

Winona and Vinemount Conservation Areas Management Plan

Final - May 2024



Prepared by: Hamilton Region Conservation Authority (HCA)

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1.0 APPROVAL STATEMENT

We are pleased to approve the Winona and Vinemount Conservation Areas Management Plan 2022 as the official policy document for the Hamilton Region Conservation Authority (HCA).

This management 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 provide guidance for management of Winona and Vinemount Conservation Areas 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

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Shawn Carey
NEC Director

Date

Christie Curley
MNRF Fish and Wildlife Policy
Branch Director

Date

2.0 INTRODUCTION

2.1 Area Summary

HCA acquired these Escarpment tracts of land to protect them from changes that could be detrimental to their sensitive features and functions. The north facing Escarpment slope is steep and tree covered, and exhibits significant plant communities unique for this area of Southern Ontario. When HCA acquired the lands, the Bruce Trail was in place below the Escarpment crest. The Bruce Trail is the official recreational trail for these conservation areas. The major land use surrounding the conservation areas are farm related with a scattering of rural residences along the adjacent roadways. The study area for this plan is shown in Figure 1. Context Map.

The original Master Development Plans for Winona and Vinemount Conservation Areas (WVCA) were prepared by HCA staff in 1979. This Management Plan is intended to replace both of those plans, consolidate all available information on file, add new information on current conditions, and recommended best management practices to help guide land management decisions for the next ten years.

WVCA is classified as Natural Environment in the Niagara Escarpment Plan (NEP), and the Niagara Escarpment is designated as a UNESCO World Biosphere Reserve. This classification and designation serves to protect the outstanding natural heritage features, cultural heritage resources, and scenic resources at WVCA. This Management Plan supports the biosphere reserve principles so that the Escarpment will remain substantially as a natural environment for future generations.

In preparing this updated plan for both conservation areas, HCA reviewed the current Niagara Escarpment Parks and Open Space System (NEPOSS) Planning Manual concept of grouping multiple parks into one management plan. The following considerations noted in the manual guided this decision:

- The conservation areas are in close proximity with a shared trail system (Bruce Trail)
- They both have the same environmental features and ecological functions.
- They both have the same level of planning complexity.
- Both areas have the same levels of service, operation and management.

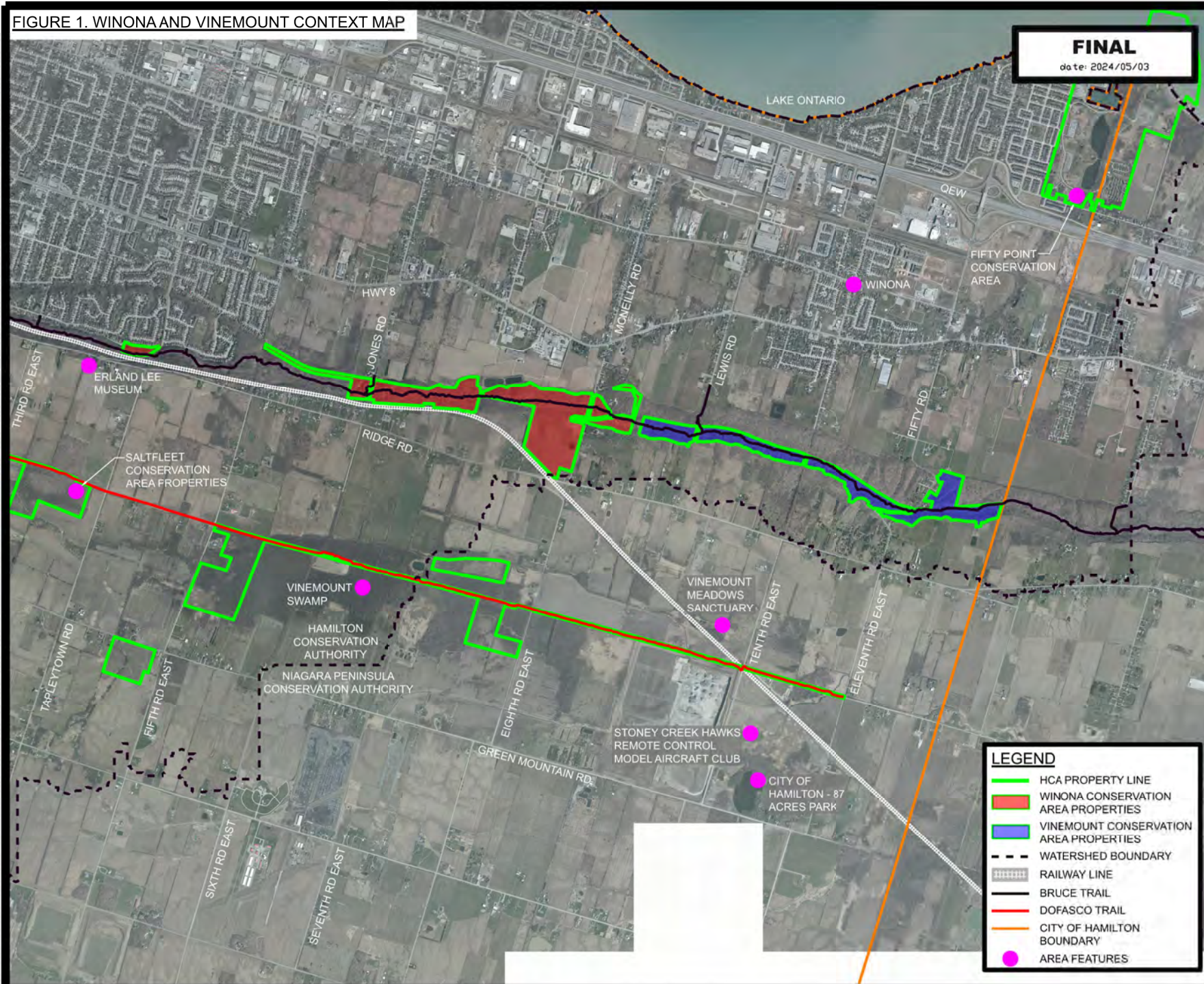
Winona Conservation Area

The 55.6 ha (137 acres) Winona Conservation Area is located on the Niagara Escarpment in Stoney Creek. It is situated between Devil's Punchbowl Conservation Area 6 km to the west, and Vinemount Conservation Area 3 km east. The Bruce Trail runs through the property and is accessible from Macdui Drive, Jones Road, and McNeilly Road.

Vinemount Conservation Area

The 36.5 ha (90 acres) Vinemount Conservation Area is located on the Niagara Escarpment in Stoney Creek. The Bruce Trail runs through the property and is accessible from Lewis Road, Winona Road, and Fifty Road. Fifty Point Conservation Area is located 2.5 km north.

FIGURE 1. WINONA AND VINEMOUNT CONTEXT MAP



FINAL
date: 2024/05/03

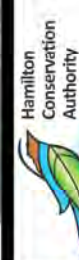


CONTEXT MAP
WINONA & VINEMOUNT MANAGEMENT PLAN

DATE: 2024/05/03

LEGEND

- HCA PROPERTY LINE
- WINONA CONSERVATION AREA PROPERTIES
- VINEMOUNT CONSERVATION AREA PROPERTIES
- WATERSHED BOUNDARY
- RAILWAY LINE
- BRUCE TRAIL
- DOFASCO TRAIL
- CITY OF HAMILTON BOUNDARY
- AREA FEATURES



A Healthy Watershed for Everyone

2.2 Key Items

The majority of the lands are designated by the province or the municipality as Environmentally Significant Areas (ESAs) or as Areas of Natural and Scientific Interest (ANSIs). The actual designation is determined by many reasons, including significant hydrological function, rare habitat, escarpment land, or species at risk to name a few.

HCA's ownership and management of these lands provides protection of their sensitive features and functions. Access to these lands is restricted to the Bruce Trail, and no other visitor amenities (such as parking) to access the trail are proposed in this plan. These lands contribute to the larger natural heritage system in the City of Hamilton (City) and surrounding municipalities, and contribute to the watershed's biodiversity.

2.3 Goals and Objectives

In 1968, Professor L.O. Gertler of the University of Waterloo prepared a study identifying sensitive Niagara Escarpment lands threatened by urban sprawl. The report made recommendations to the Ontario government to protect these lands through acquisition on a priority basis or through the use of easements and lease agreements.

As a result of the Gertler report, HCA developed a comprehensive Escarpment land acquisition program to help preserve the character of the Niagara Escarpment within its area of jurisdiction. As a part of this program, HCA acquired the Winona and Vinemount lands with a view to establishing recreational nodes at five to eight - kilometer intervals. The purpose of this program was two-fold:

1. To preserve the landscape character of significant features of the Niagara Escarpment.
2. To provide recreational access at specific locations along the Escarpment.

HCA Strategic Plan

This Management Plan supports this Vision for the land acquisition, as well as the following long-term 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.



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 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

Objectives

In addition to the above, and through further consultation and analysis during this Management Plan process, HCA supports the following long-term objectives for Winona and Vinemount Conservation Areas:

1. To preserve and protect the Niagara Escarpment.
2. To provide Bruce Trail through access.
3. That recreational facilities be passive, low density uses centred primarily on nature appreciation and trail-oriented activities.
4. To maintain the current agricultural land use agreements, and upon the expiry of those agreements actively restore the lands back to natural areas.



3.0 BACKGROUND

3.1 Study Area

HCA acquired these tracts of land for natural protection, water conservation, and recreational use. Residential land uses in the area consist of scattered rural residences and estates. The lands in the study area are used for passive recreational activities including hiking and nature study. See the appended maps for more information.

3.2 Property History

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.

Non-Indigenous settlement is noted in historic records of the formation of Upper Canada in 1792. Settlement of the area increased in 1786, with loyalist immigrants arriving from New York State in the years following the American Revolutionary War. Crown patents were granted to United Empire Loyalists who settled at first below the escarpment but then spread south creating small hamlets.

Following are key highlights of property history known to HCA at the time of land acquisition for the creation of the conservation areas.

.1 Bruce Trail History

The Bruce Trail Conservancy (BTC) is one of Ontario's largest land trusts and the steward of Canada's longest marked footpath. The "Bruce" of the Bruce Trail refers to the Bruce Peninsula through which the northern-most section of the Trail passes. In the early 1960's as the trail was being conceived, the thought was that this footpath along the full length of the Niagara Escarpment would be a trail "to the Bruce", a popular vacation destination.

The BTC was established in 1960 and by 1963 Regional Clubs were in operation. The Regional Clubs were responsible for organization, landowner approvals, construction and maintenance of portions of the trail. The Iroquoia Bruce Trail Club was formed in Hamilton on September 5, 1963 to build and maintain the BTC main and side trails from Grimsby to the Kelso Conservation Area near Milton.



The Bruce Trail took seven years to complete and was officially opened in 1967, Canada's Centennial Year. The trail runs over 900 km from Queenston to Tobermory, passing along the Escarpment face through the two conservation areas. See Figure 2. Bruce Trail Map.

HCA has a partnership agreement with the BTC and the Iroquoia Bruce Trail Club for the maintenance of the Bruce Trail crossing HCA lands. Representatives of the BTC were consulted in the writing of this Management Plan.

Figure 2. Bruce Trail Map



Map source: Bruce Trail Conservancy

.2 Winona Conservation Area History:

In 1972 the Hamilton-Wentworth Planning Area Board and HCA studied the Vinemount area and selected a suitable site on McNeilly Road for establishing a conservation area. In 1972 HCA secured a 16-ha farmstead atop the Escarpment. The property was acquired in three installments between 1972 and 1973. The Winona Conservation Area was adopted by HCA in 1973 with the acquisition of Part 9, Concession 3 in the former Township of Saltfleet. At the time of purchase, these properties were named Vinemount Conservation Area, but a distinction between Winona and Vinemount Conservation Areas has since been made (see Figure 1). HCA requested and received financial assistance with a grant from the provincial Ministry of Natural Resources, amounting to approximately 75% of the estimated cost of the acquisition. Further acquisitions were anticipated subject to land becoming available and as funding and priorities permitted. Over time, more properties were acquired along the Escarpment.

Major land uses in the area at the time of acquisition included farming and residential scattered along Ridge Road. The land for the most part was in fruit production. This production supplied the E.D. Smith and Sons Limited fruit canning and preserving factory below the Escarpment, 1 km west of the McNeilly Road and Highway 8 intersection. The Vinemount General Store was located on the northwestern corner of McNeilly Road and Regional Road 25 and functioned as the area post office. The T.H. & B. Railway Line ascended the Escarpment west of HCA property on Lot 10, Concession 3.

For the first ten years of HCA ownership, site development was limited to the following:

- Continued operation of the fruit farm
- Approximately 0.5 ha of tableland area at McNeilly Road was developed for day-use with an HCA sign, gravel parking lot for twenty cars, pit privy, split rail fencing, grassed picnic area, and a footpath to viewing areas at the brow of the Escarpment amidst a former cherry orchard.
- HCA and the farmer had service access to the interior of the property via two farm lanes.

HCA entered into a lease agreement to maintain the agricultural operation, the agreement exists to this day for the agricultural land parcel at McNeilly Road and Eighth Road.

The day use facilities that were developed near the Escarpment crest, due to their remote rural location at the time, were vandalised and eventually removed. Remnants of the parking area are still visible from McNeilly Road. The physical constraints to reach the Bruce Trail from this location, combined with a lack of municipal services such as sewage systems, limits HCA's development and use of this property for visitors. Accordingly, no visitor facilities are in place for the conservation area other than the Bruce Trail.

.3 Vinemount Conservation Area History:

One of the first Vinemount Conservation Area properties acquired is located along Fifty Road at the top of the Escarpment. The property was, at one time, in vineyard production but was not known to be a commercial operation. In the early 1970's the area was cleared in preparation for residential development but that idea was turned down by the regional government. When HCA acquired the 3.8 ha parcel in 1976 natural succession had taken over much of the lands,

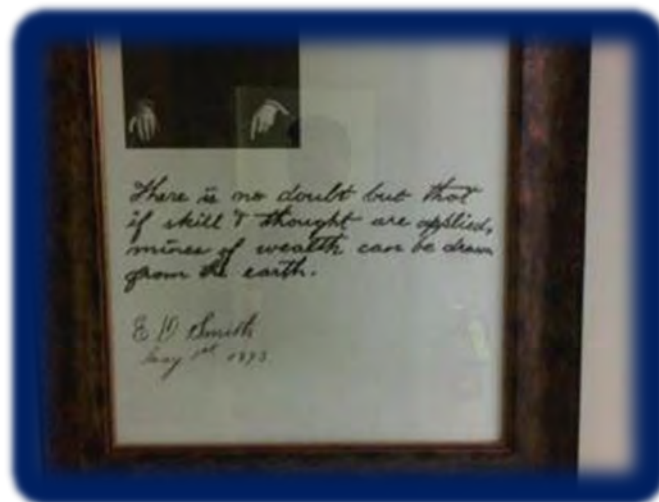
with Escarpment woodlands surrounding the property. HCA acquired the lands with the intent of preserving the Escarpment plateau, 105 meters of road frontage along Fifty Road, and access to the Bruce Trail. The objective was to allow the land to re-generate to a point where the vegetation was of natural composition matching the surrounding Escarpment woodlots.

In addition to the preservation goal, another key goal was land acquisition, especially Escarpment tableland, to provide recreational areas for picnicking, parking, and scenic lookouts. The major land uses nearby at that time were fruit farming (apple, pear, plum and cherry) and grape vineyards. Some estate residential development was occurring along the Escarpment brow. A quarry on Tenth Sideroad East was extracting dolostone, limestone and shale for the building and construction trades.

Although little in the way of history is on file for the conservation area property, much history is available for the surrounding lands. The village of Winona, in the years before Confederation, was known as 'Ontario' and before that 'The Fifty' taken from the creek of the same name. The Great Western Railroad Company built a station in 1850 along the rail line from Hamilton to Vinemount west of what is now Winona Road, and called the stop 'Ontario.' In 1867 when the act of Confederation was passed, the Province of Canada West became the Province of Ontario. The railroad station and area post office as a result, changed their names to 'Winona' after Winonah, the daughter of the Shawnee Indian Chief, Tecumseh. The first area post office was located just to the north of the conservation area on the northeast corner of Fifty Road at Highway 8.

