Genesee Land Trust

Cornell University

Genesee Land Trust Conservation Plan

Department of City and Regional Planning
CRP 689 Strategic Conservation Workshop, Fall 2007

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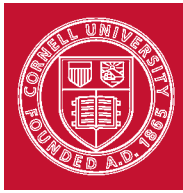

Cornell University

December 2007

Dear Friends:

The City and Regional Planning Department at Cornell University has helped nonprofit organizations overcome planning challenges with technical assistance provided in client based workshops. Over the Fall semester of 2007, nine graduate students undertook the task of creating a Strategic Conservation Plan for the Genesee Land Trust (GLT), based in Rochester, NY. Incorporated in 1989 by a group of local citizens, GLT's mission is "to preserve and protect land within the Greater Rochester area, including waterways, wetlands, farmland, open space, fish and wildlife habitat, and scenic or recreational areas."

The Cornell Team recognized the value of this mission statement by linking it to a series of inventories of important conservation resources. One of the major findings is that the GLT Territory features some of the highest quality farmland in the country. At a regional scale, forests concentrated along the Niagara Escarpment in Monroe and Orleans Counties are worthy of attention by the GLT. Finally, the Cornell Team designed and conducted a scenic resource inventory that builds on the previous work along the Seaway Trail.

Covering over 1.3 million acres, the GLT Territory is a large area for a land trust with a small staff. To help decision makers evaluate potential projects, the Cornell Team developed two suitability models that reflect GLT's broad mission. These models can be used to evaluate the merits of conservation projects, while acknowledging that the final decision rests appropriately with the GLT staff and board of directors. To assist the GLT become more proactive in approaching landowners, the Cornell Team proposes the use of focus areas, which are high priority regional landscapes, as a tool to cultivate long term landowner interest in conservation.

The next five years are crucial for both GLT and the communities within its territory. It is the hope of the Cornell Team that the GLT considers increasing its role in advocating for sound land use practices and inspiring landowners to be stewards of their land. The Cornell Team suggests that an annual review of progress be conducted to monitor the overall progress of the organization and review the effectiveness of the various tools outlined in this plan. The Cornell Team believes this plan will help the GLT deal with changes as an organization and help influence the development patterns in the region. With a plan, the future can be welcomed and not feared.

Ole M. Amundsen III, Visiting Lecturer
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History and Demographics

Introduction

The territory of the Genesee Land Trust (GLT) covers an extensive and diverse landscape. With land in eight counties, the area encompasses 1.3 million acres of glacially-formed terrain surrounding the upstate city of Rochester, New York. The Genesee River winds through the center of the region, flowing north through a series of scenic waterfalls and gorges before reaching the majestic Lake Ontario. Other remarkable features include the historically-significant Erie Canal, miles of migratory bird habitat along the shores of the Lake, and the biodiverse wetlands of the Montezuma Wildlife Refuge. Blanketed with a thick layer of rich glacial till and enjoying a climate moderated by Lake Ontario, the region also boasts some of New York State's most fertile cropland and orchards.

Because the GLT Territory encompasses such a large area (Map 1.1), this report will narrow its scope by focusing primarily on Monroe and Wayne Counties.

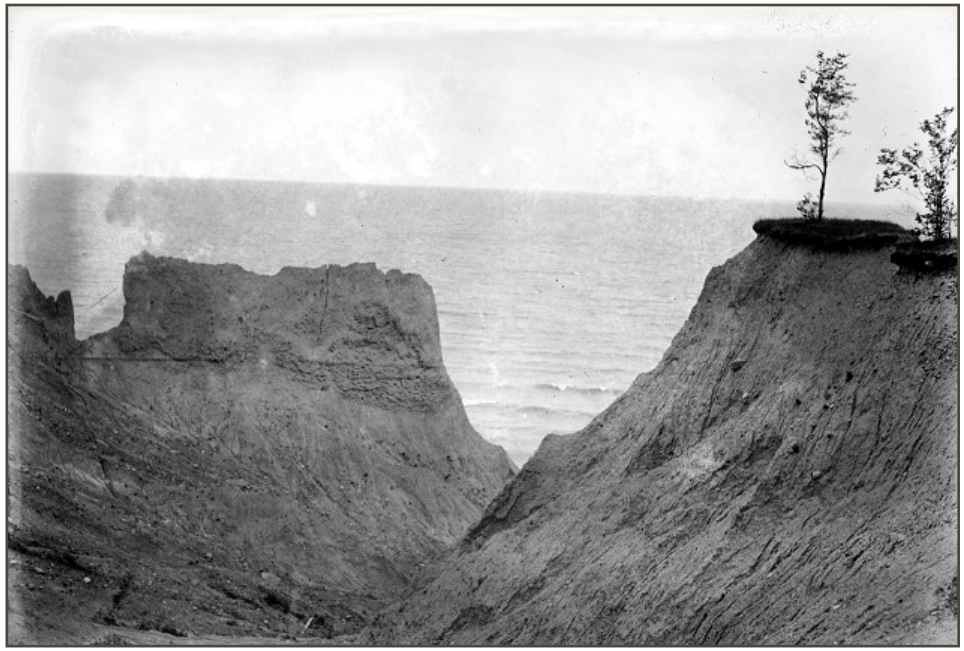


Figure 1.1 The Chimney Bluffs on Lake Ontario have been attracting photographers for a century.

History

In the 1700s, the Seneca Tribe of the League of the Iroquois sparsely inhabited the present-day GLT Territory and used the land primarily as hunting and fishing ground.[1] The end of the century brought European settlers, attracted by the region's fertile land. These settlers established themselves by capitalizing on the area's natural assets. In Monroe County, Rochesterians harnessed the Genesee River to power mills.[2] In Wayne County, settlers built asheries fueled by the area's dense forests to produce potash as they prepared the land for agriculture.[3]

Development of the region continued steadily throughout the initial decades of the nineteenth century, but accelerated drastically in 1825 with the completion of the great Erie Canal. The 363-mile waterway, twice as long as any canal in Europe, connected the Genesee region to eastern markets and New York City, and quickly established the fertile upstate land as the nation's initial breadbasket. In addition to carrying agricultural products to the east, the Canal carried people and ideas to the west. As a result, many social reform movements flourished in Monroe and Wayne Counties, including the abolition movement led by Frederick Douglass, the women's suffrage movement led by Susan B. Anthony, and religious movements such as Mormonism.[4]

By the 1850s, the Genesee region's agricultural and mill town economy was well established and Rochester had come to be known as the Flour City. However, as American expansion continued westward, the region soon found itself competing with even more productive Midwestern cities. Fortunately, with its fertile soils and lake-moderated climate, Rochester was able to transition smoothly to a new agricultural economy based primarily on orchards and seed nurseries. Thus, the Flour City became the Flower City.[5]

Over the following decades, Rochester developed its manufacturing base, initially centered on textile production and food processing, and later transitioning toward more technical industries such as the manufacture of thermometers, gear wheels, dental tools, and

perhaps most famously, optical and photographic equipment. Internationally-known companies such as Bausch and Lomb, Kodak, and Xerox thrived in this latter field and became major employers for the region.[6] Manufacturing, although not as prominent as it once was, continues to be an important component of the area's economy today.

Table 1.1 Select Population Statistics for Rochester, NY and Monroe and Wayne Counties, 1990-2000

	City of Rochester	Monroe County	Wayne County	Monroe & Wayne
2000 Population	219,773	735,343	93,765	823,696
1990 Population	231,636	713,968	89,123	803,091
Population Change 1990-2000	-11,863	21,375	4,642	26,017
Percent Change 1990-2000	-5%	3%	5%	3%

Population / Density

The U.S. Census estimated the 2000 population of Rochester, NY to be 219,773, down from 231,636 in 1990. Despite this 5 percent decrease in the city's population, the combined population of Monroe and Wayne Counties increased over the same time period by approximately 3 percent. It is important to note that Wayne County showed a slightly greater increase than Monroe, perhaps indicating higher rates of growth in areas farther from Rochester (Table 1.1).[7]

Figure 1.2 Lake Ontario's beautiful beaches have pleased generations of bathers.

A 2003 report published by the Brookings Institute compared these demographic trends to corresponding changes in land cover and identified a phenomenon it termed "sprawl without growth." Focusing on the entire upstate New York region over the period of 1982 to 1997, the study found that, while population grew by only 2.6 percent, the amount of urbanized land increased by 30 percent. As a result, population density declined throughout upstate. The Rochester/Finger Lakes region was not an exception, exhibiting an increase of 50,000 acres of urbanized area and a corresponding 14.2 percent decline in density (population per urbanized acre) over the time period.[8]

Map 1.2 presents population change in the GLT Territory between 1970 and 2000 by municipality. The decline of the City of Rochester and a few other towns contrasts sharply with the strong growth of peripheral towns. It indicates that population increase is especially high to the east and southeast of the city, as well as along the western boundary of Monroe County.[9]

Employment / Commuting

Despite the historical importance of agricultural employment in Monroe and Wayne Counties, agriculture is no longer a major employer in the region. According to the U.S. Census, in 2006, less than 2 percent of the counties' labor force was employed in the sectors of agriculture, forestry, fishing, hunting, and mining

combined. The wholesale trade, manufacturing, and retail sectors combine to account for about 30 percent of total employment in the two counties, and the educational, health, and social services sectors account for over 25 percent of total employment in the counties.[10]

Figure 1.3 Apple pickers working an orchard's abundant harvest.

