

DRAFT

A Feasibility Study for the Onondaga Escarpment Greenway



By:

Tom Anderson
Lindsey Barker
Kathleen Barnhill
Nick Brown
Lindsay Cray
Paul Dawson
Theresa Evans
Molly Foley
Malaika Green
Shara Hilton
Michaela Labriole
Catherine Miles
Amanda Morrison
Matthew Plummer
Blake Propst
Elizabeth Schmidt
Patrick Schuler
Maxwell Sloan
Scott Sterling
Lucas Tiffany
Corey Williams
Max Woyton
Li Zhang

Editor and Supervising Professor:
Diane Kuehn

FOR 476/676: Ecotourism and Nature Tourism
SUNY College of Environmental Science and Forestry
January, 2009

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	V
INTRODUCTION	1
DEFINITIONS OF LAND DESIGNATION TERMS	2
CORRIDOR-WIDE ASSESSMENT	4
INTRODUCTION	4
OVERVIEW OF CORRIDOR	4
CORRIDOR-WIDE CONNECTIONS	6
ISSUES AND CONCERNS	9
VISION.....	10
THEME.....	10
GUIDELINES.....	11
CORRIDOR-WIDE RECOMMENDATIONS	12
SPLIT ROCK	17
I. INTRODUCTION.....	17
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	18
III. NATURAL SETTING	19
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, OR EDUCATIONAL IMPORTANCE	19
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE THAT MAY BE	
ADVERSELY AFFECTED BY ANY CHANGE	20
VI. SUMMARY	21
SPLIT ROCK RECOMMENDATIONS	23
ELMWOOD PARK	25
I. INTRODUCTION.....	25
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	25
III. NATURAL SETTING	26
IV. AGRICULTURAL, SOCIAL, CULTURAL, HISTORIC, ARCHAEOLOGICAL, RECREATIONAL OR EDUCATIONAL	
IMPORTANCE	26
V. ECOLOGICAL, GEOLOGICAL AND HYDROLOGICAL SENSITIVITY TO CHANGE THAT MAY BE ADVERSELY	
AFFECTED BY CHANGE.....	28
VI. SUMMARY	29
RECOMMENDATIONS FOR ELMWOOD PARK	30
UPPER AND LOWER ONONDAGA PARK, KIRK PARK, AND VAN DUYN FIELD	32
I. INTRODUCTION.....	32
II. BENEFITS AND THREATS TO HUMAN HEALTH AND SAFETY	33
III. NATURAL SETTING	35
IV. SOCIAL, RECREATIONAL, CULTURAL, HISTORICAL, AND EDUCATIONAL IMPORTANCE.....	35
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE THAT MAY BE	
ADVERSELY AFFECTED BY CHANGE	37
VI. SUMMARY	37
RECOMMENDATIONS FOR PARKS ALONG ONONDAGA CREEK	38

CLARK RESERVATION STATE PARK	39
I. INTRODUCTION.....	39
II. BENEFITS OR THREATS TO PUBLIC SAFETY OR HEALTH	39
III. NATURAL SETTING	40
IV. CULTURAL, HISTORICAL, RECREATIONAL AND EDUCATIONAL IMPORTANCE	40
V. INHERENT ECOLOGICAL, GEOLOGICAL OR HYDROLOGICAL SENSITIVITY TO CHANGE THAT COULD BE ADVERSELY AFFECTED BY CHANGE	41
VI. SUMMARY	42
CLARK RESERVATION RECOMMENDATIONS:.....	43
RAM’S GULCH ASSESSMENT	45
I. INTRODUCTION.....	45
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	46
III. NATURAL SETTING	47
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, OR EDUCATIONAL IMPORTANCE OF LOCATION	48
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE	48
VI. SUMMARY	49
RECOMMENDATIONS FOR RAM’S GULCH	49
WHITE LAKE SWAMP	51
I. INTRODUCTION.....	51
II. BENEFITS & THREATS TO PUBLIC SAFETY OR HEALTH.....	52
III. NATURAL SETTING	53
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, OR EDUCATIONAL IMPORTANCE OF LOCATION	53
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL, SENSITIVITY TO CHANGE THAT COULD BE ADVERSELY AFFECTED BY CHANGE	53
VI. SUMMARY	54
WHITE LAKE SWAMP AREA RECOMMENDATIONS.....	55
WOODCHUCK HILL FIELD AND FOREST PRESERVE	57
I. INTRODUCTION.....	57
II. BENEFITS AND THREATS TO HUMAN HEALTH OR SAFETY	57
III. NATURAL SETTING	57
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, OR EDUCATIONAL IMPORTANCE OF LOCATION	58
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL, SENSITIVITY TO CHANGE ADVERSELY AFFECTED	58
VI. SUMMARY	59
WOODCHUCK HILL PRESERVE RECOMMENDATIONS	60

YMCA CAMP IROQUOIS	61
I. INTRODUCTION.....	61
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	61
III. NATURAL SETTING	61
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, EDUCATIONAL IMPORTANCE OF LOCATION	61
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE	62
VI. SUMMARY	62
RECOMMENDATIONS FOR YMCA CAMP IROQUOIS	63
HANSON AGGREGATES PROPERTY (SWEET ROAD).....	64
I. INTRODUCTION.....	64
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	64
III. NATURAL SETTING	65
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL RECREATIONAL OR EDUCATIONAL IMPORTANCE ..	65
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE	66
VI. SUMMARY	66
RECOMMENDATIONS FOR HANSON AGGREGATES PROPERTY	67
THREE FALLS WOODS.....	69
I. INTRODUCTION.....	69
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	70
III. NATURAL SETTING	71
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL RECREATIONAL OR EDUCATIONAL IMPORTANCE ..	71
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE	72
VI. SUMMARY	73
RECOMMENDATIONS FOR THREE FALLS WOODS.....	74
CAVALRY CLUB.....	76
I. INTRODUCTION.....	76
II. BENEFITS AND THREATS TO PUBLIC SAFETY AND HEALTH.....	77
III. NATURAL SETTING	78
IV. INHERENT ECOLOGICAL, GEOLOGICAL OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE	79
V. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, OR EDUCATIONAL IMPORTANCE OF LOCATION:	79
VI. SUMMARY	80
RECOMMENDATIONS FOR CAVALRY CLUB.....	81

LIMESTONE CREEK AND GRAMLICH BIRD SANCTUARY.....	82
I. INTRODUCTION.....	82
II. BENEFITS AND THREATS TO PUBLIC HEALTH OR SAFETY	83
III. NATURAL SETTING	83
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, OR EDUCATIONAL IMPORTANCE OF LOCATION	83
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE	84
VI. SUMMARY	84
RECOMMENDATIONS FOR GRAMLICH BIRD SANCTUARY AND LIMESTONE CREEK.....	85
OLD ERIE CANAL STATE HISTORIC PARK	90
I. INTRODUCTION.....	90
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	90
III. NATURAL SETTING	91
IV. SOCIAL, CULTURAL, HISTORICAL, ARCHAEOLOGICAL, RECREATIONAL, OR EDUCATIONAL IMPORTANCE OF LOCATION	91
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE	93
VI. SUMMARY	94
RECOMMENDATIONS FOR OLD ERIE CANAL STATE HISTORIC PARK	94
GREEN LAKES STATE PARK.....	95
I. INTRODUCTION.....	95
II. BENEFITS AND THREATS TO PUBLIC SAFETY OR HEALTH	95
III. NATURAL SETTING	96
IV. SOCIAL, CULTURAL, HISTORICAL, RECREATIONAL OR EDUCATIONAL IMPORTANCE	97
V. INHERENT ECOLOGICAL, GEOLOGICAL, OR HYDROLOGICAL SENSITIVITY TO CHANGE WHICH COULD BE ADVERSELY AFFECTED BY CHANGE:	98
VI. SUMMARY	99
RECOMMENDATIONS FOR GREEN LAKES STATE PARK	100
REFERENCES	101

ACKNOWLEDGEMENTS

We wish to thank the many individuals and organizations that helped with this project, including:

Chris Abbott, City of Syracuse Dept. of Parks, Recreation, and Youth Programs

Phillip Bonn, Manlius Greenspace Coalition

Jeff Devine, Save the County Land Trust

Allan Drew, SUNY ESF, Council of Park Friends

Meg Harris, Onondaga Community College, Council of Park Friends

Gordon Heisler, Dewitt ACC

Tom Hughes, NYS OPRHP

Bill Kappel, US Geological Survey

Don Leopold, SUNY ESF

Glen Lewis, City of Syracuse Dept. of Parks, Recreation, and Historic Preservation

John Livingstone, NYS OPRHP

Ralph Manna, Council of Park Friends

Ellen McGrew, Manlius Greenspace Coalition

Les Monostory

Bennita Rogers, Manlius Greenspace Coalition

Larry Rutledge, Elmwood Park Association

Debbie Shanahan, DACC

Kenneth Showalter, NYS OPRHP

Dan Smothergill, Council of Park Friends

Brian Solomon

Diane Wheelock, Council of Park Friends

Thank you! This project could not have been completed without your help!

INTRODUCTION

The Onondaga Escarpment is a geologic remnant of glacial times that traverses New York State from east to west. In Onondaga County, limestone formations and karst topography typical of the Onondaga Escarpment are found in a narrow corridor of land that stretches from Split Rock to Green Lakes State Park. A portion of this corridor (i.e., from Clark Reservation State Park to the Cavalry Club) is currently called the Onondaga Escarpment Nature Corridor (OENC) and is included on the “supplemental” list of the 2006 New York State Open Space Conservation Plan (NYS DEC, NYS OPRHP, & NYSDOS, 2006, p. 219; Figure 1).

This feasibility study has four main purposes:

- 1) To examine the possibility of creating an Onondaga Escarpment Greenway (OEG) that comprises the natural areas with karst and escarpment features between Split Rock and Green Lakes State Park, including the natural areas contained within the Onondaga Escarpment Nature Corridor.
- 2) To examine the potential for changing the OENC’s “supplemental” listing in the NYS Open Space Conservation Plan to a “priority” listing, and to include land surrounding the Split Rock Unique Area in this priority listing. Priority listing would make it possible in the future for the state to purchase these lands.
- 3) To identify and assess current land designations (e.g., NYS wetland classification, Town/Village building codes and zoning, park designations, Critical Environmental Area (CEA) designation) that exist for the natural areas within the OEG, and identify the potential for additional designations where needed (see the following page for definitions of these designations).
- 4) To identify the educational, historical, and recreational features of this unique natural corridor.

This feasibility study is organized into two main components:

1. a corridor-wide assessment and recommendations, and
2. natural area assessments and recommendations.

The natural areas proposed for inclusion in the OEG are discussed in detail, and were written in the format required for Critical Environmental Area designation. Although many of the areas included are not suitable for CEA designation (some are already state or city designated parks with suitable habitat protection measures in place), this format was used throughout the report to maintain consistency between natural areas. The summary included at the end of each natural area assessment discusses the suitability for additional designations.

DEFINITIONS OF LAND DESIGNATION TERMS

Conservation Easement:

A permanent, voluntary, and binding agreement between a landowner and either a government agency or land trust created for land protection or public access purposes. The ownership of the property remains with the landowner, and the landowner may qualify for an income tax deduction for his/her donation.

Critical Environmental Area (CEA):

“A geographic area designated by a state or local agency, having exceptional or unique environmental characteristics” (NY Codes, Rules, and Regulations 617.2(i)). CEAs do not prevent development; rather they make it possible for local governments to request an environmental impact review for Type 1 and unlisted actions (henceforth, called “large-scale projects”) included in the State Environmental Quality Review Act. CEAs are designated by local governments; the written justification for the CEA, a map of the CEA, and proof of a public hearing on the CEA is filed with the Commissioner of the NYS Department of Environmental Conservation (Shanahan, 2005).

Eminent Domain:

The state or federal government’s ability to appropriate private property for public use. The landowner is paid the fair market value of the property in exchange for the property title.

New York State Designated Wetland:

A marsh, swamp, fen, bog, or other wet soil area of 12.4 acres in size or larger that is protected from development by the NYS Department of Environmental Conservation. Areas adjacent to the wetland of 100 feet in width are also protected as wetland buffers (www.dec.ny.gov/lands/4937.html).

New York State Greenway:

An area (comprised of both public and private lands) that is designated by New York State for natural, recreational, cultural, and historical resource planning, enhancement, and protection through a New York State legislative act. For example, the Hudson River Valley Greenway was created through the NYS Hudson River Valley Greenway Act of 1991. Greenway designation often improves access to funding at the state level for greenway projects. Greenways can be created at the county level (through county legislation) as well. National Heritage Corridors are similar corridors designated through the National Park Service at the federal level.

Purchase of Development Rights (PDR):

A type of conservation easement that enables a land trust or government agency to purchase the development rights for a parcel of land from the landowner. The PDR is a voluntary exchange of development rights; the landowner has the right to reject any PDR offers made. PDRs are permanent and binding for the property.

Zoning:

Dividing a municipality into sections (i.e., zones) that are reserved for specific purposes (e.g., residential, commercial, agricultural, industrial). Ordinances created for each zone are used to control or direct development within the zone.

CORRIDOR-WIDE ASSESSMENT

Introduction

Several steps were taken during the fall of 2008 to familiarize the students in ESF's Ecotourism and Nature Tourism class with the OEG and the concerns and issues related to the natural areas within the corridor. First, a discussion session with residents of the Onondaga Escarpment area and individuals involved with Onondaga Escarpment planning efforts was held at SUNY ESF during one class period. Second, several field trips were taken by the class to each of the natural areas. Third, students were in contact with many stakeholders involved in this project throughout the semester. Through these efforts, the students identified the issues and concerns included in this report, and used them to formulate goals and recommendations. The students also studied interconnections between natural areas within the corridor by compiling a map of the OEG (Figure 2).

Overview of corridor

The OEG corridor comprises numerous public lands as well as developed and undeveloped private properties that are home to many residents of Onondaga County. The natural areas included in the corridor are as follows:

1. **Split Rock:** Includes Split Rock Unique Area (state owned and managed by the NYS Department of Environmental Conservation) and adjacent corporation/organization owned lands.
2. **Burnet Park.** The City of Syracuse Park contains fantastic drumlin views as well as unique pathway, stone walls, stairs, grottos, and escarpment remnants along Grand Avenue. While it would be difficult to connect this park to the rest of the OEG via a simple travel route, this park should be included in any potential greenway designations. This area is not discussed further in this report.
3. **Corcoran High School wetland.** This 10-acre parcel is owned by Corcoran High School and is used for class instruction. The property contains a small limestone outcropping and waterfall, extensive wetlands, and a nature trail system. This area is not discussed further in this report.
4. **Woodland Reservoir.** Owned by the City of Syracuse Water Department, this reservoir was built on a glacial drumlin and offers fantastic views of Syracuse. This area is not discussed further in this report.

5. **Elmwood Park:** Limestone outcrops and a historic limestone landscape are present in this park, which is managed by the City of Syracuse Department of Parks, Recreation, and Youth Programs (SDPRYP).
6. **Upper and Lower Onondaga Park, Kirk Park, and Van Duyn Field:** Also managed by the SDPRYP, these parks contain limestone landscapes and drumlin topography, as well as Onondaga Creek.
7. **Clark Reservation State Park:** Managed by the NYS Office of Parks Recreation and Historic Preservation (OPRHP), this park contains important escarpment formations, a meromictic lake (Glacier Lake), and karst topography, as well as the federally-threatened Harts-Tongue Fern.
8. **Ram's Gulch:** Owned by Hanson Aggregates, this natural area is home to the harts-tongue fern, as well as a unique glacial valley, creek, and wetland.
9. **Woodchuck Hill Preserve:** Owned and managed by the Save the County Land Trust, this natural area contains woodlands and wetlands as well as examples of karst topography.
10. **White Lake Swamp:** Privately owned, this area contains intact karst topography, White Lake, wetlands, and woodlands, as well as several rare species.
11. **YMCA Camp Iroquois:** Owned by the YMCA, this children's camp includes Lost Lake, home to one population of the American harts-tongue fern, as well as karst topography.
12. **Hanson Aggregates property (Sweet Road):** This property includes excellent examples of karst topography, as well as two populations of the American hart's-tongure fern.
13. **Three Falls Woods:** Privately owned, a portion of this natural area has been designated a CEA by the Village of Manlius; the remaining portion will soon be considered for CEA designation by the Town of Manlius. Unique karst formations and waterfalls are found in this area, as well as historic limestone kilns.
14. **Cavalry Club:** This private, members-only club was developed on karst topography and is an important connector between Three Falls Woods and Limestone Creek.
15. **Limestone Creek and the Gramlich Bird Sanctuary:** The properties bordering Limestone Creek are owned primarily by private individuals; the Village of

Fayetteville owns the Gramlich Bird Sanctuary which is also found on the creek. The glacially-formed creek is an important connector between the Cavalry Club and Green Lakes State Park, and an important resource for local anglers.

16. **Erie Canal State Park:** Managed by OPRHP, this park is a connector between Limestone Creek and Green Lakes State Park. The park's tow path is popular with bicyclists, pedestrians, and joggers.
17. **Green Lakes State Park:** This park, also managed by OPRHP, contains examples of limestone outcrops as well as two meromictic lakes (Green Lake and Round Lake). The park is popular for a diversity of recreational activities.

Corridor-wide connections

The corridor was assessed for existing and potential travel connections between natural areas. While some connections already exist (e.g., towpath in Erie Canal Park connecting to Green Lakes State Park), most connections between natural areas do not exist. Table 1 shows each natural area and the connections or potential for connections between them. Because of the difficulty in identifying transportation mechanisms that connect all of the natural areas, a type of designation that does not require physical travel between sites is recommended for this corridor; a state-designated greenway is one such designation.



Figure 1. Map of the OENC (Source: map produced for the Manlius Greenspace Coalition by Lindsay Speer). All areas in color are components of the OENC, with the exception of Clark Reservation State Park which is in red.

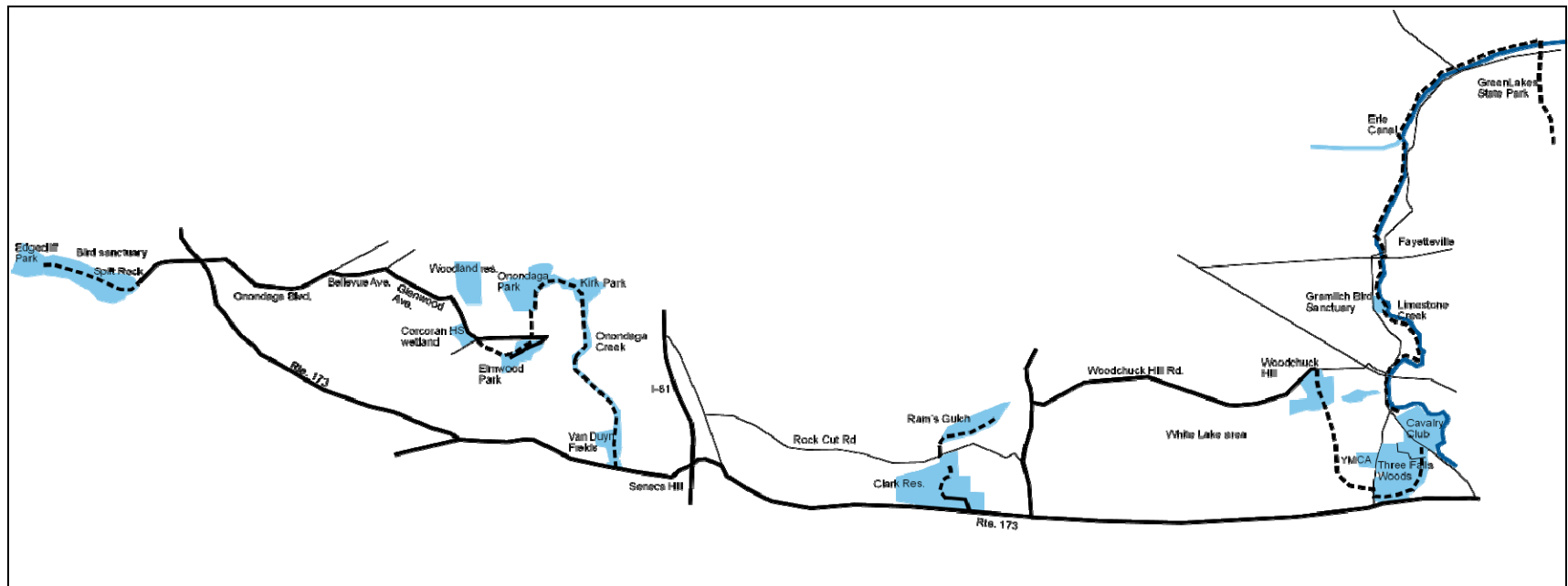


Figure 2. Map of the natural areas within the OEG.

Table 1. Natural areas and connections between them.

From (area)	To (area)	Type of existing connector	Type of potential connector
Split Rock	Elmwood Park	Roads Some sidewalks	Designated driving/pedestrian route using existing roads
Elmwood Park	Upper/Lower Onondaga Park	Roads Sidewalks	Designated driving/pedestrian route using existing roads and sidewalks
Upper/Lower Onondaga Park	Kirk Park	Roads	Pedestrian walkway recommended
Kirk Park	Van Duyn Field	None	Pedestrian walk/bike path recommended along Onondaga Creek
Van Duyn Field	Route 173	None	Pedestrian walk/bike path recommended along Onondaga Creek
Route 173	Clark Reservation	Roads Some sidewalks Possible trail	Designated driving route using existing roads, or a pedestrian route (would require the installation of sidewalks up Seneca Hill and a trail from Seneca Hill to Clark Reservation)
Clark Reservation	Ram's Gulch	Some trails	Trail extension needed along powerline corridor on eastern boundary of Clark Reservation.
Ram's Gulch	White Lake Swamp	Roads	Designated driving/pedestrian route needed across Jamesville Road and along Woodchuck Hill Road.
White Lake Swamp	Woodchuck Hill Preserve	Roads Some trails	Designated driving/pedestrian route needed along Woodchuck Hill Road; potential for trail development with Conservation Easement.
Woodchuck Hill Preserve	YMCA Camp Iroquois and Hanson area (Sweet Road)	Some trails	Potential for trail connections on Hanson land; trails should avoid YMCA property; poor connection for drivers due to confusing intersection of Woodchuck Hill Road, Route 93, and Highbridge Road.
YMCA Camp Iroquois and Hanson area	Three Falls Woods	Cross Sweet Road from Hanson area	Trail and road connections exist, but need to be marked.
Three Falls Woods	Cavalry Club	Trails	Trail connections exist, but need to be marked.
Cavalry Club	Gramlich Bird Sanctuary	Road/Trail	Designated driving/pedestrian route could be marked from Cavalry Club along Troop K Road to Highbridge Rd. to Gramlich; an alternative route would be to create a trail along Limestone Creek (conservation easements needed; proximity to golf course is a concern).
Gramlich Bird Sanctuary	Erie Canal State Park	Informal trail along Limestone Creek	Improve existing, informal trail along Limestone Creek; obtain conservation easements as needed from adjacent property owners; build pedestrian bridge to connect trail to canal towpath.
Erie Canal State Park	Green Lake State Park	Canal towpath; Sidewalks in Green Lakes	Connection exists and needs no improvement.

Issues and concerns

The following issues and concerns were identified by local residents and other stakeholders who attended a facilitated discussion session held with the students.

- Obtaining some type of formal designation for the OEG
- Connectivity of natural areas within the corridor
- Fragility of natural resources in the area
- Competing land use interests in the OEG
- Obtaining support of local governments for the OEG concept and CEA designation
- Public's difficulty in understanding the regulations regarding CEAs – residents often think it will prevent them from making changes to their homes
- Invasive species throughout the area
- The need for a strong educational program in the area that encourages minimal impact behaviors in the OEG
- Protecting of the unique resources of the area
 - Overlap types of designations (zoning, wetland designations, CEA, open space plan listing)
 - Need to move OENC from supplemental list to the priority list of the NYS Open Space Plan
- Providing recreation that suits the sensitive resources in the area
 - Recreation can increase public support, but needs to be of a level and type that minimizes impacts
 - Greenway concept vs. hiking corridor concept: or something in between?
 - Minimal trail and other facilities & small parking lots
 - Strong educational program (local schools residents and visitors)
 - Altering traditional uses of the area (e.g., hiking/biking off main trails) through education
- No single entity that oversees the enforcement of regulations in the corridor area
- Getting adequate public input into project before designation

Vision

In 10 years, we envision the Onondaga Escarpment Greenway as a place that:

1. Is recognized by the State of New York as a New York State-designated greenway that is listed as a priority area in the NYS Open Space plan.
2. Provides protection for the fragile habitats and unique cultural resources found within its boundaries.
3. Provides recreational opportunities that are consistent with the protection of the corridor's fragile resources.
4. Provides educational and interpretive opportunities for residents and visitors that illustrate the significance of the escarpment and its cultural/natural resources.