The forests on the Escarpment supplied wood for Piott's basket factory in Stoney Creek in the 1800's. The village of Winona has had many firsts in the history of the Township of Saltfleet including the first community park, watermains, and street lights.

Perhaps the village's most famous citizen, Ernest D'Israeli Smith (1855-1948) introduced Saltfleet's first fruit farming industry in 1875. He was not only a grower but a buyer and shipper of fruit as well as initiating Saltfleet's (and Winona's) first industry in 1882, with the development of the E.D. Smith and Sons food processing plant. This plant remains in use today on Highway 8.



.4 Land Acquisition Notes:

HCA acquired most of the lands for the conservation areas from the early 1970's to the late 1990's. Due to the intensive agriculture on the plain above and below the Escarpment, the Escarpment face and slope were the land parcels HCA focused on acquiring. These lands had multiple constraints to development including the lack of available municipal services, shallow soils, and sensitivity of the Escarpment terraces. A few recent and notable land acquisitions by HCA include:

- Llewellyn Smith and Helderleigh Holdings Inc., formerly E.D. Smith Fruit Farms donated 58 acres (23.47 ha) of forest and fields along the Escarpment face by McNeilly Road to HCA in 2010. This donation was comprised of 15 acres of Escarpment land by the Smith family home, known as Helderleigh House, and 43 acres of field and slope behind the former E.D. Smith food plant. The donation was made public at HCA's board meeting of November 2010.
- In 1976 HCA purchased 9.55 acres in the former Township of Saltfleet for Escarpment preservation purposes, and to potentially establish a link below the Escarpment to Fifty Point Conservation Area. Natural area inventories of the land at that time noted the significance of the Escarpment lands and forest complex for this portion of the Niagara Section of the Escarpment.

3.3 Planning and Development Controls

The conservation areas are located in Wards 9 and 10 – Stoney Creek and subject to the planning and development controls of the City of Hamilton.

The conservation areas lands are subject to additional planning and development controls being entirely within the Niagara Escarpment Plan (NEP) Area and mostly within the Niagara Escarpment Commission (NEC) Area of Development Control. See Map 3 in Appendix 1 for the boundary mapping. While these NEP lands are within the Greenbelt Plan area, the only policies within the Greenbelt Plan that apply are those under the Greenbelt Plan Section 3.3 Parkland, Open Space and Trails. The conservation areas are also designated in the NEP as Escarpment Natural Area, Escarpment Protection Area and Urban Area. The policies of the Niagara Escarpment Plan and guidelines of the NEPOSS 2021 planning manual have been observed in the preparation of this Management Plan.

HCA recognizes that certain public infrastructure such as utility corridors, trails or transportation links may be required to cross WVCA lands. HCA policy for planning review and regulation of these features adheres to the Conservation Authority Act, R.S.O. 1990 c.27; see Section 6.5 for more information.

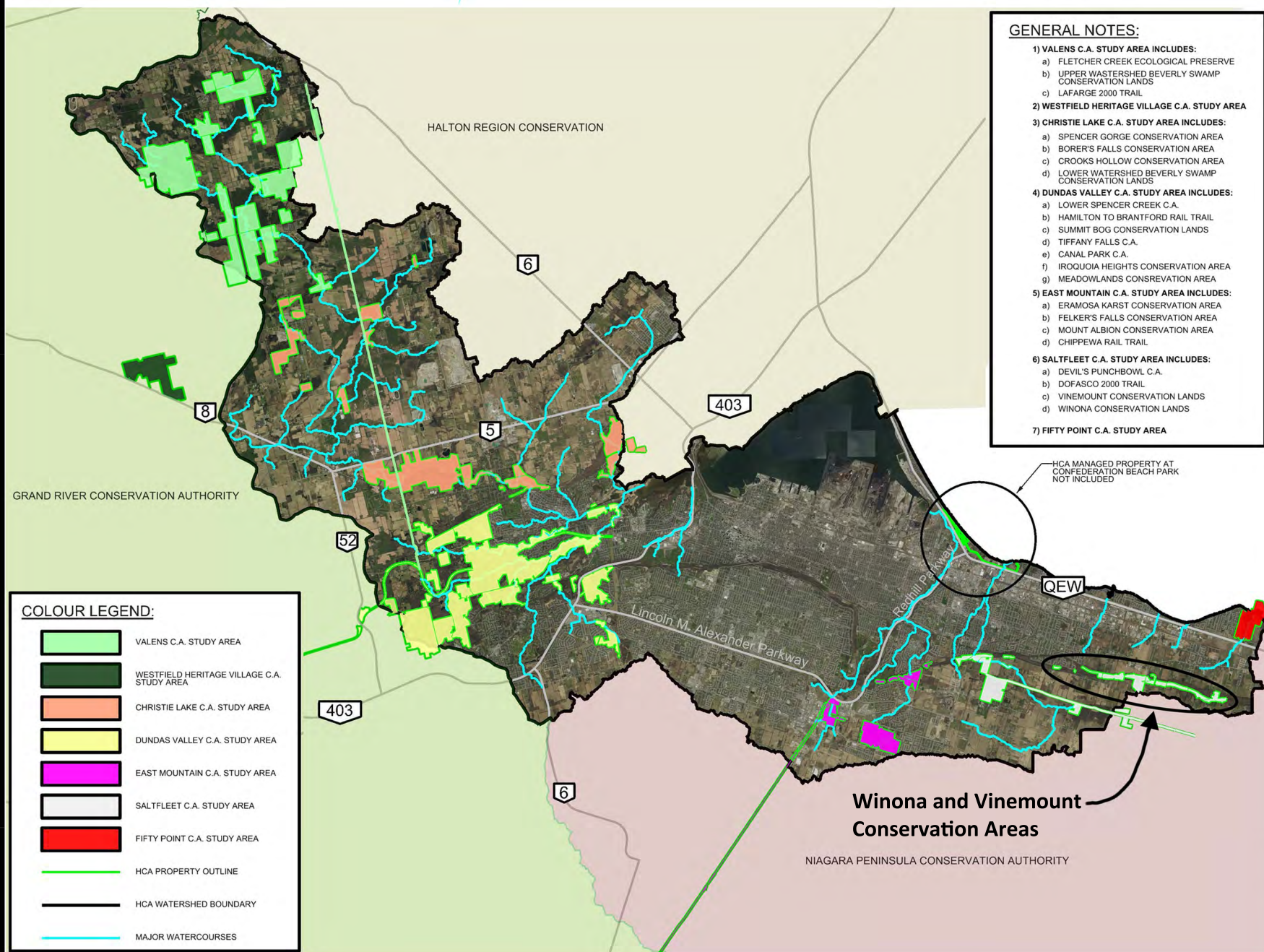
The City of Hamilton planning and development departments, as well as representatives from the Niagara Escarpment Commission; Ministry of Northern Development, Mines, Natural Resources and Forestry; and the NPCA were engaged in the scoping of this Management Plan.

3.4 Management Plan Zones

The appended maps show the Management Plan Zones for the Winona and Vinemount Conservation Areas.

HCA has approached this Management Plan with the mind-set that conservation areas in the HCA portfolio requiring Master or Management Plans and updates follow a consistent methodology as set out in HCA's 10 Year Master Plan Update Strategy. The Map shown in Figure 3. is from this Strategy.

FIGURE 3. HCA 10-YEAR MASTER PLAN STUDY AREA



DATE: 2023/01/27

MASTER PLAN STUDY AREA MAP

HCA's 10 Year Master Plan Update Strategy 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 Management Plan follows the NEPOSS planning manual, and with the information gathered in the natural heritage inventory, two land use zones are identified for Winona and Vinemount Conservation Areas. These zones are intended to help guide future planning, development, and management of the conservation areas. The zone boundaries are shown in more detail the appended Conservation Area Zone Maps.

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

- Identification and recognition of the features and attributes (values).
- Protection of key natural heritage features 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.

The two land use zones identified for Winona and Vinemount are:

- Natural Environment Zone
- Resource Management Zone

Natural Environment Zone

Natural environment zones include natural, cultural, and aesthetic landscapes in which minimum development is permitted to support low-intensity recreational activities. WVCA's natural zones are primarily the wooded area below the escarpment brow.

Table 1. Natural Environment Zone

Zone	Description	Management Direction	Permitted Uses (subject to management planning)
Natural Environment	<p>Includes scenic landscapes in which minimum development is permitted to support recreational activities that have minimal impacts on the Escarpment environment.</p> <ul style="list-style-type: none"> ➤ Significant woodlands ➤ Devil's Punchbowl Environmentally Significant Area (ESA) ➤ Niagara Escarpment Section Area of Natural and Scientific Interest (ANSI) 	<p>This zone may function as a buffer between Nature Reserve Zones and Development Zones, Cultural Heritage 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"> ➤ Bruce Trail ➤ Nature Appreciation from designated recreational trails and lookout stations ➤ Temporary scientific research ➤ Conservation practices (e.g. tree maintenance and monitoring, invasive species control, erosion control) <p>Infrastructure required for safety or accessibility may be permitted where there is no feasible alternative.</p>

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.

WVCA's resource management zones include the agricultural land and former parking area west of Eighth Road East.

Table 2. 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. Previously disturbed sites (e.g. old farm fields, abandoned quarries) where active measures are being taken to re-establish natural vegetation.</p> <ul style="list-style-type: none"> ➤ Farmed field ➤ Fallow field ➤ Former parking area ➤ Farm pond 	<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"> ➤ Farmed fields ➤ Recreational trails ➤ Educational tours ➤ Rehabilitation / naturalization projects ➤ Wetlands ➤ Research <p>Recreation uses in this zone are subject to HCA policies and management planning.</p>

4.0 NATURAL AREA INVENTORY

4.1 Natural Features

These conservation lands protect one of the more extensive continuous Escarpment features in the Niagara Peninsula.

The geomorphology of the area contains fine examples of escarpment face, cliff foot talus/side scree slide scars, boulder strewn slopes and narrow sub-escarpment terraces which are somewhat intersected by intermittent stream valleys. Portions of the slopes have very well-developed bedrock-controlled shale terrace which is strongly dissected by valleys.

The area also contains some of the most mature and diverse vegetative species in the Niagara Section of the escarpment. Of particular significance is the excellent slope forest complex which presents a mature array of highly representative features such as forested talus slopes, lower slope forests and others. As well, there is a very well-developed terrace ridge and valley pattern of forests on the narrow sand and shale ridges, similar to those of the Short Hills area in Niagara, or the valley rim forests of the Iroquois Plain.



4.2 Biophysical Inventory Methodology

Biophysical inventories completed at Winona and Vinemount Conservation Areas were mainly restricted to flora, breeding birds and Ecological Land Classification. Surveys completed by HCA staff in 2021 and 2022 are noted in Table 3. Ecological Land Classification was completed across the entire property, excluding the farmed land and former parking area near Eighth Road East, and is shown on Maps 1 and 2 in Appendix 1. Species lists are included in Appendix 4. It is intended that once farming ceases on the lands, supplementary field reviews will be conducted to update the ELC mapping.

Table 3. Summary of Ecological Field Studies

Survey Type	Dates, Year	Day(s)
Floral Inventory	2021, 2022	Concurrent with ELC surveys
Breeding Bird Surveys	2021, 2022	June 3, June 10, June 21, June 30
Ecological Land Classification (ELC)	2021, 2022	May 12 2021, May 26, June 2, 3 10, 21 and 30, Sept 13, 21 and Oct 6 2022
Incidental Wildlife	Recorded when encountered during all visits – 2021 and 2022	

4.3 Ecological Land Classification

The Ecological Land Classification (ELC) system for Ontario was used to describe the vegetation communities at WVCA. Staff conducted multi-season inventories of the property in 2020-2021. 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.

.1 Flora/ Botanical Inventory

Botanical inventories were conducted as a part of the Ecological Land Classification surveys of the property. Specific floristic inventories occurred in the fall of 2022 to further identify asters and goldenrod species as they bloom late in the season. An additional survey in the spring of 2021 was conducted for spring ephemerals (early spring flowers). Species in this group die back by mid-summer and therefore are missed when spring surveys are not conducted. 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 (Sfranks) and locally via the Hamilton Natural Areas Inventory (Schwetz 2014)



.2 Fauna Inventory

No specific surveys were conducted for 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 in the WVCA over the last 10 years. A summary of the findings is in Appendix 4.

Frog call surveys were not conducted on this property due to the lack of suitable habitat.

.3 Breeding Bird Survey

Breeding bird surveys were conducted on June 3, 10, 21 and 30, 2022 and followed the Ontario Breeding Bird Atlas (Cadman 2010) methodology.

4.4 Ecological Land Classification Results

Field surveys occurred on May 12 2021, May 26, June 2, 3 10, 21 and 30, September 13, 21 and October 6, 2022. The subject property was delineated into 11 vegetation communities. Details on community classifications can be found in Appendix 1 on Maps 1 and 2.

.1 Flora/Botanical Inventory Results

Over the course of multiple survey dates including ELC surveys, staff identified 190 species of plants. Of these, 145 are considered native plant species (76%) while 45 are non-native species (24%) and there were an additional 17 species identified to genus only. The Hamilton NAI (HCA 2014) indicates that there are 1496 species of plants in the Hamilton-Wentworth jurisdiction. Plant species within the WVCA represent 13% of that regional flora.

The Floristic Quality Index (FQI) and the Native Mean Coefficient of Conservatism (CC) have been calculated for the entire 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 both of these conservation areas is 52.82 and the mean CC value is 4.39 (Table 4). These are considered moderate to high for FQI and mean CC. This is likely reflective of the rural nature of WVCA.

Table 4. Floristic Summary and Assessment

FLORISTIC SUMMARY & ASSESSMENT		
Species Diversity		
Total Species:		190
Native Species:		145
Exotic Species		45
Species ID'd to sp. only		17
Total Taxa in Region (NAI 2014)		1496
% Regional Taxa Recorded		13%
% Native species		76%
% exotic species		24%
Co-efficient of Conservatism and Floral Quality Index		
Co-efficient of Conservatism (CC) (average)		4.39
CC 0 to 3	<i>lowest sensitivity</i>	41
CC 4 to 6	<i>moderate sensitivity</i>	90
CC 7 to 8	<i>high sensitivity</i>	13
CC 9 to 10	<i>highest sensitivity</i>	1
Floral Quality Index (FQI)		52.82

4.5 Fauna Inventory Results

.1 Breeding Birds

Breeding bird surveys were conducted within the WVCA in the spring of 2022. These surveys identified 39 species of birds including the Eastern Wood-pewee (*Contopus virens*) which is at risk provincially and federally. Other notable species include the Yellow-billed Cuckoo (*Coccyzus americanus*), Hooded Warbler (*Setophaga citrina*), and Carolina Wren (*Thryothorus ludovicianus*), which are considered rare in the City of Hamilton.



Eastern Wood-pewee

Background data was also collected from the following sources, iNaturalist, Natural Areas Inventory, and eBird. Surveys in 2012 for the NAI identified an additional 46 bird species while eBird and iNaturalist identified an additional 37 species. These were mainly composed of spring and fall migratory species and hawks and owls. These combined data sources have identified 122 species in the area. Of these 9 are provincial or federal species at risk, 20 are locally rare and 34 are locally uncommon.

.2 Butterflies and Dragonflies

Surveys completed for the Natural Areas Inventory in 2012 identified 28 species of Lepidoptera, as well as 10 species of Odonata. One additional species of Lepidoptera was recorded in the area by incidental observation. Observations of Monarch Butterflies, a provincial species at risk occurred in 2012. Three of the butterfly species found in the NAI were locally uncommon. None of the odonatan were provincially or locally rare.

.3 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. Fourteen mammal species have been recorded for this area by staff and the Natural Areas Inventory. All mammal species recorded are common to the area.