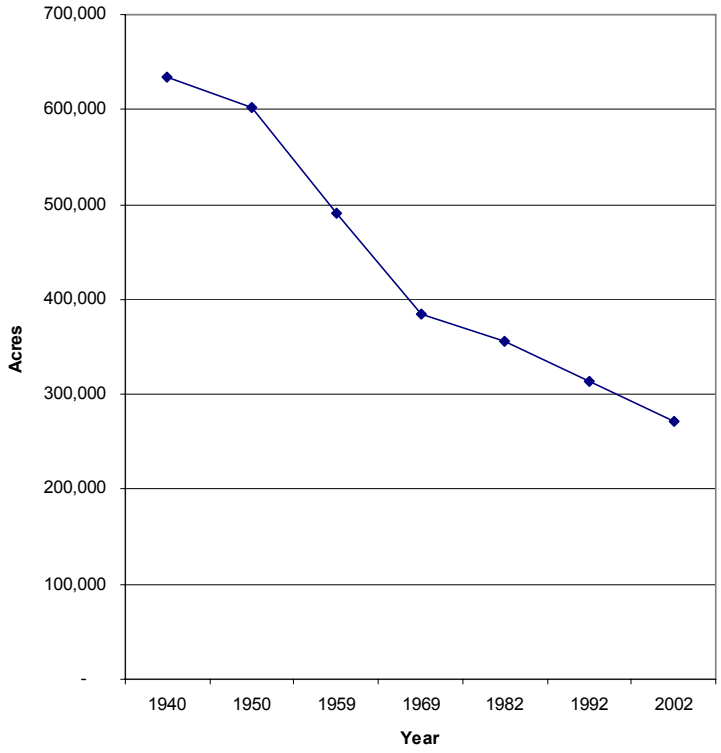
Many internationally-known companies are headquartered in Monroe County, namely Eastman Kodak, Bausch & Lomb, Constellation Brands, and Paychex. Another Rochester-based company, Xerox, recently moved its headquarters out of the region, but continues to maintain offices and manufacturing facilities in the county. Rochester also houses regional business chains, such as Wegmans Food Markets, Robert Communications, the Sutherland Group, and the major fashion label, Hickey-Freeman.

With a high proportion of its employment concentrated in the optical and imaging fields, Rochester's economy has been impacted by industry-wide shifts toward digital technology. As employment opportunities decrease in these sectors, the area's educational and health sectors are becoming increasingly important. Today, Kodak is no longer Rochester's number one employer, having been replaced by the University of Rochester.[11]

As the composition of employment in the Rochester area has shifted, so has its geographic distribution. The above-mentioned Brookings report, "Sprawl without Growth: the Upstate Paradox," notes that decentralization is not limited to population and housing, but also includes businesses. The study found that, although there was a net increase in business establishments in the Rochester area between 1994 and 1999, there was actually a decline in the number of businesses within the city limits. Business growth in the region was overwhelmingly concentrated outside the city.[12]

The decentralization of the GLT Territory's population and businesses may be expected to impact commuting times. As the population moves away from the City of Rochester, commuting times may be expected to increase. However, if businesses are also shifting away from the city, this trend may be less apparent. An analysis of U.S. Census data on commuting between 1980 and

Chart 1.1 Acres of Farmland, Monroe and Wayne County, 1940-2002



Source: U.S. Department of Agriculture. 1940-2002. Census of Agriculture. Available at: http://www.agcensus.usda.gov/

Table 1.2 Agricultural Land Statistics, Monroe and Wayne County, 1987 – 2002

Year		Monroe Co.	Wayne Co.	Total
	Land Area (Acres)	426,801	391,657	818,458
2002	Total Farmland (Acres)	106,561	165,213	271,774
	Percent Farmland	25%	42%	33%
	Number of Farms	631	904	1,535
	Average Farm Size (Acres)	169	183	177
1997	Total Farmland (Acres)	113,075	186,635	299,710
	Percent Farmland	27%	48%	37%
	Number of Farms	603	1,013	1,616
	Average Farm Size (Acres)	188	184	185
1992	Total Farmland (Acres)	110,150	174,627	284,777
	Percent Farmland	26%	45%	35%
	Number of Farms	511	919	1,430
	Average Farm Size (Acres)	216	190	199
1987	Total Farmland (Acres)	134,670	191,309	325,979
	Percent Farmland	32%	49%	40%
	Number of Farms	682	1,064	1,746
	Average Farm Size (Acres)	197	180	187

2000 reveals that Monroe County commuting times have in fact decreased, with the majority of the 2000 population traveling to work in less than 25 minutes. Commuting trends in Wayne County are slightly more complex, but show a general increase in commutes that are 35 minutes or longer. This trend might be explained by an increase in Wayne County workers who commute to Rochester.[13]

Demographics and Income

The inhabitants of the GLT Territory are predominantly Caucasian. Of the eight counties in the region, Monroe County has lowest proportion of Caucasian residents, at approximately 79 percent. African Americans make up another 14 percent of the county's population, and are generally concentrated inside the City of Rochester. The Caucasian population of Wayne County is approximately 94 percent.[14] The 2006 median household income for Wayne County was $47,607 and for Monroe County was $47,339. These numbers are somewhat lower than the state and national averages of $51,384 and $48,451, respectively.[15]

Agriculture

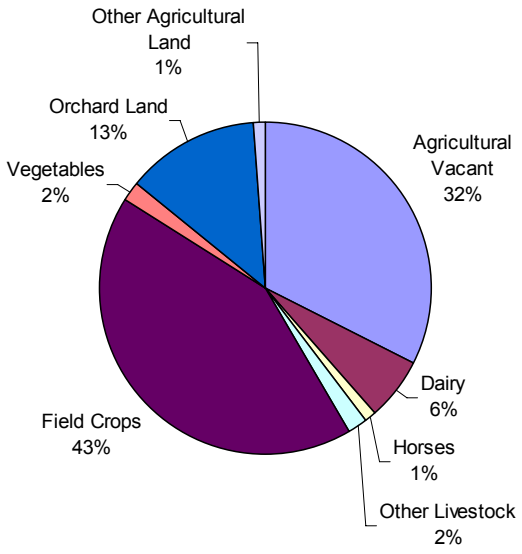
As discussed above, agriculture no longer plays the dominant employment role it once played in the region. Despite this, farming is still a prominent aspect of the physical landscape. At the time of

Figure 1.4 Waterfowl banding has helped ornithologists track seasonal migrations throughout the years.

the most recent Agricultural Census (2002) 33 percent of Monroe and Wayne Counties was listed as agricultural land. This number declined from 40 percent in 1987, representing a conversion of 54,000 acres of farmland to non-agricultural uses over the 15 year period (Table 1.2).[16] This is consistent with a general decrease in farmland over the past several decades, as presented in Chart 1.1. Interestingly, almost one-third (32 percent) of agricultural land in 2002 was listed in property assessment data as vacant, suggesting that it may not currently be actively farmed (Chart 1.2).

Field crops account for 43 percent of the farmland acreage in Monroe and Wayne Counties. Orchard crops make up an additional 13 percent, and dairy farms another 6 percent. Although field crops dominate the landscape in terms of acreage, fruits and vegetables are the area's most significant crops economically. In 2002, Monroe County ranked fourth in the state for dollars of vegetables produced. That same year, Wayne County ranked first in the state for dollars of fruits and nuts produced

Chart 1.2 Percentage of lands in each property class, Monroe and Wayne County, 1940-2002



History of Planning

"Thus the founders of Rochester, who laid out the first plan for a comfortable village in 1812, found themselves within a decade busy raising the more ambitious framework of a bustling market town. The Erie Canal brought a sudden commercial stimulus and Rochester became in the twenties America's first boom town. A heated debate ensued between those who wished to plan for the future city and those who preferred to cling to the old village traditions. But the commercial revolution brought to Rochester by the canal was not to be side-tracked, and within three decades of its settlement Rochester had become the Flour City, center of the chief northern grain producing area of the day."

Blake McKelvey, Historian[17]

Given its history of dramatic economic shifts and powerful external economic stimuli, planning for growth and development has been an important concern in the GLT Territory since the early 1800s. By the 1990s, all municipalities in the GLT Territory had adopted zoning ordinances[18] , and today, most have developed some form

Figure 1.5 Agriculture lands support the local economy and create community ties.

of comprehensive plan (Map 1.3). Nearly all of these plans express a desire to conserve, protect, preserve, or otherwise maintain their community's rural character, agricultural land, open space, or environmental resources.

For example:

- The Town of Hamlin seeks to balance "environmental forethought with a desire to maintain the Town's rural heritage, character, and charm while providing reasonable development policies."[19]

- The Town of Mendon's primary guiding principle is to "preserve the rural, open character of the community."[20]

- The Town and Village of Palmyra seek to "balance residential and business development with the protection of natural resources, agricultural land, and rural character."[21]

- The Town of Stafford plans to maintain its "unique rural character and small-town atmosphere," and to "support and protect [its] agricultural lands."[22]

The City of Rochester, incorporated in 1834, has had formal zoning in its City Code since 1919. In 1964, the city adopted its first Master Plan, which was superseded in 1999 by the Rochester Renaissance 2010 Plan[23], a product of the city's unique Neighbors Building Neighborhoods (NBN) program. Established in 1994, NBN divides the city into 10 sectors, and empowers citizens of each sector to develop a community vision statement and a sector action plan for their neighborhood.[24] The components of these 10 plans were combined to create the Renaissance 2010 Plan, which identifies several goals in the area of "Environmental Stewardship." Among these goals are to "Preserve and enhance our waterways, parks, urban forest, recreation and open space areas," to "Create an environmentally aware community that practices the values of environmental stewardship and responsibility," and to "Reclaim designated brownfields and other contaminated land, facilities, and waterways for useful productive development."[25]

Planning related to the conservation of agricultural land has been a growing priority since the early 1970s. In 1972, the Town of Perinton enacted Monroe County's first easement program. Since then municipalities within the county have instituted a variety of protection programs, ranging from voluntary easement programs to incentive zoning to disclosure notice requirements. Most townships have land in agricultural districts, and Monroe County has a Farmland and Agricultural Plan, prepared in 1999.[26]

Wayne County also has an Agricultural and Farmland Protection Plan, prepared in 1997, which emphasizes protecting farmland in the face of growing development pressures. In particular, the plan discusses the successful implementation of Purchase of Development Rights (PDR) programs in Monroe County as a potential model for Wayne County's conservation strategy. These types of programs are discussed in greater detail in Chapter 6.

Despite the considerable body of planning that has been undertaken in the GLT Territory, municipal-level planning in upstate New York is notoriously disjointed, and planning bodies often lack the funding required to implement their plans.[28] Fortunately, land trusts can be effective organizations for handling what government planning cannot, and they are particularly well-equipped to assist with goals related to the protection of open space, environmental assets, and rural character. In 1989, the Genesee Land Trust emerged to fill this role in the Greater Rochester area. Through the acquisition of property and development rights and the establishment of innovative partnerships with local governments, individuals, and private groups, the GLT has protected many important parcels throughout its territory and continues this important work today. [29]

"...planning for growth and development has been an important concern in the GLT Territory since the 1800's."