Goals

1. To have the OENC area listed as a priority area in the NYS Open Space Plan by 2012, and acquired by the state when possible.
2. To have the OEG area designated as a New York State Greenway by the year 2018.
3. To develop a corridor management plan by 2018 that includes protection measures for natural & cultural resources and the establishment of a recreation plan.
4. To create educational and interpretive opportunities for residents and visitors that illustrate the significance of the escarpment and its cultural/natural resources by 2018.

Theme

The class worked throughout the semester to identify a theme that would connect the unique resources within the OEG and that could be used for education and interpretation efforts within the corridor. The theme is:

The OEG is a unique geological and historical landscape that connects visitors and residents to a variety of flora, fauna, and cultural resources through responsible exploration and stewardship.

Guidelines

Guidelines were also developed by the class to educate visitors about protecting the OEG area during visits. These guidelines should be used on signs at trailheads and in any guidebooks developed for the OEG in the future. The guidelines are:

- Due to the limestone composition of the area, the OEG contains many unstable surfaces and features – please use caution when visiting.
- Leave all natural materials or historic artifacts at the site.
- Stay on the trail at all times – sensitive species found in the area.
- Leave no trace of your visit (carry-in and carry-out all garbage).
- Respect other users and private property.
- Follow any regulations posted in the natural area.

CORRIDOR-WIDE RECOMMENDATIONS

Move the OENC from the New State Open Space Conservation Plan Supplemental List to the Priority List. Placing the OENC on the priority list would focus the state's attention on purchasing privately-owned lands within the nature corridor, preventing future development threats and providing a greater opportunity for careful site management. Currently, the 2006 Open Space Plan defines the OENC as the area from Clark Reservation (i.e., Ram's Gulch) through Three Falls Woods and includes this corridor on the supplemental list.

In addition, the lands bordering the Split Rock Unique Area should be considered for the New State Open Space Conservation Plan Priority List. The lands bordering the Split Rock Unique area provide an important buffer for the federally threatened American hart's tongue fern. At present, these buffer lands offer little protection to the fern colony because of the lack of visitor management in the buffer area. Adding these buffer areas to the priority list would make it possible for New York State to purchase these lands in the future, providing a managed buffer for the hart's tongue fern (see Split Rock Recommendations on page 23).

Create an OEG organizing committee. A committee is needed to advance the idea and creation of the OEG. Local residents, members of non-governmental organizations, and representatives of local municipalities should comprise this committee. This committee would be responsible for seeking NYS Greenway designation for the OEG (see recommendation below) and for improving management of public natural areas within the OEG. Existing local stakeholder groups and non-governmental organizations should consider working together to establish this committee.

Work towards having the OEG designated as a New York State Greenway. The diversity of private and public lands contained within the OEG, as well as the limited travel-related connections between the natural areas within the OEG, suggests that the OEG would be best protected in the long term if it is designated as a NYS Greenway. Greenway designation is achieved through a state legislative act. It is recommended that not-for-profit groups work with Onondaga County and state senate and assembly legislators to request greenway legislation. In the future, the length of the greenway could be extended to the east and west to incorporate additional escarpment lands throughout New York. Areas within Central New York but slightly distant from the proposed OEG route discussed in this plan (i.e., Chittenango Falls and Pratt's Falls) also show escarpment features and should be considered for inclusion in this greenway.

Utilize highly visited parks to promote the OEG. The high volume of visitors to Clark Reservation and Green Lakes State Parks should be targeted to promote other areas of the OEG. Creating a working relationship with the Council of Park Friends could provide a forum for promotional literature within the Nature Center and naturalist programs at Clark Reservation. Similar information could be provided at the entrance booth and interpretive center in Green Lakes. Clark Reservation's informational brochure is provided by the Council of Park Friends; inclusion of the OEG in this document would benefit the Corridor's visibility. In addition, a new OEG website could be created and linked to existing websites for the two state parks. Once the Onondaga Park Arboretum and Botanical Garden is completed, the OEG could also be promoted through this attraction.

Create a guidebook to the OEG. A guidebook to the many natural areas within the OEG could be created to promote areas that are open to the public and suitable for visitation. Clark Reservation, Green Lakes State Park, Woodchuck Hill Preserve, and the City of Syracuse parks should be promoted as family-friendly settings for nature exploration. Guidelines for visitation as well as educational information about karst topography, the Onondaga Escarpment, and flora and fauna of the area should be included. Trail maps should be included where appropriate.

Install small parking areas in suitable locations within the OEG. Parking areas already exist within the state and city parks located in the OEG. However, several additional sites would benefit from small parking areas. These are: Split Rock (Onondaga Blvd.), Three Falls Woods (Glencliffe Road), and the Gramlich Bird Sanctuary (High Bridge Rd.). Enhancements to the parking area within the Woodchuck Hill Preserve are also recommended. Conservation easements will be needed to construct these parking areas in the privately-owned locations.

Create a system of trail markers, directional signage, and kiosks throughout the OEG. Three types of signs are necessary to enable easy visitor access to the OEG natural areas and to educate visitors during their visit:

- Trail markers used on the main pedestrian travel routes through the OEG should be of the same color and design, so that visitors can easily travel from one natural area to another.
- Directional signs (a simple OEG logo plus an arrow) should be placed along the entire OEG route to direct visitors. These signs will be especially important on sections of the route where visitors travel along the road and then enter a natural area.
- Trailhead kiosks are recommended throughout the OEG to encourage positive behaviors by visitors, orient visitors to trails, and educate visitors about the unique ecosystems, communities, and geology of the OEG area. Kiosks are recommended at the following trailheads: Split Rock (Onondaga Blvd.), Elmwood Park (near stone mill), Onondaga Park (near the old Fire

Hall), at the intersection of Onondaga Creek and Route 173 (near the Zen Center), Ram's Gulch (trailhead), Woodchuck Hill Preserve (parking area), Three Falls Woods (Glenclyffe Road), Gramlich Bird Sanctuary (High Bridge Rd.), and Village of Fayetteville (adjacent to Route 5 along Limestone Creek). Conservation easements on privately-owned lands should be obtained prior to installing any markers.

Enhance connections between the OEG and other existing trail routes. Several existing trail systems exist or are proposed for the Syracuse area. Connecting the OEG to these routes would enhance access throughout the Syracuse area and would improve the health of local residents by providing improved opportunities for recreation. Trails and other routes to be considered for connecting with the OEG are:

1) Erie Canal Towpath. The proposed OENC route includes a portion of the towpath near the village of Fayetteville. An additional connection could be created from Ram's Gulch via Jamesville Road a short distance north to the Butternut Creek Golf Course where paths (powerline right-of-way and feeder canal towpath) currently exist and could be accessed just beyond the northern edge of the golf course parking area. This path runs north-east generally between Jamesville Road and Rt. 481 for approximately two miles, continuing beyond an intersection with E. Genessee Street (where it then runs between Butternut Drive and Rt. 481), and eventually terminates at Kinne Road, just west of the entrance to the Old Erie Canal State Historic Park. This approximate 2.5 mile off-road path intersects the Town of Dewitt's Richards Green Space, a 28-acre undeveloped parcel; this area has been referred to by the Onondaga Audubon Society as one of "Three Special Birding Areas in Dewitt" in their 2002 publication, *City Cemeteries to Boreal Bogs: Where to Go Birding in Central New York*. (Figure 2; personal communication with B. Solomon, 2008).

2) Creek Walk. The city of Syracuse plans to complete construction of Phase I of the Onondaga Creekwalk (between Armory Square and Onondaga Lake) by 2010. The City has also been evaluating a Phase II of this project which involves a study to determine the most feasible location of a creekwalk between Armory Square and Kirk Park in the City of Syracuse (SMTC, 2007). As stated in the Syracuse Metropolitan Transportation Council's Long-Range Transportation Plan, 2007 Update, "the completion of each of these trails will eventually provide bicycle and pedestrian connections in such a way that local towns and villages can perhaps begin development of trails that will connect to this larger system" (Figure 4).

3) Onondaga Lake Park trails. The OEG could be connected to trails in Onondaga Lake Park and the portion of the Erie Canal towpath found in Camillus via the proposed extensions of the Onondaga Creek Walk and another new trail along the west shore of Onondaga Lake (Figure 4).

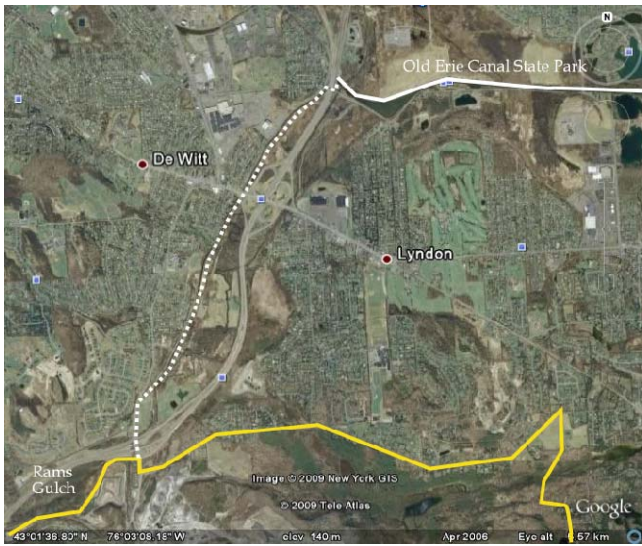


Figure 3. Possible trail connection (dotted white line) between the OEG (yellow line) and the Erie Canal towpath (white line; personal communication with B. Solomon, 2008).

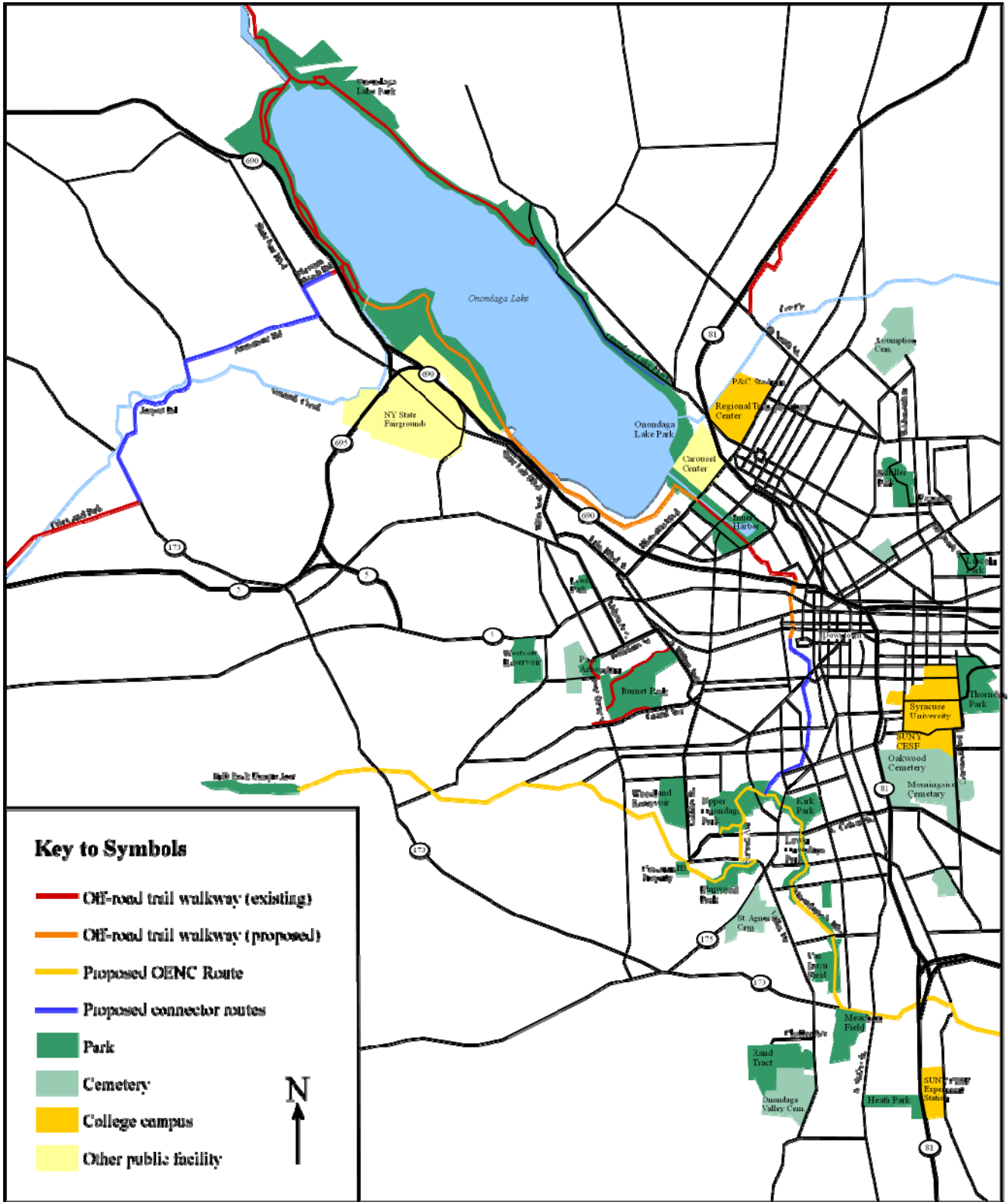


Figure 4. OEG connections with other trail systems in Syracuse.

SPLIT ROCK

I. Introduction

Split Rock, located in Onondaga County, New York, is a unique area steeped in history. The area is known for being the location of a munitions factory explosion in 1918 that killed 50 people (Chesbro & Chesbro, 2001); today, the area is primarily used for recreation. Activities (some of which are not permitted in the area) include mountain biking, all terrain vehicle (ATV) use, hiking, and dog walking; Split Rock is also often associated with adolescent delinquency. Figure 5 is an aerial photograph of the area.

Using the Recreation Opportunity Spectrum, this area could be classified as *rural*. Rural areas are characterized by a substantially modified natural environment. There are many opportunities to see other people, and the sights and sounds of human existence are evident (Clark & Stankey, 1979).

To access the Split Rock area, a potential visitor would have to drive, ride their bike, or take the bus and walk from the closest bus stop. There are two public access points. One is on the western boundary of the Split Rock area where Onondaga Boulevard comes to a dead end. There are “no parking” signs posted; however, it is evident that the area is commonly used for parking. The other access point is on the east side of the area off of Kasson Road. Here, a parking area is provided; however, accessing the parking area could potentially damage vehicles without high clearance. These parking areas, along with a series of trails, are the only facilities in the area. Transportation within the area is by mainly by trail.

Ownership of the area is divided among the State of New York Department of Environmental Conservation (NYSDEC), Onondaga County, commercial landowners, and residential land owners (Table 2). Current land designations are limited to one parcel of NYSDEC land, which is designated as the Split Rock Unique Area. This is the only portion of the area that utilizes direct management focused on controlling the invasive black swallow-wort (*Cynanchum louiseae*) and protecting the federally threatened American hart’s tongue fern (*Asplenium scolopendrium*). There is no promotion of the area and most use of the area is via word-of-mouth and some internet blogs.

Table 2: Split Rock Area Ownership Assessment, (TOTC, 2008).

Ownership	Number of Parcels	Approximate Acreage
NYSDEC	3	97
Onondaga County Division of Parks	1	24
Timberview Forestry Management	1	26.8
Onondaga Landfill Systems Inc.	4	166.5
Barrett Paving Materials Inc.	1	15
Private landowner (Canada Hill Wildlife Preserve)	3	73
Private landowner	2	75
Other residential	1	35

II. Benefits and threats to public safety or health

A. Benefits

Recreational. The Split Rock area contains a mixture of natural and man-made spaces for relaxation and recreation. It is one of the few places in Onondaga County that provides opportunities to participate in motorized and non-motorized types of recreation. For residents and visitors, it is a place to withdraw from pressures of work or daily living, exercise, and commune with nature.

B. Threats

Resource Extraction Site. Barrett Paving Materials Inc. has mining access near the eastern boundary of the Split Rock area. Materials are extracted and used for road building. This is a threat to public health and safety because mining activities have potential to harm the fragile habitats contained within the adjacent Unique Area and the operations themselves could cause personal injury. Additionally, extraction activities can cause noise, dust, and vibrations which effect the surrounding land.

Inactive Sanitary Landfill. Onondaga Landfill Systems Inc. owns a significant amount of land in the Split Rock area. Some of the land is vacant and open for public access and the rest of the property is fenced off and posted as private. The landfill is currently inactive. In 1993, the private company, Energy Tactics, had rights to use the area for a landfill gas recovery project, converting gases produced by the landfill into electricity (Lieb, 1993). Currently, Onondaga Energy Partners, L.P. owns the inactive sanitary landfill and is permitted to participate in active landfill gas recovery until 2016. Because of the potential pollutants in the area, it is a threat to public safety and health (DSHM, 2008).

Hazardous Structures. Because of the history associated with the Split Rock area, there are several structures that are still standing. A popular attraction in the area is the old rock crusher used by the Split Rock Quarry operation. This structure stands approximately 30 feet tall and is built into the side of a cliff. Visitors commonly climb the structure and are able to go inside small caves that have been carved out of the cliff on either side. Its height and the suddenness of its drop are threats to public safety. Additionally, there is the potential for portions of the structure to fall or collapse while visitors are inside.

Flooding. The floodplain within which the “Lost Lake” is located extends to beyond the public access area through a residential area to Kasson Road (SOC, 2008). Personal observations have indicated significant variations in water levels in this area. There is potential for flooding to extend beyond the “Lost Lake” area and pose a threat to neighboring residents.

III. Natural Setting

Threatened Species Habitat. The United States Fish and Wildlife Service has listed the American hart’s tongue fern (*Asplenium scolopendrium* var. *americana*) as a threatened species (USFWS, 2008). Threatened species are likely to become endangered in the future. The fern is found in close association with limestone outcroppings similar to those found along the Onondaga escarpment in the Split Rock area. It requires high humidity and deep shade. Due to its unique habitat requirements and its vulnerability to disturbance, its populations tend to be small and isolated, which increases the need to protect this species.

Wildlife Habitat. The Split Rock area provides essential habitat for several wildlife species. The area contains some forested land and some open land creating forest edges where white tailed deer (*Odocoileus virginianus*) thrive. The area also contains a floodplain that continuously has standing water known as “Lost Lake” (SOC, 2008). The floodplain is a sufficient resting or stopover site for migrating birds such as the mallard (*Anas platyrhynchos*). These habitats are not listed as critical habitats by the NYSDEC, but they are significant and should be kept in consideration.

IV. Social, Cultural, Historical, Archaeological, Recreational, or Educational Importance

A. Historic Importance

The Split Rock area is quite infamous in the annals of local history. There are two main periods of history in which local historians take interest. The Split Rock Quarry was in operation from 1881-1912. ‘The Rock’ was home to a quarry from which was limestone mined and sent to Solvay via an elaborate conveyor system. The extraction was used for the Solvay Process – its outputs were used to construct the Erie Canal and accompanying structures (Chesbro & Chesbro, 2001).

The site's inactivity did not last long – in 1915, munitions manufacturing began at the site of the former quarry operation. The facilities at Split Rock were used to support allied efforts throughout the First World War. On July 2, 1918, the munitions facility caught fire, causing an explosion that killed at least 50 men (Chesbro & Chesbro, 2001). There is a single marker commemorating the explosion that killed these men, located at the intersection of Onondaga Road and Boulevard near the eastern access point to the Split Rock area.

B. Archaeological Importance

The area has been touted as an important site in industrial archaeology, clearly linked to the historical context discussed above. The rock crusher structure found on site is an important remnant of the site's history. Other remnants of the area's historical uses are scattered throughout the site.

C. Recreational Importance

The history of public use indicates that this area has been used as a recreation area for some time. Personal observations reveal that visitors use the trails in this area for hiking, dog walking, as well as ATV use. Personal communication and online bulletins indicate that mountain bikers also use these trails relatively frequently (dirtworld.com, 2008).

Evidence and personal communication also indicate that local teenagers use sites throughout the Split Rock area as 'party spots.' There are many fire pits and evidence of parties, both in the mining area and in the Unique Area. This use of the area could present a management challenge in the future.

D. Educational Importance

This site could present educational opportunities to demonstrate how historical processes affect the landscape, and how education would be required to foster a culture of stewardship. The history of the site could also be useful for educating students in school districts within Onondaga County about local history.

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change that May Be Adversely Affected by Any Change

A. Ecological Sensitivity

The focus of this area's ecological sensitivities revolves around the federally-listed hart's tongue fern. According to the USFWS, the hart's tongue fern requires the "high humidity and deep shade provided by mature forest canopies or overhanging rock cliffs" (USFWS, 2008). Its particular habitat requirements make it rare naturally – thereby, also making the Hart's Tongue Fern "particularly vulnerable to disturbance" (USFWS, 2008). Activities known to threaten the species and its habitat include quarrying, logging, recreation, and residential development (USFWS, 2008).

Invasive species such as black swallow-wort also pose a threat to the hart's tongue fern colony in this area.

B. Geological Sensitivity

Geological sensitivity to change within Split Rock largely is connected to its place along the Onondaga Escarpment (the sensitivities with respect to geology will be similar to those found throughout the escarpment). The mining activity and the explosions at the munitions site (both of which are discussed above) may have exacerbated any pre-existing instability and uncertainty that characterizes karst topography. If any land use changes were to occur in this area, further studies would be needed to investigate possible synergistic instabilities and sensitivities.

C. Hydrological Sensitivity

Hydrology linked to karst topography throughout the escarpment has already been established as incredibly unpredictable and sensitive to change. An additional point of concern is the hydrology surrounding the so-called 'Lost Lake' area, as we have already noticed a significant variability in water levels between visits. The flood plain within which 'Lost Lake' is located, according to the floodplain information available from Onondaga County, continues through a built-out residential zone, and reaches to Kasson Road (SOC, 2008).

VI. Summary

The Split Rock area's uniqueness lies with its ecology (as it is a protected area for the federally listed hart's tongue fern), as well as its history. This area's confluence of issues presents a challenge with respect to its inclusion in the OEG, in terms of planning as well as management. Improvements are definitely needed – minimal parking facilities on the eastern entrance along Onondaga Boulevard would make access less intrusive to the neighbors (users currently park on the side of the road adjacent to neighboring property). Clear signage is essential, since users pass through a range of land ownership and jurisdictions during visits. Moreover, the site is littered with hazardous material – some of which is due to the history of the site, while some is just detritus. The remnants of the quarry and munitions operations should remain; however, if increased access is both facilitated and promoted, liability with respect to some of the dangers related to these structures would have to be considered, as would maintenance and repair of the structures.

Our recommendations regarding Split Rock's inclusion on the OEG is contingent upon appropriate management improvements. As we have discussed, the area known as Split Rock is an amalgamation of many parcels with a variety of land use designations. Certain parcels do allow public access legally; others are accessed illegally. In order to integrate Split Rock into the larger corridor, issues related to ownership and access would have to be clarified, marked clearly, and managed appropriately. Management authority and jurisdictional responsibilities will likely

prove challenging to resolve. For example, under whose management and liability would the lands fall?

That being said, we recommend that Split Rock be included in the OEG. The site provides an important demonstration of the influence of historical processes on the escarpment landscape. This site could serve an important function in the corridor – that of an educational tool demonstrating the historical processes that have damaged much of the escarpment. By extension, stewardship and protection of the places along the escarpment that remain relatively ‘natural’ will seem that much more important and meaningful.

Inclusion of Split Rock would be contingent upon management improvements, as the DEC discourages use of the Unique Area to protect the hart’s tongue fern habitat. Therefore we recommend that the Unique Area, and an appropriate buffer zone, be designated as a Critical Environmental Area, to add yet another layer of procedural protection. Moreover, the recreational uses should aggressively be funneled away from the Unique Area – perhaps through trail re-routing, signage, and other such management tools. These tools would be contingent upon agreement between the Split Rock landowners, and therefore cannot be determined at this time.

Ultimately, despite the challenges presented above, we believe Split Rock to be an important component of the OEG, both in its capacity as a teaching tool, and as a protected area.



Figure 5. Split Rock area (Source: Google Earth).

SPLIT ROCK RECOMMENDATIONS

Have buffer lands adjacent to the Split Rock Unique Area added to New York State's Open Space Conservation Plan "Priority" list. Priority listing lands adjacent to the Split Rock Unique Area will give New York State the opportunity to purchase these lands in the future. Purchase of these lands will provide a buffer zone around the area where the American hart's tongue fern is known to grow, enable the state to manage visitor activities within these buffer areas, and offer further protection for the threatened species.