.4 Herpetofauna

Incidental observations by field staff of herpetofauna include 4 different species; the American Toad (*Anaxyrus americanus*), Eastern Gartersnake (*Thamnophis sirtalis sirtalis*), Western Chorus Frog - Carolinian Population (*Pseudacris triseriata* pop. 2) and Red-spotted Newt (*Notophthalmus viridescens viridescens*). Historical survey data from the Natural Areas Inventory (2012) note an additional 13 species. This includes the Snapping Turtle (*Chelydra serpentina*), Jefferson Salamander and its associated complex (*Ambystoma jeffersonianum*) and Midland Painted Turtle (*Chrysemys picta marginata*) which are at risk provincially and federally. The Eastern Milksnake (*Lampropeltis triangulum*) is at risk federally.

4.6 Aquatic Inventory

The watercourses of these properties are intermittent in nature. Some begin as small waterfalls or cascades off the escarpment lip while most begin as groundwater seeps. They contribute to the Stoney Creek Numbered Watercourses 5, 6, 7, 9, and 12 (Fifty Creek). Some of the tributaries have sections with deeper gully erosion occurring in the steeper slope areas with the most notable area being the WC#6 features in the area of the Jones Rd. access. These headwater drainage conditions limit their significance on the properties where they occur to being indirect fish habitat. Though they still play an important role in contributing resources to the downstream habitats. Most of the watercourses are small enough that they are forded by tail users, with just a few having culverts or bridge crossings. The City also has road culverts and associated drainage infrastructure adjacent to and potentially extending onto the McNeilly and Fifty Road properties



4.7 Significant Ecological Features

Policies are in place through the City of Hamilton Official Plan and the Provincial Policy Statement to provide for the protection of significant ecological features from development. This section highlights key features and policies of the study area.

.1 Natural Heritage Designations

.1 Significant Woodlands

All of the properties within the Winona and Vinemount Conservation Areas are considered by the City to be significant woodland. Significant woodlands for the City means 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

The Devil's Punchbowl Escarpment Environmentally Significant Area (ESA) includes the entire WVCA. The ESA was designated because it meets many of the 2003 ESA criteria including:

1. Significant Earth Science Feature
 - a. the area encompasses regionally significant landforms
2. Significant Ecological Function
 - a. the area contains significant species
 - b. the area contains rare biotic communities

- c. the riparian area serves as a link between natural areas along the Niagara Escarpment
- d. the area is representative of the natural features of the Niagara Peninsula section of the Niagara Escarpment

ESA areas are 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 Area of Natural and Scientific Interest (ANSI)

Both conservation areas are also part of the provincially significant Niagara Escarpment Section Life Science ANSI. This is one of the largest natural areas on the Niagara Peninsula and includes the talus and forest slopes from McNeilly Road to Regional Road 12 in Niagara. Within this section there are 9 km of moist cliff with extensive talus and clay loam forests of Sugar Maple/Black Maple/Red Elm below. There are a few drier ridges on HCA owed lands close to Fifty Road which support Red Oak forests. This area has a high diversity of plant and bird species and old growth forests.

From Fruitland to McNeilly Road is an additional Provincially Significant Life Science ANSI, Fruitland Escarpment. It has been designated because it is contiguous with the Niagara Escarpment Section ANSI and contributes 65 ha and forms part of a 13.6 km corridor from Hamilton to Niagara.

4.8 Biophysical Inventory – Analysis

.1 Species at Risk and Locally Rare Species

.1 Significant Flora

Butternut, federally and provincially endangered, was the only plant species considered provincially rare that was found in these conservation areas. There were only a few still surviving the Butternut canker. Of the plant species recorded on the subject lands through the 2020 and 2021 field surveys, one plant species was found to be locally rare, Goldie's Wood Fern by the City of Hamilton.

.2 Significant Fauna

The following 10 species recorded at WVCA listed in Table 5 are considered species at risk either federally (SARA) or provincially (ESA). These species were recorded within either Winona or Vinemount Conservation Areas through different data sources all observed during the breeding season except Eastern Whip-poor-will which was noted on migration.

Table 5. Federal and Provincial Species at Risk

Common name	Scientific name	SARA status (Schedule 1)	ESA status	Documented
Barn Swallow	<i>Hirundo rustica</i>	THR	SC	NAI
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	NAI
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	THR	THR	ebird
Wood Thrush	<i>Hylocichla mustelina</i>	THR	SC	BBS
Bank swallow	<i>Riparia riparia</i>	THR	THR	NAI
Chimney swift	<i>Chaetura pelagica</i>	THR	THR	NAI
Canada Warbler	<i>Cardellina canadensis</i>	THR	SC	NAI
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR	NAI
Jefferson Salamander and complex	<i>Ambystoma jeffersonianum</i>	END	END	NAI
Monarch	<i>Danaus plexippus</i>	END	SC	NAI

The Barn Swallow and Canada Warbler have been reassessed recently (2020) 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 Management Plan so they will be treated as SAR in this document.

Adult Monarchs have been observed throughout the fields and open portions of the forested habitats of this conservation Area. This species is considered a species of “Special Concern” on the Species at risk in Ontario (SARO) list. This means that the species lives in the wild in Ontario but may become threatened or endangered due to a combination of threats and biological characteristics. Many of these species at risk noted above are from background documents and their exact location within the WVCA is not known. It is likely that the Chimney Swift, Barn and Bank Swallows were seen flying over these conservation areas. The Eastern Whip-poor-will was seen on migration, while the Bobolink and Eastern Meadowlark may have been recorded in the large fields adjacent to these conservation areas. Although not surveyed for, it is likely that species at risk bats use the conservation areas for parts of their life cycle. Wood thrush was heard in multiple locations within the forested slopes of the Niagara Escarpment. Finally, the Jefferson Salamander records are from the Natural Areas Inventory and likely recorded in the forested talus slopes. This species has been included as it is cryptic species to survey for and it is longed lived. 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 (23) and uncommon (38) species recorded during field surveys and found in the background research. The status for these species comes from the 2014 Natural Areas Inventory (NAI) document. These include birds, plants and butterflies and are mostly concentrated within the forested sections of the Niagara Escarpment. See Table 6. for more information.

Table 6. Locally Rare and Uncommon Species

Common Name	Scientific name	City of Hamilton Status	Source
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Rare	iNat/eBird
Black-throated Green Warbler	<i>Setophaga virens</i>	Rare	iNat/eBird
Broad-winged Hawk	<i>Buteo platypterus</i>	Rare	iNat/eBird
Carolina Wren	<i>Thryothorus ludovicianus</i>	Rare	BBS
Clay-colored Sparrow	<i>Spizella pallida</i>	Rare	NAI
Common Raven	<i>Corvus corax</i>	Rare	iNat/eBird
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	Rare	iNat/eBird
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Rare	iNat/eBird
Hooded Warbler	<i>Setophaga citrina</i>	Rare	BBS
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	Rare	NAI
Merlin	<i>Falco columbarius</i>	Rare	iNat/eBird
Northern Harrier	<i>Circus hudsonius</i>	Rare	iNat/eBird
Osprey	<i>Pandion haliaetus</i>	Rare	iNat/eBird
Peregrine Falcon	<i>Falco peregrinus</i>	Rare	iNat/eBird
Purple Finch	<i>Haemorhous purpureus</i>	Rare	iNat/eBird
Red-bellied Snake	<i>Storeria occipitomaculata</i>	Rare	NAI
Red-shouldered Hawk	<i>Buteo lineatus</i>	Rare	iNat/eBird
Ring-necked Pheasant	<i>Phasianus colchicus</i>	Rare	NAI
Sandhill Crane	<i>Antigone canadensis</i>	Rare	iNat/eBird
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Rare	BBS
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Rare	BBS
Alder Flycatcher	<i>Empidonax alnorum</i>	Uncommon	NAI
American Kestrel	<i>Falco sparverius</i>	Uncommon	NAI
American Redstart	<i>Setophaga ruticilla</i>	Uncommon	NAI
Belted Kingfisher	<i>Megaceryle alcyon</i>	Uncommon	iNat/eBird
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Uncommon	BBS
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	Uncommon	NAI
Bobolink	<i>Dolichonyx oryzivorus</i>	Uncommon	NAI
Brown Creeper	<i>Certhia americana</i>	Uncommon	BBS
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	Uncommon	BBS
Chimney Swift	<i>Chaetura pelagica</i>	Uncommon	NAI
Common Sootywing	<i>Pholisora catullus</i>	Uncommon	NAI
Compton Tortoiseshell	<i>Nymphalis l-album</i>	Uncommon	NAI
Cooper's Hawk	<i>Accipiter cooperii</i>	Uncommon	BBS
Eastern Bluebird	<i>Sialia sialis</i>	Uncommon	NAI
Eastern Meadowlark	<i>Sturnella magna</i>	Uncommon	NAI
Eastern Phoebe	<i>Sayornis phoebe</i>	Uncommon	iNat/eBird
Eastern Screech-Owl	<i>Megascops asio</i>	Uncommon	iNat/eBird
Herring Gull	<i>Larus argentatus</i>	Uncommon	NAI

Common Name	Scientific name	City of Hamilton Status	Source
Least Flycatcher	<i>Empidonax minimus</i>	Uncommon	NAI
Mourning Warbler	<i>Geothlypis philadelphia</i>	Uncommon	NAI
Nashville Warbler	<i>Oreothlypis ruficapilla</i>	Uncommon	iNat/eBird
Northern Mockingbird	<i>Mimus polyglottos</i>	Uncommon	NAI
Orchard Oriole	<i>Icterus spurius</i>	Uncommon	NAI
Purple Martin	<i>Progne subis</i>	Uncommon	NAI
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Uncommon	BBS
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Uncommon	iNat/eBird
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Uncommon	BBS
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	Uncommon	NAI
Scarlet Tanager	<i>Piranga olivacea</i>	Uncommon	NAI
Silvery Blue	<i>Glaucopsyche lygdamus</i>	Uncommon	NAI
Turkey Vulture	<i>Cathartes aura</i>	Uncommon	BBS
White-throated Sparrow	<i>Zonotrichia albicollis</i>	Uncommon	NAI
Winter Wren	<i>Troglodytes hiemalis</i>	Uncommon	BBS
Wood Thrush	<i>Hylocichla mustelina</i>	Uncommon	BBS
Yellow-throated Vireo	<i>Vireo flavifrons</i>	Uncommon	BBS

.3 Significant Wildlife Habitat

The Significant Wildlife Habitat Technical manual (Ontario 2000) along with the Eco regional criteria tables for Ecoregion 7E (OMNR 2015) were used to determine and define significant wildlife habitat (SWH) on the WVCA 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 (see Section 4.7). 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.

.4 Seasonal Concentrations of Animals

Seasonal concentrations 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). WVCA is within 5 km of Lake Ontario. HCA staff did not undertake migratory land bird studies on these

properties. It is assumed due to the position on the landscape, both the proximity to Lake Ontario and being some of the remaining forest stands that this area would function as migratory bird habitat. Migration occurs in the spring from April to May and then again from late July to October.

.2 Bat hibernation and Maternity Colonies

Although not surveyed, suitable habitat exists in these conservation areas for both bat hibernation caves and maternity colonies. There are cliffs and talus within these conservation areas that may support bat hibernation. There are also a number of snag trees within the forested communities that would support bat maternity colonies.

.3 Reptile Hibernaculum

This is a difficult type of significant wildlife habitat due to the cryptic nature of snakes. Ecology staff found three eastern gardeners snakes near a hole in the talus near Fifty Road. It is assumed this was a hibernaculum. There are likely others along the escarpment that went undetected.



Eastern Garter Snake

.5. Rare Vegetation Communities

These communities include areas that contain a provincially rare vegetation community, as defined by the NHIC and/or areas that contain a vegetation community that is rare within the planning area.

.1 Cliff and Talus Slopes

Cliff and talus slopes occur throughout these conservation areas. Cliffs are any vertical or near vertical rock that is greater than 3 m in height. While talus slopes are rock rubble at the base of the cliff. They are rare in the province and sensitive vegetation communities.



.6 Specialized Habitats of Wildlife

This is a community or diversity-based category as many species of 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 two or more seeps or springs. There

are many springs along the talus slope within the conservation areas. These areas are often used as water sources for wildlife in the winter when other water sources are frozen.

7 Habitat for Species of Conservation Concern and Rare Wildlife Species

Habitat for species of conservation concern includes wildlife that are listed provincially as species concern or are rare and declining. Table 7 provides a list of the seven species located within the WVCA. This list includes species seen flying over the WVCA such as Bald eagle and Peregrine Falcon. Eastern Wood Pewee was noted in several locations within the forested section of the Niagara Escarpment. Midland Painted Turtle, Eastern Milksnake and Snapping Turtle records come from the background materials. These species were likely recorded near small pools or agricultural ponds along the escarpment. Eastern Milksnake has been included even though it is considered special concern only nationally. This is a recognition that this is a cryptic species and its habitat should also be considered during any developments in the conservation area. Barn swallow, Canada warbler and Wood thrush could be included in Table 7 as well. In the writing of this plan even though these species are only considered special concern provincially, they will be treated as Species at Risk due to their federal status.

Table 7. Species of Conservation Concern

Common name	Scientific name	SARA status (Schedule 1)	ESA status	Source
Eastern Wood-Pewee	<i>Contopus virens</i>	SC	SC	2022
Bald Eagle	<i>Haliaeetus leucocephalus</i>	NAR	SC	eBird
Peregrine Falcon	<i>Falco peregrinus</i>	NAR	SC	eBird
Common Nighthawk	<i>Chordeiles minor</i>	SC	SC	BBS
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	NAR	SC	NAI
Eastern Milksnake	<i>Lampropeltis triangulum</i>	SC	NAR	NAI
Snapping Turtle	<i>Chelydra serpentina</i>	NAR	SC	NAI

4.9 Natural Areas Recommendations

The natural habitat features at WVCA have been evaluated for restoration opportunities and invasive species removals. Restoration in certain areas can assist with buffering the natural habitats from the impacts of moderate to high levels of visitor use.

Priorities for natural areas conservation and restoration in this Management Plan are as follows:

1 Conservation Targets for Winona and Vinemount Conservation Areas (Nature Reserve Zone)

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 WVCA. Conservation of existing forest and talus habitats and biodiversity is an important target for this WVCA. There are few impacts to the Sugar Maple forests, talus and cliffs. A very low level of invasive species was found and a diversity of species were recorded. These targets and issues were used to provide restoration and enhancement opportunities in the next section.

.2 Restoration/enhancement opportunities in the Nature Reserve, Natural and Resource Management Zones

The existing natural habitat features at WVCA have been evaluated for restoration opportunities. Restoration in certain parts of this property can assist with enhancing biodiversity and habitat resiliency for the forest and talus along the Niagara Escarpment. Priorities for natural areas restoration are as follows.

.1 Enhance biodiversity and long-term forest resiliency

The talus and forested slopes along the Niagara Escarpment are dominated by Sugar Maple. There is a very low diversity of other species within these forested areas. Butternut and White Ash used to form a canopy along with the Sugar Maple. These two species have been lost to invasive forest pest. In order to ensure these forests are 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 disease resistant butternut, shagbark and bitternut hickory, basswood and black walnut. To support this priority, this plan sets out capital budgets (see Appendix 2) for Natural Areas Restoration over the 10-year lifespan of this plan. This budget allows for HCA staff monitoring of the talus and forested slopes and to determine appropriate projects to enhance biodiversity. Outcomes of these management actions and further recommendations would be followed up on in the next scheduled Management Plan for WVCA.

.2 Stewardship with private landowners

These conservation areas form a narrow band of forest through an agricultural and rural landscape. The width of the forested communities is less than 300m wide and HCA generally owns only a portion of this area. Interior forest habitat does not exist within this area. This is reflected in the lack of interior forest birds breeding in these conservation areas. Increasing the width of these forested blocks will require work with adjacent private landowners to plant trees in the back portions of unused fields. This would also help add a buffer to these forests as local land uses change. Opportunities for HCA to acquire adjacent lands should also be explored with adjacent landowners, to help conserve the Escarpment habitat.

.3 Invasive species should be controlled

There are low levels of a number of invasive species located within these two conservation areas. As these populations are low this would be a great opportunity to control these species before large populations establish. To achieve this objective, an overall invasive species management plan should be developed for these Conservation Areas. More details on this restoration opportunity are outlined in Section 5.2.