Conclusion

"...the GLT will become increasingly important in the establishment of successful and lasting conservation programs."

The historical development of the GLT Territory has been closely tied to its physical landscape. The region's fertile soil, unique climate, and glacial topography, along with water resources, such as Lake Ontario, the Genesee River, and later the Erie Canal, all strongly influenced the economic growth of the area. Despite a general economic shift away from agriculture and toward the manufacturing and service sectors, the ecological services and aesthetic value of the area's physical landscape remain important to the GLT Territory and its residents.

Although the region's population growth in the first decade of the twenty-first century is minimal, conversion of natural and agricultural land continues at high rates. This "sprawl without growth" presents an important challenge to those seeking to maintain the characteristics of the physical landscape that are an important part of the area's economic history, future sustainability, and quality of life.

Many of the GLT region's municipalities have acknowledged this challenge and begun to address it through comprehensive planning efforts; however, these efforts have been disjointed and sometimes overshadowed by instances of inter-municipal competition. This lack of coordination has undermined the effectiveness of many conservation programs. As "sprawl without growth" continues to threaten the GLT Territory's natural and agricultural landscape, municipal cooperation and the efforts of non-governmental entities like the GLT will become increasingly important in the establishment of successful and lasting conservation programs.

Figure 1.6 An old photograph of a country lane shows the lasting value of a beautiful scenic cooridor.

Endnotes

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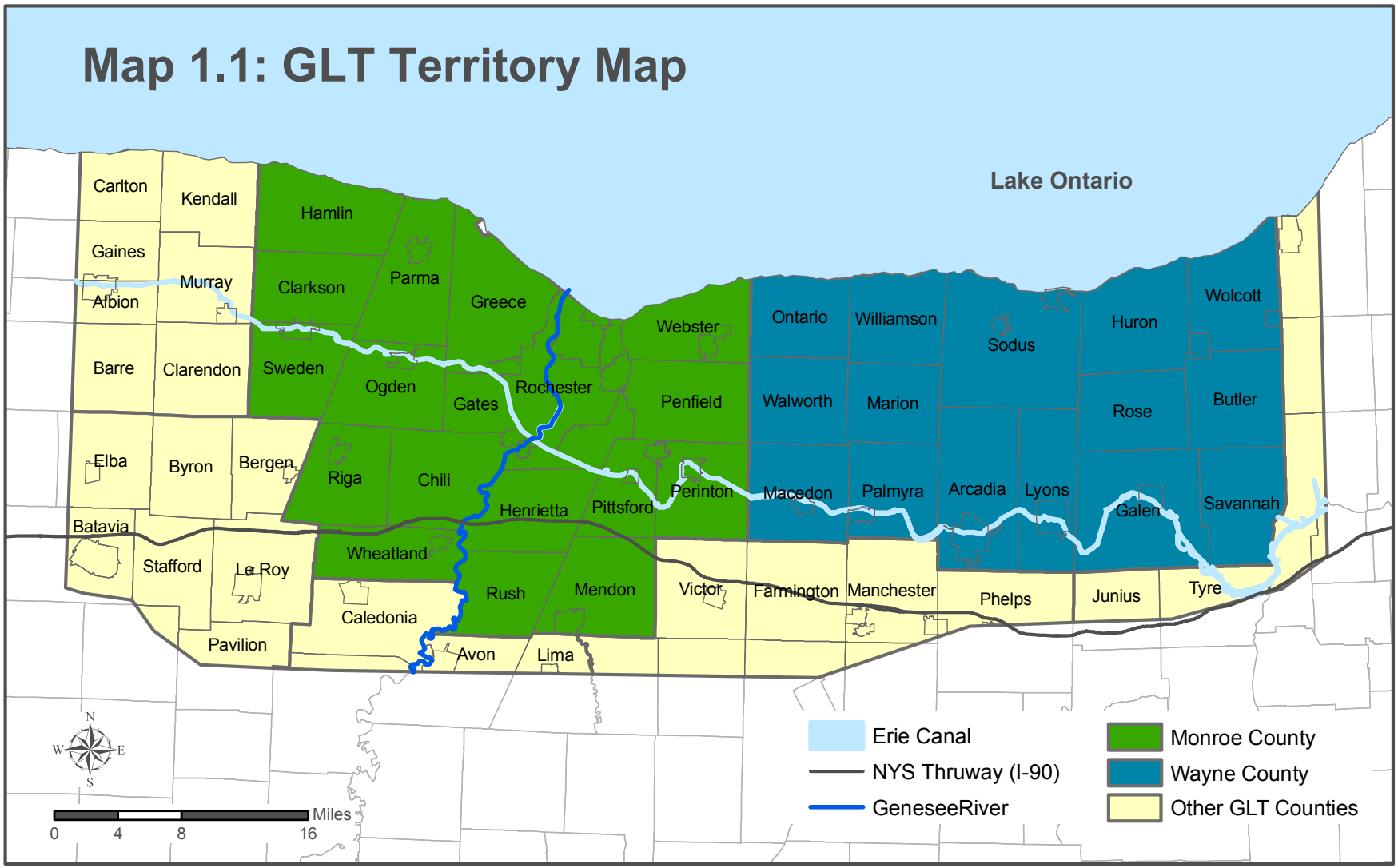
[29] Genesee Land Trust. Official Website. Online. http://www.geneseelandtrust.org, accessed 18 September 2007.

[30] Pendall.

Map 1.1: GLT Territory Map



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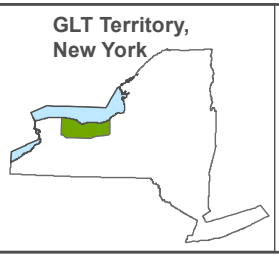
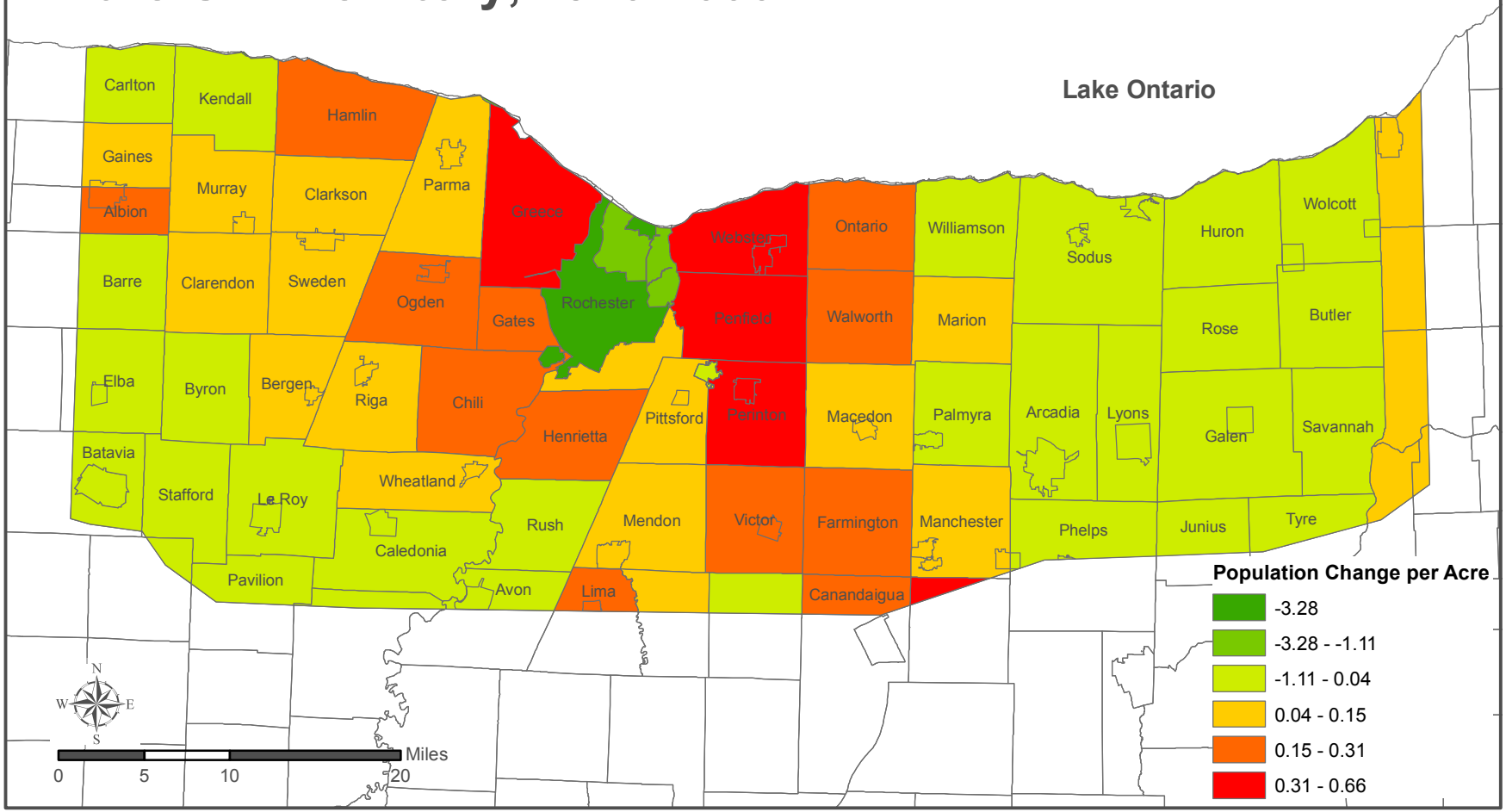


GLT Boundary source: Town of Greece
Municipal Boundaries source: CUGIR
Erie Canal source: Tug Hill Commission
NYS Thruway source: CUGIR

Map created by Strategic Conservation Planning Workshop,
Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 1.2: Population Change per Acre in the GLT Territory, 1970-2000



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GLT Territory, New York

GLT Boundary source: Town of Greece
Municipal Boundaries source: CUGIR
Population Data: US Census, 1970, 2000