Work to get Split Rock placed on the NYS Register of Historic Places. Split Rock's historical relevance to Central New York should be highlighted. Petitioning to get the former mining facility and the remnant structures scattered throughout the area on the New York State Register of Historic Places would be an effective means of preserving history, and providing management guidelines for the historical resources.

Designate a Critical Environmental Area at Split Rock. This designation would provide both the public and private lands within the Split Rock area with additional layer protection. While this designation does not prevent future development of the properties within Split Rock, it does enable local townships to carefully consider the potential environmental impacts associated with large-scale developments or site changes. In conjunction with the existing Unique Area designation and the proposed Historic Register designation, the CEA would provide important environmental impact considerations for the private lands bordering and buffering the Unique Area. Consideration for a CEA would need to be approved by both the Town of Onondaga and the Town of Camillus.

Develop a map of the Split Rock area. Complete an inventory of the trails and standing historic structures in the area and develop a map. Visitors to the Split Rock area can use this map to follow the pre-established trails and to locate historic structures. The map can be designed to keep visitors away from areas where the American hart's tongue fern is known to grow.

Improve parking facilities. Establish a designated parking area near the eastern public access site on Onondaga Boulevard and improve the designated parking area near the western public access site. Well-designed parking facilities will accommodate handicapped use and provide visitors with safe and easy access to the Split Rock area. These facilities will reduce confusion regarding the Split Rock area public access, and prevent visitors from parking on the property of adjacent landowners.

Facilitate landowner/stakeholder meetings. Land ownership within the wider area known as Split Rock is complex, and the usages (legal or otherwise) are varied. Facilitating a landowner meeting (utilizing public participation experts at SUNY ESF) is an invaluable first step in developing long and short term goals for the area. A subsequent stakeholder meeting could include representatives from user groups, and should occur in the planning process for Split Rock's integration into the OEG.

Develop interpretive displays. Raising awareness about the historical and ecological features of the site is of vital importance to facilitate improved practices within Split Rock. By highlighting important features and guiding behaviors, interpretative displays would further management goals and foster stewardship, helping the DEC preserve and protect the Hart's Tongue Fern, as well as the area's historical resources.

ELMWOOD PARK

I. Introduction

Elmwood Park contains 65 acres of woodlands and landscaped areas, and is enjoyed daily by many Syracuse residents. It is owned by the City of Syracuse and currently designated as property classification # 963 Municipal Park. The basic setting (ROS) of the area is best described as rural. Elmwood is used by many people for picnicking, walking, baseball, and playing on the playground. There are many recreational facilities in the park including a little league baseball diamond, a covered pavilion, park benches, picnic tables, and a playground consisting of swings, slides, seesaws, and climbing bars.

There are many ways people enter the park. The most common is walking, however people can also bike or drive to and within much of the park. The park is managed by the City of Syracuse Department of Parks, Recreation, and Youth Programs (CSDPRYP), and is listed on the Historic Register as a historic landscape. The park is included in the proposed Onondaga Botanical Garden & Arboretum Master Plan. Currently the park is not promoted, other than on the CSDPRYP website (personal communication with Glen Lewis, 2008).

II. Benefits and Threats to Public Safety or Health

A. Benefits

Recreational. Elmwood Park is a very important natural setting for the local residents in the area. The park gets daily use for picnicking during the warmer months. There is also a set of hiking trails which allowing the residents to experience nature, as well as a route for students to travel home from school. The baseball diamond gets steady use during the summer months. A centrally-located playground attracts youngsters to the park.

Educational. SUNY ESF has used the area as a place to study biodiversity. A Bioblitz was conducted in the park in 2003; 661 different species of plants and wildlife were identified in the park. The Stewards of Syracuse often visit the Park and help to keep the area clean while introducing young people to the natural world. SUNY ESF's S.C.I.E.N.C.E. Corps uses the park as part of a weeklong exploration of Syracuse's urban ecosystem.

Natural. There are many natural benefits that Elmwood Park offers. These include improved air quality, clean water, and reduced topsoil erosion. Air quality is improved because the trees and plants in the area produce oxygen and filter pollutants from the air. Furnace Brook, which runs through the park, is known locally for its water quality and trout population. Topsoil erosion is reduced because trees and plants help hold it to hold the soil in place, especially on the steep slopes

located within the park. Limestone outcrops, remnants of the Onondaga Escarpment, can be seen along the rim trail in the park.

Historical. The historic landscape within the park is unique to Syracuse. Limestone bridges, staircases, and retaining walls, built in the 1930s by the Works Progress Administration, are found throughout the park.

B. Threats

Vandalism. There is a high rate of vandalism and littering within the park, and residents sometimes feel threatened while spending time in the park. The lights in the park have not worked for two years, which adds to the problem (Rutledge, 2008).

Flood Plain. The Area's soil is roughly 17% Fluvaquents soils which are "frequently flooded" soils (USDA, 2007). This makes the area susceptible to flooding.

Stone Maintenance. Many of the stone staircases and retaining walls within the park require repair in order to keep them safe for park visitors.

III. Natural Setting

Elmwood Park contains a great diversity of flora and fauna. The most comprehensive list was put together by SUNY ESF during their Bioblitz; 661 different species were identified in the park (see Figure 6). Trees, shrubs, and other plant life composed the greatest number of species with 237 found. Insects were the next best represented group, with 132 species; 86 different soil invertebrates were found in the area. Wild Turkey was one of the 50 bird species found in Elmwood. The Bioblitz found 48 mosses, lichens and ferns, and 45 species of fungi. Thirty-seven species of aquatic invertebrates were found. Humans were one of the 13 species of mammals. Six fish species were found, including brook and brown trout. Five different species of amphibians and two reptiles comprised the remainder of the groups represented.

IV. Agricultural, Social, Cultural, Historic, Archaeological, Recreational or Educational Importance

A. Agricultural Importance

The land comprising Elmwood Park was used for farmland until 1889 when the property was transformed into a first class pleasure resort. Agricultural land use is no longer in practice; however, there is potential for a community garden.

B. Social Importance

Community Connectedness. Elmwood Park provides opportunities for people to interact with and learn from members of their local community either while congregating at the park to enjoy leisurely activities or by getting involved in a volunteer group. The Elmwood Park Neighbors Association (EPNA) is a good example of a community group that fosters social networks so that individuals feel like members of the community.

Social Consciousness. Residents feel greater responsibility for protection of the park through a feeling of ownership and awareness of the broader importance of the park to themselves and the community as a whole. By taking care of this local natural asset, residents can take pride in maintaining and improving the environment of their community.

C. Historical Importance

Mickles Furnace. Nicholas Mickles built a foundry in 1800 and used Furnace Brook to produce cast kettles for boiling brine for use in the salt industry and to cast thousands of cannon balls for the U.S. Government during the War of 1812. The Onondaga Historical Association Museum and Research Center and the William G. Pomeroy Foundation commemorated the site with a historical marker.

Stone Mill. According to local legend, this mill was constructed in 1848 for use as a distillery (CNE). Since then, it has been used as a plaster mill, a stable, a private house and, since 1943, as a clubhouse for the Elmwood Fish and Game Club. The Syracuse Department of Parks, Recreation and Youth Programs acquired the mill in 2000 with the mission to convert it into a nature interpretive center.

National Register of Historic Places. Elmwood is listed as # 05000439, designated by the National Park Service as of May 19, 2005 as part of Historic Designed Landscapes of Syracuse.

TERA Stonework. New York State responded to the Stock Market Crash of 1929 by setting up the Temporary Emergency Relief Administration (TERA) in 1931. Approximately \$48,000 worth of projects were funded between 1931 – 1935, including the stone bridges and stone staircases still in existence in Elmwood Park (CNE).

D. Archeological Importance

Due to the prior existence of the foundry and the variety of uses for the stone mill, there is potential archeological interest in this area.

E. Recreational Importance

Elmwood Park offers a number of seasonal recreational activities that give local residents the chance to exercise, unwind, and spend time with nature. These activities include baseball, hiking, biking, fishing, birdwatching and picnicking. The park could also be used for winter activities such as snowshoeing and cross-country skiing.

F. Educational Importance

Hands-On Learning. The Center for Nature Education (CNE) uses the park to promote environmental awareness, understanding, and stewardship through their Elementary School Program. The SUNY College of Environmental Science and Forestry S.C.I.E.N.C.E. (Summer Camps Investigating Ecology in Neighborhood and City Environments) Corps uses the park in their six-week program to help cultivate and sustain middle school students' interest in science by emphasizing urban ecology and urban ecosystems.

Scientific Research. Elmwood Park offers a unique opportunity to investigate a vast diversity of plants, arthropods, insects, birds, mosses and fungi due its mix of natural forest and human structured park. Faculty from SUNY ESF's Environmental and Forest Biology department cataloged 661 different species during a 24-hour Bioblitz in May of 2003 (Figure 6). Furnace Brook is another resource that is utilized for research by Project Watershed, a volunteer organization that monitors water quality of the brook.

V. Ecological, Geological and Hydrological Sensitivity to Change That May Be Adversely Affected by Change

A. Ecological Sensitivity

State Protected Plants. Many plants located in the park are state-protected: hawthorn, white baneberry, flowering dogwood, running strawberry bush, butternut, bloodroot, purple trillium, maidenhair spleenwort, lady fern, bulblet fern, common fragile fern, spinulose woodfern, common wood fern, ostrich fern, and interrupted fern. Their habitats, along with the other species located in the park, are sensitive to changes in soil, exposure, nutrients, and human activities.

Aquatic Habitat. The Trout and freshwater shrimp make their home in Furnace Brook as it has a low sustained flow all year and cool water temperature from being spring fed from the carbonate bedrock aquifer (Kappel, 2008). These organisms are sensitive to change in base flow, water temperature and turbidity that could be caused by a change in land use, an increase in storm runoff or impacts to the aquifer itself.

Wildlife Habitat. Birds, amphibians, and mammals are sensitive to human activities and physical changes to the landscape.

B. Geological Sensitivity

Erosion Susceptibility. The slopes in the park range from 2% to 40%. Combined with the coarse, shallow soil of the valley, the steep slopes makes soil erosion a problem in the park (CNE). This erosion issue is noticeable during storm flows and impairs the water quality of Furnace Brook (Kappel, 2008). Any changes in vegetation cover would increase the threat of sliding.

C. Hydrological Sensitivity

Unconfined Aquifer. The aquifer includes the carbonate bedrock on the surrounding hillsides as well as the bedrock floor below (Kappel, 2008). As this is an unconfined aquifer, it is very susceptible to changes in land use and surface cover that affect the permeability of the soil.

Recharge and Discharge Area. This glacial meltwater valley is a water recharge and discharge area, but the watershed itself is not fully understood. The sensitivity of this watershed is unknown, but should be regarded as high due to the irreversible impacts that changes in land use could have on the valley's ability to function as a recharge and discharge area.

VI. Summary

Elmwood Park is a unique area of land that features an incredible diversity of birds, trees, plants, wildlife, mosses, fungi, insects, arthropods, and flowers. While being a prime example of nature's beauty and 1930s stonework, it is also rich in human history and provides numerous learning possibilities. Management of Elmwood Park is minimal due to budgetary limitations of the City of Syracuse Department of Parks, Recreation and Youth Programs; the Elmwood Park Association does take on some of the tree and ground maintenance (Rutledge, 2008). Better management of stream bank erosion and invasive plant species is needed in the park. In addition, some improvements are recommended: working lights and security measures to increase residents' feeling of safety and to deter vandalism; repairs to stonework; the addition of restrooms and more park benches; clean-up of glass on staircases and trails; and trail markers to channel visitor travel within the park and reduce human impacts on vegetation.

This area should not be designated as a Critical Environmental Area as its rugged landform, forested slopes and natural water features are protected by its park designation. The park is a great candidate for the Onondaga Escarpment Greenway as this glacial melt-water valley links the Corcoran wetland to Onondaga Park;

however, there is no greenspace or creek that connects the two parks. Furnace Brook flows underground downstream from the dam, eventually flowing beneath Onondaga Ave. to a point of connection with Onondaga Creek near Kirk Park (CNE). The only connection is via busy city streets and sidewalks.

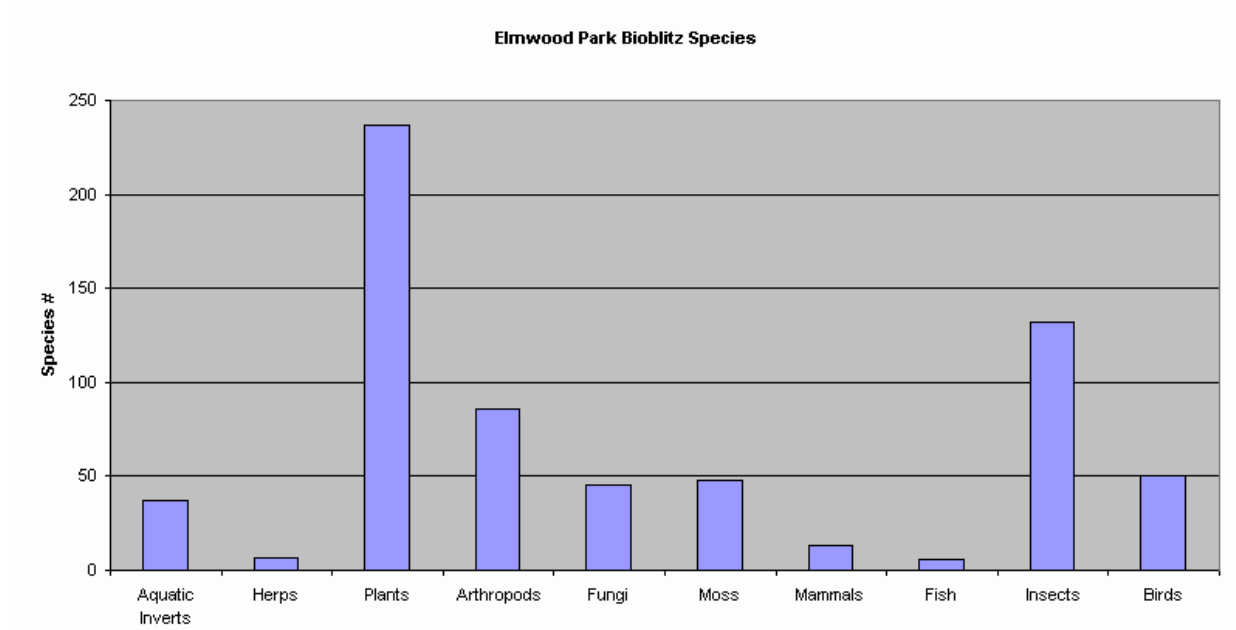


Figure 6. Bioblitz categories (source: www.esf.edu/efb/bioblitz/bioblitzres03.htm).

RECOMMENDATIONS FOR ELMWOOD PARK

Improve Security. Local residents and visitors currently have safety concerns related to the park as there is gang activity in the area and vandalism in the park. The park needs security patrols and lighting to decrease the possibility of illegal activity, making the park more attractive to visitors. Feelings of security might also increase if more people visit the park and if the historic mill interpretive center is opened.

Improve/Install Facilities. A restroom facility as well as a drinking fountain should be installed as neither of these are present in the park. The facilities could be installed in the proposed “Stone Mill Nature Interpretative Center,” making the park a more comfortable place to visit. Families will feel more connected to the park as they will be able to spend a longer amount of time there without having to go home to use the restroom.

Protect Biodiversity. Protecting diversity should center around two measures: invasive species control and erosion control. Invasive species control should focus on controlling the spread of invasive species in and around the park, thereby providing a healthier environment for the native species. Erosion control should

focus on using native plants to stabilize the stream bank and the steep slopes in the park. Protecting biodiversity will not only help preserve the park, but will also continue to conserve the diversity of the Onondaga Escarpment Greenway.

Nature Interpretative Center. The historic stone mill building is currently vacant, but conveniently located at the entrance of the park. The City of Syracuse purchased the building with the intention of turning it into a nature interpretive center. This would be a wonderful addition to the park in that it would provide visitors, educators and students with information on the park's diverse species. The fact that the Stone Mill itself has historical significance adds to the interpretive experience. This center could also house a map of the facilities, trails and historical areas located in the park. The nature center could also display information on the Onondaga Escarpment Greenway as it is located in an area that is heavily populated and could introduce these residents to other areas of the corridor of which they were not aware.

Designate and Mark Trails. The park does not currently have designated trails. The trail that follows the creek is easy to follow; however, the trails that go up into the forested section of the park are not marked, and form a web of trails that can be confusing to visitors and that impact the vegetation. Portions of these trails could be closed and rehabilitated, while a designated hiking trails is established to channel visitor use through a smaller section of the forested. This delineation would decrease visitors impacts on sensitive vegetation, and reduce soil compaction and erosion, and make it easier for visitors to navigate around the park. Providing interpretive information through a park guidebook would add interest to the trails. The lower trail that follows the river is paved and could be designated as a biking and hiking trail, although it is relatively short distance for biking.

Implement Marketing Program. While researching this project, we found that even though Elmwood is one of Syracuse's most diverse parks, there is a lack of information on the park and what it has to offer. We found that only a few Elementary schools regularly use the park for educational purposes, and only a few web sites list Elmwood park as one of Syracuse's natural resources. The Department of Parks, Recreation and Youth Programs could consider developing a marketing program that focuses on attracting elementary, middle and high school groups. The marketing program could also focus on bird watchers, hikers, and nature enthusiasts not only from the local area, but from the surrounding counties as well.

UPPER AND LOWER ONONDAGA PARK, KIRK PARK, AND VAN DUYN FIELD

I. Introduction

Upper and Lower Onondaga Park (henceforth referred to as Onondaga Park), Kirk Park, and Van Duyn Field are managed by the City of Syracuse Department of Parks, Recreation, and Youth Programs. The basic ROS setting for all four areas is rural/urban. Upper and Lower Onondaga Park and Kirk Park are designated as 'community parks,' which are used by the residents from neighborhoods they are located in as well as outside residents. To be considered a community park, the park must contain a facilities complex and a significant greenspace (www.syracuse.ny.us/parks/parks.html). These are present in Onondaga Park and Kirk Park but are lacking in Van Duyn Field. For this reason, Van Duyn Field is designated as 'playlots, fields, or courts,' and recreational use is determined by permits issued by the Department of Parks, Recreation, and Youth Programs. Upper and Lower Onondaga Parks are also designated as an official Syracuse Historic Preservation District due to their historical and cultural significance for the City of Syracuse.

Upper Onondaga Park encompasses 67 acres and Lower Onondaga Park encompasses approximately 15 acres. Kirk Park is comprised of 33 acres and Van Duyn Field encompasses approximately 18 acres. The environmental and historical integrity of Onondaga Park is also maintained by various neighborhood and historical groups, such as the Onondaga Park Association, Greater Strathmore Neighborhood Association, and the Onondaga Historical Society.

Transportation to and from Onondaga Park, Kirk Park, and Van Duyn Field and connections to outlying areas is made possible through Centro, the local public bus company. Centro bus routes connect the Strathmore neighborhood to other areas within the City of Syracuse and surrounding suburbs through the Salina Street Hub (www.centro.org). Paved streets meander through Onondaga and Kirk Parks, providing easy access for pedestrians, motorized vehicles, and bicycles. Lower Onondaga Park and Kirk Park are connected by Onondaga Park Drive, which turns into Onondaga Creek Boulevard. This boulevard runs along Onondaga Creek towards Van Duyn Field. Access to Van Duyn Field is a simple jog southwest from Onondaga Creek Boulevard.

Onondaga Park and Kirk Park are currently used for a variety of activities, including free and public swimming with locker room/bathroom facilities; athletic courts including tennis, basketball, football, rollerblading, and baseball; walking trails which may be paved or dirt based; paved roadways for easy motor vehicle access;

and marked lanes for walking and/or bicycling. Kirk Park provides local children and teens with summer and after-school programming through the Seals Community Center. Parking is limited in Onondaga Park to on-street parking in specific areas delineated by municipally maintained street signs. Kirk Park has parking available at the Seals Community Center and along the rear side of the football field to accommodate visitors to athletic games. Parking is ample at Van Duyn Field, but only when school is not in session at adjacent Van Duyn Elementary School. During school hours, parking is very limited at Van Duyn Field. Onondaga Park and Kirk Park currently provide open greenspace for residents within the City of Syracuse, which includes areas for picnicking, trail walking (easy to moderate level of activity), or other activities that require grass and open space.

Management of all four parks rests with the City of Syracuse Department of Parks, Recreation, and Youth Programs. This department oversees permitting for recreational usage and also has divisions that oversee grounds keeping including greenhouse management, forestry, signage within the parks, and planning and development (www.syracuse.ny.us/parks/aboutUs.html). Indirect methods of management also include neighborhood watch programs through the neighborhood associations mentioned previously.

There is limited promotion of the parks themselves, although there is promotion of events located in and around the parks, leading to greater exposure for the parks themselves. For example, the City of Syracuse's website has a link for visitors to the site can see 'What's Happening at Parks and Recreation,' but there is no direct public promotion of the parks alone (www.syracuse.ny.us).

II. Benefits and Threats to Human Health and Safety

A. Benefits

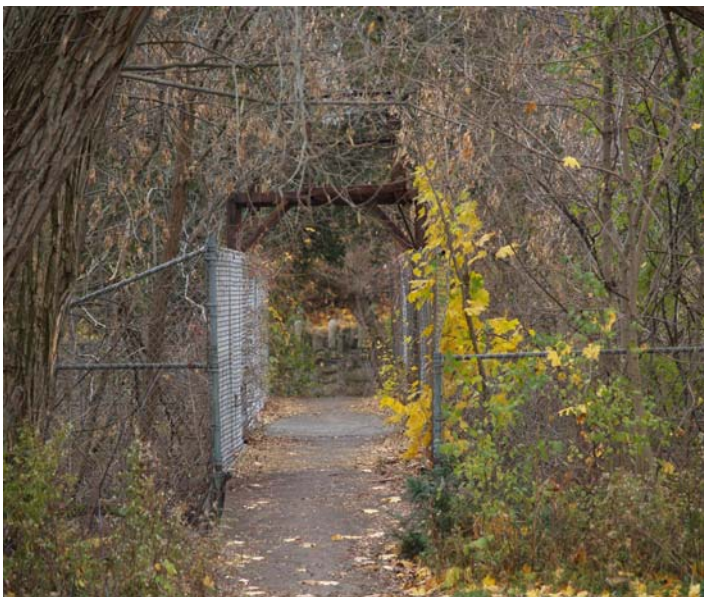
Recreational. Upper and Lower Onondaga Park, Kirk Park, and Van Duyn Field provide a clear benefit to recreational health in Syracuse. Each park contains ample open space and footpaths, sidewalks, and paved roadways to facilitate walking, biking, and/or rollerblading. There is a paved road connection between Upper Onondaga Park, Lower Onondaga Park, and Kirk Park via Onondaga Parkway and/or Kirk Parkway along Onondaga Creek. This connection allows pedestrians, bicyclists, and motor traffic to access the three parks easily. The connection between Kirk Park and Van Duyn Field meanders through neighborhoods via paved streets and sidewalks. Upper and Lower Onondaga Parks and Kirk Park provide access to free public swimming facilities during the summer season. All four areas contain public access to athletic fields, including basketball, tennis, track, football, and baseball. Access to public recreational areas provides a clear benefit to public health.

Open Spaces. The City of Syracuse maintains Upper and Lower Onondaga Park and Kirk Park and provides seasonal enhancement through plants and trees. These areas contribute to the acreage of open space within the City of Syracuse and provide local residents and visitors with open areas to enjoy nature and wildlife such as squirrels, birds, and chipmunks.

B. Threats

Human Safety. Upper Onondaga, Lower Onondaga and Kirk Park are often populated with large groups of unsupervised youth. Kirk Park borders neighborhoods with a known gang population and related activities. This activity could pose a significant threat to human safety, especially of single visitors. In addition, unsanctioned cage fighting has been reported in the area, which could lead to confrontation between park visitors.

Human Health. These parks have accumulated large amounts of trash and suffer from vandalism. Visitors are subjected to trash in and around public areas which could pose a threat to human health. Weeds, grass, and bushes have been allowed to grow unchecked in many areas of the lower parks, which allow for the further accumulation of trash. Overgrown plant materials also make navigation through narrow trails or across bridges difficult or unsafe. Trash, including toxic chemicals such as paint and bleach, has been discarded onto roadsides and over the fence into Onondaga Creek. This poses a threat to human health but could also adversely affect the water table by seeping into the ground, and affect sewage overflow areas by causing blockages.