5.0 CONSERVATION AREA MANAGEMENT

5.1 Land Management

Land management planning will be accomplished through adherence to the guidelines of the management zones noted in this plan, and through additional resource management plans developed by HCA as necessary. The overall intent will be to ensure protection and conservation of the significant natural areas noted as Natural Zones on the appended maps.

The ecological mapping and species data documented within this plan are provided as a baseline inventory to help guide future land management decisions and project planning. Where active management is required for a particular species, it will be accomplished through an HCA approved resource management strategy considering the guidelines outlined in this plan, and in accordance with policies of all governing agencies.

5.2 Vegetation Management

Additional non-native plant species will not be deliberately introduced into the conservation areas. Introduction of any new plant species by HCA will consider the biodiversity of the site, historical data of species present in the area, research, and additional relevant species inventories and contiguous surroundings within an approved restoration and stewardship strategy. In this plan “non-native” means species not native to Ontario as well as species native to Ontario but not to Hamilton. 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 plan. An overall invasive species management plan should be developed for the conservation areas.

Invasive Species in Winona and Vinemount Conservation Areas

The species detailed below are a threat to the biodiversity and conservation values at WVCA. Trails throughout the conservation areas are movement pathways for a number of invasive species. The following section details the invasive species that occur in WVCA.

.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, 2012). Birds and small mammals feed on the berries of this plant, which has caused it to spread. While the spread of this species is currently limited in the conservation areas, an effort will need to be undertaken to prevent future dominance of this species in the community. 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. The larger tree-like shrubs may require the cut-stump method of removal. Herbicide should be applied to fresh stumps or girdles or else the tree will re-sprout (Anderson, 2012). This species was low in number throughout the area, except near Fifty Road where

there are larger polygons of Common Buckthorn close to urban development.

.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 mono cultures that decrease plant biodiversity and create poor habitat for wildlife.

There is currently a small population on HCA property off of Fifty Road. If there is enough water where the population is located (an excess of 30cm), an effective control strategy would include cutting and drowning of stems when water levels are highest in June. If water levels are not favourable for this strategy, pesticide application in the seasonal dry period (September/October) would be the best option (Nichols, 2020). A combination of these strategies can be employed to best suit the changing conditions within the patch. This population should be prioritized due to its small size which will make control easier and prevent spread into the surrounding community.

.3 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, 2012). 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 throughout much of Vinemount Conservation Area along the Bruce Trail. 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. Priority should be placed on the removal of second year plants.

.4 Greater Celandine

Greater Celandine (*Chelidonium majus*) was introduced to North America from Europe in the 1600s as a medicinal plant (Tree Canada, n.d.). It can grow in dense stands shading out any native diversity, and spreads readily by seed with the help of ants (Invasive Plant Atlas, n.d.). There is a small population of Greater Celandine currently growing in WVCA along the Bruce Trail. A toxic sap is released when any part of the plant is crushed that could be irritating to the skin and eyes. Therefore, if manual removal is chosen care should be taken by staff to don the appropriate personal protective equipment. It is likely plants will readily grow again from root fragments using manual removal, however this method could be used to limit the spread. In order to fully eradicate the species, it is likely the application of a systemic herbicide will be required to attack the roots of the plant (late fall or early spring) (Tree Canada, n.d.).

.5 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. Within WVCA, there are currently single plants along the Bruce Trails and small polygons throughout other sections of this property. 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. Species identification in the spring should be prioritized to ensure only invasive honeysuckles are being treated.

.6 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 about 30 plants on the Bruce Trail just west of Fifty Road. Dame's rocket (*Hesperis matronalis*) can be pulled relatively easily from moist soil before the seeds mature in the spring. Alternatively, chemical herbicide can be applied in the late fall to rosettes over the course of a few years until the seed bank is depreciated (Johnson, 2010).

.7 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). Larger trees or ones difficult to manually remove can receive a basal spray of Garlon (Miller, 2003). There is currently a very small population of European Privet in WVCA. This population should be prioritized while it is still small and can more easily be eradicated before it becomes well established.

.8 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). 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).

One large plant has been identified in Vinemount Conservation Area west of Fifty Road. There were also a few scattered stems along the Bruce Trail. Removal or chemical treatment at this location should be prioritized as it can be more easily eradicated and prevent an established population while it is only an individual plant.

5.3 Fish and Wildlife Management

There is no direct fish habitat however the watercourses are still valuable as indirect fish habitat as they transport nutrients and sediment downstream. They should be protected in such a way that this important process is not disrupted.

For wildlife these lands act as refuge from the largely developed lands around them and as landscape linkages. As such populations should be protected from harvest and harassment on these properties.

For wildlife/human conflict HCA has developed the Hamilton Conservation Authority Wildlife Conflict Management Strategy. This strategy outlines the process and methods staff are to follow when dealing with any animal related issues within all conservation areas. 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.

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 reintroduced, and existing populations replenished if feasible and acceptable to HCA.

5.4 Cultural Heritage Management

The following information from the 1979 Winona and Vinemount Master Plans is provided to supplement the property history noted in Section 3.2.

Vinemount is an area rich in history. The first European settlers were the United Empire Loyalists that arrived in the 1780's. E.D. Smith was a pioneer in the production of grapes, having set out vineyards in 1875 on a portion of Lots 7 and 8, concession 1V. Due to the introduction of the grape culture, the small community on the intersection of McNeilly Road and Regional Road 25 was given the name 'Vinemount'.

A house located just south of Ridge Road on the Eighth Road East, Stoney Creek (McNeilly Road) was built around the turn of the 20th century by E.D. Smith and Erland Lee. The building housed a creamery and cheese factory, later to become a spray plant for the fruit industry. The Women's Institute of Winona bought the building in 1928 for use as a meeting hall. Later the structure became the Vinemount Community Centre and has since been remodeled as a private dwelling.

A frame home built by the late Erland Lee on Ridge Road at Tapleystown Road is of provincial historical significance. The home was the site of the first meeting of the Women's Institute of Winona in 1905, the second such women's organization in the world. In 1896, the Toronto, Hamilton and Buffalo Railway was constructed providing rail service from Hamilton to Smithville, in southern Lincoln County. Vinemount was a stopover, but with the advent of the automobile, passenger train service decreased and Vinemount's popularity as a stopover declined.

There are no heritage designations for these conservation areas. However, the City of Hamilton Cultural Heritage Resources Inventory notes a number of properties nearby of heritage designation, historic value, or heritage interest. More historic research and study of the conservation areas is encouraged, to further promote knowledge and understanding about the property and the area cultural history.

Incompatible resource uses and recreational activities will be restricted or prohibited where necessary to protect cultural heritage resources. Any capital projects recommended for the property will require approval by the HCA Board of Directors, and may require approval from the City of Hamilton and the Niagara Escarpment Commission.

Archaeological studies have not been completed for the conservation areas. Archaeological studies in the surrounding area have demonstrated that this area of southern Ontario has been occupied by people as far back as 11,000 years ago as the glaciers retreated. More information is noted in HCA's Saltfleet Master Plan from archaeological assessments completed for the Saltfleet constructed wetlands.

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. Archaeological and historical artifacts may only be removed, and heritage landscapes altered, as part of an HCA approved cultural heritage research or management plan. Protection and management will be undertaken in consultation with all governing agencies and First Nations.

5.5 Agricultural

A small field is being actively farmed under a long-standing lease agreement with HCA. The field is on the Escarpment tableland at Ridge Road and McNeilly Road. See Appendix 1 for maps of the area.

HCA's long-term vision for active and formerly active agricultural fields is to see the land revert back to natural area. Active management to remove invasive species, along with restoration planting to enhance these lands is



recommended once farming stops. More detailed restoration plans will be required to implement restoration of these lands. HCA will consider restoration strategies when evaluating agricultural lease renewals.

5.6 Managed Forest

The nearest HCA managed forest parcel is the Vinemount Swamp, which is included within the Saltfleet Conservation Area Master Plan. The long-term objective of this plan is to sustain a healthy forest. Invasive species management and restoration projects to help naturalize these areas in support of this objective are noted in Section 4.9.

5.7 Conservation Area Operations

HCA will review the operation plan for these lands and provide staff with information and resources as required to operate the conservation areas 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.

Some disturbances to the area lands have been observed by HCA staff over time, including encroachment, unauthorized access (ATV trails), and dumping. The operation plan shall include monitoring of the lands to address these items as they occur. Individual volunteers and partner organizations may also assist in monitoring programs in the conservation areas as approved by HCA.

The 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 areas' operations in accordance with HCA policy such as:

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

5.8 Research

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

Potential research projects should focus on the natural areas to help guide HCA management efforts for:

- Enhancing forest biodiversity and long-term forest resiliency.
- Improving habitat for breeding birds in stewardship with land areas.
- Invasive species controls for Escarpment lands.

These projects would help support the natural areas recommendations noted in Section 4.9.

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. Authorization is obtained by contacting the staff ecologists who administer the process and issue letters of authorization or permission. This process would also extend to any other activities that could impact the ecological integrity of these lands.



6.0 MANAGEMENT PRACTICES

6.1 Natural Heritage Conservation

This Management Plan outlines priorities for natural areas conservation and restoration in recognition of the significant ecological features on these lands. As noted in Section 4.7, the conservation areas contain significant woodlands, environmentally sensitive areas, and Areas of Natural and Scientific Interest (ANSI). As noted in Section 4.8, the conservation areas also contain significant flora and fauna species, significant wildlife habitat, rare vegetation communities, and provincially rare cliff and talus slopes of the Niagara Escarpment. Accordingly, HCA supports the recommendations noted in Section 4.9 for natural areas conservation and restoration in this Management Plan, notably:

- Conservation targets for the Natural Zones shown on the appended maps.
- Enhancing biodiversity and long-term forest resiliency.
- Stewardship with area landowners to add natural buffer for the forest habitat.
- Control of invasive species.
- Conversion of agricultural/cultivated lands to natural area.

6.2 Water Management

Water crossings of the Bruce Trail are not considered to be navigable under the Federal Navigation Protection Act (formerly the Navigable Waters Protection Act), thus crossings do not have to provide for navigation.

Under current use the mix of the stream channel crossings is currently sustainable however if traffic on the trails increases there will be a need to formalize more of the forded crossings to structured ones such as bridges to prevent degradation of the stream channels and banks.

Significant gully erosion of some of the WC#6 tributaries in the area of Jones Road, could impact trail use and location in this area. Given HCA does not own any of the table lands that contribute to these channels we are limited in options to try and reduce this erosion. This section of trail should be monitored.

No new trail development is proposed that could adversely affect water resources. Should installation or replacement of culverts, bridges and boardwalk features for water crossings be required, HCA will adhere to federal, provincial and local policies and regulations and any proposed project will be reviewed internally by HCA Ecologists. See Section 4.0 for more information.

6.3 Conservation Area Experiences

HCA acquired these lands on the Niagara Escarpment because of their environmental significance and the overall role they play in the health and natural heritage of the watershed. These properties will continue to remain protected natural areas under HCA control and management.

Public access into WVCA is via the Bruce Trail. Property access off trail is only permitted for approved research, see Section 5.8 for more information.

Recreational activities are monitored by HCA and activities may be restricted or prohibited to protect the property, natural resources, and for public safety. During preparation of this plan HCA set up trail counters to monitor the number of visitors entering the conservation areas. More information on the trail counts can be found in Appendix 3. HCA's trail counter recorded consistent monthly use of the Bruce Trail from May to September. In October, trail visitation doubled with the Thanksgiving holiday and peak of fall colour in this month. Attendance on weekends is typically double over weekdays, with the majority of visitors on the trail mid-day (10am – 3pm).



No visitor parking is provided by HCA for these lands. When offsite parking is found to be causing traffic and safety issues, HCA will enlist the assistance of municipal agencies for traffic control. Traffic control will be evaluated on a case by case basis by all agencies involved. Should this be a persistent problem HCA will work with municipal partners on traffic and visitor management strategies and solutions.

Due to the sensitive nature of the lands, motorized recreational activities are not permitted, with the exception of HCA approved service vehicles and emergency service (EMS) units.

The following recreational activities are currently permitted in the conservation areas:

- Hiking
- Nature Appreciation (from trails and designated lookout stations)

To protect the resource and provide a safe recreational experience for all visitors, the following recreational activities are not permitted:

- Cycling
- Horse Riding
- Winter Snowshoeing, Cross Country Skiing
- Unmanned Aerial Vehicle (Drones)
- All-terrain vehicles
- Motor bikes
- Snowmobiling

Approved research activities may be exempt from these restrictions, see Section 5.8.

6.4 Education and Environmental Awareness

HCA encourages further research to provide interpretive and educational information on the natural features and history of this area. Additional signage and rest areas are not anticipated to be required for the trail, however digital opportunities to promote and describe the trail and its features are offered by the Bruce Trail Conservancy. HCA provides online information about the significance of these natural areas and their need for protection. As HCA updates and develops new park-related brochures, maps and interpretive materials for this conservation area, the Escarpment's status as a World Biosphere Reserve should be recognized, as well as these public lands being within NEPOSS and including a portion of the Bruce Trail. Developing visitors' awareness and appreciation of Ontario's natural and cultural heritage, and fostering a commitment to protect that heritage for all generations is supported in the goals and objectives of this plan.

6.5 Public Infrastructure – Utilities, Trails and Transportation

It is recognized that public infrastructure exists and has historically altered lands in the study area. This section is intended to provide guidance for future HCA management of this land use.

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 WVCA 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 ecological preserve and when implementing items from this Management 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.

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

6.6 Management Guidelines

.1 Permitted Uses

In addition to Section 6.3, leashed dogs are permitted on this portion of the Iroquoia Section of the Bruce Trail. Unleashed dogs anywhere on the Bruce Trail can lead to strained relations with neighbouring landowners. HCA and The Bruce Trail Conservancy review permitted trail uses together, and activities such as dog walking may be banned at their discretion.

.2 Restricted Uses

In addition to the restrictions noted in Section 6.3, no open fires or camping are permitted. Hunting and trapping are not permitted. Foraging is not permitted.

.3 Agreements

HCA has an agreement with The Bruce Trail Conservancy to manage this portion of the Bruce Trail in the conservation area. The HCA may enter into other management agreements to assist with specific management items in the conservation area. HCA values the support from area residents and landowners, businesses, service clubs and volunteer organizations that currently or could contribute in a variety of ways. The HCA will continue to nurture existing support and seek out new opportunities for community partnership agreements.

6.7 Maintenance Guidelines

.1 Bruce Trail Maintenance

The Bruce Trail Conservancy oversees a trail maintenance volunteer program to maintain the Bruce Trail. The program is administered through the Iroquoia Club Trail Development and Maintenance Director, and trail maintenance volunteers. Volunteers visit the property at least twice a year, complete annual reports on the conditions of the property, provide input into stewardship plans, and help with volunteer activities such as maintaining trail blazes and signs, trail clearing and maintenance, and removing garbage.

.2 Conservation Area Maintenance

.1 Vegetation Clearing

Vegetation is only to be removed on the Bruce Trail to ensure safe sight lines, reduce hazards and encroachment onto the trail. Any vegetation clearing beyond the trail is subject to review by HCA. Best management practices are to be followed so that maintenance activities, equipment and tools do not spread invasive species.

Trees and brush may be cut and pruned only to enable resource management as supported by this plan, to ensure public safety, and service easements (utility corridors) subject to specific service agreements. Trees and brush cut will be left to deteriorate naturally as close as possible to where they have been felled, or if that is not feasible, may be chipped and used (not on the trails) by HCA in other conservation areas.

Chemical fertilizers, herbicides, pesticides and suppressants will not be used for any vegetation management purpose except: insect and disease control under conditions set out in this plan; and eradication of non-native species where it has been demonstrated other methods are not feasible.

.2 Fencing

Boundary fencing may be considered to protect sensitive ecological areas from public access, for research purposes, or for public safety. Boundary fencing will be maintained by HCA, along with the appropriate signage.

.3 Lighting

The trail will not be lit and is intended to only be open sunrise to sunset.