Map created by Strategic Conservation Planning Workshop,
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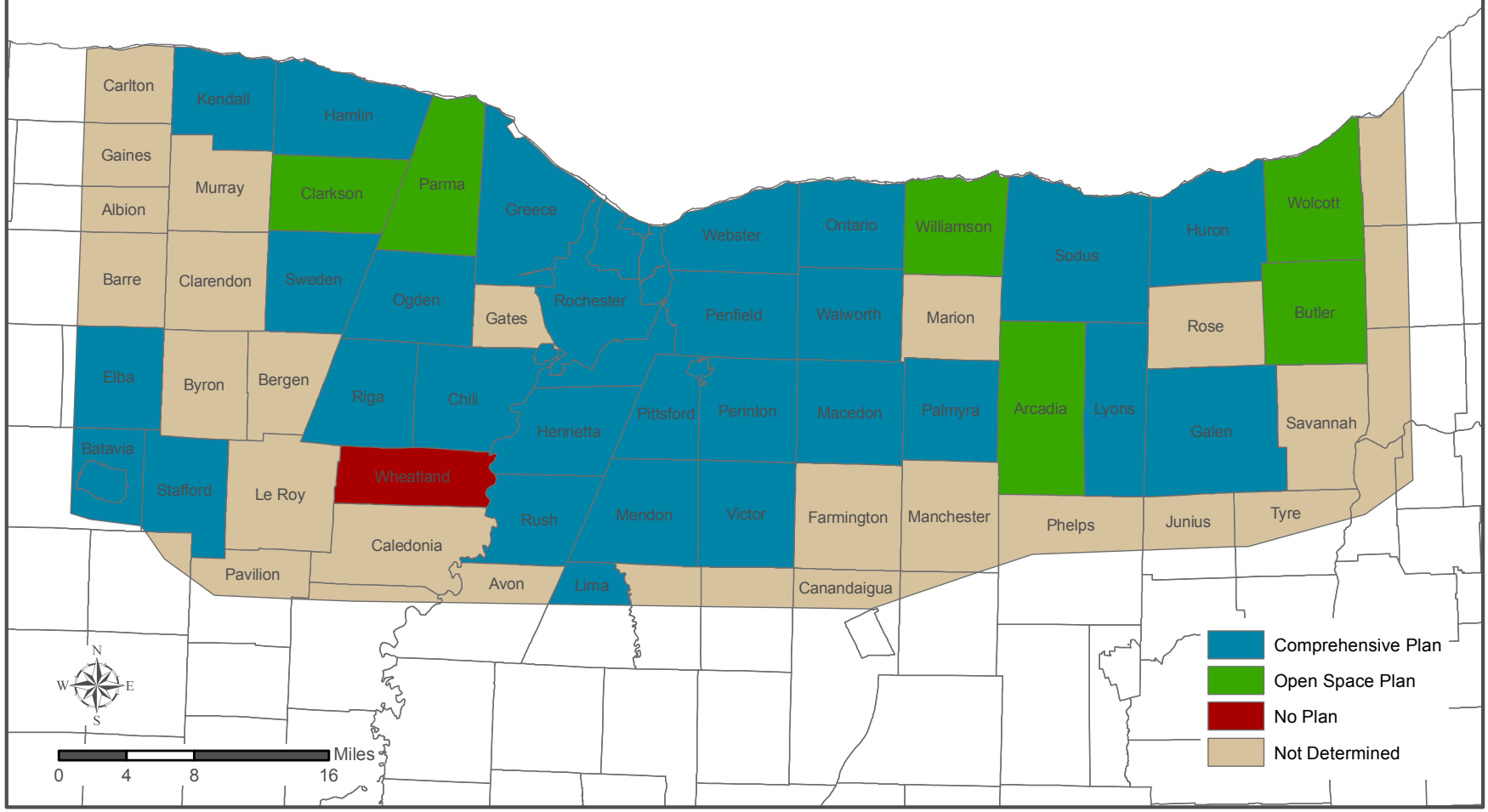
Map 1.3: Comprehensive Planning by Municipality, 2007



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GLT Territory, New York

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Natural Resources

Introduction

The GLT Territory extends into eight counties, but the majority of its acreage lies in Monroe and Wayne Counties. Geologically similar, these counties both feature abundant rich soils and prime farmland, however the similarities end there. The City of Rochester dominates a large part of Monroe County, while Wayne County remains predominantly rural. As a result, Wayne County retains the majority of the GLT Territory's species rich areas, as well as most of its larger, undisturbed tracts of important ecological communities. Despite its rural nature, Wayne County is losing prime farmland and its environment faces threats similar to those faced by Monroe County. The increasing urbanization of lands in the GLT Territory presents both opportunities and challenges for conservation. By identifying existing ecological conditions in the GLT Territory, this chapter will enable decision-makers to think critically about the future and make informed land conservation decisions.

Figure 2.1 Stream corridors such as this one allow wildlife to travel between forested patches and provide recreational opportunities for community members.

Geology

The geology of Monroe and Wayne Counties is the result of a massive glacial retreat occurring 10,000 years ago. As the glaciers scraped their way across the GLT Territory, they left their mark on the landscape in the form of drumlins, kettle holes, eskers, and moraines. Drumlins, which resemble north-pointing raindrops, are particularly prominent in the GLT Territory. In addition to scraping the landscape, the quickly retreating ice sheets left behind deposits ranging in size from fine sand to large boulders.

The bedrock of the GLT Territory consists of soft but compressed shale, embedded with alternating layers of weather-resistant rock. Over the centuries, ice, wind, and water have carved this bedrock into unique cliff formations and deep gorges. The emergence of the City of Rochester is due largely to these geologic forces, which created the powerful waterfalls that spurred the nascent city's economy.

Existing Ecological Conditions

Water Resources

Aquifers

An aquifer is an underground region of permeable rock layers in which the water is either "flowing" or relatively stationary. Unconfined aquifers are found relatively close to the surface and are characterized by water flowing through porous rock. This form of aquifer receives its water recharge through the lands positioned vertically above the aquifer. When water is relatively stationary beneath the surface, resembling a reservoir, it is a confined aquifer. This form of aquifer receives its water recharge from a great distance and is "dammed" by an impermeable layer of rock or clay. The New York Bureau of Water Supply Protection classifies aquifers into confined, unconfined, and unknown. The water quality entering the recharge zone dictates the viability of the aquifer. In the GLT Territory, there are 329,622 acres of aquifers, which underlie 25.3 percent of the area. Of this, 61.6 percent are confined aquifers and 36.4 percent are unconfined (Map 2.1)

Figure 2.2 Extensive freshwater marshes offer nesting habitats for birds and waterfowl, habitat for fish and other aquatic wildlife, and scenic beauty to the GLT Territory.

Wetlands

Wetlands are environmentally, ecologically, and economically integral natural systems. Also known as marshes, bogs, and swamps, wetlands are the home to highly specialized (endemic) species and extraordinarily complex ecosystems. Wetlands are also natural water purifiers, filtering out pollutants and excessive nutrients. Lakes, streams, and rivers rely on wetlands to absorb stormwater runoff and purify incoming waters. Humans benefit from the ability of wetlands to retain and clean our drinking water. The New York State Department of Environmental Conservation defines four classes of wetlands in the state. These classes indicate the benefits of wetlands provided to the ecosystem as well as to manmade systems. Over 80 percent of wetlands in Monroe and Wayne Counties are classified as wetlands "of greatest importance" which includes Class I and II wetlands.

Rivers and Streams

The entire territory of the GLT lies within the Lake Ontario watershed and contains a network of 2,939 miles of moving water. The largest river in the watershed, running northward from Pennsylvania and through Rochester, is the Genesee River. The Genesee's rich floodplain and large waterfalls allowed the "Flour City", Rochester, to boom. Another influential surface water body is the Erie Canal. The Canal incorporates many of the local streams surrounding it, diverting the streams from their natural paths, and leading to an unusual water network in the region. Lake Ontario forms the northern border of the GLT Territory. The riparian corridors next to the lake provide both shelter and forage for migratory birds before they begin the flight across the lake. A major goal of water resources management in the Lake Ontario watershed is the restoration of the once-thriving salmon fishery. Several of the streams and rivers draining from the GLT Territory into Lake Ontario were once important salmon spawning areas.

Soils, Farmland, and Agriculture

Soils

The soils in the GLT Territory are of especially high quality. The best draining soils, Class I and Class II, comprise over 68 percent of the land, or 888,237 acres. As seen in Map 2.2, an east to west swath of well and moderately drained soil spreads through the center of the territory. This area is loosely correlated to the orientation and location of the low lying areas through which the Erie Canal flows.

> "The emergence of the City of Rochester is due largely to these geologic forces, which created the powerful waterfalls that spurred the nascent city's economy."

Prime Farmland and Agriculture

Soils must meet certain requirements to be classified as prime farmland. The Natural Resources Conservation Services uses soil type,

land use, frequency of flooding, irrigation, water table, and wind erodability among many other criteria to make soil class designations. Two other important classifications include "prime farmlands if drained" and "farmlands of statewide importance." In Monroe and Wayne Counties, 47.9 percent of all lands meet the standards of prime farmlands (Map 2.3). From 1992 to 2001, the prime farmlands being used for agriculture shrunk nearly 10 percent, from 65.3 percent to 55.8 percent. Conversely, development on prime farmlands increased just over 6 percent, from 13.6 percent to 19.8 percent, over the same time period. All farmlands in Monroe and Wayne Counties have been decreasing in number and acreage over the last several decades.

Figure 2.3 The rich agricultural lands of the GLT Territory produce abundant fruits, vegetables, and row crops like this farmer's autumn cabbage crop.

The area's high quality soils, combined with Lake Ontario's moderating effect on ambient temperatures, make the GLT Territory one of the most productive agricultural regions in the country. The region's history rests on the shoulders of centuries of successful agricultural practice, and agriculture remains important to the region today. Wayne County currently provides New York State with at least one-third of its apples annually. Monroe County ranks in the top 50 producers nationally of both apples and cherries. Other vegetable crops such as corn, onions, potatoes, as well as dairy and grain, compose the remainder of the agricultural landscape. As noted in Chapter 1, agriculture continues to be a dominant land use in the region.