Crossing Onondaga Creek in Kirk Park



Crossing Onondaga Creek at Van Duyn Field



Trash lining Onondaga Creek Blvd. and at the Onondaga Creek crossover at Van Duyn Field

III. Natural Setting

The setting for this area is an urban natural setting. The majority of parks within this area are covered in grass. Other surfaces are paved or a body of water. There are many trees throughout both the upper and lower Onondaga parks that provide habitat for a variety of wildlife including birds and squirrels. Also during the spring and summer months, flowers are planted throughout the park to increase aesthetics. The greenhouse on site is responsible for planting (throughout Syracuse) approximately 50,000 summer annuals; 15,000 spring bulbs; 300 perennials; and 25 foliage plants that are purchased yearly to be used for various events (www.syracuse.ny.us/parks/greenhouse.html).

IV. Social, Recreational, Cultural, Historical, and Educational Importance

A. Social and Recreational

Upper Onondaga Park, Kirk Park, and Van Duyn Field are locations in which gatherings of local and non-local residents take place on a regular basis. Upper Onondaga Park is the site of fishing derbies, organized runs, wedding ceremonies, and other various social gatherings that strengthen the ties between visitors and the location. Upper Onondaga Park is promoted and preserved in part by the Greater Strathmore Neighborhood Association and Onondaga Park Association, local groups dedicated to the preservation of the areas' history and greenspaces. Kirk Park is the location of the Seals Community Center, which provides after-school and summer recreational opportunities for local school children. The center provides seasonal access to a swimming pool and facilities. Van Duyn Field supports Little League and adult leagues through permitted use, and is used for recreation by the Van Duyn Elementary School, which is adjacent to the Field. All of the parks

described provide access to playgrounds and athletic fields, providing the



opportunity for social interaction through recreation on a daily basis.

Playground at Upper Onondaga Park

Playground at Lower Onondaga Park

B. Cultural and Historical

In addition to being an essential link to urban nature, Upper and Lower Onondaga Park and Kirk Park are important cultural and historical locations within the City of Syracuse. Onondaga Park was originally an agricultural plot, but with the advent of the electric street car in the 1800s, people spread from urban centers into more suburban locales, including the areas surrounding Onondaga and Kirk Parks. In 1894, Woodland Reservoir opened and replaced the need for Wilkinson Reservoir, now the site of Hiawatha Lake. As a result, the land surrounding Wilkinson Reservoir was donated to the City of Syracuse, creating Onondaga Park. As the neighborhood surrounding Onondaga Park grew, famous local architects such as Ward Wellington Ward and Merton Granger designed Arts and Crafts style houses for wealthy residents (www.syracusesthenandnow.org/Nghbrhds/Strathmore/Strathmore.htm). As a result of the historical and cultural significance of Onondaga Park with relation to the surrounding neighborhoods, the Syracuse City Council declared the area an “official Syracuse Historic Preservation District,” further granting protection to the cultural and historical nature of the area. The parks also contain important historic stone landscapes and features (e.g., staircases, fountains, and ponds) that were created in the 1930s by the Works Progress Administration.

Kirk Park also has historical and cultural significance to the City of Syracuse. In the late 1890s, Kirk Park was the center of horse and bicycle racing in the city. It was the

site of fairs and circuses, and provided a much needed recreational center for local residents while Syracuse's urban center was in development. It was officially made into a park in 1910, and has remained the focus of neighborhood recreation ever since.

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change that May Be Adversely Affected by Change

A. Ecological Sensitivity

These areas are community parks and fields that have already endured a significant amount of change. Over one hundred years ago, these areas were cleared for their current uses (although some uses have been slightly altered over time). Hiawatha Lake does support aquatic life. The fish population here can be significantly affected by what people do. This lake is isolated so it is at a higher risk for eutrophication and other anthropogenic risks. One potential problem would also be over fishing. If the fish population is reduced, it will not be able to replenish itself naturally and stocking would be needed. Onondaga Creek is also currently greatly impacted by stormwater overflow. The City of Syracuse is currently working to correct this problem.

VI. Summary

Kirk Park, Van Duyn field, and Upper and Lower Onondaga Parks are important to the neighborhoods that surround them as well as to Syracuse as a whole. These parks have a variety of athletic fields, swimming pools, pedestrian walkways, playground equipment, and community centers, and provide recreational opportunities that are important to both children and adults. The area is also historically important as it has been used recreationally for over a century. Onondaga Park's historic landscape, designed by George Kessler, and structural architecture has led to the area's designation as an historic preservation district.

Due to the protected nature of these parks as municipally recognized 'City of Syracuse' parks and Onondaga Park's designation as a historic preservation district, it is unnecessary to designate these areas as Critical Environmental Areas. These parks are different than many of the other sites in the proposed OEG, due to the largely developed landscapes within Onondaga Park, Kirk Park, and Van Duyn Field. As City of Syracuse parks, existing management is adequate and acceptable as is. However, further enhancements to historic stonework as well as the creation of gardens will be needed as plans for the Onondaga Park Arboretum and Botanical Garden are implemented. The main importance of these sites as a component of the OEG is their potential use as a connector with other sites within the corridor via Onondaga Creek. Enhancements and extensions of existing walkways and paths will be needed to create this connection.

RECOMMENDATIONS FOR PARKS ALONG ONONDAGA CREEK

Delinate a clear connective corridor along Onondaga Creek. A continuous pathway that stretches from the Summit Street entrance of Upper Onondaga Park to Route 173 in the Valley section of Syracuse is needed. A pathway should be added in Upper and Lower Onondaga Park to keep pedestrians off the road. Existing sections of road along Onondaga Creek Blvd. should be turned into pedestrian/bike only routes. A new pathway that runs parallel to Onondaga Creek will be needed where this section of road ends. Metal fencing along Onondaga Creek should be replaced with fencing that enables views of the creek, but maintains the safety of those using the path.

Create an Onondaga Creek Neighborhood Association. An association created by a group of neighbors and business owners who wish to make their neighborhood safer and cleaner can result in less crime, cleaner greenspace, and a caring community supportive of OEG interests. The association should consist of residents who are closest to the sites and who have a vested interest in maintaining the historic and aesthetic integrity of their parks and neighborhoods.

Create a local park and OEG awareness campaign targeted at local college students. An awareness campaign would allow for students to learn about nearby recreational opportunities, and would provide information about bus routes, recreational facilities, and park events.

Create community service opportunities in the parks. By demonstrating a need for service, local groups and organizations could volunteer their time to make improvements in the parks. This effort could be coordinated with other local service efforts such as SUNY ESF's College Day of Service program.

Conduct clean-up of Hiawatha Lake. Debris found in Hiawatha Lake should be removed to improve water quality and recreational experiences within Upper Onondaga Park.

Showcase OEG flora in the Onondaga Arboretum and Botanical Garden. The proposed Onondaga Botanical Garden and Arboretum could be an important mechanism for showcasing the unique flora of the Onondaga Escarpment. A native garden of limestone flora would enhance connections between the proposed OBGA and the OEG.

CLARK RESERVATION STATE PARK

I. Introduction

Clark Reservation is a state-owned park in Jamesville, New York, about one mile west of the village on Route 173. The property was donated to the New York State Board of Regents in 1915 by Mary Clark Thompson, in memory of her father, the former governor of New York State. At the time of donation, only 108 acres were included. Clark Reservation officially became a state park in 1926 and is now 365 acres in size.

Today Clark Reservation State Park contains vast recreational and educational opportunities for children and adults; buildings within the park are handicap accessible. There are many recreational opportunities including the hiking trails throughout the park, scenic overlooks, a volleyball court, baseball field, playground, picnic/pavilion area and fishing. On the educational spectrum, the Council of Park Friends runs a fully functional nature center. Clark Reservation is accessible only by car or bike. At this time there is no public transportation; the nearest Centro route stops at Nob Hill Apartments, 2.1 miles to the west.

There are multiple facilities in the park including a two picnic shelters, public restrooms, a nature center, maintenance structures and NYS Parks Central Region headquarters building. There is an extensive parking lot, which can accommodate many vehicles including buses and large vans. On the ROS, a portion of Clark Reservation would be classified as rural, while the wooded areas of the park are classified as roaded natural.

II. Benefits or Threats to Public Safety or Health

A. Benefits

Natural. Clark Reservation contains a 10-acre lake named Glacier Lake that provides habitat for many terrestrial and aquatic species in the area. The current 308 acres of forested lands contain many diverse ecosystems, creating habitats for numerous different species of plants, animals and insects.

Recreational. The vast trail system in the park allows for great recreational experiences such as hiking and nature study, benefiting the overall health of visitors. In addition, Glacier Lake provides opportunities for fishing.

Geological. Clark Reservation is a geologic masterpiece of sedimentary rock carved out by the glaciers during the end of the ice age. This has caused large cliff faces of up to 180 feet high. Trails hug the rim of these cliffs, creating a safety concern for park managers. The large masses of sedimentary rock can also be found as walkways for trails, which have been worn down to the rock. When wet, the rock

can cause slippery conditions for visitors. Sedimentary rock is also famous for its large cracks and splits caused by weathering over many years. These cracks can easily cause users to harm themselves while hiking.

III. Natural Setting

Clark Reservation has been studied for hundreds of year for its natural, geologic, and botanical wonders. Some of the current habitats found throughout the park are white cedar forests, shrubs and open forests, mature hardwood stands and wetlands adjacent to the lake. There are many rare and endangered plants species found in the park such as the hart's tongue fern. The karst topography, limestone cliffs, and plunge basin contained within the park are outstanding examples of features of the Onondaga Escarpment.

Glacier Lake itself is a very unique ecosystem. When the glaciers were receding during the ice age, melt water flowing over the limestone cliffs turned into a massive waterfall. The plunge pool created from this waterfall is a meromictic lake (the top layer of water does not mix with its bottom layer). Glacier Lake is about 60 feet deep and covers 10 acres within the park boundaries. It is currently a healthy ecosystem with many fish species including the sunfish, bullhead, and pickerel.

IV. Cultural, Historical, Recreational and Educational Importance

A. Cultural Importance

Through its history, Glacier Lake has been the beneficiary of numerous name changes. The original given name for the lake is "Kai-yah-koo," meaning satisfied with tobacco. An Iroquois myth provides the context for this name. While elements of the myth seem unlikely, the tale mentions an Indian path from the Oneida to Onondaga that "passed along the brim of this lake," (unknown, 1885) providing a historical context for Clark Reservation.

B. Recreational Importance

Clark Reservation State Park provides visitors with an abundance of recreation possibilities. The park marks and maintains eight trails that take full advantage of the park's 365 acres, exposing users to a number of different ecosystems and innumerable opportunities for nature observation and photography. While mountain biking is not allowed in the park, the trail network is suitable for walking or trail running in warm-weather months, and snowshoeing and cross-country skiing during winter. Fishing in Glacier Lake is permitted and remains an under-utilized recreation activity at Clark Reservation. Species found in the lake include pickerel, bullhead, and sunfish.

C. Educational Importance

Interpretation is an important addition to Clark Reservation State Park and provides visitors with easily understandable information about the natural world. Signage is prominent in the picnic and playground area, informing visitors of the geological history of the region, common species in the park, and other topics.

The Nature Center, operated by the Council of Park Friends (a local not-for-profit group), features exhibits related to the natural history of Clark Reservation. Information is provided on the flora, fauna and geology of the park. Over the summer, naturalists lead interpretive nature walks from the Nature Center.

For independent learners, the Mildred Faust Trail is the setting for a self-guided nature trail. A brochure is available to visitors providing descriptions of natural phenomena at various points along the trail. The nature trail is named after Syracuse University botany professor and Council of Park Friends trustee Mildred Faust, who died in 1988.

V. Inherent Ecological, Geological or Hydrological Sensitivity to Change that Could Be Adversely Affected by Change

A. Ecological.

Plant Communities. Clark Reservation State Park is home to the Federally-listed hart's tongue fern and other fragile plant species. Recreation presents a potential threat for their viability. While traffic on the existing trail network in Clark Reservation does not impact these species, visitors straying from the trail can easily damage the plant communities.

Invasive Species. Recent, but very serious threats to native plant communities in Clark Reservation are invasive species. Along the Mildred Faust trail is a patch of - *Vinca minor* that is probably an escapee from a local residence. However, a much more significant threat is black swallow-wort (*Vincetoxicum nigrum*). The black swallow-wort, a native to Western Europe, has established an extensive population in Clark Reservation. The Park is experimenting with various techniques to control its spread into critical habitats.

B. Geological

Clark Reservation State Park contains Onondaga Escarpment features such as a plunge basin, limestone outcrops, and karst topography. The lands within Clark Reservation State Park are considered by the DEC to be a "Significant Natural Community." These lands would be extremely sensitive to change if development were to occur here. However, the land within the park is protected by the State of New York's Office of Parks, Recreation and Historic Preservation, and is thus protected from development.

C. Hydrological

Glacier Lake is a delicate and unique body of water. Groundwater discharge provides the lake with much of its water. Fortunately, much of the watershed of the meromictic lake is owned by New York State, decreasing the likelihood of pollution. On-going efforts are underway for the State to acquire additional in-holdings within the lake's watershed (NYS DEC, 2008). In addition, monitoring of mercury levels may be needed for Glacier Lake due to increased levels of mercury over the past decade (Syracuse Post Standard, June 1, 2008).

VI. Summary

Clark Reservation State Park represents an area that has experienced little development for nearly 100 years. Offering some of the best views of the Onondaga Escarpment in the region, a meromictic lake, and a healthy combination of upland and wetland habitats, Clark Reservation is truly a special place.

Clark Reservation State Park is the perfect candidate for inclusion in the OEG. Clark Reservation is a park of substantial size presenting an opportunity for outdoor recreation in a natural setting in close proximity to downtown Syracuse. The existing interpretation is high quality. The proximity to other proposed sites in the OEG and the park's historic ties to the White Lake area further support its inclusion.

Managed under the New York State Office of Parks, Recreation and Historic Preservation, the management objectives of the State Parks are precise and appropriate. A substantial set of facilities and services are provided for visitors of Clark Reservation. Becoming part of the OEG would have little bearing on the overall management of the State Park. The Council for Park Friends, a non-profit organization responsible for operating the Clark Reservation nature center, would be a good partner for publicizing the Corridor.

Though Clark Reservation State Park possesses many important environmental features, a CEA should not be pursued because of the existing state park designation. The Office of Parks, Recreation and Historic Preservation has a stated goal of "conserving, protecting and enhancing [state parks] for public enjoyment today and into the future." Clark Reservation currently has a series of protective measures in place, ensuring its environmental quality, and does not require additional designations.

CLARK RESERVATION RECOMMENDATIONS:

Establish a walking corridor that connects Clark Reservation with Ram's Gulch. National Grid property to the east of Clark Reservation's border contains a utility right of way currently used for recreation. While this public access is not sanctioned, National Grid has been amenable to recreation easements in the past. Pursuing an easement for a utility right of way to link Clark Reservation with Rock Cut Road, and ultimately Ram's Gulch, is essential for establishing this connection. If the easement is granted, signage should be erected on Rock Cut Road to direct recreationists.

Establish a walking or driving route between Clark Reservation and Seneca Hill. Two alternatives could be considered for connecting Route 173 on Seneca Hill with Clark Reservation State Park:

- 1) Create a trail route (Figure 7) to connect Route 173 with Clark Reservation** (personal communication with B. Solomon; 2009). More study of this possible route is needed to identify land ownership, the need for conservation easements to enable public access, and safety hazards (especially in regard to limestone cliffs and abandoned quarry in the area). This is the more scenic of the two alternatives presented here, but would require greater effort to implement.
- 2) Create a driving route along Route 173 to Clark Reservation.** Widening of the shoulder and OEG signage would be needed to enable pedestrian and bicycle access.



Figure 7. Map showing two alternative routes for travelling from Seneca Hill to Clark Reservation (red line = trail; yellow line = driving route along Route 173).

Facilitate access through an extended CENTRO route. Encourage visitation to the Clark Reservation and other OEG access points through public transportation. Centro route 240 travels to Nob Hill Apartments multiple times daily, just 2.1 miles from the entrance to Clark Reservation. Encouraging Centro to extend this route just 4 miles would increase accessibility to those reliant upon public transportation.

Promote the OEG in the Clark Reservation Nature Center. A poster showing the proposed OEG corridor has already been created for the nature center by the Council of Park Friends. As additional materials on the OEG are created, they should be made available in the nature center. If an OEG website is created, linking it to the Council of Park Friends website is recommended.

RAM'S GULCH ASSESSMENT

I. Introduction

Most of the land in Ram's Gulch is owned by Hanson Aggregates, Inc. (see Figure 8 for an aerial view of the area). According to the Onondaga County GIS website a small section is part of the lands purchased in order to build the Interstate-481, and is controlled by the state. The area is zoned as industrial. The DEC has designated the wetlands and tailings pond as state designated wetlands. Using the Recreation Opportunity Spectrum, most of the area can be designated as roaded natural; however, the areas of Ram's Gulch nearest the mine tailings and associated gravel roads are hard to categorize, and would probably fall under an industrial version of "rural" as this is the very outskirts of the mine.

The two tax parcels owned by Hanson Aggregates that comprise Ram's Gulch itself total 101.98 acres. Exact details on the size of the portion attached to the highway is unavailable, but by comparison appears to be about 5 acres. In addition, the current trail runs along the bottom edge of a third parcel of land owned by Hanson before terminating at the road. This parcel is 14.67 acres in total.

Current uses for Ram's Gulch were identified based on evidence found at the site, a limited amount of time observing the area, and the statements of area users. Further study of the area is needed for a full list of current uses. Positive current uses of the area include hiking, biking, bird watching, and scientific study. Current uses which could cause harm to other uses or the area include rifle/shotgun shooting, impromptu camping, campfires, and littering/dumping. Hanson currently does not appear to utilize most of the areas within Ram's Gulch itself. One part of the area is used to store mine tailings.

Travel within the location is limited to pedestrian and bicycle. Travel to the location can be accomplished by car, but there is no official parking lot. Travel by bike appears to be fairly common, as well as by foot from the local neighborhood. There is a connection to a corner of Clark Reservation (through lands owned by a power company) which appears to be utilized to access Ram's Gulch. There are no bus routes approaching the area.

Within the location itself there are gravel roads circling the tailings area and several trails running throughout the rest of the property. There are no parking lots, restrooms, signage, or buildings within the area.

Beyond a few private property signs there is no apparent management for the area. Hanson's management plan was not found. No official marketing and promotion of the area is done. Word of mouth appears to be the only method by which new users learn about the area.



Figure 8. The Ram's Gulch area (white boundary line) is shown. The yellow line is a possible route for an OEG trail.

II. Benefits and threats to public safety or health

A. Benefits

The wetlands area and the tailings pond work to reduce contamination of nearby Butternut Creek by runoff from both the highway and the mine.

The area provides opportunities for exercise and recreation to the public, even though it is posted.

B. Threats

Rail road proximity. A railroad line runs through the property and parallels much of the trail.

Quarry hazards. If people were to wander into the tailings area at a time when it was active they might encounter mine vehicles.

Air quality. The site is within close proximity of an incinerator which may affect air quality.

Unauthorized activities. Current user activities may pose a hazard. Specifically rifle/shotgun shooting, campfires, littering/dumping, and possible collisions between pedestrians and bicyclists.

Invasive species. Another threat to the area is the invasive black swallow-wort, which is threatening to overrun some of the Woods' native plant species.

III. Natural Setting

Three distinct areas of interest, or habitats, can be found within Ram's Gulch: The cliff-top, the gulch, and the wetland. Each has its own flora, fauna, and/or geological features of interest, and each has been impacted by humans in a different way.

The Gulch. This area appears to be the most sensitive of the areas to impact. The federally threatened hart's tongue fern has been found in the gulch. Further development of trails in this area would adversely affect this rare plant. Many other species of fern evident as well. A small stream flows through this area and feeds into the wetlands. There is evidence of illegal dumping within the gulch and of possible impacts of runoff from the highway.

The wetland. The wetland has traditionally supported a heron rookery. Nests are visible, but it is unknown if they are still in use. Many species of birds and mammals (e.g., beaver) are evident in this portion of Ram's Gulch. The wetlands consist mostly of marsh grasses, with some spruce and cedar. The outermost gravel road of the mine loops through the wetland and terminates at a spur trail off the main trail.

The cliff-top. The main trail through the area runs through this section. Species are diverse and varied along its length, and many species of birds are observed. The trail through this section sometimes provides a vantage point to look out over the cliffs into the gulch. The limestone cliffs themselves are often broken down or weathered and provide interest.

IV. Social, Cultural, Historical, Archaeological, Recreational, or Educational Importance of Location

A. Social

Besides impromptu gatherings evidenced by campfires and other debris, there appears to be no current social use of the area.

B. Historical

Ram's Gulch served as a Boy Scouts of America camp from 1919-1970. Half the land that comprised this camp was plowed under to make room for the highway but there are ruins of one of the cabins just off the main trail. Remnants of the historic water "ram" that gave the gulch its name also exist in the Gulch. There may still be remnants of these devices to be found.

C. Recreational

From various sources it has been determined that a significant portion of the trails' users are bicyclists. The main trail is considered to be a major component of an established loop through the quarries. Hiking/snowshoeing, depending on the season, along the trail is evident. The area has many good features to attract bird-watchers.

D. Educational

Opportunities abound for studies in botany, ornithology, and the impact on the marsh of runoff. SUNY ESF occasionally brings students to Ram's Gulch for fieldwork. The Sierra Club also sponsors hikes into the area.

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change Which Could Be Adversely Affected by Change

A. Ecological

A very small colony of the hart's tongue fern grows on a south-facing slope within Ram's Gulch, unusual for this species which normally prefers the shade of north-facing slopes. This species is extremely sensitive to disruptions in its habitat. For this reason, recreational use of the Gulch should not be encouraged.

B. Geological

The escarpment cliffs may be unstable and increased human traffic may cause collapse in some areas. The stone features are vulnerable to vandalism.

C. Hydrological

Spring water emerging from the cliffs is evident; care must be taken not to damage this natural water drainage. The wetlands in the area play an important role in purifying the water that flows into Butternut Creek.

VI. Summary

Ram's Gulch has many resources in need of protection and many opportunities for recreation that take into consideration the sensitivity of these resources. The health of the threatened hart's tongue fern should be considered in whatever management is considered for this site. In planning access to the area, descent into the gulch should be discouraged to protect the habitat of the fern.

The current trails are well maintained by those who use them, without apparent help or hindrance from the landowners. The main trail would need little attention if the area was brought into the OEG, assuming that usage does not increase too drastically. Some trail maintenance and minor rerouting may improve safety. A management plan would be needed as none currently exists.

Ram's Gulch meets the criteria for Critical Environmental Area designation. This small parcel of land is home to a great number of species, some rare and some not. Consideration should be given to purchase of this area by New York State, because of its unique geology and wildlife, and its proximity to Clark Reservation. Ram's Gulch would make an excellent addition to the OEG because of its recreational opportunities, unique flora and fauna, and role as a connection to other natural areas within the OEG.

RECOMMENDATIONS FOR RAM'S GULCH

Long-term protection for Ram's Gulch. Three options exist for the long-term protection of Ram's Gulch:

1) Addition to Clark Reservation State Park. Ram's Gulch could be added onto Clark Reservation State Park through purchase by the state. The location of Ram's Gulch (i.e., directly across Rock Cut Road from Clark Reservation) would make this addition possible. This option would provide better protection than the second option.

2) CEA designation. Ram's Gulch meets all criteria for CEA designation. While the wetland portion of Ram's Gulch is already protected by a NYS wetland classification, CEA designation would provide the opportunity for environmental review of large-scale future changes to this property.

3) Conservation easement from Hanson Aggregates. By communicating with Hanson Aggregates, the potential for legal visitor access to Ram's Gulch can be determined. This

knowledge is essential to all future planning efforts for the OENC. Obtaining a conservation easement to enable public use of the main trail through Ram's Gulch should be considered.

Map vegetation within Ram's Gulch. In order to prevent access to areas within Ram's Gulch that contain fragile habitat or rare species, a survey of Ram's Gulch should be completed. Once completed, trails and other improvements should be routed away from these habitats. A survey of this nature would also be useful for determining where environmental cleanup efforts may be needed. A local organization such as the Sierra Club may be able to provide assistance with this effort.

Identify the users of Ram's Gulch over one year. Details about the users of Ram's Gulch need to be identified in order to effectively maintain recreational use of the area while protecting the fragile ecosystem contained in the Gulch and the wetland. Information such as the recreational interests of visitors, how often they visit, how they travel to Ram's Gulch, and the sections of Ram's Gulch they visit need to be determined. Short visitor interviews conducted during all four seasons are necessary to determine this information. As there is evidence of use by different types of users, this study is also essential in determining possible user conflicts. This information would also provide insight into possible public concerns regarding proposed site improvements or changes. The staff and students of the College of Environmental Science and Forestry may be a source of information for and assistance with this project.