.4 Garbage Collection

Garbage cans will not be provided. Trail users are expected to practice “pack in-pack out” trail etiquette.

.5 Washrooms

No washrooms are provided along the trail. Information signs may be used to direct trail users to conservation area parking areas and washrooms.

.6 Winter Maintenance

There will be no snow removal along the trail.

.7 Signage

Five types of signs are permitted along the trail: information, designation/direction, regulatory, warning, and interpretive. All signs are to follow the partners sign standards.

Information signs are intended to provide general information about the trail, identify the trail and may include a map.

Designation and direction signs are for wayfinding and may include maps for orientation. These signs are to be placed at trail heads and entry points and at trail nodes. Entrance signs, map boards, blazes, and trail post markers are some examples of this type of signage.

Regulatory signs are to be placed at roads. Warning signs are to be placed where there are anticipated safety concerns. Municipal traffic signs are an example of this type of signage.

Interpretive signs are intended to provide educational information on the site features and history of the area. Memorial plaques are an example of this type of signage.

.8 Watercourses

Trail maintenance at watercourse crossings is to be reviewed by both HCA and the Bruce Trail Conservancy. This requirement includes reviewing features such as culverts, boardwalks, bridges, and associated structures before maintenance work proceeds. Also, monitoring of the lands for gulley erosion and mitigation/rehabilitation plans be considered and with adjacent landowners.

.9 Invasive Species

Invasive species removal is recommended as high priority, especially where the ESA's could be threatened. A separate and more detailed invasive species management plan is recommended in order to plan and prioritize this work.

7.0 SUMMARY

7.1 Implementation Priorities

Winona and Vinemount Conservation Areas are unique natural areas with environmentally sensitive lands. The overall intent of this Management Plan is to ensure protection and conservation of the natural areas, while allowing visitors passive day use recreation opportunities walking through the area on the Bruce Trail.

Continued safe enjoyment of the Bruce Trail requires on-going maintenance. HCA will continue to work with the Bruce Trail Conservancy in support of this goal.

A Capital Development Priorities budget is included in Appendix 2 to help HCA budget over the life of this plan the necessary activities to achieve these management goals. In summary, the following priority items are recommended to be implemented for the life of this Management Plan:

.1 Environmental Management:

An overall invasive species management plan should be developed for the Conservation Area, as well as a monitoring program to examine the effectiveness of management directions and activities described in Sections 4 to 6 of this plan. See Section 4.9 Natural Areas Recommendations for more information on these management goals:

- Enhancing biodiversity and long-term forest resiliency.
- Stewardship with area landowners to add natural buffer for the forest habitat.
- Control of invasive species.

.2 Trail Maintenance:

Conduct maintenance inventory to assess annual requirements for trail clearing, surfacing and condition reviews. Provide design and maintenance recommendations to the Bruce Trail Conservancy.

.3 Signage Replacements:

Signs are to be replaced by HCA and the Bruce Trail Conservancy in priority sequence to ensure public safety. The Niagara Escarpment Parks and Open Space System (NEPOSS) program logo may also be used on park signage and literature to identify these conservation lands within NEPOSS.



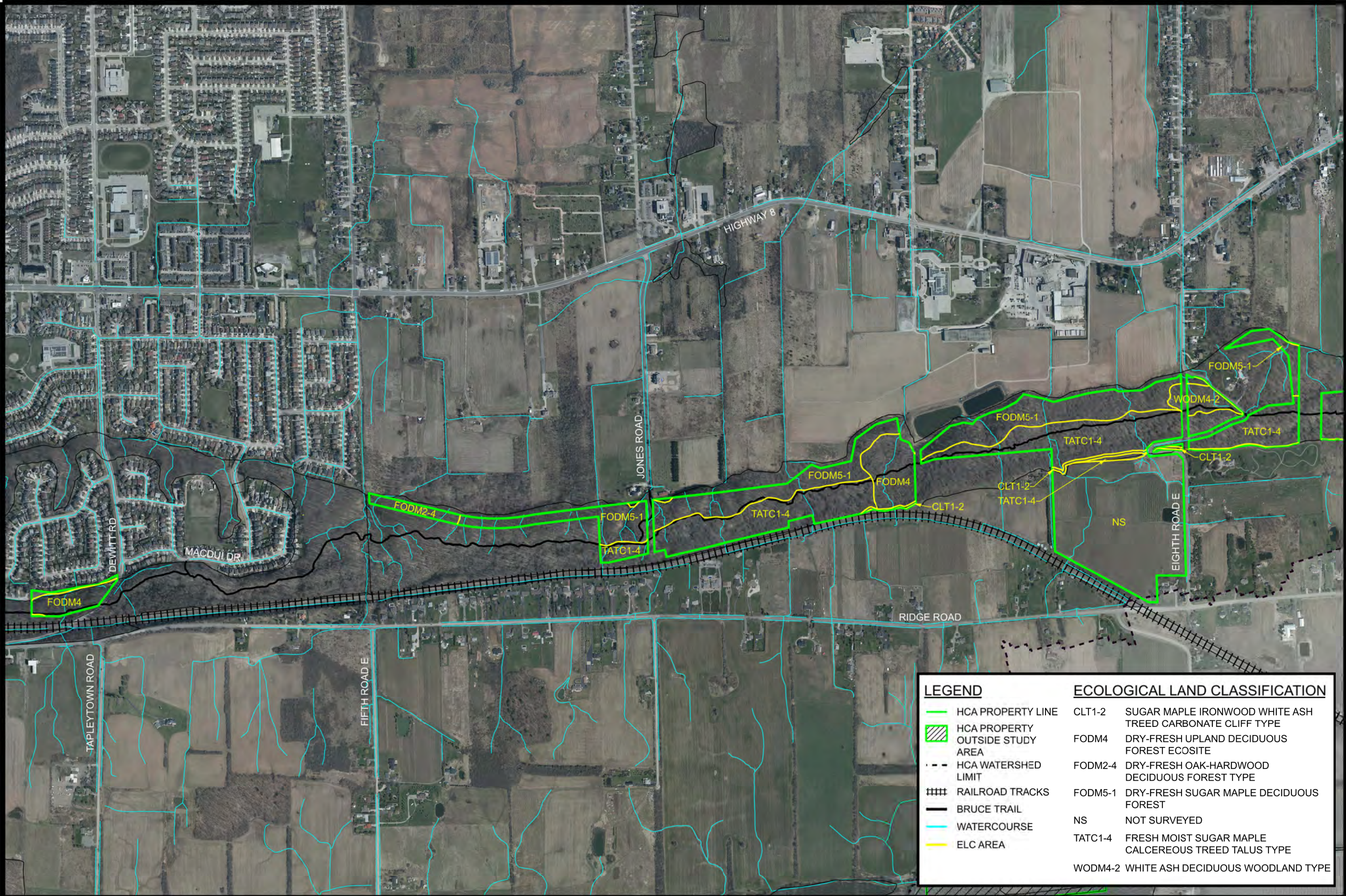
8.0 APPENDIX CONTENTS

1. Mapping
2. Capital Development Priorities
3. Trail and Vehicle Counter Data
4. Species Inventories
5. References

APPENDIX 1

Mapping

Map 1	Winona Conservation Area ELC
Map 2	Vinemount Conservation Area ELC
Map 3	Niagara Escarpment Plan Area
Map 4	Winona Conservation Area Zones
Map 5	Vinemount Conservation Area Zones



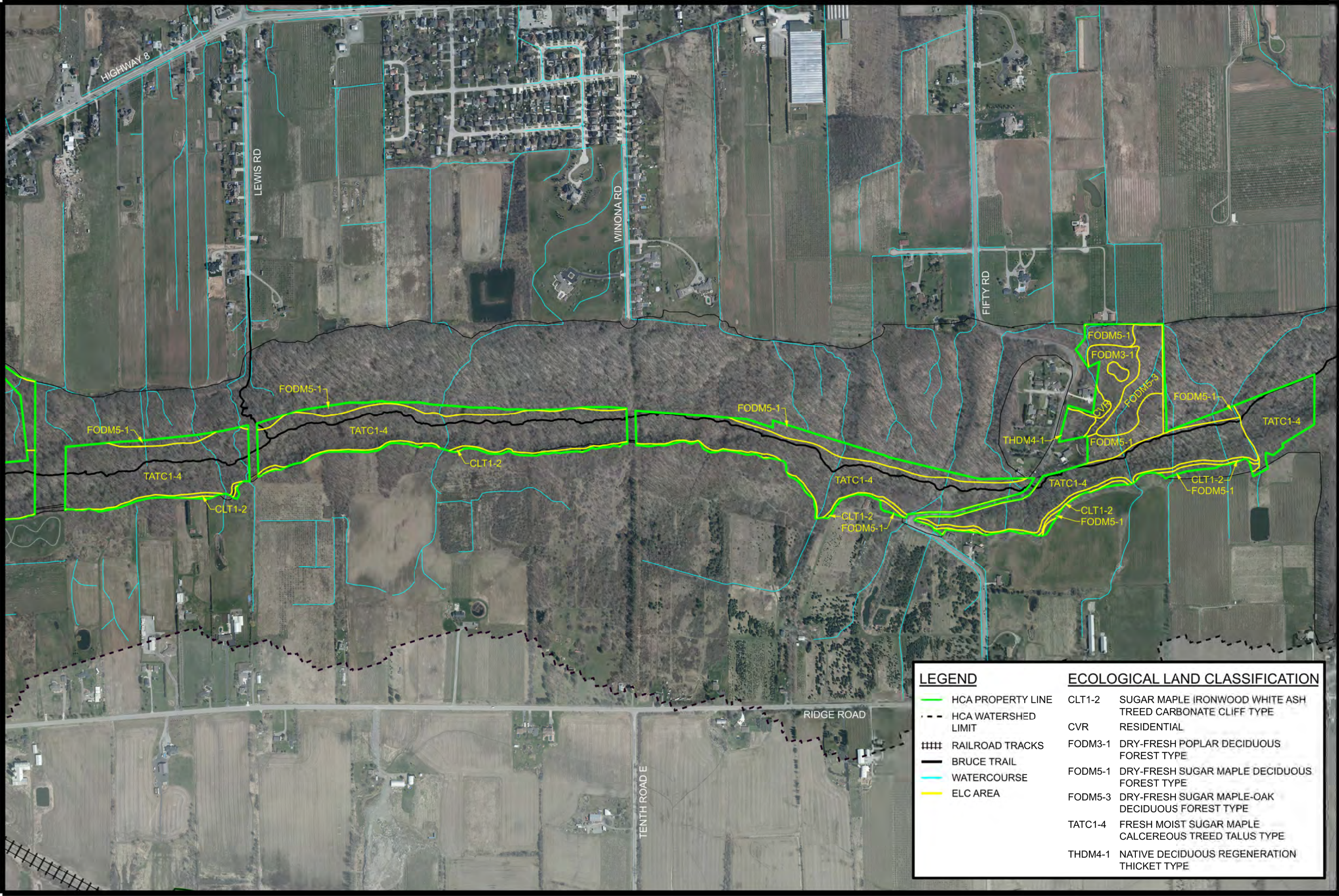
LEGEND		ECOLOGICAL LAND CLASSIFICATION	
	HCA PROPERTY LINE	CLT1-2	SUGAR MAPLE IRONWOOD WHITE ASH TREED CARBONATE CLIFF TYPE
	HCA PROPERTY OUTSIDE STUDY AREA	FODM4	DRY-FRESH UPLAND DECIDUOUS FOREST ECOSITE
	HCA WATERSHED LIMIT	FODM2-4	DRY-FRESH OAK-HARDWOOD DECIDUOUS FOREST TYPE
	RAILROAD TRACKS	FODM5-1	DRY-FRESH SUGAR MAPLE DECIDUOUS FOREST
	BRUCE TRAIL	NS	NOT SURVEYED
	WATERCOURSE	TATC1-4	FRESH MOIST SUGAR MAPLE CALCEREOUS TREED TALUS TYPE
	ELC AREA	WODM4-2	WHITE ASH DECIDUOUS WOODLAND TYPE



ECOLOGICAL LAND CLASSIFICATION
WINONA & VINEMOUNT C.A. MANAGEMENT PLAN

DATE: 2023/02/06





**ECOLOGICAL LAND CLASSIFICATION
WINONA & VINEMOUNT C.A. MANAGEMENT PLAN**

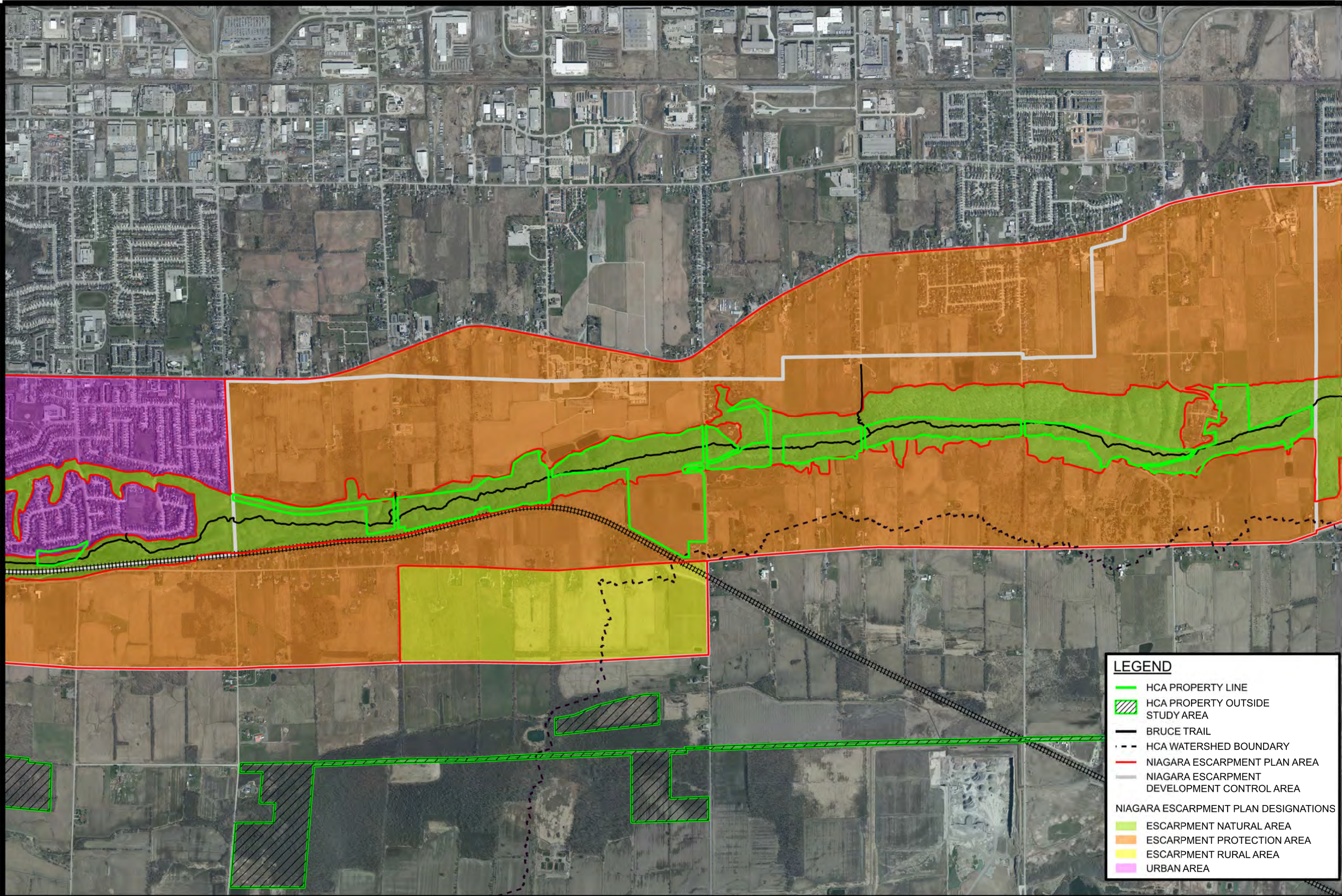
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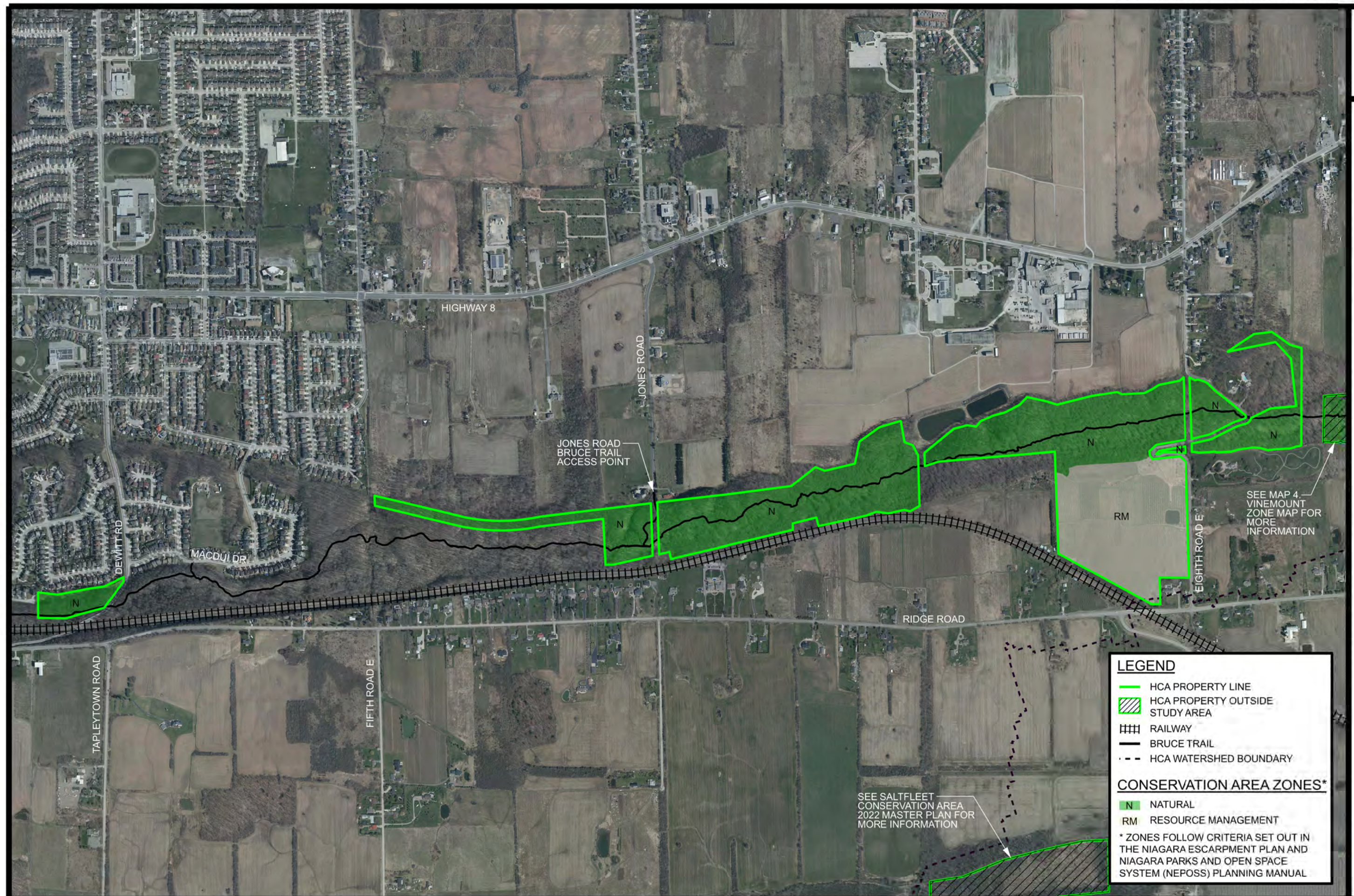