Agricultural Districts

The New York State Agricultural District Law governs preservation of agricultural lands of high importance and quality throughout the state, primarily through the designation of Agricultural Districts. Agricultural Districts are overlay zoning districts applied at the county level for the protection and promotion of agricultural activity in the county.[1] In Monroe County, there are five Agricultural Districts identified by parcel, totaling 131,411 acres (Map 2.4). In Wayne County there are nine districts, soon to be consolidated into four, totaling 312,505 acres. These agricultural districts provide farmers with multiple benefits including limits on property taxes, an agricultural land use assessment, and protection under New York State Right to Farm legislation.

Land Cover

Spanning eight counties and over 1.3 million acres of land, the GLT Territory includes a wide spectrum of land cover types, or land uses. An analysis of the 2001 United States Geological Survey (USGS) reveals that pastures and cropland dominate the GLT Territory (Map 2.5; Technical Appendix). Because the USGS derives its data from satellite imagery, it may overestimate the extent of agricultural land; however, the survey is still a useful tool for analyzing the relative extent of various land cover types and mapping their general locations. Forested lands follow closely behind pastures and cropland as the next largest category of land cover. Forested land covers approximately 21 percent of the GLT Territory and includes

deciduous trees, evergreens, oaks, and sugar maple mesics, as well as other less populous hardwood and softwood varieties. The third most substantial land cover within the GLT Territory is developed land. A combination of urban and suburban land composes over 15 percent of the GLT Territory.

Moving beyond aggregated land covers and examining the individual characteristics of both Monroe and Wayne Counties reveals an ecological "tale of two counties." The counties are fairly close in size, with Monroe covering 426,801 acres and Wayne covering 391,656 acres; however, land use differs dramatically between the two (Technical Appendix). Dominated by the City of Rochester, over 30 percent of Monroe County is classified as developed land. By comparison, only 7 percent of Wayne County is categorized as developed. Consistent with this low percentage of developed land, Wayne County has higher percentages of farmland, forested land, and wetlands than does Monroe County. These differences in land cover undoubtedly will have important ramifications for the GLT in terms of targeting future conservation areas, combating unchecked urban growth, and protecting agricultural lands in its territory.[2]

Figure 2.4 Lush tree canopies provide shelter for wildlife, cleanse polluted air, and lower city temperatures in summer.

Species Richness

Species richness, the number of species present in a given area, can be inferred based on the area's land cover. More specifically, by counting the number of species present in an area with a certain type of land cover, one can infer that a comparable number of species is present in other areas with the same land cover type. This technique essentially estimates the potential number of species an area may support. As such, it should be treated as one among many indicators to measure the species inhabitation of a land area. Because the richness data contained in this report dates to 1996, the analysis and maps should be cross-checked with current field work as more recent data become available.

The species richness analysis conducted for the GLT Territory reveals a diverse range of species richness across the service area (Map 2.6; Technical Appendix). Approximately 50 percent of the GLT Territory is classified as Low in terms of species richness, 8 percent contains Very High levels of species richness, and less than 2 percent of the land supports only a Very Low level of species richness.

Disaggregating the data to the county level produces some interesting statistics. As stated, 8 percent of the GLT Territory supports high levels of species richness, but almost one-half of this 8 percent is contained solely within Wayne County. Further, Monroe County contains 36 percent of the land identified as Low in terms of species richness which is largely attributable to Rochester (urban land bears a low richness classification). Another analysis compares the species richness levels with protected lands to discern if conservation efforts are adequately targeting areas with high levels of species richness. Performing this analysis reveals that over 10 percent of the protected lands contain Very High levels and nearly 30 percent of protected lands encompass High levels of species richness (Technical Appendix). Much like the land cover data, knowing the varying levels of species richness can help guide the GLT in its future conservation efforts.[3]

Important Bird Areas

Important Bird Areas (IBA) is an official designation placed on sites that represent critical habitats for the survival and conservation of birds.[4] Most Important habitats must meet specific criteria, but are generally defined as the largest, least fragmented patches of habitat that support the highest richness of species with the greatest chance of long-term protection.[5] There are nine IBAs designated within the GLT Territory (Map 2.7). Five of the IBAs correspond neatly with identified wetland areas, with the largest IBA situated in and around the Montezuma Wetlands Complex. Three IBAs are situated within the publicly-owned Rochester area urban parks, which, while subject to heavy human use, provide protection for nesting and migratory birds. The identification and conservation of IBAs within the GLT Territory is critical because of the large number of migratory birds that seasonally inhabit the area.

Figure 2.5 Delicate monarch butterflies migrate each autumn through the GLT Territory, feasting on pollen provided by meadow and field flowers, such as this goldenrod.

Rare, Threatened, and Endangered Species

One hundred and seventy-four sites within the GLT Territory host rare, threatened, or endangered species including vertebrate animals, freshwater mussels, dragonflies, and vascular plants. Map 2.8 depicts these species as points showing the general location of the species and the type of listing designated by the State of New York. Rare, threatened, and endangered species are spread throughout the GLT Territory, but, interestingly, their numbers are concentrated in Monroe County, where over 40 percent of the species can be found.

Land Protection Analysis

Protected Lands

Within the GLT territory, 45,748 acres of land are permanently protected (Map 2.9). The largest category of protected lands is land owned by public agencies. Both federal and state conservation agencies, such as the US Fish and Wildlife Service and the New York Department of Conservation, have significant land holdings in the GLT service territory.

Large swaths of the GLT Territory currently do not have any protected lands. Most of the permanently protected land lies within Monroe County, particularly in the Rochester metropolitan area. Many small parks are located in the Rochester area; most are owned by local governments but some are privately owned. These semi-protected lands supplement the permanently protected areas, and because they are interspersed throughout the developed areas of Monroe County, they represent a significant source of protected land. The GLT protects 3.5 percent of all permanently protected lands within the GLT Territory. This amounts to approximately 1,600 acres, with 48 percent in Monroe County and 52 percent in Wayne County.

Semi-Protected Lands

Agricultural Tax Reduction Program

One of the more popular tax reduction programs utilized in the GLT Territory is found under Section 305 of the New York Agricultural and Markets Law. This program reduces the assessed value of

agricultural land both within and outside of agricultural districts. The land must contain at least seven acres that have been used for the production and sale of crops, livestock, or livestock products for at least two years. Gross sale limitations depending upon the size of the parcel also apply.[6] In Monroe County, nearly 86,000 acres are enrolled in this program, covering 20 percent of the entire county (Map 2.10;Technical Appendix). In addition, almost 40 percent of Wayne County, totaling 155,000 acres, benefits from this assessment program (Map 2.11).

Forestry Tax Reduction Program

Another important tax assessment program is Section 480a of the New York Real Property Tax Law. This program encourages long-term forest management by offering reduced tax assessments to owners who adhere to a DEC-approved forest management plan and meet size and tenure requirements.[7] While this program does not enjoy the staggering popularity of Section 305, 308 acres are protected in Monroe County and 645 acres in Wayne County (Technical Appendix). Nonetheless, it is another viable tool for land conservation that could help direct future land acquisitions.

Figure 2.6 Mixed hardwood forests shelter diverse plant and animal communities.

Environmental Threats

Climate Change

One of the most significant threats to water resources in the northeastern United States, and the GLT Territory, is climate change. According to the United States Global Change Research Program, an increase in both temperature and precipitation will occur in the northeast.[8] As a result, water resources are threatened by an intensified and more dramatic flooding potential. Local salmon restoration efforts face a threat of increased water temperatures, further stifling the salmon's natural spawning cycle. As a result of climate change, the extremely sensitive ecological balance within wetlands will face changes in air temperature, water temperature, and water quantity, possibly untangling intricate ecosystems.

Climate change threatens the viability of certain forms of agriculture and forests in the GLT Territory as well. Increasingly saturated soils and warmer temperatures will result in a shift in the variety of productive crops. For instance, the climate may become too warm for profitable apple production. Flooding of lowland fields and muckland farms will be an increased risk as well. In addition, sugar maple mesic forests will recede north to the cooler climate.

Unpredictable patterns caused by climate change could make it difficult to plan future land acquisitions and may even cast doubt on current land holdings. Will a beautiful sugar maple mesic forest today be replaced by another species in a few decades? Climate change is a significant threat to consider while planning for the future.

Urban Sprawl

The most recognizable threat to the landscape is urban sprawl. A comparative analysis of the 1992 and 2001 land coverages reveals that the amount of developed land (including all levels of intensity) grew by over 5 percent (Map 2.12; Technical Appendix). At first glance, this growth may not appear particularly dramatic. However, it is important to remember that population growth was minimal over this period. Furthermore, an incredible 72 percent of this growth occurred within Monroe County alone (11 percent occurred in Wayne County, and the remaining 17 percent is spread out among the other six counties in the GLT Territory). In sum, stagnant population growth is consuming an increasing amount of land and at disproportionately higher rates in Monroe County.

Land use changes also threaten the river systems of the GLT Territory. Rivers require buffers to protect the water quality. There are 68,772 acres of buffer lands within the territory. Between 1992 and 2001, the GLT Territory lost 8,310 acres of protective forest buffer lands. Furthermore, a 2,047 acre increase in developed land breached the territory's stream buffers.

On a daily basis, encroaching development threatens the agriculture industry in Wayne and Monroe Counties. These daily threats include complaints of farming practices, loss of profits, and other employment opportunities in nearby communities. Additionally, farmers face the temptation to subdivide lands as declining profits and increasing land values intensify development pressure. During this period of population density decrease, the GLT Territory lost 495,784 acres (8.5 percent) of agricultural lands.

Reduction in Forested Land

A less recognizable threat is the change in forested land. From 1992 to 2001, the amount of forested land in the GLT Territory decreased from 28 percent to 21 percent. While a 7 percent reduction may not seem significant, a visual representation of this change paints a different picture. As revealed on Map 2.13, forest losses and gains are scattered across the entire GLT Territory in no discernable pattern.

Figure 2.7 Agricultural lands with woodland borders provide mixed habitat and scenic views.