Develop an interpretive program for Ram's Gulch. A strong educational effort is needed in Ram's Gulch to protect the fragile resources and enable recreation. This effort could include the following:

- A trailhead kiosk with a map showing:
 - where visitor access is permitted,
 - historical information (e.g., the areas' past history as a Boy Scout camp, the history of the water ram from which the gulch received its name),
 - information about the Onondaga Escarpment, and its flora and fauna, and
 - visitor guidelines.
- Warning signs along the main trail indicating that visitors should not travel off the main trail and that visitors should be alert to other users (e.g., bicyclists).

WHITE LAKE SWAMP

I. Introduction

White Lake Swamp is located on Woodchuck Hill Road in the Town of DeWitt, and is about 459 acres in size (Figure 9). White Lake Swamp is comprised of wetlands and forest and is home to some rare and endangered species. On the Recreation Opportunity Spectrum it would be classified as Roaded Natural, due to the existence of some adjacent roads and a natural setting.

The area is federally designated as a Class C flood zone (minimal flood threat) and a state designated wetland, and has a town zoning code of vacant industrial (use code # 340). As of 2007, the land value of the area was assessed at \$300,000. The area contains two sub-divisions owned by Hanson Aggregates and General Crushed Stone, as well as private land. Currently, no public access is allowed.

History of ownership. The area was previously owned by the Allied Corporation that operated a quarry which was separated from the residential lots on Woodchuck Hill Road by a portion of the area known as the Buffer Lands. In 1986, Allied sold the land to the General Crushed Stone Company. The deed from Allied to General Crushed Stone contained the following restrictive covenant for the Buffer Lands that is currently at issue on appeal:

" The 'Buffer Lands' are that part of the premises hereby conveyed lying northerly of the 'Approx. Escarpment Line' as shown on a map entitled 'The Solvay Process Company, New York, Syracuse Plant, Inventory Map-- Jamesville Quarry, Land in Towns of Dewitt and Manlius. The Grantee covenants on behalf of itself, its successors and assigns, that so long as any part of the premises hereby conveyed is used as a quarry, the Buffer Lands will remain in their natural state. This covenant shall be a covenant running with the land, binding on and enforceable against the Grantee, its successors and assigns. This covenant is for the benefit of and enforceable by all parties owning property adjoining the premises hereby conveyed and the Grantor, its successors and assigns. This covenant is also enforceable by Nature Conservancy."

In 1997, Mr. Robert Congel purchased 461.45 acres of the Buffer Lands with the intent to develop the property by constructing a personal residence and erecting a perimeter fence. The deed conveying the premises to Mr. Congel recited that it was "subject to all other title matters of record." Plaintiffs commenced an action to enforce the restrictive covenant and to prevent development of the Buffer Lands. Although The Nature Conservancy was originally a party to this action, it has executed a stipulation of discontinuance and is no longer a party.



Figure 9. Approximate boundary (white line) for the White Lake area.

II. Benefits & Threats to Public Safety or Health

A. Benefits

Health. If a trail were to be constructed within the White Lake area, opportunities for recreation would be created; at present, no recreational opportunities are available to the public.

B. Threats

Proximity to the Jamesville Quarry. Although the quarry has significant barriers (high chain-link fencing) there are obviously some liability issues with people being injured while recreating in the nearby quarry (i.e. slopes in the escarpment where the quarry waste was deposited are sparsely vegetated and are considered unstable or hazardous).

III. Natural Setting

There are significant natural forested areas around White Lake. There are also state designated wetlands and an abundance of flora and fauna, some of which are endangered and protected.

IV. Social, Cultural, Historical, Archaeological, Recreational, or Educational Importance of Location

A. Archaeological Importance

The White Lake area was formed, to a great extent during de-glaciation. The lake basin was formed from a waterfall flowing over the escarpment, and includes a steep-sided glacial outwash channel. Elevations range from 524 to 780 feet.

B. Historical Importance

There is an important history of land acquisition around the White Lake area dating back to 1865. This area was once used for public fishing and research by surrounding schools; these uses are no longer permitted by the current landowners. Recently, use of the area has been a topic of dispute between property owners, the Town of Dewitt, and local residents.

C. Recreational/Social Importance

Installing a trail in the area would provide health benefits (noted above) and would also connect Woodchuck Hill Road with the land owned by Save the County, enabling connections to natural areas throughout the OENC.

D. Educational Importance

In the past, White Lake Swamp was used for field trips by local schools, universities and colleges. Research and monitoring of flora in the area (especially rare species) has also been conducted in this area.

V. Inherent Ecological, Geological, or Hydrological, Sensitivity to Change that Could Be Adversely Affected by Change

A. Ecological Sensitivity

The karst topography in this area is home to many fragile and/or rare species. One endangered animal is the Indiana Brown Bat. In addition, at least 66 state-protected plant species and two Federally-listed endangered plant species are found here. Many of the rare plants, such as Moonwort and Slender Cliff-brake, occurring in this area are vulnerable to habitat changes.

B. Geological Sensitivity

The karst topography of the area is extremely sensitive to any changes in use, especially since the geology of adjacent quarry lands have already been greatly affected by change. Lands bordering Jamesville Quarry could present some geological sensitivity that may deem portions unsafe if a trail were to be constructed. The talus slopes of the escarpment in this area could be severely disturbed with minimum human usage due to the looseness of the talus.

VI. Summary

White Lake is an aesthetically pleasing area with the potential benefits for low-impact recreation such as hiking and birdwatching. There is potential for this area to be an educational tool for schools, universities and various research projects (e.g., examining the current state of one of the many flora listed as a “sensitive” plant species).

White Lake is also a crucial connector between Ram’s Gulch and the Woodchuck Hill Preserve, and between the Woodchuck Hill Preserve and the Hanson Aggregates property along Sweet Road. Ownership of the White Lake area has been varied between private landowners and mining companies. As such, public access into the area has unfortunately been hindered. Additionally, the development of a connecting travel route from Ram’s Gulch to Three Falls Woods would be unlikely unless a conservation easement permitting public access is obtained from landowners.

It is important for the White Lake Area to be included in the Onondaga Escarpment Nature Corridor because of its ecological sensitivity and its importance as a connector between natural areas within the OENC and the larger OEG. A portion of the area is currently protected as a New York State wetland. An additional designation such as a CEA could be considered by the Town of Dewitt since, due to the unique geological and ecological aspects of this area, the criteria for a Critical Environmental Area designation are met. CEA designation would provide the township the opportunity to conduct an environmental review of any large-scale projects proposed for the area.

WHITE LAKE SWAMP AREA RECOMMENDATIONS

Determine level of community support for CEA designation of the White Lake Area.

The designation of the White Lake area as a CEA will require effort on the part of local residents and the Town of Dewitt. Before proceeding with such an endeavor, determining the level of support from the community is important. Adding this topic as a discussion point to the agenda for a Dewitt Town Board meeting is recommended. A request for this discussion can be made through the Supervisor's Office at the Dewitt Town Hall office. The DeWitt Town Board meets the second and fourth Mondays of each month in the DeWitt Town Hall at 7:30 p.m. (Town of DeWitt, 2008). In addition to a discussion of this topic at a town board meeting, a survey mailer should be sent out to local residents using the tax records for the township. This mailer should be a simple questionnaire (questions and format to be determined) that would gauge community support or lack thereof. This recommendation should be the first step taken before going forward with any of the other White Lake Area recommendations. SUNY ESF faculty would likely be able to assist the Town of Dewitt with this effort if funding is made available for mailing expenses. The decision to move ahead or not to move ahead with CEA designation should be based on this resident input.

Acquire a conservation easement from the Hanson Aggregates Company and/or other property owners. A conservation easement could be put in to place for a pre-determined portion of the White Lake area. A conservation easement could provide tax benefits to landowners (Nature Conservancy, 2008), and could enable public access to this unique resource. If both parties are unwilling to establish a conservation easement, a different type of easement called a purchase of development rights (PDRs) should be considered (Nature Conservancy, 2008). "In a PDR program, public funds are used to purchase the land's development rights, in effect creating a conservation easement on the land while the land remains in private ownership. PDRs are voluntary and share widespread support" (Nature Conservancy, 2008). In this instance, landowners could choose not to provide public access but would agree to give up all rights to develop the land in the future. The Town of DeWitt would likely need to lead any efforts directed towards obtaining either a conservation easement or PDR.

Reestablish the White Lake Wilderness Committee. For many years White Lake and its surrounding areas were protected by a neighborhood group that called itself the "White Lake Wilderness Committee." While little information is available about who the committee members were, re-establishing a special committee could be helpful in rejuvenating a community-wide sense of priority and importance for protecting the area. It would also serve to educate those who know very little about

the history of ownership and use of the area, and to unite those who are aware and concerned for the preservation of the area.

Begin a new, larger scale biodiversity assessment. The last biodiversity assessment for White Lake took place in 1977 with the help of Elizabeth Yanuck working for the Nature Conservancy. Since then, the Conservancy has backed out of all matters concerning White Lake and much alteration to the land and its buffer areas has taken place. Should the White Lake area be considered for any type of designation (such as a CEA), re-assessing the biodiversity of the area and studying the potential for environmental impacts resulting from recreation will be necessary.

Survey potential trail routes in the White Lake area. Two alternatives have the potential to connect Ram's Gulch to the Woodchuck Hill Preserve:

1) Obtain a conservation easement from landowners that enables public access, and then construct a footpath/trail through the White Lake area. This type of trail would provide an excellent opportunity for local resident to enjoy this unique ecosystem. An extensive survey of possible trail routes through the White Lake area would be needed. Because of its ecological and geological composition, it is important to consider the concerns associated with a White Lake trail system:

- Ecosystem sensitivity should be determined with the suggested biodiversity assessment, focusing attention to the locations of vulnerable species of flora and fauna. The proposed trail would need to maintain a distance from these locations.
- The escarpment slopes where the quarry waste has been deposited. This area is considered unstable and hazardous, and the proposed trail should avoid these areas.
- Use of the area would need to be limited and carefully monitored to avoid overuse associated with popular tourist destinations. To avoid overuse, direct parking access to the trail through White Lake is not recommended; instead, access to the proposed trail would be via the Woodchuck Hill Preserve Trail system only.

2) Create a route that follows Woodchuck Hill Road from Jamesville Road to the entrance road of the Save the County preserve (see Figure 10 on page 63). Road shoulders might need to be widened to implement this alternative; directional signs will be needed as well. A conservation easement would be needed for a small section of private land just south of the Woodchuck Hill preserve in order to connect (via trail) the Preserve with the Hanson property on Sweet Road.

WOODCHUCK HILL FIELD AND FOREST PRESERVE AND SNOOK'S POND

I. Introduction

Woodchuck Hill Field and Forest Preserve is owned by the *Save the County Land Trust*, a private, non-profit organization. The preserve comprises excellent examples of karst forests as well as wetlands. Exposed limestone bedrock is found in the area, as well as wetlands, mixed deciduous hardwood stands, and conifer stands, all showing little sign of interference by humans. This 95-acre property is adjacent to Snook's pond. The preserve can be accessed by following a driveway (1.6 miles east of Maple Drive and 0.5 mile west of NY 92) that is located on Woodchuck Hill Road. The driveway is marked with a sign that is easily seen from the road. From the small parking area, well-marked trails can be accessed, allowing visitors to enjoy the site for hiking, running, wildlife viewing, and fishing. Motorized vehicle use is not allowed beyond the parking area. Snook's Pond, adjacent to the preserve, is privately owned.

II. Benefits and Threats to Human Health or Safety

A. Benefits

Health. Woodchuck Hill Field and Forest Preserve is beneficial to human health. The 95-acre area has a trail that can be used for hiking, running, walking, biking or walking a dog. This unique area also promotes environmental awareness, encouraging visitors to make small changes in the way they live their lives to foster a healthier environment.

B. Threats

Unauthorized trail use. Tire tracks from ATVs were noticed on parts of the trail. Use of the trails by hikers and ATV operators at the same time could lead potentially to collisions.

Drainage pipes. In some areas of the preserve, pipes were laid across the trail from the higher elevations where houses are present to the wetland area. These pipes pose a tripping hazard for trail users.

III. Natural Setting

The preserve is located adjacent to residential property. The preserve contains a mixture of hardwoods, wetlands, and a pond. Major tree species include black cherry, red and sugar maple, eastern hemlock, red pine, eastern white pine, and different species of oak. Bedrock and fossils are exposed throughout the area. Flora typical of karst topography and wetlands are also found in the preserve. Deer,

squirrels, birds, frogs, fish, and woodchucks are often seen. A portion of the preserve contains NYS designated wetlands.

Snook's Pond is a shallow pond with a dam. It contains largemouth bass and blue gill. This area is not accessible to the public and is posted by the Snook's Pond Development LLC. Snooks Pond is classified as a NYS designated wetland.

IV. Social, Cultural, Historical, Archaeological, Recreational, or Educational Importance of Location

A. Social and Cultural Importance

Woodchuck Hill Field and Forest Preserve and Snook's Pond currently and historically have played important roles in human activities. In terms of cultural and social aspects, these sites provide excellent opportunity to recreate and reconnect with the natural world.

B. Archaeological Importance

From a historical standpoint, the sites are important because of the scarcity of undeveloped escarpment lands in Central New York. The donation of the preserve lands to *Save the County* was made specifically to protect this natural area from development. The bedrock protruding from the ground contains many fossils, which provide opportunity to study and observe archeology.

C. Recreational Importance

Hiking, fishing, wildlife observation, fossil hunting (removal is not permitted), running, and relaxation are only some of the ways visitors can use the preserve for recreation. Groups such as the Sierra Club include the preserve in their hiking itinerary. Snook's Pond is used for fishing by private landowners only.

D. Educational Importance

Different educational institutions use the preserve to teach students about many aspects of nature. However, the preserve is also a great place for families and children to improve their knowledge of flora and fauna, as well as geology. Snook's Pond is not used extensively for education due to its private ownership.

V. Inherent Ecological, Geological, or Hydrological, Sensitivity to Change Adversely Affected

A. Ecological and Hydrological Sensitivity

The karst topography of this area is extremely sensitive to change. The wetlands in the preserve and adjacent to Snook's Pond are important for maintaining local water

quality. Development of the Snook's Pond area could adversely affect fish species found in the pond as well as water quality.

VI. Summary

The historic value and unique natural features of Woodchuck Hill and Snook's pond make them important additions to the Onondaga Escarpment Nature Corridor. Woodchuck Hill Field and Forest Preserve is a special place with many unique characteristics. The limited maintenance of the site gives the preserve a natural, undisturbed feel. Being located adjacent to a suburban area, the preserve's natural features could be easily harmed without the protection of Save The County and a wetland designation. CEA designation is not recommended for the Save the County property due to these existing designations. Snook's Pond, which is privately owned, is a designated NYS wetland; a CEA designation for Snook's Pond would provide the Town of Manlius with the opportunity to request the environmental review of large-scale projects.

WOODCHUCK HILL PRESERVE AND SNOOK'S POND RECOMMENDATIONS

Consider CEA designation for Snook's Pond. CEA designation would provide the Town of Manlius with the opportunity to request an environmental review of large-scale projects at Snook's Pond. The CEA would need to be approved by the Town of Manlius.

Clean up rubbish on property boundary. Debris is found along the properties adjacent to the Woodchuck Hill Field and Forest Preserve. In one specific case, there is garbage and a torn down building. Not only is this unsightly, but it could be hazardous to visitors. Cleaning up debris around the property will enhance the aesthetics and provide a safer experience for users. Organizing a clean-up day (led by Save the County) and asking for volunteers from local organizations (e.g., Scouts, Sierra Club) and residents could quickly accomplish this recommendation.

Provide information kiosk at preserve parking area. No signs or information regarding the property currently exist on the preserve. The trail system is confusing because there are unmarked areas and areas that appear to turn into ATV trails or private land. Having a map at a kiosk would help clear up confusion that visitors may encounter. The kiosk should include information about flora, fauna, and geology of the preserve, as well as the location of other natural areas within the OEG.

Remove trail hazards. Two main hazards exist along the trails within the Woodchuck Hill Preserve. First, there are a few locations on the property where snags hang over the main trails. To protect visitors to the preserve, these snags should be removed. Any snags not posing immediate danger should be left in place to benefit wildlife. Second, drainage pipes are present across trails in various locations throughout the preserve, creating hazards for trail users and degrading the appearance of the preserve. These need to either be removed or routed via culverts under the trails.

Improve delineation of parking area. The location of the preserve's parking area is difficult to distinguish because it is adjacent to a farm house and is accessed via the same driveway. Delineating the edge of the parking area with logs or 6"x6" cedar curbs is recommended.

YMCA CAMP IROQUOIS

I. Introduction

Fifty-eight acres, in Manlius, NY, is designated to the YMCA's Camp Iroquois. As far back as 1930, the camp has owned the area located on Evergreen Lake. Camp Iroquois is used for recreational use only during the summer months; summer camp is from late June through August every year. The camp is closed in the fall, winter, and spring. During the summer the camp has many recreational facilities such as an in-ground pool, lake front area, adventure course, horse corral and riding area, miles of hiking trails, archery range, basketball court, sports field, covered pavilions, and a 28-foot-high climbing wall. The camp has its own website promoting summer camp.

II. Benefits and threats to public safety or health

A. Benefits

Health. The YMCA camp provides many benefits to the public and creates a healthy environment for children and the surrounding community. The camp provides financial assistance to families who could not otherwise afford to have their children attend.

B. Threats

Structural and radon. Because of its location on karst topography, the camp area is not suitable for extensive building construction due to instabilities in the bedrock and the potential for radon gas problems.

III. Natural Setting

This camp has been maintained for both recreational facilities and open space since the 1930s. Areas have been cleared for sports fields, but much of the camp property consists of natural woodlands.

IV. Social, Cultural, Historical, Archaeological, Recreational, Educational Importance of Location

A. Recreational

The summer day camp for children is one of the oldest running day camps in the US. The camp provides education and exercise for its campers, as well as the opportunity for children to socialize in a non-school setting. Recreational opportunities include a in-ground pool, lakefront area, adventure course, horse corral & riding area, miles of hiking trails, archery range, basketball court, sports field, covered pavilions, and 28-foot climbing wall. In addition, Evergreen Lake is stocked and provides fishing access.

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change Which Could Be Adversely Affected by Change

A. Ecological

Evergreen Lake borders the camp, and provides habitat for fish and wildlife.

B. Geological and Hydrological

The portion of the property that borders the camp facilities is comprised of karst topography. This area is extremely sensitive to change due to instabilities in the limestone bedrock. The hydrology of the area could also be greatly impacted by any additional development of the site.

VI. Summary

Camp Iroquois would be an ideal component of the Onondaga Escarpment Corridor due to its natural and geological resources. However, although the camp has miles of trails within its boundaries, use of this property is not recommended for the public due to privacy concerns for the campers. The connecting trail between the Woodchuck Hill Preserve and Three Falls Woods is recommended for a location just south of the YMCA property (see Figure 10). Although the YMCA currently protects the area from development, CEA designation should be considered for this area in case property ownership of the area changes in the future.

RECOMMENDATIONS FOR YMCA CAMP IROQUOIS

Have the YMCA Camp Iroquois property designated as a CEA. Although the property is currently protected by the YMCA, any future changes in ownership could enable additional site development. In addition, this property meets the criteria for CEA designation. For these reasons, it is suggested that the property be designated as a CEA. The Town of Manlius would be responsible for approving the CEA designation.



Figure 10. The YMCA property is shown with a white line. The yellow line indicates the proposed OENC trail.

HANSON AGGREGATES PROPERTY (SWEET ROAD)

I. Introduction

South of YMCA Camp Iroquois is a large wooded area owned by Hanson Aggregates, Inc. (Figure 11). This wooded area is comprised of karst topography, limestone outcrops, and two populations of the American hart's tongue fern. The area has several trails that receive use from local hikers and horseback riders. The area would be categorized as roaded natural on the Recreational Opportunity spectrum due to the natural state of its woodlands, and its proximity to a road (Sweet Road) along one border and Jamesville Quarry on another.

II. Benefits and threats to public safety or health

A. Benefits

Buffer. The Hanson Aggregates property acts as a buffer between the town of Manlius and the Jamesville quarry. Having this undeveloped acreage between a residential area and a heavy construction site has kept the town a safe distance from noise and dust resulting from the quarry. If the property were not protected, destruction of the forest could cause a number of environmental and physical impacts on the people of Manlius.

Recreation. The wooded portion of the Hanson Aggregates property has tremendous potential for recreation because of the existence of trails within its boundaries. The trails, which are already used for horseback riding and hiking, are currently posted to discourage use. These trails could provide an important connection within the OENC corridor between the Save the County Woodchuck Hill Preserve and Three Falls Woods.

B. Threats

Structural instability and radon. The karst topography of the area is not suitable for development due to instabilities in the bedrock and the potential for radon gas emissions in buildings. The sinkholes in the area could cause construction-related injuries as well as structural damage.

Invasive species. Another threat to the area is the invasive black swallowwort, which is found commonly along the trails and near the population of American hart's tongue fern. Swallow-wort adapts to many different habitats, including the unique limestone-dependent forests of this property.

Need for designated trails. While trails within the area appear to be well-used and are marked with painted blazes on the trees, they are not formally designated for public use. Posted signs are placed at the entrance to the trails by Hanson

Aggregates to discourage use. The lack of designated trails could pose a safety hazard to individuals who wander off the trails onto the loose limestone substrate or who are not familiar with the trails. Designated and marked paths would greatly reduce the chances of injury or harm to visitors. Designated trails could also be used to channel visitors further away from one of the hart's tongue fern populations which is within easy walking distance from one of the trails.

III. Natural Setting

The Hanson Aggregates property provides important habitat for many rare and threatened species of plants. In addition to two colonies of the American hart's tongue fern, other state-protected species are found in the area such as bloodroot (*Sanguinaria canadensis*) and white baneberry (*Actaea pachypoda*). Numerous fern such as walking fern and maidenhair spleenwort are also located in the limestone crevices found throughout the property.

The property provides a home to many bird species, including the pileated woodpecker (*Dryocopus pileatus*) and the scarlet tanager (*Piranga olivacea*). Wildlife include mammals such as the white tailed deer, woodchucks, squirrels, and fox. The Indiana Bat, a federally endangered species, has a hibernaculum in this general area.

IV. Social, Cultural, Historical, Archaeological Recreational or Educational Importance

A. Social

The Jamesville quarry is adjacent to this property. The wooded portion of the Hanson Aggregates property provides an important sound, dust, and appearance barrier from the quarry for local residents who live nearby.

B. Recreational

Although there are no formally designated trails, the existing trails on the property are used for horseback riding and hiking by local residents. It is important to note that these trails are currently posted for no use by Hanson Aggregates.

C. Educational

While the unique topography and landscape of the area is a great place to study karst topography and ecology, the area is not currently used for educational activities other than the monitoring of rare species.

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change Which Could Be Adversely Affected by Change

A. Ecological Sensitivity

The Hanson Aggregates property is home to unique flora and fauna. One of the most important species to note is the endangered Indiana bat (*Myotis sodalis*; L. Speer, personal communication, June 11, 2007). In addition, two colonies of the federally threatened hart's tongue fern are found in the area. It is likely that any changes made to the wooded portion of this property would disrupt the health of these species. Disruption to the ecosystem would also likely encourage the spread of invasive species such as black swallow-wort, which already lines the trails in the area. Even minor changes in the area could result in dramatic alterations in biodiversity.

B. Geological Sensitivity

Changes to the karst topography in this area could greatly alter drainage as well as increase erosion and rock falls. Changes could affect the "load bearing ability of subterranean rock structures which can increase the rate of occurrence of sinkhole formation" (W. Foulkrod, personal communication, June 2, 2007).

C. Hydrological Sensitivity

The Hanson Aggregates property is located adjacent to many important lakes and ponds, that are part of the important and unique karst hydrology of the area. Changes to the topography would like affect local drainage and water quality.

VI. Summary

The wooded portion of the Hanson Aggregates property is a relatively untouched example of karst topography. It is home to several rare and endangered species, and has escarpment features such as limestone outcrops and sinkholes. While the area is currently maintained as an undeveloped buffer for Jamesville Quarry, Critical Environmental Area designation would provide additional protection in the future. This area also is an important connector between the Woodchuck Hill Preserve and Three Falls Woods.

RECOMMENDATIONS FOR HANSON AGGREGATES PROPERTY

Have the property designated as a Critical Environmental Area. Designation of this area as a CEA would provide the Town of Manlius with the opportunity to request an environmental review of future large-scale projects proposed for this site, maintaining the area's unique ecosystem and importance as a buffer from the quarry into the future. This area meets the CEA criteria. Most of this area is located within the Town of Manlius, through which CEA designation would need to occur.

Obtain a conservation easement to enable public use. A conservation easement is needed from Hanson Aggregates for a narrow corridor of the property that connects the Save the County preserve and White Lake area with Three Fall Woods. Obtaining this easement would make it possible to formally designate a connector trail, enhancing travel through the OENC.