DATE: 2023/09/15

NIAGARA ESCARPMENT PLAN AREA WINONA & VINEMOUNT C.A. MANAGEMENT PLAN





LEGEND

- HCA PROPERTY LINE
- HCA PROPERTY OUTSIDE STUDY AREA
- RAILWAY
- BRUCE TRAIL
- HCA WATERSHED BOUNDARY

CONSERVATION AREA ZONES*

- N NATURAL
- RM RESOURCE MANAGEMENT

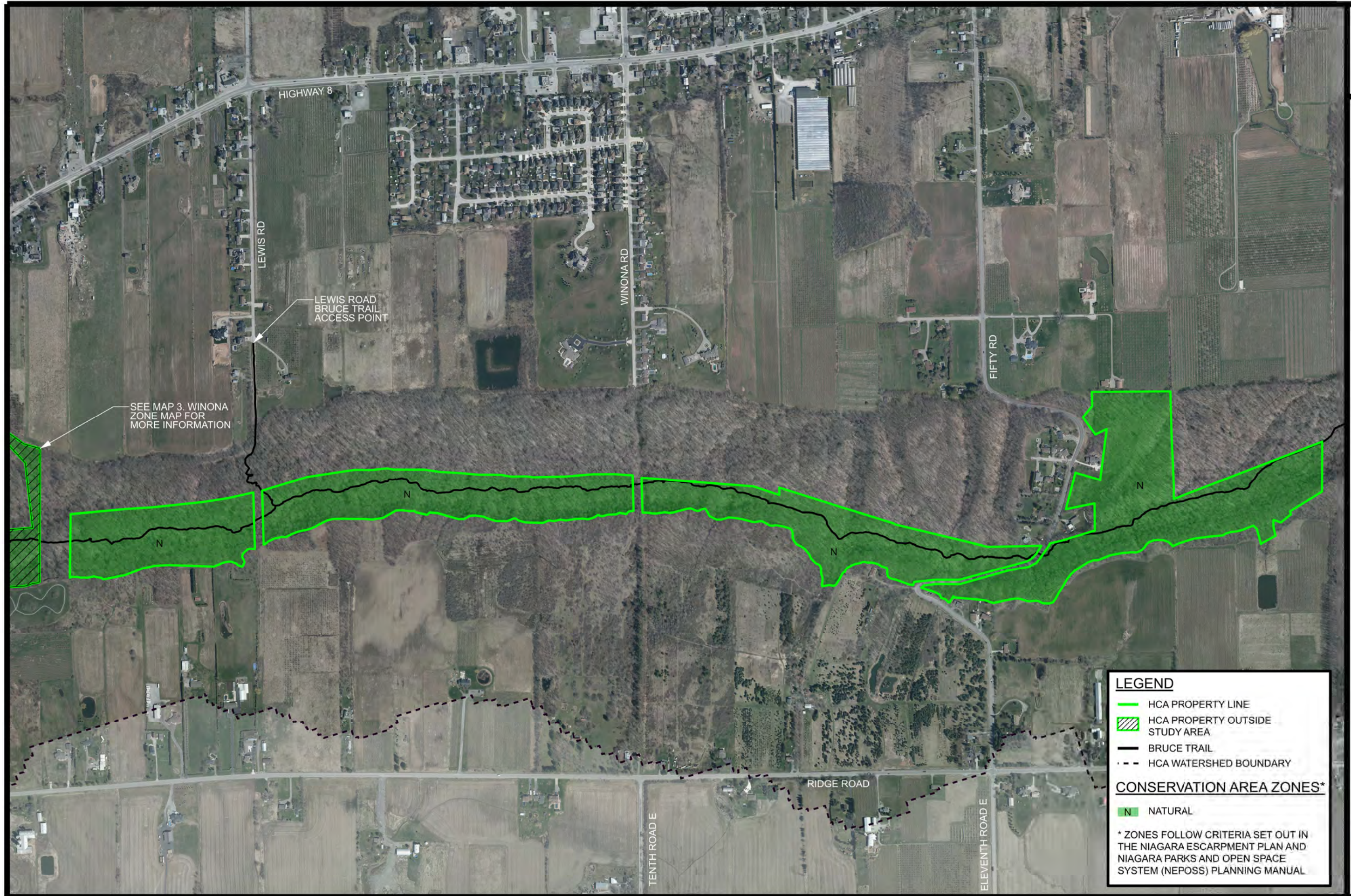
* ZONES FOLLOW CRITERIA SET OUT IN THE NIAGARA ESCARPMENT PLAN AND NIAGARA PARKS AND OPEN SPACE SYSTEM (NEPOSS) PLANNING MANUAL



**WINONA CONSERVATION AREA ZONES
WINONA & VINEMOUNT C.A. MANAGEMENT PLAN**

DATE: 2023/01/30





LEGEND

- HCA PROPERTY LINE
- ▨ HCA PROPERTY OUTSIDE STUDY AREA
- BRUCE TRAIL
- HCA WATERSHED BOUNDARY

CONSERVATION AREA ZONES*

- N NATURAL

* ZONES FOLLOW CRITERIA SET OUT IN THE NIAGARA ESCARPMENT PLAN AND NIAGARA PARKS AND OPEN SPACE SYSTEM (NEPOSS) PLANNING MANUAL



**VINEMOUNT CONSERVATION AREA ZONES
WINONA & VINEMOUNT C.A. MANAGEMENT PLAN**

DATE: 2023/01/30

Capital Development Priorities

WINONA & VINEMOUNT CAPITAL PRIORITIES: 2022 - 2032

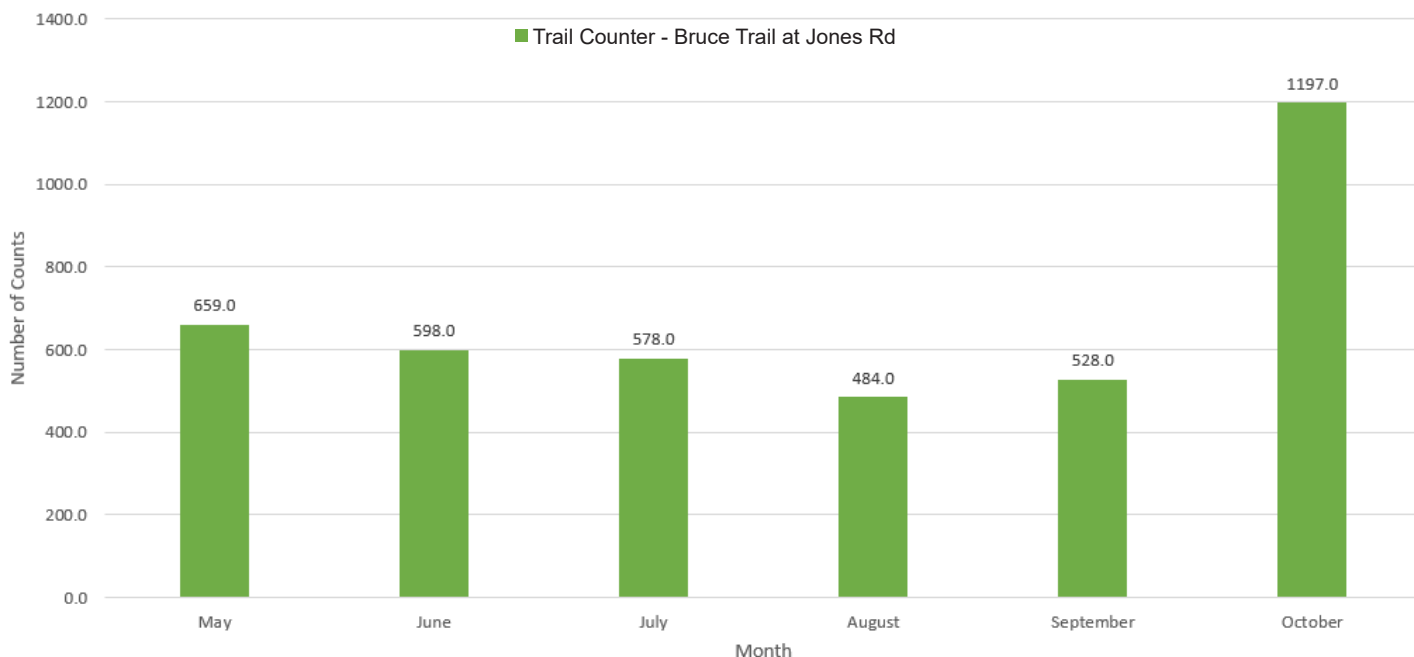
A. <u>Conservation Area Improvements</u>	*Budget (72.5K)
A1+ Invasive Species Management	\$ 50,000
A2+ Natural Areas Restoration	\$ 20,000
A3 Signage	\$ 2,500

* Budget costs are in 2022 dollars, projects and budgets to be reviewed annually.
 + Costs subject to ecological findings and recommendations.

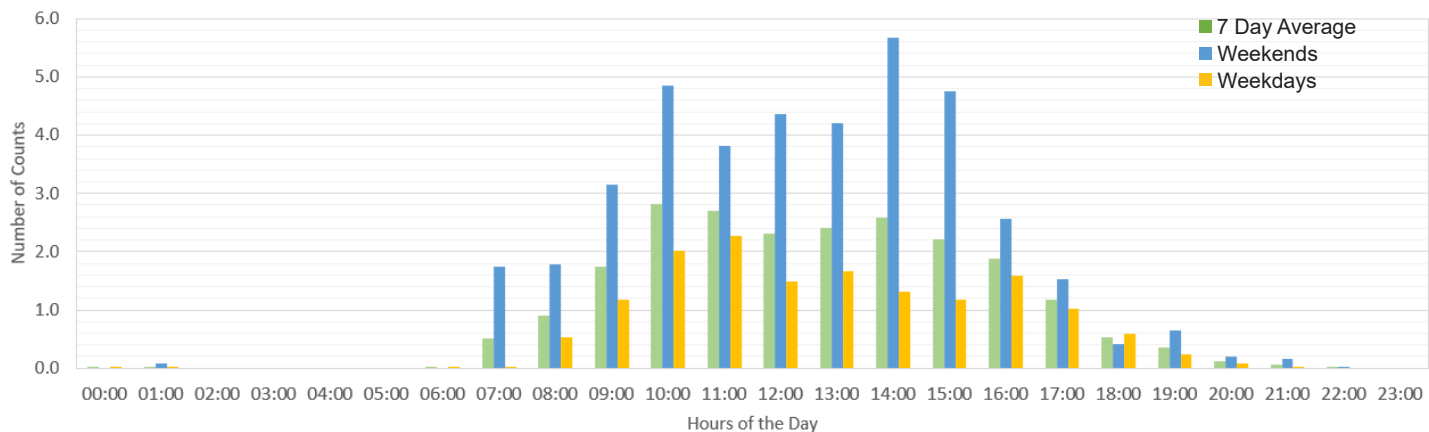
Trail and Vehicle Counter Data

Trail Counter Summary

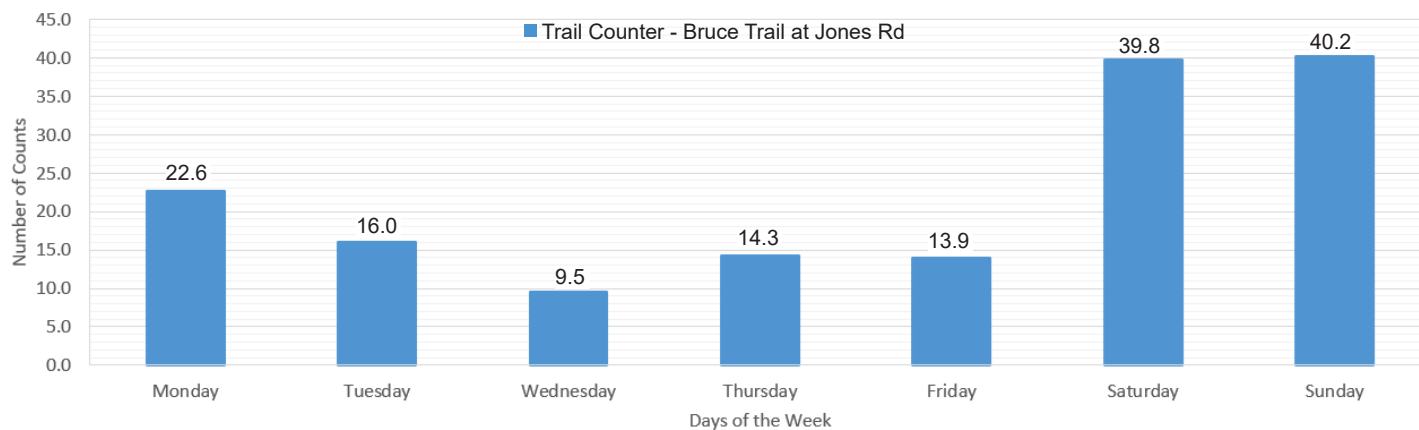
Trail Counter (Bruce Trail at Jones Road) - Monthly Totals 2022