Conclusion

The GLT Territory encompasses a geographic area that hosts a range of land covers, geographic features, and biodiversity. Given these complexities and the sometimes disparate characteristics of the eight counties within the Territory, this chapter highlights the need for creative and multi-faceted approaches to land conservation. With an enhanced grasp of the natural resources in the Territory, the GLT can better engage landowners and local governments to promote a unified conservation effort.

Endnotes

[1] Wayne County. 1997. Wayne County Agricultural and Farmland Protection Plan.

[2] Monroe County. 1999. Monroe County Farmland Protection Plan.

[3] New York State Department of Agriculture and Markets. 2007. Farmer Benefits and Protections, Agricultural Districts. On-line. http://www.agmkt.state.ny.us/AP/agservices/agdistricts.html, accessed 19 September 2007.

[4] Land cover is derived using satellite and remotely sensed imagery; therefore, land cover is a good predictor of land use, but inherently contains errors due to this data collection method.

[5] USGS Land Coverage. 1992, 2001. The USGS Land Cover Institute. On-line. http://landcover.usgs.gov/landcoverdata.php, accessed 15 September 2007.

[6] USGS Land Coverage. 1996. GIS File. Compliments of Jonathan Sinker.

[7] Liner, Jillian. 2004. Audubon Uses GIS to Identify Important Bird Areas in New York State, ArcNews Online. On-line. http://www.esri.com/news/arcnews/summer04articles/audubon-uses.html, accessed 18 September 2007; Burger, Michael and Jillian Liner. 2005. *Important Bird Areas of New York: Habitats Worth Protecting.* Albany, NY: Audubon New York, 3.

[8] Liner, 3.

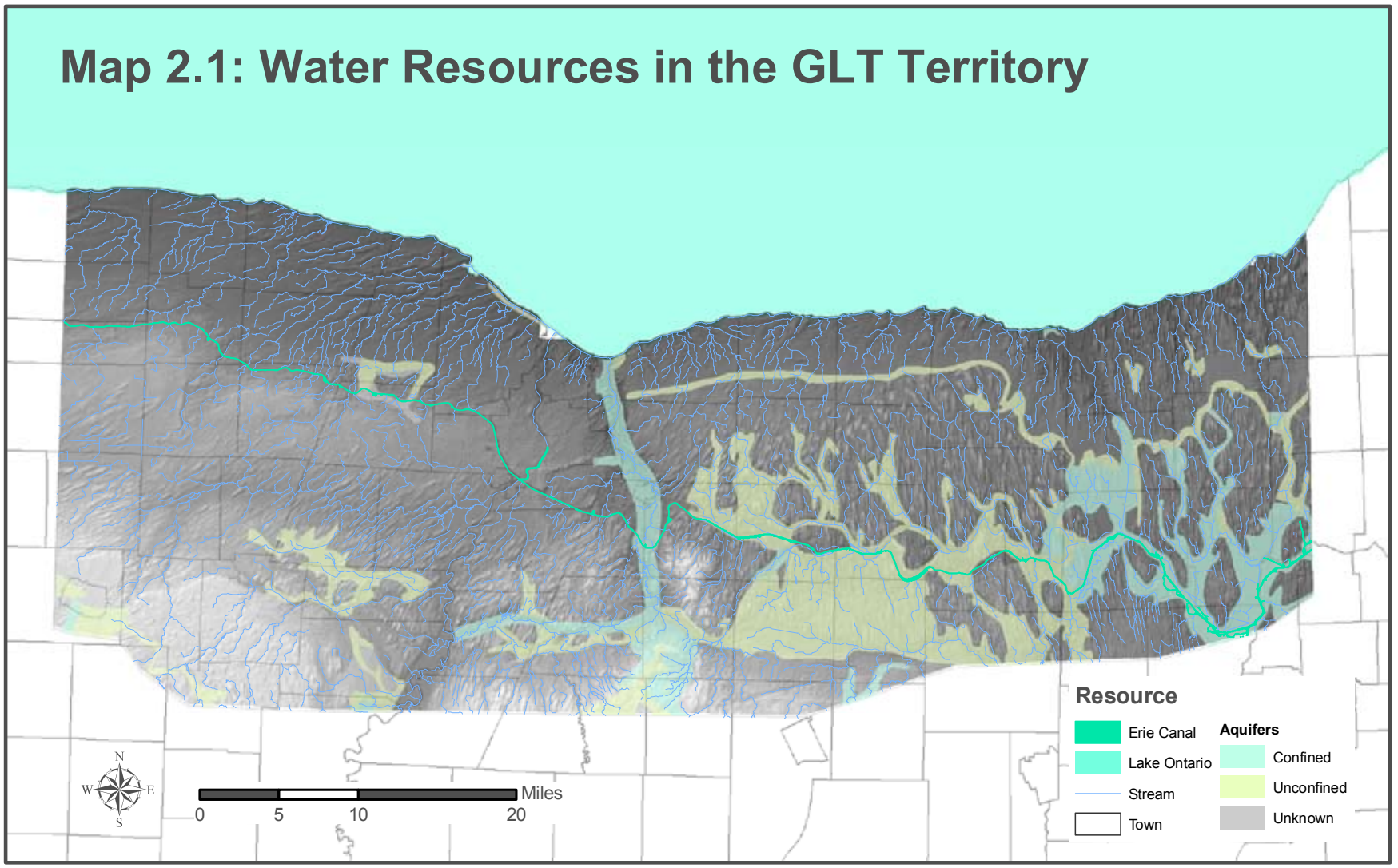
[9] State Board of Real Property Services. 2007. Partial Reduction in Real Property Taxes for Eligible Farmland in New York State, Agricultural Assessments, Q & A's. On-line. http://www.orps.state.ny.us/pamphlet/exempt/agassess.htm, accessed 22 September 2007.

[10] Office of Real Property Services, 1993. Joint Report of the New York State Department of Environmental Conservation and Board of Equalization and Assessment on the Forest Tax Laws (Sections 480 & 480a of the Real Property Tax Laws), Forms, Publications, and Procedures. On-line. http://www.orps.state.ny.us/ref/pubs/forestlaws/, accessed 22 September 2007.

[11] Barron, Eric. 2001. "Potential Consequences of Climate Variability and Change for the Northeastern United States" in *Climate Change Impacts on the United States* by National Assessment Synthesis Team, US Global Change Research Program. On-line. http://www.usgcrp.gov/usgcrp/Library/nationalassessment/04NE.pdf, accessed 22 September 2007.

Figure 2.8 This flooded quarry has the potential to become a scenic recreational resource and habitat for birds, mammals, and aquatic life.

Map 2.1: Water Resources in the GLT Territory



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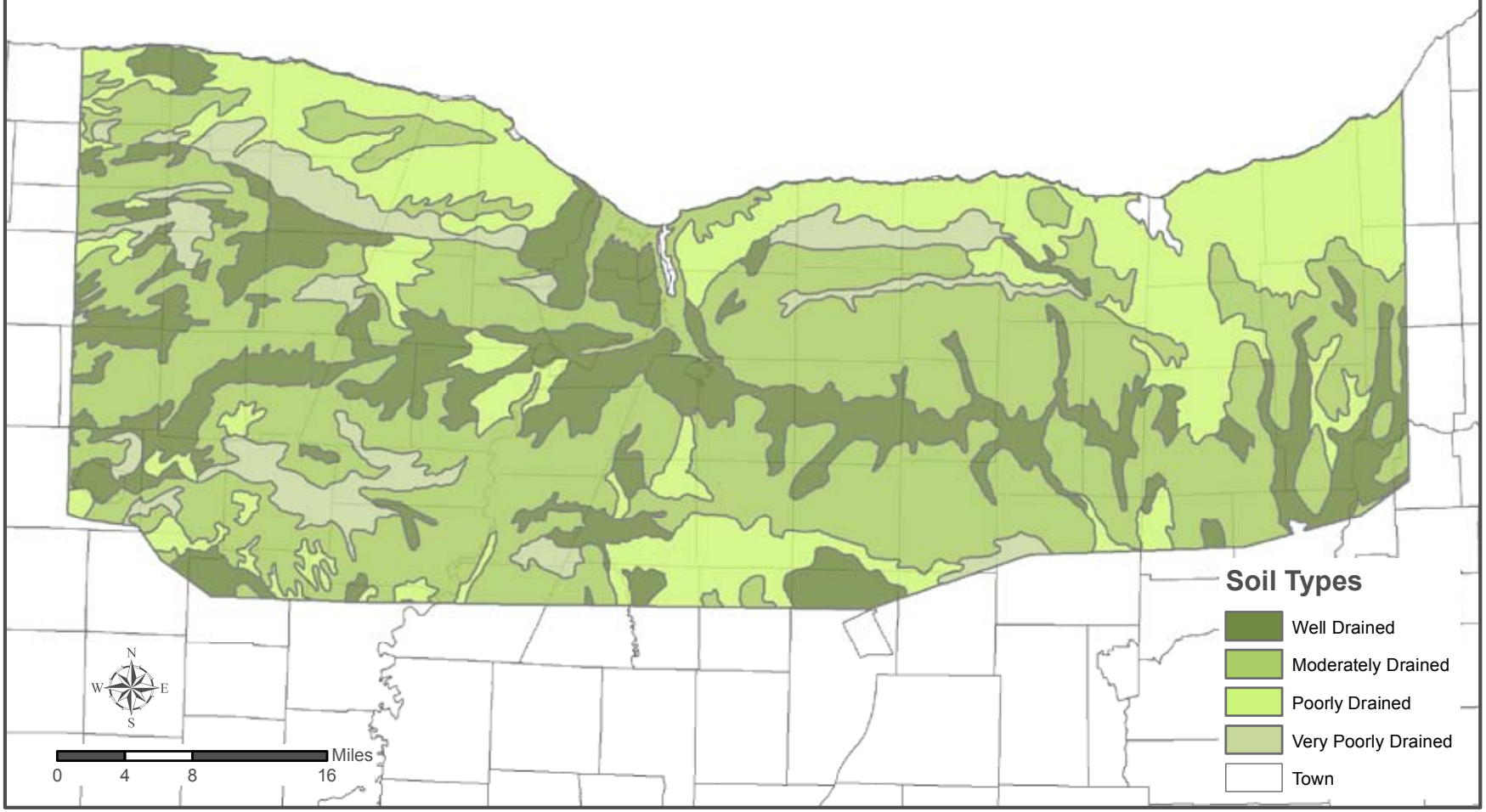
Cornell University