Designate a public use trail in the area. Although trails are currently marked and used in the area, the network of trails is confusing and directs visitors within relatively close proximity to one of the hart's tongue fern colonies. A public use trail should be designated that connects Woodchuck Hill Preserve with Three Falls Woods, but that is re-routed away from the fern colony. In order to limit use of this trail, a parking area is not recommended.



Figure 11. The undeveloped portion of the Hanson Aggregates property is outlined in white. The yellow line indicates the proposed route for an OENC trail (source: Google Earth; edited by D. Kuehn).

THREE FALLS WOODS

I. Introduction

Three Falls Woods, located in Manlius, New York, is a 175-acre woodland containing three distinct waterfalls created by tributaries of Limestone Creek, as well as trails, cultural artifacts, a very diverse and unique ecology, and karst topography. Once mined by early settlers for limestone and later for natural hydraulic cement for the Erie Canal, the area was also used for bridle paths by Troop D Cavalry Veterans of the Spanish-American War, whose horses were stabled on what is now Cavalry Club land. Three Falls Woods was left to revert back to its natural state over 100 years ago. The area is primitive and the public uses Three Falls Wood as a place for recreation and reflection. Current uses include hiking, bird watching, and cross-country skiing. The portion of Three Falls Woods located in the Village of Manlius (about one-quarter of the property) was designated as a Critical Environmental Area (CEA) under local law in 2007, while the part of Three Falls Woods located in the Town of Manlius is protected by a covenant (B. Rogers, personal communication, October 24, 2008).

Once owned by Allied Chemical and used as buffer land, Three Falls Woods is currently owned by William Camperlino. Mr. Camperlino has allowed the public access to Three Falls Woods. His subdivision proposals for the property include private homes as well as a rest home for the elderly. Litigation is currently underway concerning the covenant protecting the town portion of the Woods (www.manliusgreenspace.org) as a buffer from Jamesville Quarry.

Additionally, Three Falls Woods is part of the current Onondaga Escarpment Nature Corridor (OENC), a 7-mile stretch of land that has been included on the supplemental list of the New York State Open Space Plan. It is possible to reach Three Falls Woods by foot, bicycle, or automobile, but there are no formal parking areas and entrances to the area are not clearly marked. Additionally, the area is not readily accessible using public transportation. There are a number of access points to the trails, with one trail access location on Sweet Road and another on Glencliffe Road which has a small parking area.

The trails within Three Falls Woods are old cavalry bridle trails or deer paths and are not marked (B. Rogers, personal communication, October 24, 2008). These trails are currently used for walking and cross-country skiing. There are no facilities such as restrooms within the Woods. Due to the fact that this is a privately-owned property whose owner does not profit from the visitors to the area, there is no marketing and little promotion. It is possible to find websites with information about why and how to visit Three Falls Woods, and word of mouth is positive and strong, although some lifelong residents of Manlius have not heard of the Woods (E. McGrew, personal communication, October 24, 2008). Additionally, the Manlius

Greenspace Coalition, a group that was influential in Three Falls Woods' CEA designation, promotes some limited visitation as a way to educate the public about the need for conservation of the area.

II. Benefits and threats to public safety or health

A. Benefits

Buffer. The Woods act as a buffer zone between the town of Manlius and the Jamestown quarry. Having 175 acres in between a residential area and heavy construction site has kept the town a safe distance from any noise pollution resulting from the quarry. If the Woods were in fact not protected, destruction of the forest could cause a number of environmental and physical impacts on the people of Manlius.

Recreation. Three Falls Woods provides the important health benefits of recreation and relaxation. The trails in Three Falls Woods are commonly used for hiking and nature study.

Educational. Three Falls Woods provides excellent examples of karst topography and ecosystem. Educational walks are occasionally held in the area by local organizations and colleges.

B. Threats

Structural instability. The karst topography of the area is not suitable for development due to instabilities in the bedrock and the potential for radon gas emissions in buildings. The sinkholes found throughout the Woods could cause construction-related injuries as well as structural damage. Many of the homes in the surrounding area have experienced some structural damage due to the unstable land (B. Rogers, personal communication, October 24, 2008).

Invasive species. Another threat to the area is the invasive black swallowwort, which is threatening to overrun some of the Woods' native plant species. This species adapts to many different habitats, including the unique limestone-dependent forests of Three Falls Woods.

Need for designated trails. The lack of designated trails and paths could pose a safety hazard. Since people who use the area for hiking set out to find a trail or make their own trail while in the area, it is possible for them to use areas that are unstable without even realizing. Much of the area is exposed rock; because the falls and stream provide constant moisture, the smooth limestone becomes very slick and is potentially dangerous. Designated and marked paths would greatly reduce the chances of injury or harm to visitors, and would also channel use along designated route (rather than enabling use throughout the area).

III. Natural Setting

Three Falls Woods is the largest uninterrupted forest within 10 miles, making it an important “refuge for plants and wildlife” (D. Althoff, personal communication, 2007). Populations of frogs and salamanders around the country are rapidly decreasing, but the streams, falls, and vernal pond in this area provide prime habitat for amphibian breeding (L. Monostory, personal communication, 2007). In addition to providing habitat for amphibians and mammals such as deer and bats, the Woods provide a home to many bird species, including the pileated woodpecker, wild turkey, and scarlet tanager, both of which require large forested areas (B. Rogers, personal communication, October 24, 2008). Also, the hydrological features of Three Falls Woods help to maintain the health of fisheries along Limestone Creek, a designated trout stream.

In addition to the fauna, over 80 different bryophyte species have been identified in a preliminary survey of the area. Dozens of state-protected native plant species, such as bloodroot (*Sanguinaria canadensis*) and white baneberry (*Actaea pachypoda*) are present in the Woods. Additionally, a number of old-growth trees, some up to 500 years old, have been identified and lend the area a unique feel (www.manliusgreenspace.org). The presence of the various plant species “around the edges of this community will help it maintain the microclimatic characteristics that help make this community unique” (W. Foulkrod, personal communication, June 2, 2007).

Aside from the flora and fauna, Three Falls Woods has many other features contributing to its unique natural setting. In addition to the spectacular three waterfalls, there are a number of glacial erratics (i.e., rocks that were carried and dropped by glaciers) dotting the landscape. One of the Woods’ most striking areas is the Hemlock Bowl. This kettlehole has its own microclimate and is home to giant hemlocks and ferns. Many visitors to Three Falls Woods maintain that the Hemlock Bowl is a special, spiritual place and an ideal example of a natural setting (B. Rogers, personal communication, October 24, 2008).

IV. Social, Cultural, Historical, Archaeological Recreational or Educational Importance.

A. Social

The neighboring town of Manlius has been a community with close ties to the land for close to 200 years. A majority of the area surrounding Three Falls Woods had been cleared for farmland, pasture, and limestone quarries. The Jamesville quarry sits just south of the Woods. Close to thirty years ago, as the quarry planned to expand, the community set out to protect the land from any further development since the Woods acts as a buffer between the quarry and the residential areas. This

relationship between the woods and the community has allowed the area to keep development to a minimum, keep traffic down, and allow the town to maintain its own identity. To the people of Manlius, these woods hold an important place within the community as part of their identity and pride (www.manliusgreenspace.org).

B. Recreational

The close proximity to a number of towns has made the Woods a favorite place for outdoor recreation. Although there are no designated trails, the Woods is used by hikers, nature lovers, and cross country skiers year-round. The Woods attracts many visitors that are looking for “untouched” woodlands.

C. Educational

Unlike many of the surrounding state parks or protected areas Three Falls Woods does not have an educational center or a visitors’ center. The unique topography and landscape of the area is a great place to study and examine in a protected area. For geologists and natural scientists alike, the Woods offers the chance to experience firsthand a karst landscape.

D. Historical

Within the Three Falls Woods, a number of historical artifacts have been found throughout the years. Stonewalls, which are easily over hundreds of years old, cross the Woods. They were used to mark land boundaries of early military lots. Dating back to about the same time as the stone walls, lime kilns can be found in certain areas. Because of the abundance of limestone in the area the kilns were built to produce quicklime, which was used for plaster and or mortar and was used to build the Erie Canal (B. Rogers, personal communication, October 24, 2008).

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change Which Could Be Adversely Affected by Change

A. Ecological Sensitivity

Three Falls Woods is home to unique flora and fauna. One of the most important species to note is the endangered Indiana bat (*Myotis sodalis*; L. Speer, personal communication, June 11, 2007). There is a known hibernaculum in the area surrounding Three Falls Woods and the possibility of another existing within the Woods itself. As such, it is more than likely that any changes made to Three Falls Woods would disrupt this already endangered species. Also, disruption of the plant life that has grown in and around the limestone would “increase the possibility of invasive species taking over the landscape” (D. Althoff, personal communication, 2007). Bryophyte species play a key role in protecting water quality, and small alterations in the environment could affect the mosses’ filtration abilities (R. Kimmerer, personal communication, 2007). Finally, as mentioned, a number of

protected species, both plant and animal, have been found in Three Falls Woods. Even minor changes in the area could result in dramatic alterations in biodiversity.

B. Geological Sensitivity

The karst topography “presents a series of unknowns when change is implemented” (D. Althoff, personal communication, 2007). Change to the topography could greatly alter drainage in the area as well as increase erosion and rock falls. Changes could affect the “load bearing ability of subterranean rock structures which can increase the rate of occurrence of sinkhole formation” (W. Foulkrod, personal communication, June 2, 2007). The area is already littered with sinkholes, and in fact, one of the most unique features of Three Falls Woods is the large combination sinkhole/kettle -- the Hemlock Bowl.

C. Hydrological Sensitivity

Three Falls Woods is a critical recharge and discharge area. A complex system of stacked aquifers is concentrated in the karst topography. One of the Woods’ key features is its disappearing stream which flows underground to outlying areas, impacting nearby residences as well as the Cavalry Club. Adjacent property owners depend on the Woods for maintaining water quality. Additionally, the Glencliffe area already experiences immense problems with flooding (Byrnes, 2007). In 1976, the Army Corp of Engineers constructed a spillway in the gorge/floodplain area of Three Falls Woods to help with floodplain mitigation. Nevertheless, the area remains hydrologically unstable today. This spillway is currently maintained by the village.

VI. Summary

Three Falls Woods as it stands today is a natural area that is utilized by the community for its natural beauty, recreational opportunities, and nature study. Wildlife and plant life throughout the woods are in need of protecting since these Woods tend to be one of their last refuges in an area under constant threat of development. Since the land is privately owned, given the right offer, the Woods could be purchased by another developer. A CEA designation for the portion of the Woods that falls within the Town of Manlius would give the Town the opportunity to request an environmental review of large-scale projects proposed for the property in the future.

Three Falls Woods has little to no human development, which is a major attraction to many of its frequent visitors. However, designating a small system of trails would make the Woods a more welcoming area for visitors, and would channel visitor use to certain portions of the Woods only. Establishing a small parking area would keep visitors from parking on private property. Finding a compromise between leaving the Woods in its natural state and utilizing basic management strategies would

make the Woods a more welcoming recreational area and protect the area's fragile ecosystem.

Three Falls Woods is an important component of the Onondaga Escarpment Nature Corridor, since it provides an important connection between the YMCA Camp Iroquois and the Cavalry Club. Its natural setting, the falls, and its size could no doubt be a highlight of the OENC.

Three Falls meets all of the criteria needed to be a protected critical environmental area (CEA). The Woods offers a number of unique rock formations, waterfalls, and wildlife habitats, and serves an important role in the local community. As noted, a portion of the Woods is already designated as a CEA, and the Manlius Greenspace Coalition has prepared the necessary documents to designate the rest of the Woods as a CEA (B. Rogers, October 28, 2008). To make the OENC a functional and enjoyable corridor will require a lot of cooperation within the community. Projects like the OENC and areas like Three Falls Woods enrich the local residents with a sense of pride that such a unique area could be in our own backyard.

RECOMMENDATIONS FOR THREE FALLS WOODS

Expand Critical Environmental Area designation. Obtaining a CEA designation under local law for the portion of the Woods located in the Town of Manlius would create the opportunity for environmental review of any large-scale development plans for the area.

Collaborate with the New York State Preservation Society to preserve the lime kilns. The kilns in Three Falls Woods are important reminders of the area's history, but are currently on the verge of collapse. Working with a state historian, technical assistance should be obtained to preserve the historic kilns, ensuring that future generations are able to learn from and enjoy these unique historical features.

Manage invasive plant species. Collaborate with the New York State DEC to develop a strategy for managing invasive plants. Species such as black swallow-wort and Japanese knotweed threaten to overrun the native species found within Three Falls Woods, potentially affecting the unique character of the Woods.

Increase Sweet Road's suitability for pedestrians. Increase road shoulder width, lower speed limits and employ safety signs along the stretch of Sweet Road from YMCA Camp Iroquois to the Three Falls Woods trailhead. Also, create a pedestrian crosswalk at the trailhead to enable visitors to safely cross Sweet Road.

Build or designate a parking area. Having a safe and secure parking area will allow visitors to park their cars legally and without trespassing onto neighboring properties. The parking area will also serve as an entrance to the woods, increasing the exposure of and accessibility to Three Falls Woods and the OENC. A parking area could be placed either at the entrance on Sweet Road or at the informal parking area on Glencliffe Road.

Mark and map trails that are already utilized. The trails in Three Falls woods today for the most part are animal trails and foot paths that are not always clear and could potentially be dangerous. Most of the terrain is damp, exposed rock; marking the trails will keep hikers from wondering off the trails, trampling plant life, and will encourage the use of safe areas of terrain only. Markers will ensure the safety of the visitor and will make it easier for visitors to enjoy the woods. Mapping out the trails will act as a visual aid for points of interest and allow the visitor to plan routes.

Create a welcoming/information kiosk. Installing an educational kiosk at the proposed parking/entrance area is recommended. The kiosk would present a brief historical, cultural and geological background of the woods as well as the surrounding areas. A map of the woods and its trails could be provided at the kiosk, as well as information about the OENC and OEG.

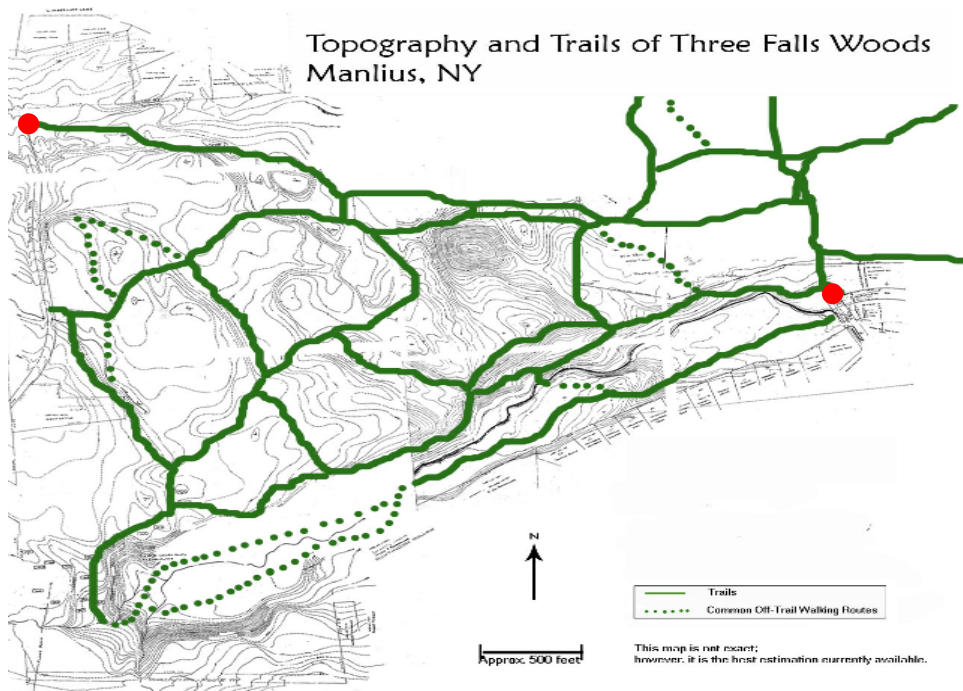


Figure 10. Map of Three Falls Woods (source: Manlius Greenspace Coalition). Potential trailhead locations are indicated with a red dot.

CAVALRY CLUB

I. Introduction

The Cavalry Club is a private golf and country club located in the Town of Manlius. This exclusive club includes a golf course on karst topography that was designed by nationally-recognized golf architects Dick Wilson and Joe Lee. The Cavalry Club is located in a unique natural setting as it is surrounded by forested area and adjacent to Limestone Creek. A large portion of the club's property is used as a golf course; the remainder is a natural wooded area located to the west of the parking area (Figure 12). The Club is registered as having three tax parcels with a total acreage of 154.81. All parcels are zoned for country club use.

The history of the Cavalry Club begins in 1904 when a National Guard cavalry troop was formed by a group of men from Syracuse; the troop was originally called Troop D, first New York Cavalry. In 1907, the Jefferson St. Armory (now the location of the Museum of Science and technology in Syracuse) was built as quarters for the Troop. Eventually, the Armory's size became insufficient for the needs of a horse cavalry and the members of Troop D used their assets to purchase the Devendorf farm in the Town of Manlius, NY. Stables, training areas, small arm ranges, and a clubhouse were constructed (www.cavalryclub.org/history.php)

After World War II, the Troop formed Cavalry Veterans of Syracuse, Inc. and opened its membership to others in the community for the purposes of patriotism, social and recreational activities, and the spirit of camaraderie and respect. Several years later, the wives of these veterans formed the Ladies Auxiliary of Cavalry Veterans of Syracuse, Inc. and began developing social events to benefit the membership. In 1965, after the addition of two swimming pools, the Cavalry Golf Club was officially opened. The facility now includes a club house, an 18-hole golf course, a driving range, tennis courts, a pro-shop, banquet and events facilities, and two dining rooms. All facilities are accessible for people with physical disabilities.

The golf course is an 18-hole, 6,741-yard course that has state of the art irrigation and maintenance equipment to keep the grass in prime condition. Designers of the course altered the naturally occurring landscape during the construction of the golf course, but did so in a way that incorporates the surroundings. For example, native tree species were planted on the course and views of Limestone Creek are maintained.

The Cavalry Club appeals to all ages by offering a range of activities throughout the year. The club caters to older members primarily during the summer months when the golf course is open and to families during the other seasons by hosting events like Thanksgiving dinner and Santa's visit. The club also hosts a number of events such as a Wine Dinner and an Annual Stein and Nine- micro brews party.

Currently, the Cavalry Club is not on a bus route, and does not have a marked sidewalk or bicycle trail. This facility is accessible by driving a personal vehicle and parking within the “members only” parking area.



Figure 12. Boundary (white line) of the Cavalry Club property. The yellow line indicates the proposed OENC route (source: Google Earth; edited by D. Kuehn).

II. Benefits and Threats to Public Safety and Health

A. Benefits

Recreational. Benefits are provided by both the recreational facilities located on the Cavalry Club property as well as through informal activities associated with Limestone Creek and the wooded area across the road from the golf course. The

country club portion of the property is used primarily for golf. Fishing is the primary activity enjoyed at Limestone Creek. The woodlands west of the parking area are used for hiking and nature study, and offer an important connection with Three Falls Woods.

OENC connection. The wooded portion of the Cavalry Club provides an important connection between Three Falls Woods and Limestone Creek. Without this connection, there is a small separation between these two natural areas that would make it necessary for visitors to drive from the parking area on Glencliffe Road to the Gramlich Bird Sanctuary. Creating this connection and informing Cavalry Club members about the outdoor recreation opportunities available to them on the Cavalry Club's property would provide additional benefits to members and perhaps attract new members seeking outdoor recreation opportunities.

B. Threats

Potential conflicts between users. Golf course use (in particular, safety concerns related to flying golf balls) make it necessary to separate any outdoor recreational activities on the property from golf course use. Troop K Road separates the golf course from the wooded area owned by the Cavalry Club; maintaining this separation is essential to safe use of the area by all recreationists.

Pedestrian crossing. The Cavalry Club is located on Troop K Road in Manlius, New York. The road is in a rural setting with intermittent traffic going at varying speeds. The tendency in this kind of setting is to drive faster than one would in an urban setting because of the "open road." This is a threat to human health and safety because drivers using this road would not expect to encounter hikers or other recreationists crossing or walking along the side of the road. Due to curves in the road, drivers would have little time to avoid pedestrians if they aren't expecting them. Warning signs posted along the road could help to lessen the surprise factor and improve the safety of recreationists using the road.

III. Natural Setting

The Cavalry Club is located in a natural setting characterized by karst topography, forested area, wildlife, and natural flowing water in the form of a river. While the golf course is maintained as a landscaped setting, the wooded area to the west of the parking area is maintained as a natural setting. The wooded area consists of karst topography and contains limestone features and sinkholes. Surface and ground water drain through these land forms into Limestone Creek on the east side of the Cavalry Club. The creek is home to numerous species of wildlife including birds, frogs, and fish.

IV. Inherent Ecological, Geological or Hydrological Sensitivity to Change Which Could Be Adversely Affected by Change

A. Geological

The Cavalry Club is located on land characterized by karst topography. This natural geological feature is prone to erosion and highly sensitive to groundwater pollution. This karst topography is a natural phenomenon that occurs throughout the area surrounding the Cavalry Club. Additional development to this site would pose a risk to the fragile natural environment of this area. In addition, because the wooded portion of the Cavalry Club is adjacent to Three Falls Woods (a Critical Environmental Area), it provides an important buffer of protection to the CEA.

B. Hydrological

Limestone Creek (along the eastern boundary of Cavalry Club) is both a recharge and discharge area that eventually flows into Oneida Lake. Limestone Creek is vulnerable to pollution as well as other human activities. A narrow buffer of land separates the golf course from the creek; maintaining this buffer strip is essential for the long term health of the creek and to prevent golf course fertilizers from entering the creek. Any future development near the creek would likely result in an increased risk of flooding.

In addition, the karst hydrology of Three Falls Woods has been identified as the primary water source that feeds the streams, springs, and fairway ponds of the Cavalry Club Golf Course, a FEMA floodplain (P. Rubin). Three Falls Woods subsurface hydrology supplies the drinking water well, springs, and pond of a nearby farmhouse, then discharges through a culvert under Troop K Road to the Cavalry Club.

C. Ecological

While there are no endangered species currently living on Cavalry Club property, the karst ecosystem of the wooded portion of the property in particular is highly sensitive to any impact. In addition, because the Cavalry Club is adjacent to the boundary of a Critical Environmental Area, there is a chance that rare species found in Three Woods Falls could be affected by changes in use of the wooded portion of the Cavalry Club.

V. Social, Cultural, Historical, Archaeological, Recreational, or Educational Importance of Location:

A. Social importance

The Cavalry Club is an area of social or cultural importance primarily to its members. The wooded portion of the property, however, also is important to those interested in hiking in the Three Falls Woods area. The wooded portion of the

Cavalry Club property has the potential to provide an important recreational connection between Three Falls Woods and the Gramlich Bird Sanctuary. Without incorporating this wooded area into the OEG, connections between these two natural areas will be via driving only. This site is a socially important area because it connects two places that support “present-day activities of groups of people” (Shanahan, 2005).

B. Historical importance

The Cavalry Club has a rich history that predates the establishment of the private golf club (see introduction for a detailed history of the property). The Cavalry Club’s origins involve world and national wars, making them an important component of both local and United States history. This history is important to all Central New York residents and should be communicated to all individuals using the Cavalry Club property.

C. Recreational importance

The club was established for patriotic, social, and recreational reasons and, therefore, from the start has been a site where recreation has been practiced and enjoyed. The landscaped portion of the club is used for golf, tennis, and swimming, while the undeveloped portions are used for hiking. With Limestone Creek so close, there is the potential to expand recreational opportunities to include fishing. This area offers scenic vistas as well.

VI. Summary

The Cavalry Club has a large golf course and club house area, borders Limestone Creek, and contains an undeveloped wooded area. The wooded portion of the property contains karst topography, which greatly impacts drainage into Limestone Creek. Two of the most important features of this area are the connectivity that the Cavalry Club property provides between Three Falls Woods and Limestone Creek, and the buffer that the wooded portion of the Cavalry Club provides to the Three Falls Woods CEA. For these reasons, this wooded portion of land should be included in the OENC. Including this area in the OENC could also increase awareness of Three Falls Woods and Limestone Creek by members and non-members, and could enhance member and non-member access to Three Falls Woods. The wooded portion of the Cavalry Club should be considered for either designation as a Critical Environmental Area or for a conservation easement in order to provide additional protection for the karst topography it contains and to ensure its future as a buffer for Three Woods Falls.

