Multiflora Rose
P-RUBALLE	Rubus allegheniensis	Allegheny Blackberry
P-RUBIDME	Rubus idaeus ssp. strigosus	Wild Red Raspberry
P-RUBOCCI	Rubus occidentalis	Black Raspberry
P-RUBODOR	Rubus odoratus	Purple-flowering Raspberry
P-SAL_SP	Salix sp.	Willow Species
P-SANCANA	Sanguinaria canadensis	Bloodroot
P-SAN_SP	Sanicula sp.	Snakeroot Species
P-SOLALAL	Solidago altissima var. altissima	Eastern Tall Goldenrod
P-SOLFLEX	Solidago flexicaulis	Zigzag Goldenrod
P-SOLHIHI	Solidago hispida var. hispida	Hairy Goldenrod
P-SOL_SP	Solidago sp.	Goldenrod Species
P-ASTLATE	Symphotrichum lateriflorum	Calico Aster
P-TILAMER	Tilia americana	American Basswood
P-TORJAPO	Torilis japonica	Erect Hedge-parsley
P-RHURADI	Toxicodendron radicans	Poison Ivy
P-RHURANE	Toxicodendron radicans var. radicans	Eastern Poison Ivy
P-RHURARY	Toxicodendron radicans var. rydbergii	Western Poison Ivy
P-TRIEREC	Trillium erectum	Red Trillium
P-TRIGRAN	Trillium grandiflorum	White Trillium
P-ULMAMER	Ulmus americana	American Elm
P-ULMRUBR	Ulmus rubra	Slippery Elm
P-URTDIDI	Urtica dioica ssp. dioica	European Stinging Nettle
P-VERTHAP	Verbascum thapsus	Common Mullein
P-VEROFFI	Veronica officinalis	Common Speedwell
P-CYNNIGR	Vincetoxicum nigrum	Black Swallow-wort
P-VIOPUBE	Viola pubescens	Yellow Violet
P-VIOSORO	Viola sororia	Woolly Blue Violet

Plant Species Inventoried, Tapleystown Woods (cont.)

SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
P-VITRIPA	Vitis riparia	Riverbank Grape
P-XANSTRU	Xanthium strumarium	Rough Cocklebur
P-ZANAMER	Zanthoxylum americanum	Common Prickly-ash

Bird Species Inventoried, Tapleystown Woods

HCA Staff	HCA Staff	HCA Staff	NAI	Incidental Sightings	e-bird Data	Species_Code	OFO_Scientific_Name	OFO_Common_Name
x	x	x	x		x	B-RWBL	Agelaius phoeniceus	Red-winged Blackbird
				x		B-WODU	Aix sponsa	Wood Duck
					x	B-NOPI	Anas acuta	Northern Pintail
	x	x	x			B-MALL	Anas platyrhynchos	Great Crested Flycatcher
	x					B-GBHE	Ardea herodias	Yellow-billed Cuckoo
			x			B-CEDW	Bombycilla cedrorum	Scarlet Tanager
			x		x	B-CAGO	Branta canadensis	Red-tailed Hawk
		x				B-GHOW	Bubo virginianus	American Goldfinch
	x	x	x (VO)	x		B-RTHA	Buteo jamaicensis	American Crow
x	x					B-NOCA	Cardinalis cardinalis	Bobolink
					x	B-KILL	Charadrius vociferus	Killdeer
			x			B-YBCU	Coccyzus americanus	Northern Flicker
	x	x	x (VO)			B-NOFL	Colaptes auratus	Gray Catbird
		x	x			B-EAWP	Contopus virens	Brown-headed Cowbird
	CF					B-AMCR	Corvus brachyrhynchos	Brown Thrasher
x	x	x	x (VO)			B-BLJA	Cyanocitta cristata	Red-eyed Vireo
		x			x	B-BOBO	Dolichonyx oryzivorus	Savannah Sparrow
x						B-DOWO	Dryobates pubescens	Eastern Kingbird
	x					B-GRCA	Dumetella carolinensis	Canada Goose
					x	B-HOLA	Eremophila alpestris	Horned Lark
			x (VO)			B-WOTH	Hylocichla mustelina	Great Blue Heron
					x	B-DEJU	Junco hyemalis	Dark-eyed Junco
				x		B-EASO	Megascops asio	Eastern Screech-Owl
	x	x	x			B-RBWO	Melanerpes carolinus	Song Sparrow
				x		B-RHWO	Melanerpes erythrocephalus	Red-headed Woodpecker
x	x		x			B-SOSP	Melospiza melodia	Blue Jay
x				x		B-BHCO	Molothrus ater	Great Horned Owl
x	x	x				B-GCFL	Myiarchus crinitus	Indigo Bunting
			x			B-SAVS	Passerculus sandwichensis	American Woodcock
		x	x			B-INBU	Passerina cyanea	Downy Woodpecker
	x		x			B-SCTA	Piranga olivacea	Northern Cardinal
					x	B-VESP	Poocetes gramineus	Vesper Sparrow
x	x	x	x		x	B-COGR	Quiscalus quiscula	Common Grackle
	x	x			x	B-AMWO	Scolopax minor	White-breasted Nuthatch