Bruce Trail Counter - 24 Hour Average



Bruce Trail Counter - Average Count by Day for 2022



Natural Areas Inventory – Species List

Appendix 4.1	Plant Species
Appendix 4.2	Bird Species
Appendix 4.3	Mammal Species
Appendix 4.4	Butterflies and Dragonflies
Appendix 4.5	Amphibians and Reptiles

Plant Species Inventoried in Winona and Vinemount Conservation Areas

Ali	SPECIES_CODE	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
x	P-ACENEGU	Acer negundo	Manitoba Maple
x	P-ACESANI	Acer nigrum	Black Maple
x	P-ACEPLAT	Acer platanoides	Norway Maple
x	P-ACERUBR	Acer rubrum	Red Maple
x	P-ACESASA	Acer saccharum	Sugar Maple
x	P-ACESPIC	Acer spicatum	Mountain Maple
x	P-ACHMILL	Achillea millefolium	Common Yarrow
x	P-ACTPACH	Actaea pachypoda	White Baneberry
x	P-ACTRUBR	Actaea rubra	Red Baneberry
x	P-ADIPEDA	Adiantum pedatum	Northern Maidenhair Fern
x	P-EUPRUGO	Ageratina altissima var. altissima	Common White Snakeroot
x	P-AGR_SP	Agrimonia sp.	Agrimony Species
x	P-AGRSTRI	Agrimonia striata	Woodland Agrimony
x	P-ALLPETI	Alliaria petiolata	Garlic Mustard
x	P-ALLTRIC	Allium tricoccum	Wild Leek
x	P-AMELAEV	Amelanchier laevis	Smooth Serviceberry
x	P-ARCLAPP	Arctium lappa	Great Burdock
x	P-ARITRTR	Arisaema triphyllum ssp. triphyllum	Jack-in-the-pulpit
x	P-ASACANA	Asarum canadense	Canada Wild-ginger
x	P-ASPOFFI	Asparagus officinalis	Garden Asparagus
x	P-BARVULG	Barbarea vulgaris	Bitter Wintercress
x	P-BERTHUN	Berberis thunbergii	Japanese Barberry
x	P-BETPAPY	Betula papyrifera	Paper Birch
x	P-BIDFRON	Bidens frondosa	Devil's Beggarticks
x	P-CARCONC	Cardamine concatenata	Cut-leaved Toothwort
x	P-CARDIPH	Cardamine diphylla	Two-leaved Toothwort
x	P-CARALBU	Carex albursina	White Bear Sedge
x	P-CARPLAN	Carex plantaginea	Plantain-leaved Sedge
x	P-CARRADI	Carex radiata	Eastern Star Sedge
x	P-CAR_SP	Carex sp.	Sedge Species
x	P-CARCORD	Carya cordiformis	Bitternut Hickory
x	P-CAROVAT	Carya ovata	Shagbark Hickory
x	P-CAUGIGA	Caulophyllum giganteum	Giant Blue Cohosh
x	P-CAUTHAL	Caulophyllum thalictroides	Blue Cohosh
x	P-CHEMAJU	Chelidonium majus	Greater Celandine
x	P-CICINTY	Cichorium intybus	Chicory
x	P-CIRLUCA	Circaea canadensis ssp. canadensis	Canada Enchanter's Nightshade
x	P-CIRVULG	Cirsium vulgare	Bull Thistle
x	P-CLAVIRG	Claytonia virginica	Narrow-leaved Spring Beauty
x	P-CLIVULG	Clinopodium vulgare	Field Basil
x	P-CONMAJA	Convallaria majalis	European Lily-of-the-valley
x	P-CORALTE	Cornus alternifolia	Alternate-leaved Dogwood
x	P-CORFORA	Cornus racemosa	Gray Dogwood
x	P-CORRUGO	Cornus rugosa	Round-leaved Dogwood
x	P-CORSTOL	Cornus sericea	Red-osier Dogwood
x	P-CRA_SP	Crataegus sp.	Hawthorn Species
x	P-CYSBULB	Cystopteris bulbifera	Bulblet Fern
x	P-DACGLOM	Dactylis glomerata	Orchard Grass
x	P-DAUCARO	Daucus carota	Wild Carrot
x	P-DICCANA	Dicentra canadensis	Squirrel-corn
x	P-DICCUCU	Dicentra cucullaria	Dutchman's Breeches
x	P-DIELONI	Diervilla lonicera	Northern Bush-honeysuckle
x	P-DIPFUSY	Dipsacus fullonum	Common Teasel

Plant Species Inventoried in Winona and Vinemount Conservation Areas (cont.)

x	P-DRYCART	<i>Dryopteris carthusiana</i>	Spinulose Wood Fern
x	P-DRYGOLD	<i>Dryopteris goldiana</i>	Goldie's Wood Fern
x	P-DRYINTE	<i>Dryopteris intermedia</i>	Evergreen Wood Fern
x	P-DRYMARG	<i>Dryopteris marginalis</i>	Marginal Wood Fern
x	P-ELYREPE	<i>Elymus repens</i>	Creeping Wildrye
x	P-EPIHELL	<i>Epipactis helleborine</i>	Eastern Helleborine
x	P-ERIANNU	<i>Erigeron annuus</i>	Annual Fleabane
x	P-ERIPHIL	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane
x	P-ERYAMAM	<i>Erythronium americanum</i> ssp. <i>americanum</i>	Yellow Trout-lily
x	P-EUOOBOV	<i>Euonymus obovatus</i>	Running Strawberry Bush
x	P-ASTMACR	<i>Eurybia macrophylla</i>	Large-leaved Aster
x	P-EUTGRAM	<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod
x	P-FAGGRAN	<i>Fagus grandifolia</i>	American Beech
x	P-FER_SP	Fern sp.	Fern Species
x	P-FRAVEAM	<i>Fragaria vesca</i> ssp. <i>americana</i>	American Woodland Strawberry
x	P-RHAFRAN	<i>Frangula alnus</i>	Glossy Buckthorn
x	P-FRAAMER	<i>Fraxinus americana</i>	White Ash
x	P-FRAPENN	<i>Fraxinus pennsylvanica</i>	Green Ash
x	P-GALAPAR	<i>Galium aparine</i>	Cleavers
x	P-GAL_SP	Galium sp.	Bedstraw Species
x	P-GERMACU	<i>Geranium maculatum</i>	Spotted Geranium
x	P-GERROBE	<i>Geranium robertianum</i>	Herb-Robert
x	P-GEUALEP	<i>Geum aleppicum</i>	Yellow Avens
x	P-GEUCANA	<i>Geum canadense</i>	White Avens
x	P-WALFRAG	<i>Geum fragarioides</i>	Barren Strawberry
x	P-GEULACI	<i>Geum laciniatum</i>	Rough Avens
x	P-GEU_SP	Geum sp.	Avens Species
x	P-GLEHEDE	<i>Glechoma hederacea</i>	Ground Ivy
x	P-GLYSTRI	<i>Glyceria striata</i>	Fowl Mannagrass
x	P-HACVIRG	<i>Hackelia virginiana</i>	Virginia Stickseed
x	P-HAMVIRG	<i>Hamamelis virginiana</i>	American Witch-hazel
x	P-HEPACTU	<i>Hepatica acutiloba</i>	Sharp-lobed Hepatica
x	P-ANEAMER	<i>Hepatica americana</i>	Round-lobed Hepatica
x	P-HESMATR	<i>Hesperis matronalis</i>	Dame's Rocket
x	P-HIESCAU	<i>Hieracium scabrum</i>	Rough Hawkweed
x	P-HYDCANY	<i>Hydrophyllum canadense</i>	Canada Waterleaf
x	P-HYDVIRG	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
x	P-IMPCAPE	<i>Impatiens capensis</i>	Spotted Jewelweed
x	P-IMPPALL	<i>Impatiens pallida</i>	Pale Jewelweed
x	P-IRIVERS	<i>Iris versicolor</i>	Harlequin Blue Flag
x	P-JUGCINE	<i>Juglans cinerea</i>	Butternut
x	P-JUGNIGR	<i>Juglans nigra</i>	Black Walnut
x	P-LAPCANA	<i>Laportea canadensis</i>	Wood Nettle
x	P-LAPCOMM	<i>Lapsana communis</i>	Common Nipplewort
x	P-LEE_SP	<i>Leersia</i> sp.	Cut Grass Species
x	P-LIC_SP	Lichen sp.	Lichen Species
x	P-LIGVULG	<i>Ligustrum vulgare</i>	European Privet
x	P-LONCANA	<i>Lonicera canadensis</i>	Canada Fly Honeysuckle
x	P-LONDIOI	<i>Lonicera dioica</i>	Limber Honeysuckle
x	P-LONMAAC	<i>Lonicera maackii</i>	Amur Honeysuckle
x	P-LON_SP	<i>Lonicera</i> sp.	Honeysuckle Species
x	P-LONTATA	<i>Lonicera tatarica</i>	Tartarian Honeysuckle
x	P-LUNANNU	<i>Lunaria annua</i>	Annual Honesty
x	P-LYTSALI	<i>Lythrum salicaria</i>	Purple Loosestrife
x	P-MAICANA	<i>Maianthemum canadense</i>	Wild Lily-of-the-valley

Plant Species Inventoried in Winona and Vinemount Conservation Areas (cont.)

x	P-MAIRARA	Maianthemum racemosum	Large False Solomon's Seal
x	P-MAI_SP	Maianthemum sp.	False Soloman's Seal Species
x	P-MATSTPE	Matteuccia struthiopteris var. pensylvanica	Ostrich Fern
x	P-MENCANA	Menispermum canadense	Canada Moonseed
x	P-MITDIPH	Mitella diphylla	Two-leaved Mitrewort
x	P-MORALBA	Morus alba	White Mulberry
x	P-PREALBA	Nabalus albus	White Rattlesnakeroot
x	P-MOS_SP	no data2	Moss Species
x	P-ONOSSENS	Onoclea sensibilis	Sensitive Fern
x	P-OSTVIRG	Ostrya virginiana	Eastern Hop-hornbeam
x	P-OXACORN	Oxalis corniculata	Creeping Wood-sorrel
x	P-OXASTRI	Oxalis stricta	Upright Yellow Wood-sorrel
x	P-PARQUIN	Parthenocissus quinquefolia	Virginia Creeper
x	P-PARINSE	Parthenocissus vitacea	Thicket Creeper
x	P-POLLAPA	Persicaria lapathifolia	Pale Smartweed
x	P-PHAARUN	Phalaris arundinacea	Reed Canary Grass
x	P-PHRAUST	Phragmites australis	Common Reed
x	P-PHRLEPT	Phryma leptostachya	Lopseed
x	P-PILPUMI	Pilea pumila	Dwarf Clearweed
x	P-PIL_SP	Pilea sp.	Clearweed Species
x	P-HIECACA	Pilosella caespitosa	Meadow Hawkweed
x	P-PINSTRO	Pinus strobus	Eastern White Pine
x	P-PLAMAJO	Plantago major	Common Plantain
x	P-POANEMO	Poa nemoralis	Woods Bluegrass
x	P-GRA_SP	Poa sp.	Grass Species
x	P-PODPELT	Podophyllum peltatum	May-apple
x	P-POLACRO	Polystichum acrostichoides	Christmas Fern
x	P-POPDEDE	Populus deltoides ssp. deltoides	Eastern Cottonwood
x	P-POPGRAN	Populus grandidentata	Large-toothed Aspen
x	P-POPTREM	Populus tremuloides	Trembling Aspen
x	P-DUCINDI	Potentilla indica	Mock-strawberry
x	P-PRUVUVU	Prunella vulgaris ssp. vulgaris	Common Self-heal
x	P-PRUAVIU	Prunus avium	Sweet Cherry
x	P-PRUSERO	Prunus serotina	Black Cherry
x	P-PRUVIVI	Prunus virginiana	Choke Cherry
x	P-PYRCOMM	Pyrus communis	Common Pear
x	P-QUEALBA	Quercus alba	White Oak
x	P-QUERUBR	Quercus rubra	Northern Red Oak
x	P-RANRECU	Ranunculus recurvatus	Hooked Buttercup
x	P-RHACATH	Rhamnus cathartica	Common Buckthorn
x	P-RHUTYPH	Rhus typhina	Staghorn Sumac
x	P-RIBCYNO	Ribes cynosbati	Prickly Gooseberry
x	P-ROSCARO	Rosa carolina	Carolina Rose
x	P-ROSMULT	Rosa multiflora	Multiflora Rose
x	P-RUBALLE	Rubus allegheniensis	Allegheny Blackberry
x	P-RUBIDID	Rubus idaeus ssp. idaeus	Common Red Raspberry
x	P-RUBIDME	Rubus idaeus ssp. strigosus	Wild Red Raspberry
x	P-RUBOCCI	Rubus occidentalis	Black Raspberry
x	P-RUBODOR	Rubus odoratus	Purple-flowering Raspberry
x	P-RUDHIRT	Rudbeckia hirta	Black-eyed Susan
x	P-RUM_SP	Rumex sp.	Dock Species
x	P-SAL_SP	Salix sp.	Willow Species
x	P-SAL_SP	Salix sp.	Willow Species
x	P-SAMCANA	Sambucus canadensis	Common Elderberry
x	P-SAMRAPU	Sambucus racemosa ssp. pubens	Red Elderberry

Plant Species Inventoried in Winona and Vinemount Conservation Areas (cont.)

x	P-SANCANA	<i>Sanguinaria canadensis</i>	Bloodroot
x	P-CORVARI	<i>Securigera varia</i>	Common Crown-vetch
x	P-SOLDULC	<i>Solanum dulcamara</i>	Bittersweet Nightshade
x	P-SOLALAL	<i>Solidago altissima</i> var. <i>altissima</i>	Eastern Tall Goldenrod
x	P-SOLCAES	<i>Solidago caesia</i>	Blue-stemmed Goldenrod
x	P-SOLCANA	<i>Solidago canadensis</i>	Canada Goldenrod
x	P-SOLFLEX	<i>Solidago flexicaulis</i>	Zigzag Goldenrod
x	P-SONOLER	<i>Sonchus oleraceus</i>	Common Sow-thistle
x	P-STATRIF	<i>Staphylea trifolia</i>	American Bladdernut
x	P-ASTCORD	<i>Symphyotrichum cordifolium</i>	Heart-leaved Aster
x	P-ASTERER	<i>Symphyotrichum ericoides</i> var. <i>ericoides</i>	White Heath Aster
x	P-ASTLALN	<i>Symphyotrichum lanceolatum</i> ssp. <i>lanceolatum</i>	Panicled Aster
x	P-ASTLATE	<i>Symphyotrichum lateriflorum</i>	Calico Aster
x	P-ASTNOVA	<i>Symphyotrichum novae-angliae</i>	New England Aster
x	P-ASTONON	<i>Symphyotrichum ontarionis</i>	Ontario Aster
x	P-ASTPIPI	<i>Symphyotrichum pilosum</i> var. <i>pilosum</i>	Old Field Aster
x	P-ASTPUPU	<i>Symphyotrichum puniceum</i> var. <i>puniceum</i>	Swamp Aster
x	P-ASTUROP	<i>Symphyotrichum urophyllum</i>	Arrow-leaved Aster
x	P-TAROFFI	<i>Taraxacum officinale</i>	Common Dandelion
x	P-THADIOI	<i>Thalictrum dioicum</i>	Early Meadow-rue
x	P-THUOCCI	<i>Thuja occidentalis</i>	Eastern White Cedar
x	P-TIACORD	<i>Tiarella cordifolia</i>	Heart-leaved Foam-flower
x	P-TILAMER	<i>Tilia americana</i>	American Basswood
x	P-TORJAPO	<i>Torilis japonica</i>	Erect Hedge-parsley
x	P-RHURADI	<i>Toxicodendron radicans</i>	Poison Ivy
x	P-RHURANE	<i>Toxicodendron radicans</i> var. <i>radicans</i>	Eastern Poison Ivy
x	P-RHURARY	<i>Toxicodendron radicans</i> var. <i>rydbergii</i>	Western Poison Ivy
x	P-TRIEREC	<i>Trillium erectum</i>	Red Trillium
x	P-TRIGRAN	<i>Trillium grandiflorum</i>	White Trillium
x	P-TUSFARF	<i>Tussilago farfara</i>	Colt's-foot
x	P-TYPANGU	<i>Typha angustifolia</i>	Narrow-leaved Cattail
x	P-ULMAMER	<i>Ulmus americana</i>	American Elm
x	P-ULMRUBR	<i>Ulmus rubra</i>	Slippery Elm
x	P-UVUGRAN	<i>Uvularia grandiflora</i>	Large-flowered Bellwort
x	P-VIBACER	<i>Viburnum acerifolium</i>	Maple-leaved Viburnum
x	P-VIBLENT	<i>Viburnum lentago</i>	Nannyberry
x	P-VIBOPUL	<i>Viburnum opulus</i>	Cranberry Viburnum
x	P-VICCRAC	<i>Vicia cracca</i>	Tufted Vetch
x	P-VINMINO	<i>Vinca minor</i>	Periwinkle
x	P-VIOCANA	<i>Viola canadensis</i>	Canada Violet
x	P-VIOPUBE	<i>Viola pubescens</i>	Yellow Violet
x	P-VIOSORO	<i>Viola sororia</i>	Woolly Blue Violet
x	P-VIO_SP	<i>Viola</i> sp.	Violet Species
x	P-VITRIPA	<i>Vitis riparia</i>	Riverbank Grape