RECOMMENDATIONS FOR CAVALRY CLUB

Community partnership. Community involvement has been a large part of the club's history, as it was local men and women who first formed the club. If an OEG committee is created (see page 12), a representative of the Cavalry Club could become involved. By partnering with local organizations and municipalities involved in the OEG, the Cavalry Club could enhance its already excellent reputation and create new recreational opportunities for residents and non-residents.

Obtain conservation easement. Creating a trail connection between the Limestone Creek section of the OEG and Three Falls Woods would require the creation of a conservation easement on the wooded portion of Cavalry Club land. A conservation easement would provide the needed public access, long-term protection for the property, and a tax benefit for the Cavalry Club.

Designate trail connection between Three Falls Woods and the Cavalry Club. After a conservation easement is obtained, designate the existing trail in the area as a public access trail.

Install safety signs along Troop K Road. In order to connect the wooded portion of the Cavalry Club property with the Gramlich Bird Sanctuary for pedestrian use, it will be necessary for visitors to cross and walk on the shoulder of Troop K Road. Pedestrians crossing the road or using the shoulder of the road in this area may not be expected by drivers; signs warning drivers of pedestrian use are strongly recommended.

Promote trails to existing and potential members. By opening hiking trails on the wooded portion of its property, the Cavalry Club has the opportunity to provide new recreational activities for existing members and to attract new members who may be seeking outdoor experiences. Nature hikes that leave from the Cavalry Club parking area could be sponsored by the club to attract new members.

LIMESTONE CREEK AND GRAMLICH BIRD SANCTUARY

I. Introduction

The Gramlich Bird Sanctuary (also referred to as the Fayetteville Bird Preserve) is an area of land that encompasses approximately eight acres of land on both sides of Limestone Creek east of Highbridge Street at Audubon Parkway. In 1987, the land was listed as 10.2 acres in size; currently, it is listed as eight acres (the difference may be due to imprecise measurements or the fact that the creek has changed its course over time; www.fayettevilleny.gov/AboutParks.aspx#Fayette).

The land was given to the Village of Fayetteville in 1933 by Jacob and Belle Gramlich to provide a Forever Wild area along Limestone Creek. In the 1920s, the land was planted with approximately 3,000 seedlings by Fred Gramlich and his brother J.E. (Red) Gramlich as part of a Boy Scout conservation merit badge. The Boy Scouts also cleared paths and thinned over growth in the Sanctuary in the 1960s and were involved in several clean-up projects throughout the 1970s. The Fayetteville Garden Club was also involved in planting shrubs to provide nesting spots in the area. In 1959, several test wells were drilled near Limestone Creek in an effort to find a suitable water source for the Fayetteville Village public water system; these tests were unsuccessful since the water tested too hard for use.

The state's Department of Environmental Conservation and the Army Corps of Engineers approved a plan for the Village of Fayetteville to rip-rap creek banks that were eroded by heavy rain in 2000. The cost of this project was to come from the Gramlich "Trust Fund" that was estimated to be \$20,000 to \$30,000. There is not a detailed record of the origin of this Trust Fund, but the Village Clerk, Martin Lynch stated that it was in existence when he became the clerk in 1978.

Currently the area is being use mainly for fishing and hiking. Hullar Enterprises is located at the entrance to the Sanctuary and operates a hatchery and fishing company that is open early spring through the summer. Although there is parking for the fishing area, there is no designated parking area for the Bird Sanctuary. The site also does not have an entrance sign. Wide trails exist through the sanctuary along the west bank of Limestone Creek, and are maintained by Hullar Enterprises. A geocache in the area is visited only a few times each season (Groundspeak, 2008). No management strategies are currently being employed by the Village of Fayetteville for the bird sanctuary, and there is no promotion or marketing of the area.

The trail through the sanctuary follows Limestone Creek through Fayetteville and past Genesee Street. The area north of Genesee St. along the creek is designated as public property and extends to Old Erie Canal State Park. Currently there are no

active management strategies along this section of Limestone Creek by the Village of Fayetteville or the Town of Manlius.

II. Benefits and Threats to Public Health or Safety

A. Benefits

Recreational. Both the Gramlich Bird Sanctuary and Limestone Creek provide important recreational benefits for residents of the Town of Manlius. Both provide opportunities for birdwatching and fishing.

Buffer. Much of the area surrounding the creek is occupied by residential and commercial developments (see Figure 13). Both the bird sanctuary and Limestone Creek provide an important natural buffer within the residential area, and through the commercial district of Fayetteville.

Water quality. Limestone creek exists as a surface water reservoir; the area around the stream is a natural wetland and floodplain. The wetlands help filter out contaminants from surface water run-off that would otherwise appear in the creek.

B. Threats

Flooding. Any buildings too close to the area could likely have structural and flooding problems due to the existence of a flood plain along Limestone Creek.

III. Natural Setting

The area around Limestone Creek is an essential wildlife habitat. Not only does the area provide a crucial habitat for native birds and mammals, but it also provides an undeveloped area for the enjoyment of visitors. Wildlife habitats, especially those surrounding water bodies, are ecologically sensitive; due to the increasingly limited availability of wildlife habitat in the area it is important to preserve these natural areas. In addition, the state-designated wetland areas surrounding the creek provide a service to wildlife species and act as a filter for Limestone Creek (Figure 13).

IV. Social, Cultural, Historical, Archaeological, Recreational, or Educational Importance of Location

A. Recreational importance

The bird sanctuary and Limestone Creek provide recreational opportunities for fishing, bird watching, hiking and potentially paddling right in the middle of a residential area. Because of this location, this area has a tremendous opportunity to provide readily accessible recreation opportunities for local residents.

B. Educational importance

This area has long been an educational asset to the Village of Fayetteville and Town of Manlius. This area has been used by the Boy Scouts as part of a conservation merit badge, and could provide future educational opportunities for school groups interested in learning about wetland ecosystems.

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change Which Could Be Adversely Affected by Change

A. Hydrological sensitivity

The area around Limestone creek is a wetland and a floodplain (see Figure 13), and is very ecologically sensitive to change. Changes to the wetland would likely influence the water quality of Limestone Creek.

B. Ecological sensitivity

This area is one of the few undeveloped areas in the Village of Fayetteville, making it important for bird and wildlife habitat. Limestone creek also provides habitat for many species of fish and amphibians.

VI. Summary

The Gramlich Bird Sanctuary and Limestone Creek are of recreational, educational and historical importance to the village of Fayetteville. This area contains woodlands, a state-designated wetland, and a creek, all of which provide important habitat for many species of wildlife. The bird sanctuary does not have any entrance signs or parking areas and could use these improvements, while a parking area providing access to the creek does exist in the Village of Fayetteville. The only management offered for the bird sanctuary at this time is trail maintenance which is provided by the neighboring fish pond business.

The bird sanctuary is designated according to the property deed as a Forever Wild area, which should protect it from development in the future. A portion of the sanctuary and Limestone Creek is also a state-designated wetland. Both the bird sanctuary and Limestone Creek should be included in the Onondaga Escarpment Nature Corridor because of their natural elements and because they provide an important connection route between Three Falls Woods and Old Erie Canal State Park.

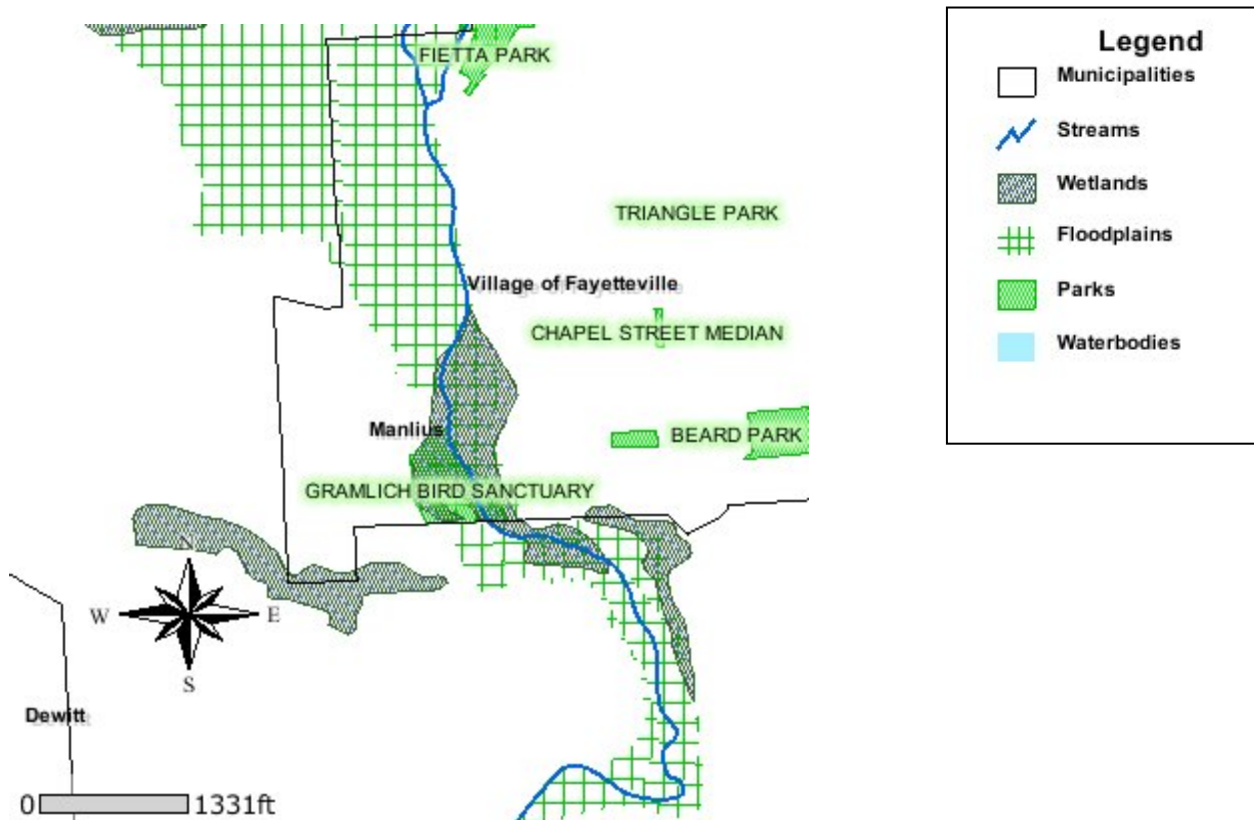


Figure 13. Map of wetland and floodplain areas surrounding Limestone Creek (source: www.maphost.com/syracuse-onondaga/main.asp).

RECOMMENDATIONS FOR GRAMLICH BIRD SANCTUARY AND LIMESTONE CREEK

Formalize trail along Limestone Creek. By designating a trail along Limestone Creek from the bird sanctuary into the Village of Fayetteville, recreational access to the creek would be greatly improved and connections with the other natural areas in the OEG would be created. A management plan would need to be created and implemented by the Village of Fayetteville to maintain the trail and provide a secure area for recreating. This type of trail could provide an important economic and social benefit to residents and the village, by making the village easier to access and attracting nature enthusiasts to the area.

Enhance OEG connections to the north. The trail that starts in Gramlich Bird Sanctuary continues north along Limestone Creek almost all the way to Old Erie Canal State Park. With minimal improvements, this trail could readily become a designated public trail. Conservation easements may need to be considered for the areas directly north of the Sanctuary since this area borders residential land. Figure 14 outlines the area where the trail already exists and the area where a connection

needs to be made across Limestone Creek to continue the trail to Old Erie Canal State Park.

Connections to the south with the Calvary Club. Three alternatives exist to connect the bird sanctuary with the cavalry Club:

1) By following a two-mile stretch of Troop K Road and Highbridge Road, a biking/walking/driving route from the Cavalry Club to Gramlich could easily be designated (see Figure 15). The alternative would be the easiest to create since no conservation easements would be needed. However, safety signage and possibly shoulder widening could be required. Constructing a small trailhead with kiosk at the bird sanctuary on Highbridge Road is recommended to direct visitors off the road and through the sanctuary to Limestone Creek and the trail that travels north to Fayetteville (Figure 16).

2) Create a trail along Limestone Creek that connects the bird sanctuary to Highbridge Road (just north of the intersection of Troop K Rd. and Highbridge Road); Highbridge Road and Troop K Road would be used for the remainder of the route to the Cavalry Club (Figure 15). Several conservation easements or more would be needed for the trail portion of this route; safety signage and possible shoulder widening would be needed along Troop K Road. This option would provide a more scenic recreational experience for ORNC visitors than alternative 1.

3) Create a trail along Limestone Creek that connects the bird sanctuary with the Cavalry Club property (Figure 15). While this alternative would be the most scenic of the three options, it would be the most difficult to implement because of the large number of conservation easements needed. In addition, the proximity of the trail to the Cavalry Club Golf Course would create a safety hazard (flying golf balls) for trail users.

Organize community clean-up effort. A clean-up effort is needed for the area along Limestone Creek north of the Gramlich Bird Sanctuary due to the amount of trash found along the trail. By organizing a clean-up effort, the Village of Fayetteville could increase interest in the area by local residents. Clean-up and preservation efforts in the past have been conducted by the Boy Scouts and the Fayetteville Garden Club, but there have not been any organized efforts since the 1970s. Involving local school groups in this effort could also increase stewardship of the area in the future.

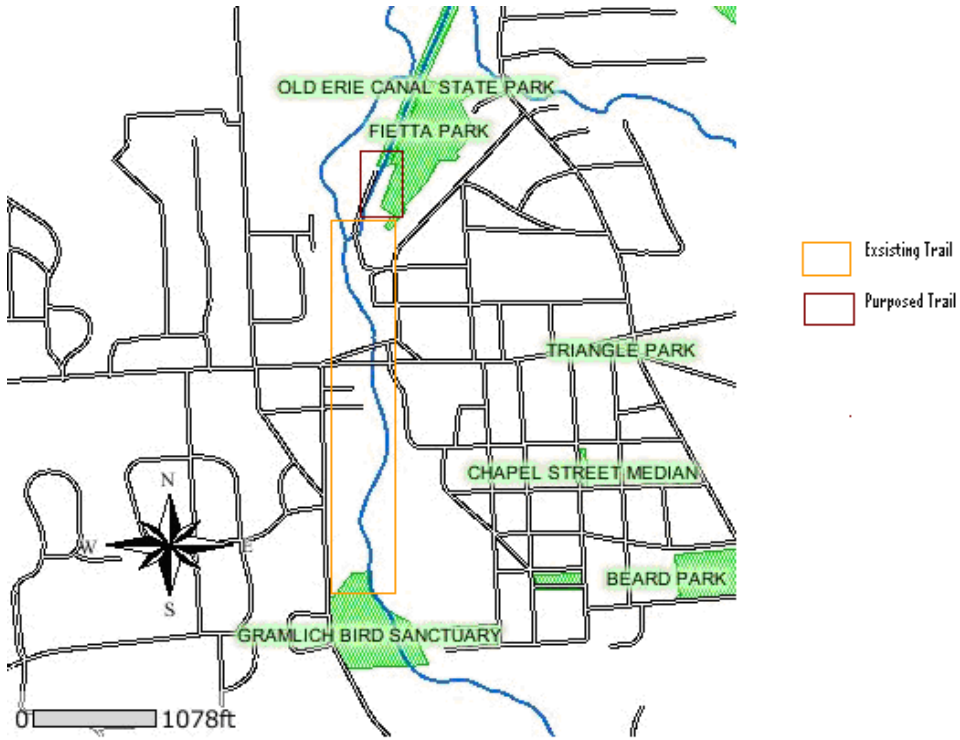


Figure 14. OEG corridor to the north along Limestone Creek.



Figure 15. Map showing three alternative routes to connect the Cavalry Club with the Gramlich Bird Sanctuary (yellow line = proposed OENC route; blue line plus purple line = alternative 1; red plus purple = alternative 2; orange plus red = alternative 3).

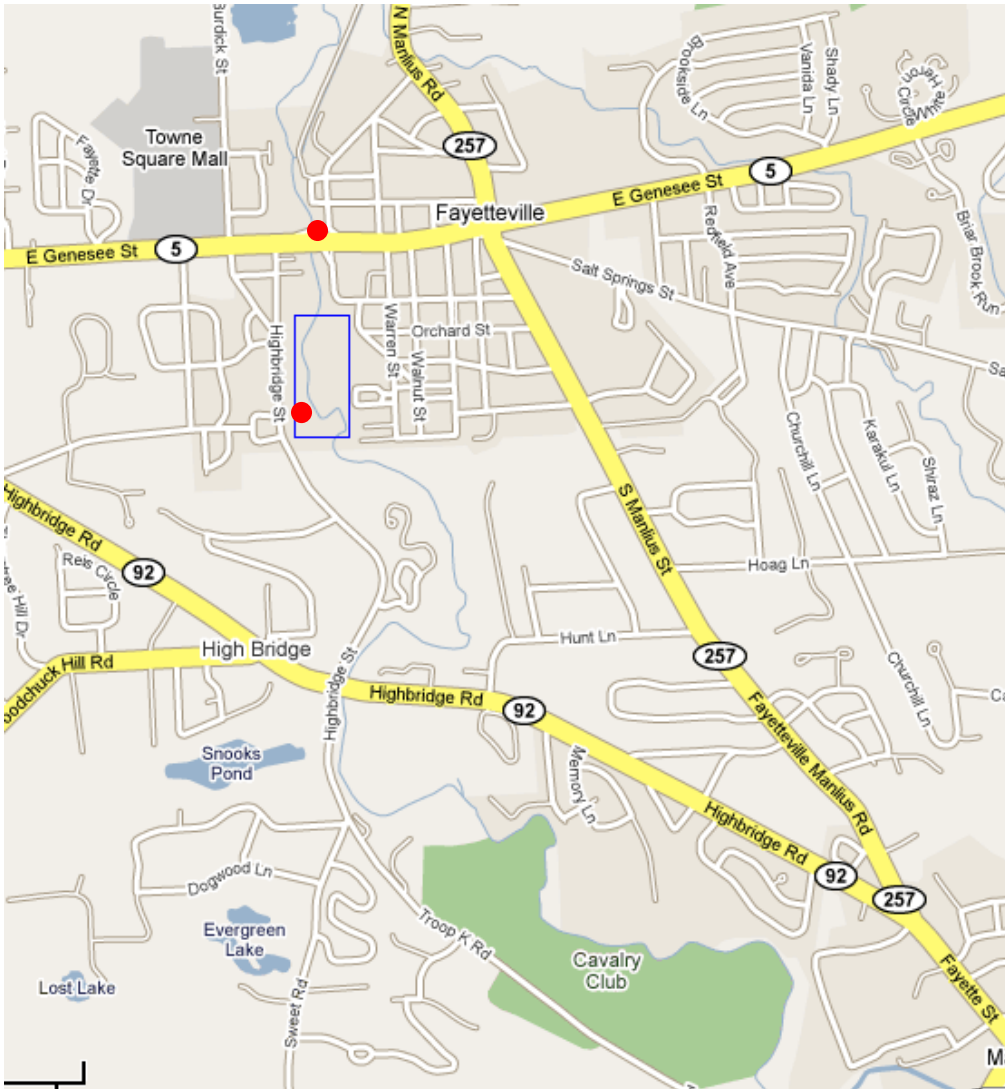


Figure 16. OEG corridor to the South along Highbridge and Troop K Roads to the Cavalry Club (Gramlich Bird Sanctuary outlined in blue; red circles indicate recommended kiosk placement).

Expand knowledge of bird sanctuary and Limestone Creek through addition of kiosks. Both the bird sanctuary and Limestone Creek currently have very low use. Installing two interpretive kiosks (one at the proposed trailhead for the bird sanctuary and one in the Village of Fayetteville in the parking area on Limestone Creek that is adjacent to Route 5; Figure 16) would provide information about both locations to visitors, create a connection with the rest of the OEG, and provide important information about the unique resources in the area. The kiosk located in Fayetteville could be used to inform visitors about both Limestone Creek and local businesses, thus increasing the economic benefit of the OEG on the community. Information on fishing and the history of the Gramlich Bird Sanctuary would be included on the kiosk located at the sanctuary. Both kiosks should include information about the OEG.

Enhance the trails in the Gramlich Bird Sanctuary. The trails throughout the bird sanctuary are currently very wide because they are maintained with a lawnmower. In order to prevent invasive species from acquiring a hold along the trail edges within the wooded portion of the sanctuary, it is recommended that maintenance of the trails be completed without the use of a lawnmower in the future. This change in trail maintenance will create narrower trails that will better fit the “forever wild” designation of the area. Because the wider trail along Limestone Creek enables access to the area by people with physical disabilities, maintaining the existing wide section of the trail along the Creek is recommended.

OLD ERIE CANAL STATE HISTORIC PARK

I. Introduction

Old Erie Canal State Historic Park is a part of the New York State Park system, and is managed by the NYS Office of Parks, Recreation, and Historic Preservation. It is a linear park, encompassing a 36-mile segment of the original Erie Canal's Long Level section. This section of the original canal extends eastward from Butternut Creek in the town of Dewitt, New York (east of Syracuse) to just outside of the city of Rome, New York (Figure 17). This section of the canal was in active use between 1825 and 1917.

The terrain is woodland and wetland, and presents opportunities for hiking, picnicking, horseback riding, bicycling, canoeing, fishing, and snowmobiling. Several areas have footbridges that aid access to the canal towpath where visitors can view the remnants of stone aqueducts. The park offers reservable picnic pavilions, and carriage rides are available by appointment.

The park can be reached via Thruway (I-90) exits 33, 34, and 34A. However, public transport is not available to the park.

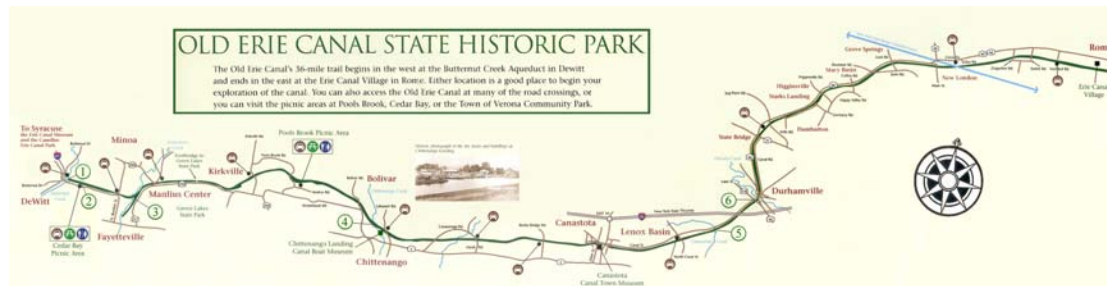


Figure 17. Map of Old Erie Canal State Historic Park (source: <http://www.eriecanal.org/OECSHP.html>)

II. Benefits and threats to public safety or health

A. Benefits

Recreational. The park's woodlands and wetlands offer good opportunities for hiking, picnicking, bicycling and other outdoor activities that enhance public health.

Water quality. Wetlands adjacent to the canal are important for filtering contaminants out of water runoff, and improving the water quality of the canal.

B. Threats

Pollution. The canal waters contain contaminants. As a linear corridor, the canal has transports sediment and pollutants.

III. Natural Setting

Although this park is highly developed, lands bordering the towpath are important for water quality and wildlife. The forested lands adjacent to the towpath contain a mixture of conifers and deciduous trees. The low lying marsh areas support a dense growth of shrubs and wetland vegetation. The large sections of wetlands along the canal are state-designated wetlands and are of high ecological sensitivity (Fig. 3). The canal area and adjoining lands abound with many species of wildlife; white tailed deer, woodchuck, rabbits, squirrels, skunks, and muskrats are but a few.

IV. Social, Cultural, Historical, Archaeological, Recreational, or Educational Importance of Location

A. Social Importance

Strengthen the sense of community. The park passes near or through several communities, including Fayetteville, Manlius Center, Kirkville, Chittenango, Canastota, Durhamville and New London. The canal is important historically to these communities, and provides an important social connection for them today.

OEG connection. The Erie Canal provides an important connection between Limestone Creek and Green Lakes State Park for the OEG. A bridge across the canal connects to a pedestrian walkway across Route 290 (Green Lakes Road) and leading directly into Green Lakes State Park.

B. Historic Importance

The Erie Canal, the first major canal project in the United State, is a popular travel route for boats extending from the Hudson River to Lake Erie, approximately 340 miles. First proposed in 1699, it was built from 1817 to 1825, and was the first major transportation route between the eastern seaboard (New York City) and the mid-western interior of the United States. Use of the canal was important in the 1800s because travel on the canal was faster than using carts pulled by draft animals and cut transport costs by about 95%. The Canal resulted in a massive population surge in western New York state, opened the west to increased settlement, and was a major factor in the rise of New York City as the chief port of the U.S. "Beyond the physical wonder of the canal is the fact that it opened the settlement and industrialization of the country all the way beyond the Mississippi" (Reisem, 2000).