GLT Territory, New York

Map created by Strategic Conservation Planning Workshop,
Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 2.2: Soil Classifications in the GLT Territory



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Map created by Strategic Conservation Planning Workshop,
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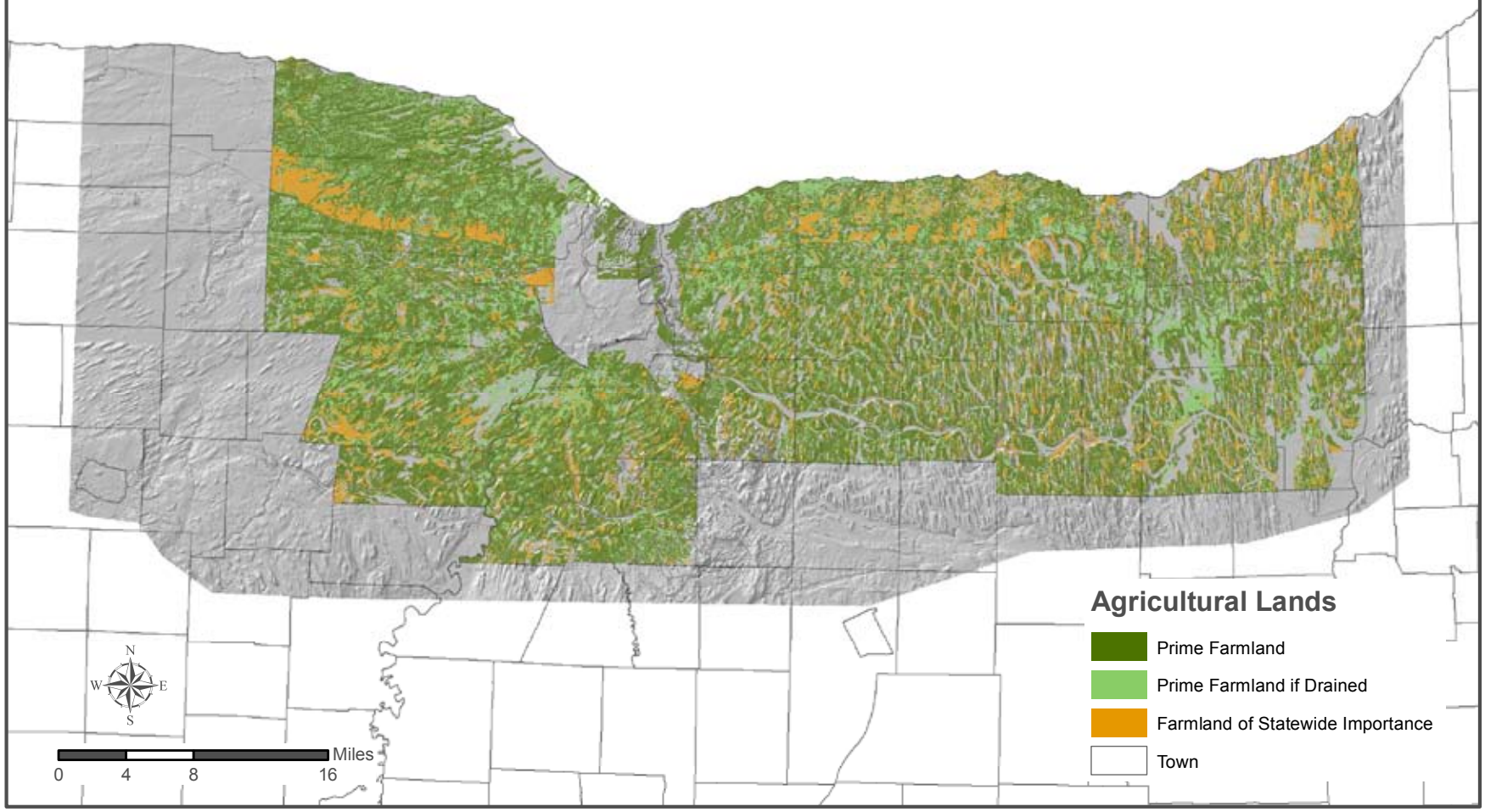
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 2.3: Prime Farmlands in Monroe and Wayne Counties



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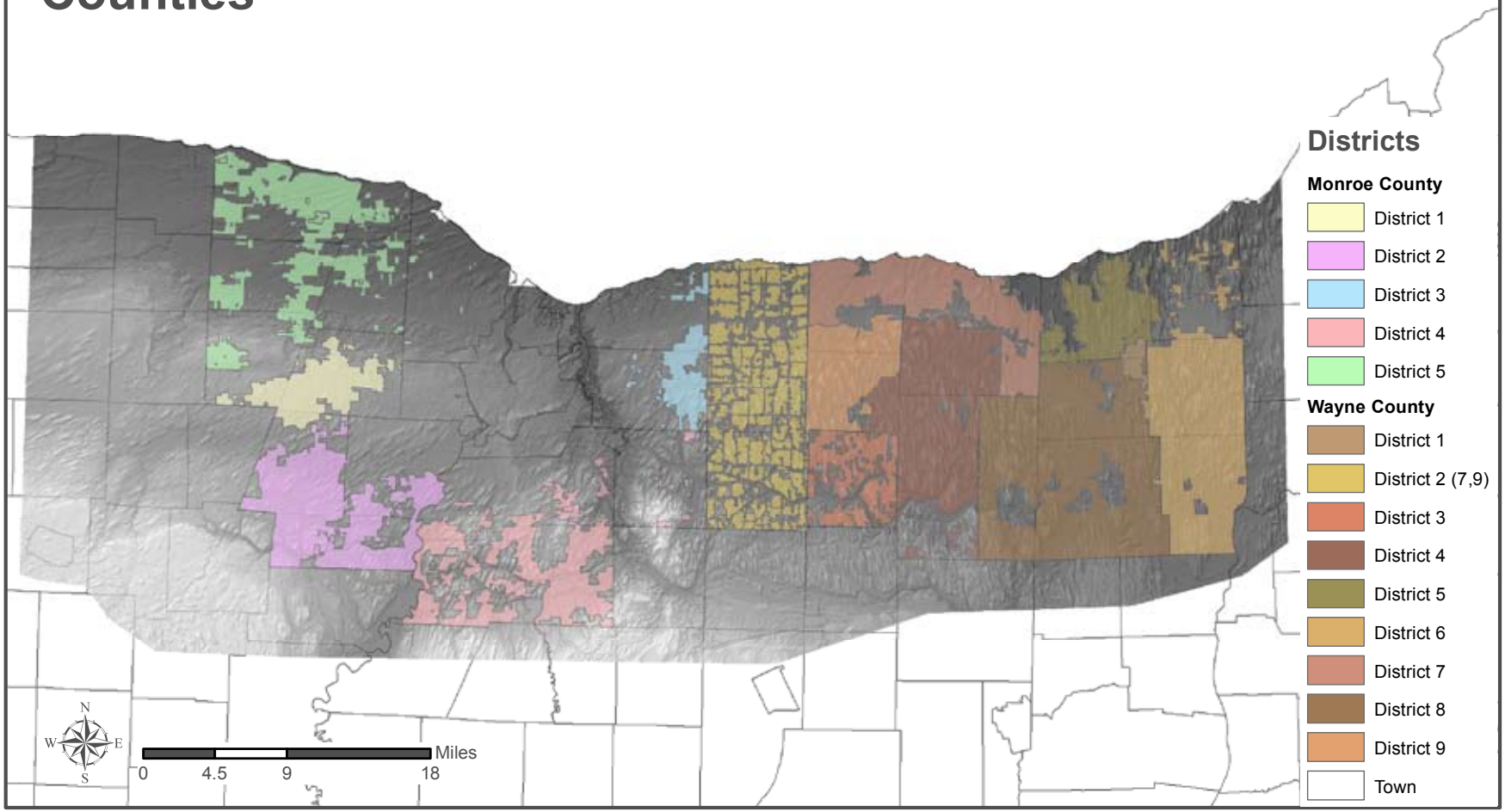
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 2.4: Agricultural Districts in Monroe and Wayne Counties