Bird Species Inventoried in Winona and Vinemount Conservation Areas

ebird&iNat	HCA Staff	NAI	Species_Code	OFO_Scientific_Name	OFO_Common_Name
x			B-CORE	Acanthis flammea	Common Redpoll
	x		B-COHA	Accipiter cooperii	Cooper's Hawk
	x		B-SSHA	Accipiter striatus	Sharp-shinned Hawk
		x	B-SPSA	Actitis macularius	Spotted Sandpiper
x			B-NSWO	Aegolius acadicus	Northern Saw-whet Owl
	x		B-RWBL	Agelaius phoeniceus	Red-winged Blackbird
x			B-MALL	Anas platyrhynchos	Mallard
x			B-SACR	Antigone canadensis	Sandhill Crane
x			B-WPWI	Antrostomus vociferus	Eastern Whip-poor-will
		x	B-RTHU	Archilochus colubris	Ruby-throated Hummingbird
	x		B-CEDW	Bombycilla cedrorum	Cedar Waxwing
		x	B-CAGO	Branta canadensis	Canada Goose
x			B-GHOW	Bubo virginianus	Great Horned Owl
	x		B-RTHA	Buteo jamaicensis	Red-tailed Hawk
x			B-RSHA	Buteo lineatus	Red-shouldered Hawk
x			B-BWHA	Buteo platypterus	Broad-winged Hawk
	x		B-NOCA	Cardinalis cardinalis	Northern Cardinal
x			B-HETH	Catharus guttatus	Hermit Thrush
x			B-SWTH	Catharus ustulatus	Swainson's Thrush
	x		B-BRCR	Certhia americana	Brown Creeper
		x	B-CHSW	Chaetura pelagica	Chimney Swift
		x	B-KILL	Charadrius vociferus	Killdeer
x			B-NOHA	Circus hudsonius	Northern Harrier
	x		B-YBCU	Coccyzus americanus	Yellow-billed Cuckoo
	x		B-BBCU	Coccyzus erythrophthalmus	Black-billed Cuckoo
	x		B-NOFL	Colaptes auratus	Northern Flicker
		x	B-RODO	Columba livia	Rock Pigeon
	x		B-EAWP	Contopus virens	Eastern Wood-Pewee
		x	B-AMCR	Corvus brachyrhynchos	American Crow
x			B-CORA	Corvus corax	Common Raven
	x		B-BLJA	Cyanocitta cristata	Blue Jay
x			B-TUSW	Cygnus columbianus	Tundra Swan
		x	B-BOBO	Dolichonyx oryzivorus	Bobolink
	x		B-DOWO	Dryobates pubescens	Downy Woodpecker
		x	B-HAWO	Dryobates villosus	Hairy Woodpecker
	x		B-GRCA	Dumetella carolinensis	Gray Catbird
		x	B-ALFL	Empidonax alnorum	Alder Flycatcher
		x	B-LEFL	Empidonax minimus	Least Flycatcher
		x	B-WIFL	Empidonax traillii	Willow Flycatcher
		x	B-HOLA	Eremophila alpestris	Horned Lark
x			B-MERL	Falco columbarius	Merlin
x			B-PEFA	Falco peregrinus	Peregrine Falcon
		x	B-AMKE	Falco sparverius	American Kestrel
		x	B-MOWA	Geothlypis philadelphia	Mourning Warbler
		x	B-HOFI	Haemorhous mexicanus	House Finch
x			B-PUFI	Haemorhous purpureus	Purple Finch
x			B-BAEA	Haliaeetus leucocephalus	Bald Eagle
		x	B-BARS	Hirundo rustica	Barn Swallow
x			B-CATE	Hydroprogne caspia	Caspian Tern
	x		B-WOTH	Hylocichla mustelina	Wood Thrush
		x	B-OROR	Icterus spurius	Orchard Oriole
x			B-DEJU	Junco hyemalis	Dark-eyed Junco
x			B-NSHR	Lanius borealis	Northern Shrike
		x	B-HERG	Larus argentatus	Herring Gull

Bird Species Inventoried in Winona and Vinemount Conservation Areas (cont.)

		x	B-RBGU	Larus delawarensis	Ring-billed Gull
x			B-BEKI	Megasceryle alcyon	Belted Kingfisher
x			B-EASO	Megascops asio	Eastern Screech-Owl
	x		B-RBWO	Melanerpes carolinus	Red-bellied Woodpecker
	x		B-WITU	Meleagris gallopavo	Wild Turkey
		x	B-SWSP	Melospiza georgiana	Swamp Sparrow
	x		B-SOSP	Melospiza melodia	Song Sparrow
		x	B-NOMO	Mimus polyglottos	Northern Mockingbird
	x		B-BHCO	Molothrus ater	Brown-headed Cowbird
	x		B-GCFL	Myiarchus crinitus	Great Crested Flycatcher
x			B-NAWA	Oreothlypis ruficapilla	Nashville Warbler
x			B-OSPR	Pandion haliaetus	Osprey
		x	B-NOWA	Parkesia noveboracensis	Northern Waterthrush
		x	B-HOSP	Passer domesticus	House Sparrow
		x	B-SAVS	Passerculus sandwichensis	Savannah Sparrow
x			B-FOSP	Passerella iliaca	Fox Sparrow
	x		B-INBU	Passerina cyanea	Indigo Bunting
		x	B-RINP	Phasianus colchicus	Ring-necked Pheasant
		x	B-RBGR	Pheucticus ludovicianus	Rose-breasted Grosbeak
		x	B-SCTA	Piranga olivacea	Scarlet Tanager
x			B-SNBU	Plectrophenax nivalis	Snow Bunting
	x		B-BCCH	Poecile atricapillus	Black-capped Chickadee
		x	B-BGGN	Poliophtila caerulea	Blue-gray Gnatcatcher
		x	B-PUMA	Progne subis	Purple Martin
	x		B-COGR	Quiscalus quiscula	Common Grackle
x			B-RCKI	Regulus calendula	Ruby-crowned Kinglet
x			B-GCKI	Regulus satrapa	Golden-crowned Kinglet
		x	B-BANS	Riparia riparia	Bank Swallow
x			B-EAPH	Sayornis phoebe	Eastern Phoebe
		x	B-AMWO	Scolopax minor	American Woodcock
		x	B-OVEN	Seiurus aurocapilla	Ovenbird
x			B-BTBW	Setophaga caerulescens	Black-throated Blue Warbler
x			B-BBWA	Setophaga castanea	Bay-breasted Warbler
	x		B-HOWA	Setophaga citrina	Hooded Warbler
		x	B-YRWA	Setophaga coronata	Yellow-rumped Warbler
x			B-PAWA	Setophaga palmarum	Palm Warbler
	x		B-CSWA	Setophaga pensylvanica	Chestnut-sided Warbler
	x		B-YWAR	Setophaga petechia	Yellow Warbler
		x	B-AMRE	Setophaga ruticilla	American Redstart
		x	B-BLPW	Setophaga striata	Blackpoll Warbler
x			B-BTGW	Setophaga virens	Black-throated Green Warbler
		x	B-EABL	Sialia sialis	Eastern Bluebird
x			B-RBNU	Sitta canadensis	Red-breasted Nuthatch
	x		B-WBNU	Sitta carolinensis	White-breasted Nuthatch
x			B-PISI	Spinus pinus	Pine Siskin
	x		B-AMGO	Spinus tristis	American Goldfinch
		x	B-CCSP	Spizella pallida	Clay-colored Sparrow
		x	B-CHSP	Spizella passerina	Chipping Sparrow
		x	B-FISP	Spizella pusilla	Field Sparrow
x			B-ATSP	Spizelloides arborea	American Tree Sparrow
		x	B-NRWS	Stelgidopteryx serripennis	Northern Rough-winged Swallow
		x	B-EAME	Sturnella magna	Eastern Meadowlark
	x		B-EUST	Sturnus vulgaris	European Starling
		x	B-TRES	Tachycineta bicolor	Tree Swallow
	x		B-CARW	Thryothorus ludovicianus	Carolina Wren

Bird Species Inventoried in Winona and Vinemount Conservation Areas (cont.)

	x		B-HOWR	Troglodytes aedon	House Wren
	x		B-WIWR	Troglodytes hiemalis	Winter Wren
	x		B-AMRO	Turdus migratorius	American Robin
		x	B-EAKI	Tyrannus tyrannus	Eastern Kingbird
	x		B-YTVI	Vireo flavifrons	Yellow-throated Vireo
		x	B-WAVI	Vireo gilvus	Warbling Vireo
	x		B-REVI	Vireo olivaceus	Red-eyed Vireo
	x		B-MODO	Zenaida macroura	Mourning Dove
		x	B-WTSP	Zonotrichia albicollis	White-throated Sparrow
x			B-WCSP	Zonotrichia leucophrys	White-crowned Sparrow

Mammal Species Inventoried in Winona and Vinemount Conservation Areas

HCA staff	NAI	Species_Code	Scientific_Name_NHIC	Common_Name_NHIC
	x	M-NSTS	Blarina brevicauda	Northern Short-tailed Shrew
	x	M-VIOP	Didelphis virginiana	Virginia Opossum
	x	M-WOOD	Marmota monax	Woodchuck
	x	M-MEVO	Microtus pennsylvanicus	Meadow Vole
	x	M-MINK	Neovison vison	American Mink
x		M-WTDE	Odocoileus virginianus	White-tailed Deer
	x	M-WFMO	Peromyscus leucopus	White-footed Mouse
x		M-RACC	Procyon lotor	Northern Raccoon
x		M-GRSB	Sciurus carolinensis	Eastern Gray Squirrel Black Phase
	x	M-GRSQ	Sciurus carolinensis	Eastern Gray Squirrel
	x	M-EACO	Sylvilagus floridanus	Eastern Cottontail
x		M-EACH	Tamias striatus	Eastern Chipmunk
x		M-RESQ	Tamiasciurus hudsonicus	Red Squirrel
x		M-REFO	Vulpes vulpes	Red Fox

Butterflies and Dragonflies Surveyed in Winona and Vinemount Conservation Areas				
HCA Staff	NAI	Species_Code	NHIC_Scientific_Name	NHIC_Common_Name
	x	O-GRDA	Anax junius	Common Green Darner
	x	L-LESK	Ancyloxypha numitor	Least Skipper
	x	O-EBJE	Calopteryx maculata	Ebony Jewelwing
	x	L-SPAZ	Celastrina lucia	Northern Spring Azure
	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-ETBL	Cupido comyntas	Eastern Tailed Blue
	x	L-MONA	Danaus plexippus	Monarch
	x	O-FABL	Enallagma civile	Familiar Bluet
	x	L-SSSK	Epargyreus clarus	Silver-spotted Skipper
	x	O-EAPO	Erythemis simplicicollis	Eastern Pondhawk
	x	L-SIBL	Glaucopsyche lygdamus	Silvery Blue
	x	O-EAFO	Ischnura verticalis	Eastern Forktail
	x	O-DTWH	Leucorrhinia intacta	Dot-tailed Whiteface
	x	O-WISK	Libellula luctuosa	Widow Skimmer
	x	O-TSSK	Libellula pulchella	Twelve-spotted Skimmer
	x	L-VICE	Limenitis archippus	Viceroy
	x	L-LWSA	Megisto cymela	Little Wood-Satyr
x		L-MOCL	Nymphalis antiopa	Mourning Cloak
	x	L-COTO	Nymphalis l-album	Compton Tortoiseshell
	x	L-TISW	Papilio glaucus	Eastern Tiger Swallowtail
	x	L-BLSW	Papilio polyxenes	Black Swallowtail
	x	L-COSW	Pholisora catullus	Common Sootywing
	x	L-PHYPAS	Phyciodes cocyta	Northern Crescent
	x	L-PECR	Phyciodes tharos	Pearl Crescent
	x	L-CAWH	Pieris rapae	Cabbage White
	x	O-COWH	Plathemis lydia	Common Whitetail
	x	L-PESK	Polites peckius	Peck's Skipper
	x	L-COMM	Polygonia comma	Eastern Comma
	x	L-QUMA	Polygonia interrogationis	Question Mark
	x	L-BAHA	Satyrrium calanus	Banded Hairstreak
	x	L-GSFR	Speyeria cybele	Great Spangled Fritillary
	x	L-EUSK	Thymelicus lineola	European Skipper
	x	O-BLSA	Tramea lacerata	Black Saddlebags
	x	L-READ	Vanessa atalanta	Red Admiral
	x	L-AMLA	Vanessa virginiensis	American Lady

Amphibians and Reptiles Inventoried in Winona and Vinemount Conservation Areas

All	Species_Code	SCIENTIFIC_NAME_NHIC	COMMON_NAME_NHIC
x	H-JEFF	Ambystoma (jeffersonianum complex)	Jefferson complex (undetermined)
x	H-JESA	Ambystoma jeffersonianum	Jefferson Salamander
x	H-AMTO	Anaxyrus americanus	American Toad
x	H-SNTU	Chelydra serpentina	Snapping Turtle
x	H-MPTU	Chrysemys picta marginata	Midland Painted Turtle
x	H-TGTF	Hyla versicolor	Gray Treefrog
x	H-MISN	Lampropeltis triangulum	Eastern Milksnake
x	H-BUFR	Lithobates catesbeianus	American Bullfrog
x	H-GRFR	Lithobates clamitans	Green Frog
x	H-LEFR	Lithobates pipiens	Northern Leopard Frog
x	H-EANE	Notophthalmus viridescens viridescens	Red-spotted Newt
x	H-RBSA	Plethodon cinereus	Eastern Red-backed Salamander
x	H-SPPE	Pseudacris crucifer	Spring Peeper
x	H-MICF	Pseudacris triseriata pop. 2	Western Chorus Frog - Carolinian Population
x	H-BRSN	Storeria dekayi	DeKay's Brownsnake
x	H-RBSN	Storeria occipitomaculata	Red-bellied Snake
x	H-EAGA	Thamnophis sirtalis sirtalis	Eastern Gartersnake
x	H-SLID	Trachemys scripta elegans	Red-eared Slider
x	H-UNKNOWN	Unknown sp.	Unknown Herp Species

APPENDIX 5

References

References

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