Figure 18. Canal bridges near Green Lake State Park (Aerial photo from Google Earth, edited by Li Zhang)

C. Recreational Importance

The park consists of restored segments of the canal's waterway and towpath. The towpath has been resurfaced with stone dust and is suitable for biking, hiking, horseback riding, cross-country skiing, or snowmobiling. The canal also is navigable by canoe or kayak for short segments throughout the park. All-terrain vehicles (ATVs) and motorcycles are not permitted, and no campsites are available in the park. Several picnic areas are available on the route and are accessible via nearby roads. The park is frequently used by local people for recreation and serves as a wonderful place for exercises. Several bridges are located along the canal, one of which serves as a connection with Green Lakes State Park (Figure 18 (map 2)).

D. Educational Importance

Attractions like Chittenango Landing Canal Boat Museum, Erie Canal Village, and the Canastota Canal Town Museum are found along the old canal, and provide a great educational experience about the history of early America and the

development of New York State. Within the section of Canal that provides the connection between Limestone Creek and Green Lakes is a large interpretive kiosk that discusses the history of the canal.

V. Inherent Ecological, Geological, or Hydrological Sensitivity to Change Which Could Be Adversely Affected by Change

A. Ecological sensitivity

Although the canal is human-made, the wetlands found adjacent to the canal are sensitive to change. In addition, the canal itself can be a major transporter of sediment and pollutants. Changes to the surrounding woodlands and wetlands could result in further water quality degradation. The large patches of wetland and woodlands along the canal also provide important habitat for diverse species of wildlife. The area also serves as a buffer to Green Lakes State park, found directly across Route 290 from the canal.

B. Hydrological sensitivity

The water level can be affected by flood and drought due to seasonal changes. Much of the towpath corridor to be included in the OEG is either designated as a state wetland or a wetland buffer (Figure 19).

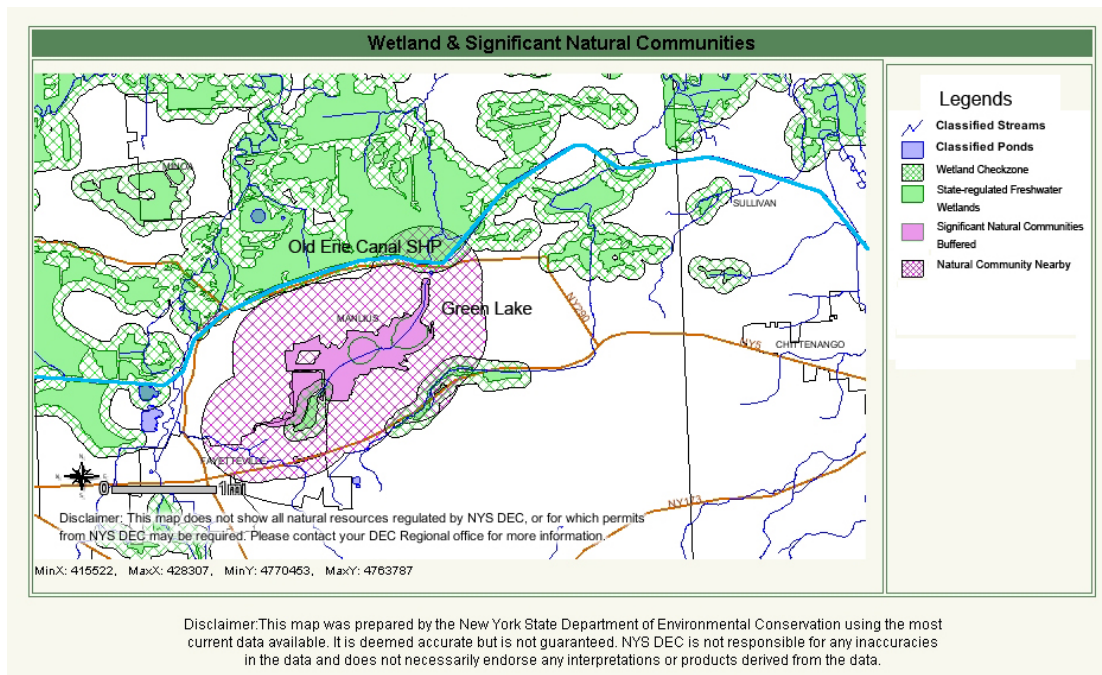


Figure 19. Map of wetlands and significant natural communities (source: <http://www.dec.ny.gov/lands/5124.html>, edited by Li Zhang)

VI. Summary

Old Erie Canal State Historic Park is an essential historic site with multiple functions. The historic background of the park provides unique educational opportunities. The linear space of the park creates connectivity through the OEG corridor and enhance the sense of community between canal villages. The park's woodlands and wetlands provide important habitat for wildlife. To summarize, Old Erie Canal State Historic Park is an important component of the Onondaga Escarpment Natural Corridor, and adds an historic element to the recreational experience of park and OEG users. This area is not recommended for Critical Environmental Area designation due to the existing state park and state-designated wetland designations.

RECOMMENDATIONS FOR OLD ERIE CANAL STATE HISTORIC PARK

Enhance connections between the OEG and the canal. Collaboration with canal attractions and communities can effectively spread information about and promote the OEG area. For example, Erie Canal Museum in downtown Syracuse is a great resource of information on local history and would be a good place to promote the Onondaga Escarpment Natural Corridor. Brochures about the OEG could be made available to visitors at canal attractions to encourage use of both the canal tow path and the OEG corridor for recreation.

Improve connectivity to Green Lake. A bridge and trail currently connect the canal towpath to Green Lake State Park. Directional signage indicating access to Green Lakes State Park could encourage more use of these existing facilities. In addition, painting a pedestrian cross walk on Route 290 would make it easier for pedestrians using the canal towpath to access Green Lakes.

GREEN LAKES STATE PARK

I. Introduction

Green Lakes State Park is 1,756 acres in size and is managed by the New York State Office of Parks, Recreation, and Historic Preservation. This state park is currently used for recreation as well as research, education, and community outreach programs. A large portion of Green Lakes State Park is categorized as rural on the Recreation Opportunity Spectrum, as the area is characterized by a substantially modified natural environment where opportunities to socialize with others are common. Other portions of the park can be classified as roaded natural, since natural woods abound in close proximity to paved and unpaved roads and trails. The concentration of users is moderate to high, and is highest during the summer months when the park is open for swimming, camping, and picnicking.

The Park offers a plethora of all-season recreational opportunities including camping, hiking, swimming, fishing, golfing, picnicking, snowshoeing, and cross-country skiing. The park is easy to access and locate from the Thruway (I-90) via Exit 34A (I-481 South) and Kirkville Rd. There is a \$7 admission fee for the park during the summer and early fall, and lots of parking. There are handicap accessible facilities, as well as restrooms, a snack bar, and a clubhouse restaurant.

Green Lakes state park is promoted through the marketing of the state park system. There is an informative website, as well as brochures throughout New York State that advertise the park. The current management strategies are working to ensure that the diversity and the integrity of the plant and animal communities within the park are not compromised, that visitor use is linked to low-impact nature activities in the wooded portions of the park and around the lakes, and that the park will serve as a place for scientific and educational study in the community.

II. Benefits and Threats to Public Safety or Health

A. Benefits

Recreational benefits. Green Lakes State Park offers recreational opportunities for all four seasons. The Green Lake Trail and the Round Lake Trail present excellent views of the lakes for easy, year round hiking, nature study, and jogging. The beach is perfect for swimming and picnicking, and fishing is a popular lake activity. There is an 18-hole golf course that serves as a prime snowshoe and cross-country ski location during the winter months. Trails through the wooded areas of the park offer exceptional opportunities for hiking and mountain biking. There are pavilions, cabins, and campsites for those seeking a longer stay in this scenic environment. The bountiful recreation activities encourage local residents to go outside and get active, providing numerous health benefits.

Air quality. The upland forest surrounding the lakes raises the air quality significantly for the nearby community through oxygen generated by photosynthesis. Air quality contributes to a sense of well-being as well as health.

Buffer zones. The park provides a buffer zone from urban Syracuse. It serves as a peaceful retreat from the noise and stress of modern urban life.

III. Natural Setting

Fish and Wildlife Habitat. Rainbow trout, zooplankton, small mouth bass, bluegills, brown bullheads, yellow perch, and others contribute to making Green Lake a popular fishing location in the county. Fish are stocked in Green Lake, but both stocking and fishing have been suspended in Round Lake for research purposes. One-hundred species of birds exist within the park boundary. A preliminary listing of the Green Lakes birds by W.F. Miner and E. Schneider in 1986 includes an estimated 68 species of breeding birds and 64 species of migrants. Wild turkeys have been observed frequently on the golf course (Petty, 1991). A variety of mammals including the white tailed deer, wood chuck, raccoon, red squirrel, grey squirrel, mink, skunk, cotton tailed rabbit, chipmunk, red fox, grey fox, flying squirrel, weasel, bat, shrew, and field mouse frequent the park boundaries.

Forest and Vegetation. Park records indicate the existence of 60 species of trees. Trees in the golf course are not indigenous to central New York, but if you walk along the trails and into the adjacent forest the climax forest species is typical Central New York. The forest southwest of Round Lake contains a canopy of sugar maple, beech, tulip poplar, hemlock, basswood, ironwoods, and yellow birch. A number of these trees have a diameter that exceeds three feet. The forest understory includes saplings of striped maple, mountain maple, witch hazel, witch hobble, and dogwoods. White cedar is a common evergreen growing at the edge of the lakes where sunlight is available (Petty, 1991).

Around 100 wildflower species, including coltsfoot and hepaticas, red and white trilliums, jack-in-the-pulpits, wild ginger, Dutchman's breeches, bellwort, and violets are found in the park. There are also 25 fern species including the common sensitive fern, marginal shield fern, Christmas fern, walking fern, spleenwort and maidenhair fern. Green Lakes State Park has the ability to sustain a variety of life forms that provides an intricate ecosystem. It is a local example of biodiversity in action.

Areas of Important Aesthetic or Scenic Quality. The two glacial lakes (Green and Round Lakes) are meromictic lakes, which means that there is no fall and spring mixing of surface and bottom waters. Such lakes have a high potential for evidence of ancient plant and animal life. The color of the water in both lakes is the caused by the interaction of lake depth, water clarity, limited plant life, and the presence of

calcium carbonate. *Deadman's point* is a unique "reef system" constructed by living organisms. The actual term is microbialite, which means that the reefs were formed due to the abundance of calcium carbonate precipitated by small bacteria (Petty, 1991). Round Lake is a registered Natural Landmark of the U. S. National Park Service, and the only meromictic lake in the United States to be included in this program.

IV. Social, Cultural, Historical, Recreational or Educational Importance

A. Social Values

Community character. The village of Fayetteville is adjacent to Green Lakes State Park. The people that live in Fayetteville share a heightened awareness of the unique characteristics of the park's two meromictic lakes and surrounding old growth forest. Because of its high use, past and present, from people all over Syracuse, the park has become an important community asset for swimming, hiking, and cross country skiing.

Potential for connectivity. There is already a working link from the Old Erie Canal state Historical Park to the main entrance of Green Lakes State Park. It is used frequently used by bikers and joggers.

B. Historic Value

Much of the land that makes up Green Lakes was part of a military tract that, in 1872, was divided into lots as compensation for soldiers. David Collin III was the owner of most of the land. In 1928, 725 acres of land and the two lakes were purchased by the state. The Civilian Conservation Corps built many of the facilities visitors use today, including the old administration building, cabins, the beach, golf clubhouse, trails and roads. In 1975, the state acquired another 188 acres to protect the unique characteristics of the lake. The following year the state purchased two additional adjacent parcels of land, which added 25% to the size of the park. Robert Trent Jones, often regarded as the most important and influential golf course designer in the world, designed the golf course in the park in 1935. The golf course was opened in 1936, and is one of the major attractions at Green Lakes today.

C. Recreational Value

Green Lakes State Park offers infinite opportunities for every season. Activities include the opportunity to walk, hike, jog, dog walk, bird watch, snowshoe, cross country ski, and swim in an outdoor environment. The golf course is also a major recreational outlet within the park.

D. Educational Value

The park has an important educational value due to the extensive educational programs held for visitors and local school groups. Located in the Pine Woods camping area, the small nature center offers an interpretive look at the park. Two naturalists employed during the summer months offer interpretive walks, projects for kids and adults, and bring in presenters. Local schools take advantage of this outdoor classroom throughout the year. Every year an Enviro-thon is held in the park by local public schools.

V. Inherent Ecological, geological, or Hydrological Sensitivity to Change Which could be Adversely Affected by Change:

A. Hydrological Sensitivity

Round lake and Green Lake, two of the eleven meromictic glacial plunge basins in the United States, are found in the park (see aerial view of these lakes in Figure 20). A permanent layer of minerals makes the water unable to respond to temperature induced seasonal density variation and so is unable to undergo a complete turnover as is customary annually in most lakes. The absence of turnover leads to the production of toxic gases. Fish have a hard time and life is confined to the upper surface. There are three levels of water: the sediment of dissolved minerals at the bottom, the water that doesn't mix in the middle, and the thin layer of water that does mix at the top. Although there have not been any studies done on the effects of brought in sand, and swimming, the possibility of layer disruption is present.

B. Geological sensitivity

Geologic formations surround the lake basins, with Vernon red shale and gypsum in the bottom layers, shale of the Syracuse formation in the middle layer, and dolomite at the top. The creation by visitors of unauthorized trails on these remnants of the Onondaga Escarpment have adverse affects on the geology and appearance of the site. Swimming off Dead man's point is another example of a behavior that negatively impacts the unique geology of the area.

C. Ecological Sensitivity

A large portion of the park is old-growth forest. Visitors can see many old specimens of tulip trees, sugar maples, beech, basswood, hemlocks, and white cedars. The old growth forest is marketed as a highlight on interpretive walks lead by the nature center staff. The heavy use of the trails around the lakes and within the old growth forest causes these areas to be particularly sensitive to the trampling of vegetation and soil erosion and compaction. In addition, invasive plant species within the park need to be carefully monitored to prevent their spread in this unique area.

VI. Summary

Green Lakes State Park possesses a plethora of unique flora and fauna, and two of the eleven meromictic lakes in the U.S. It is these lakes that draw over a million visitors a year, and have elicited considerable geological interest. Round Lake, a rare and fragile ecosystem, has since become a registered National Natural Landmark of the U. S. National Park Service, and is the only meromictic lake in the United States to be included in this program to date. Overall management of the park is excellent. One area within the park that could use additional management, however, is the shoreline area around Green Lake which has experienced excessive soil compaction and vegetation trampling. Invasive species monitoring is also needed along the fragile lakeshores to prevent the growth of species such as purple loosestrife and black swallow-wort.

Due to its high yield of income during the summer months, the park environment is run strictly like a business, however with trail deterioration, invasive species and other such issues, the park really needs a more environmental agenda. Since Green Lakes is already a well-loved and established park, it would be the ideal location to promote the OEG. The easy accessibility of the park for visitors and the existing connectivity with Old Erie Canal State park make Green Lakes a great candidate to be included in the Onondaga Escapement Nature Corridor. Due to its status as a state park, the National Natural Landmark status of Round Lake, and the adequate management it receives from the state, designation as a Critical Environmental Area is not necessary.

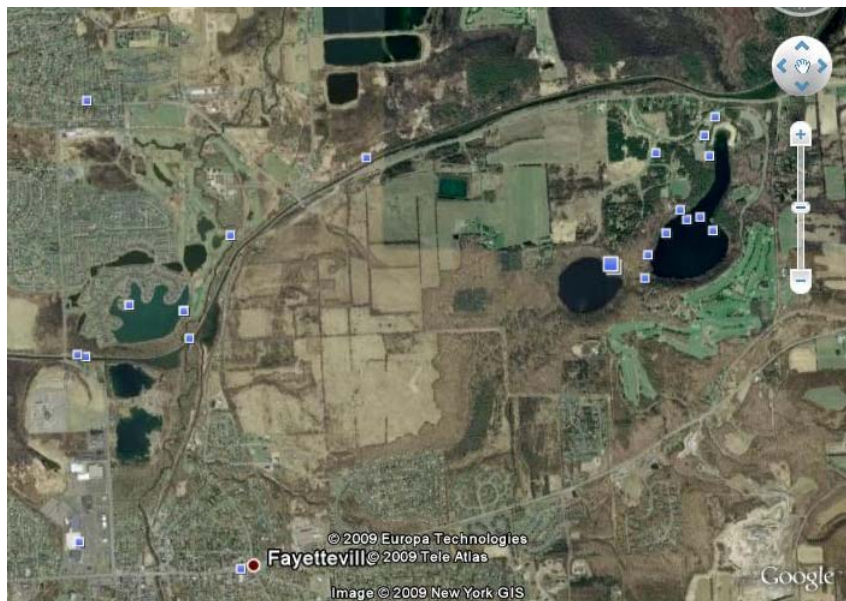


Figure 20. An aerial view of Green Lakes State Park showing Round Lake and Green Lake (source: Google Earth).

RECOMMENDATIONS FOR GREEN LAKES STATE PARK

Promote visitor stewardship of the lakes. The trails around both Green lake and Round Lake are severely damaged from overuse. Expand educational efforts along the Round and Green Lake trail through the use of small interpretive signs posted at areas along the lakeshores that show signs of soil compaction, erosion, and vegetation trampling. The signs should be small (about 8.5" x 11") in size so that they do not negatively impact the scenery of the area. Educating visitors about the unique characteristics of the lakes and encouraging environmental stewardship in visitors using the lake trails can also be accomplished through efforts at the Nature Center and in school programs held in the park. Visitors should be educated on proper trail use etiquette and conservation techniques. In addition, efforts to rehabilitate the vegetation along these trails should be implemented to prevent further erosion and potential impacts on the fragile "reef" ecosystem in the lakes.

Maintain relationships with current State Park managers. The OEG should incorporate existing management strategies and practices used at Green Lakes State Park. Building a relationship between state park managers and OEG organizers is a necessary first step in achieving OEG's greatest potential.

Promote the OEG throughout Green Lakes State Park. The high use of the park creates the ideal opportunity to promote the OEG to like-minded outdoor enthusiasts. This promotion could be easily achieved through a small exhibit within the interpretive nature center and informative brochures.

Encourage Green Lakes State Park as a buffer from stressful modern urban life. Green Lakes State Park is a place where local residents can find peace and serenity in the greater Syracuse area. Modern urban life is taxing, noisy, and demanding. The OEG and Green Lakes State Park should be promoted as a place to escape from daily stress. Advertisements that extol the virtues of recreating at Green Lakes State Park should be placed in high use areas such as on public buses or at the mall.

REFERENCES

- Bureau of Land Management. (1998). Ruby Canyon/Black Ridge Integrated Resource Management Plan.
- Cavalry Club. (2008). "Cavalry Club." Accessed online November 14th, 2008 at www.cavalryclub.com
- Cavalry Club. (2008). "History." Accessed online at www.cavalryclub.org/history.php
- Central New York Regional Transportation Authority, Centro Division. Accessed online at www.centro.org/cnyCentroSchedules.aspx
- Center for Nature Education. (2008). "Know Your City Parks: Elmwood Park." Accessed online at www.takeahike.org/Elmwood.html
- City of Syracuse Department of Parks, Recreation and Youth Programs. (2008). "Elmwood Park." Accessed online at www.syracuse.ny.us/parks/elmwoodPark.html
- City of Syracuse Department of Parks, Recreation, and Youth Programs. Accessed online at www.syracuse.ny.us/parks/aboutUs.html
- "City of Syracuse." Accessed online at www.syracuse.ny.us
- Chesbro, S. & Chesbro, S. (2001). "Split Rock July 2, 1918: The night of the blast." Accessed online October 30, 2008 at home.twcny.rr.com/splitrock/splitrock.html.
- Clark, R. N., & Stankey, G. H. (1979). The recreation opportunity spectrum: A framework for planning, management, and research. Gen. Tech. Rep. PNW-98. Portland, OR: USDA, Forest Service, Pacific Northwest Forest and Range Experiment Station.
- dirtworld.com. (2008). "MTB Trails in New York." Accessed online November 13, 2008 at www.dirtworld.com/trails/traillist.asp?id=34.
- Galloway, D.L., D.R. Jones, and S.E. Ingebritsen. (2000). Land Subsidence in the United States. US Geological Survey. Accessed online at water.usgs.gov/ogw/pubs/fs00165/
- "Green Lakes of Onondaga." Putnam's Magazine.
- Groundspeak, Inc. (2008). "Geocaching - The Official Global GPS Cache Hunt Site." Access online October 25, 2008 at www.geocaching.com

- Kappel, W.M. and Miller, T.S., Hydrogeology of the Valley-Fill Aquifer in the Onondaga Trough, Onondaga County, New York: U.S. Geological Survey Scientific Investigations Report 2005-5007, p. 4.
- Kuehn, D. (ed.). (2004). A Tourism Plan for the City of Syracuse's Parks and Greenspaces. State University of New York College of Environmental Science and Forestry.
- Langbein, W. B. (1976). Hydrology and Environmental Aspects of the Erie Canal (1817-99). U. S. Government Printing Office.
- Lieb, K. (1993). 1993 Landfill gas survey update. Waste Age Magazine, 57-64.
- New York State Department of Environmental Conservation Division of Solid and Hazardous Materials (DSHM). (2008). Active Landfill Gas Recovery Facilities. Albany, New York.
- NYS DEC. §193.3 Protected native plants. Environmental Conservation Law, (§ 3-0301, 9-0105, 9-1503) Accessed online at www.dec.ny.gov/regs/15522.html
- NYS DEC, NYS OPRHP, & NYSDOS. (2006). 2006 NYS Open Space Conservation Plan. Accessed online at www.dec.ny.gov/docs/lands_forests_pdf/osp2006.pdf
- NYS DEC. (2008). "Clark Reservation State Park." Accessed online at www.dec.ny.gov/lands/6002.html
- NYS Office of Parks, Recreation and Historic Preservation. (2008). "New York State Parks: Environmental Management Bureau." Accessed online November 8, 2008 at www.nysparks.com/environ/default.asp
- "Old Erie Canal State Historic Park." Accessed online at www.nysparks.us/sites/info.asp?siteID=31
- Preservation Association of Central New York, Syracuse Then and Now. Accessed online at syracusesthenandnow.org
- Reisem, R. O. (2000). Erie Canal Legacy: Architectural Treasures of the Empire State. The Landmark Society of Western New York in conjunction with the Mohawk Valley Heritage Corridor Commission.
- Senior, J. and M. Townsend. "Healthy Parks, Healthy People" and other social capital incentives of Parks Victoria, Australia. Deakin University and Parks Victoria. (2005). Accessed online at www.interenvironment.org/pa/senior.htm
- Shanahan, D. (2005). *Handbook for the Designation of Critical Areas*.

- Syracuse Metropolitan Transportation Council (SMTC). (2007). "Long Range Transportation Plan." Accessed online at www.smtcmpo.org/lrtp.asp
- SUNY ESF Office of Communication. "ESF Science Corps and Girls Inc. of CNY research pollution at Elmwood Park." SUNY ESF. Accessed online at www.esf.edu/communications/news/2007/08.13.elmwood.htm
- Syracuse City Hall, Office of the Mayor. (2003). "Bioblitz In Elmwood Park". Renewing Syracuse. Syracuse Neighborhood Initiative. Accessed online at www.syracuse.ny.us/pdfs/Renewing%20Syracuse/July2003/July2003page6.pdf
- "The Erie Canal." Accessed online at www.eriecanal.org/OECSHP.html
- The Nature Conservancy. (2008). "Conservation easements: All about conservation easements." Accessed online at www.nature.org/aboutus/howwework/conservationmethods/privatelands/conservationeasements/about/allabout.html
- Town of DeWitt. (2008). "Town of DeWitt: Town board." Accessed online November 4, 2008 at www.townofdewitt.com/?PageID=426
- Town of Onondaga Town Clerk. (2008). "Town of Onondaga Tax Maps." Accessed online.
- United States Fish and Wildlife Service. (2008). "Endangered Species Program: American Hart's Tongue Fern." Accessed online at www.fws.gov/midwest/endangered/plants/amerihtf.html.
- "Water Encyclopedia." Advameg, Inc. 2007 - 2008. Accessed online at www.waterencyclopedia.com/Hy-La/Karst-Hydrology.html
- "Web Soil Survey." (2007). United State Department of Agriculture.
- "Wetland Designation." Accessed online at www.dec.ny.gov/lands/5124.html
- "YMCA Day Camp Iroquois." (2008). Accessed online at www.campiroquois.org.
- Yanuck, E. (1977). Master Plan: White Lake Swamp Preserve. The Nature Conservancy. 112pp.