Bird Species Inventoried, Tapleystown Woods (cont.)

HCA Staff	HCA Staff	HCA Staff	NAI	Incidental Sightings	e-bird Data	Species_Code	OFO_Scientific_Name	OFO_Common_Name
x		x	x		x	B-YWAR	Setophaga petechia	American Robin
		x				B-WBNU	Sitta carolinensis	Wood Thrush
			x			B-AMGO	Spinus tristis	House Wren
			x		x	B-FISP	Spizella pusilla	Mallard
					x	B-EUST	Sturnus vulgaris	European Starling
			x		x	B-BRTH	Toxostoma rufum	Red-bellied Woodpecker
	x	x				B-HOWR	Troglodytes aedon	Field Sparrow
x	x	x				B-AMRO	Turdus migratorius	Eastern Wood-Pewee
		x				B-EAKI	Tyrannus tyrannus	Cedar Waxwing
	x		x			B-REVI	Vireo olivaceus	Yellow Warbler

Mammal Species Inventoried, Tapleystown Woods				
NAI	incidental	Species_Code	Scientific_Name_NHIC	Common_Name_NHIC
x	x	M-COYO	Canis latrans	Coyote
	x	M-WTDE	Odocoileus virginianus	White-tailed Deer
x	x	M-RACC	Procyon lotor	Northern Raccoon
	x	M-GRSB	Sciurus carolinensis	Eastern Gray Squirrel Black Phase

Butterfly Species Inventoried, Tapleystown Woods				
NAI	iNat	Species_Code	NHIC_Scientific_Name	NHIC_Common_Name
x		L-SUAZ	Celastrina neglecta	Summer Azure
x		L-WONY	Cercyonis pegala	Common Wood-Nymph
x		L-COSU	Colias philodice	Clouded Sulphur
x		L-SSSK	Epargyreus clarus	Silver-spotted Skipper
x		L-JUDW	Erynnis juvenalis	Juvenal's Duskywing
x		L-MOCL	Nymphalis antiopa	Mourning Cloak
	x	L-GISW	Papilio cresphontes	Giant Swallowtail
x		L-TISW	Papilio glaucus	Eastern Tiger Swallowtail
x		L-PECR	Phyciodes tharos	Pearl Crescent
x		L-CAWH	Pieris rapae	Cabbage White
x		L-COMM	Polygonia comma	Eastern Comma
x		L-BAHA	Satyrium calanus	Banded Hairstreak
x		L-GSFR	Speyeria cybele	Great Spangled Fritillary
x		L-EUSK	Thymelicus lineola	European Skipper
x		L-READ	Vanessa atalanta	Red Admiral
x		L-PALA	Vanessa cardui	Painted Lady
x		L-BRDA	Wallengrenia egeremet	Northern Broken-Dash

APPENDIX 7

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