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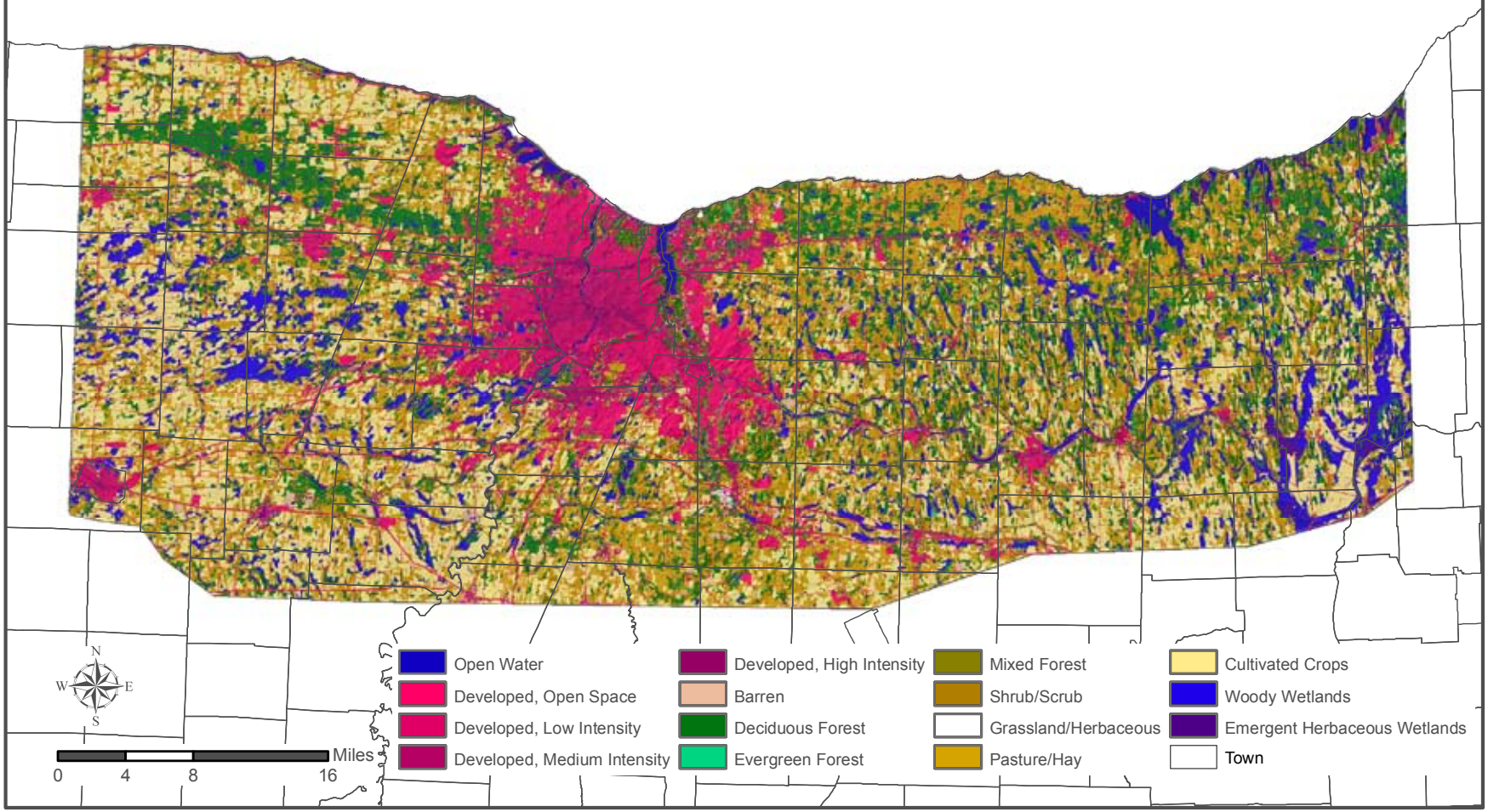
Map 2.5: Land Cover in the GLT Territory, 2001



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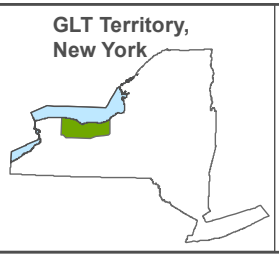
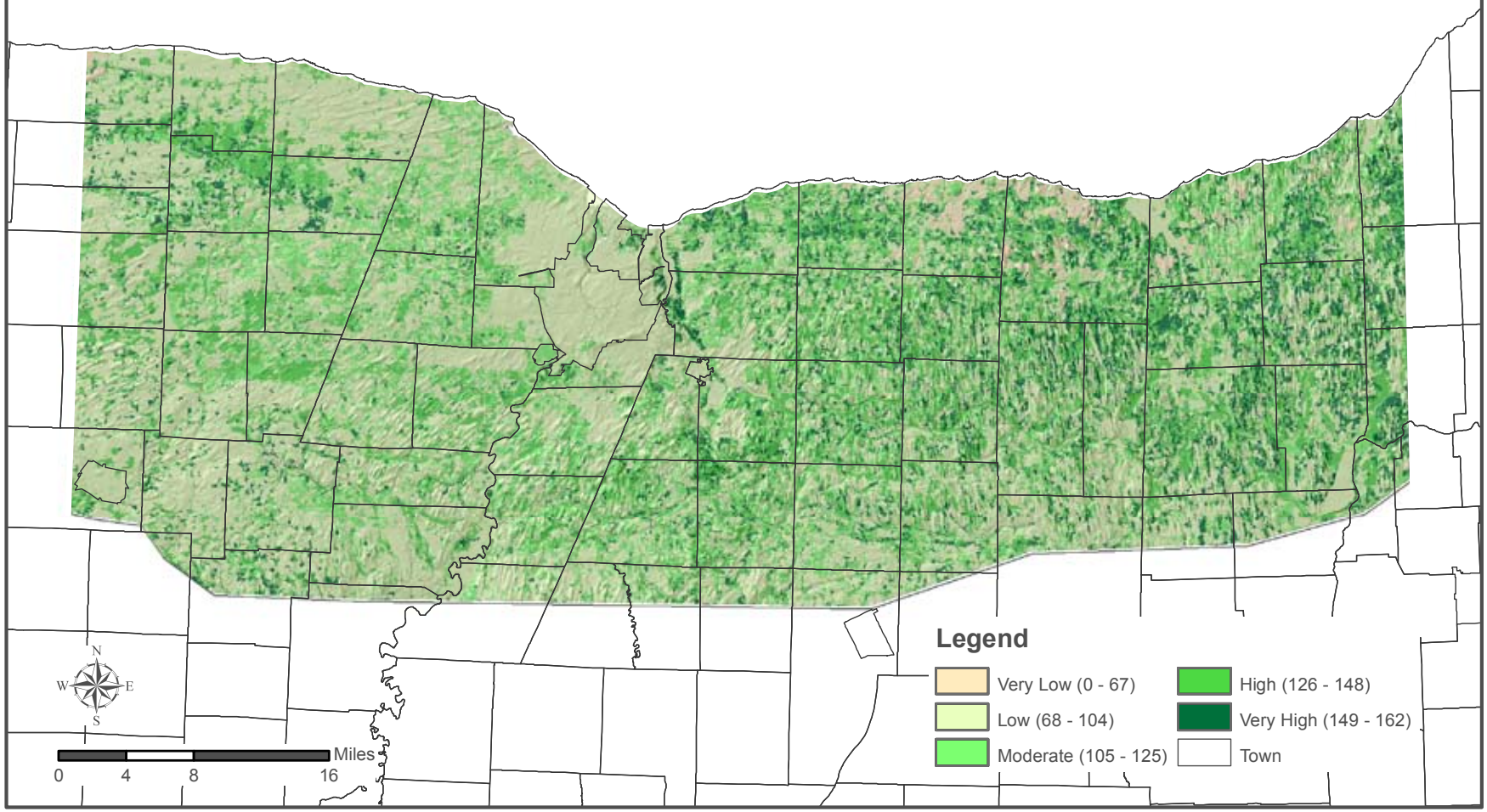


Map created by Strategic Conservation Planning Workshop,
Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 2.6: Species Richness in the GLT Territory, 1996



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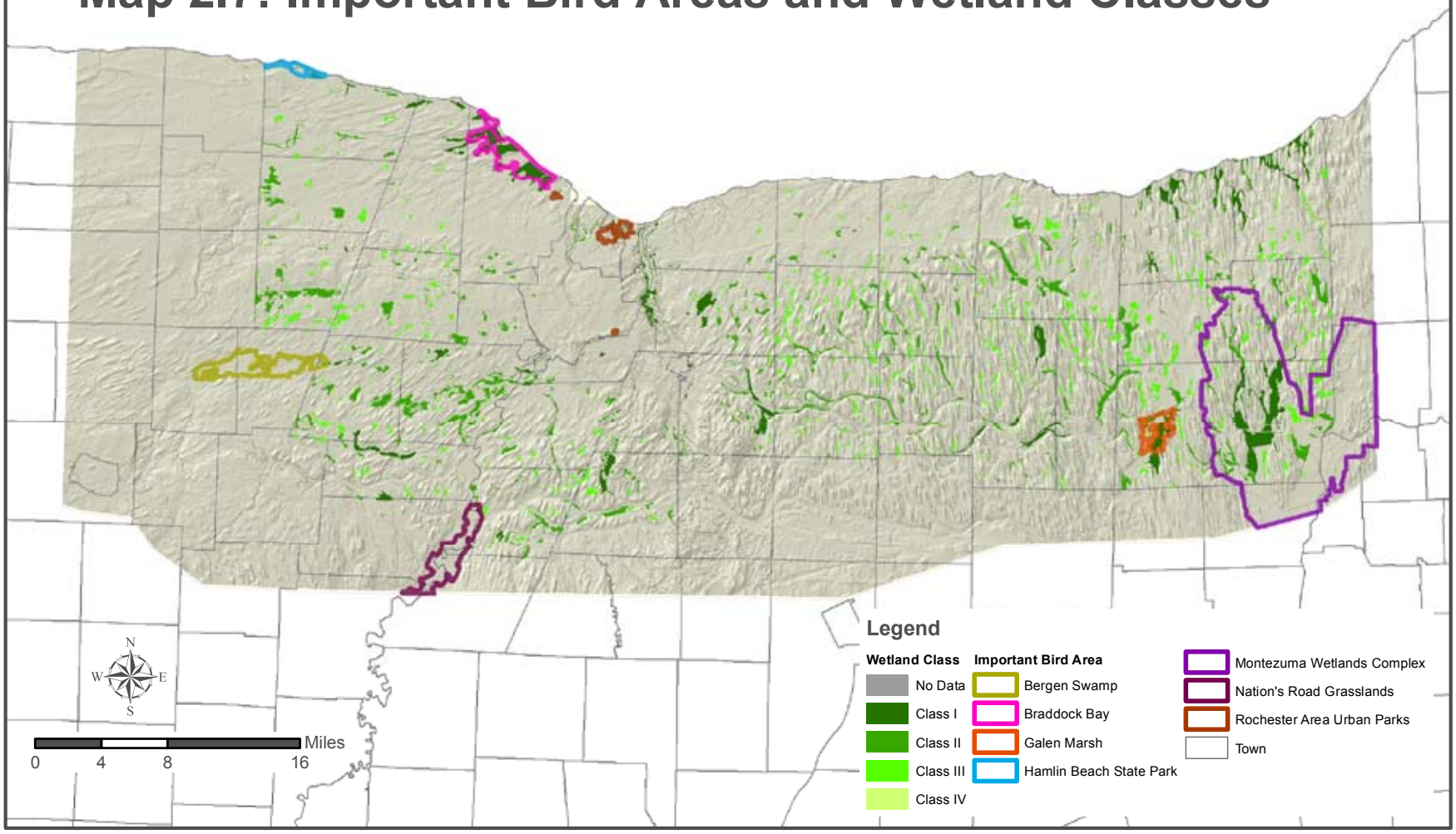
Map 2.7: Important Bird Areas and Wetland Classes



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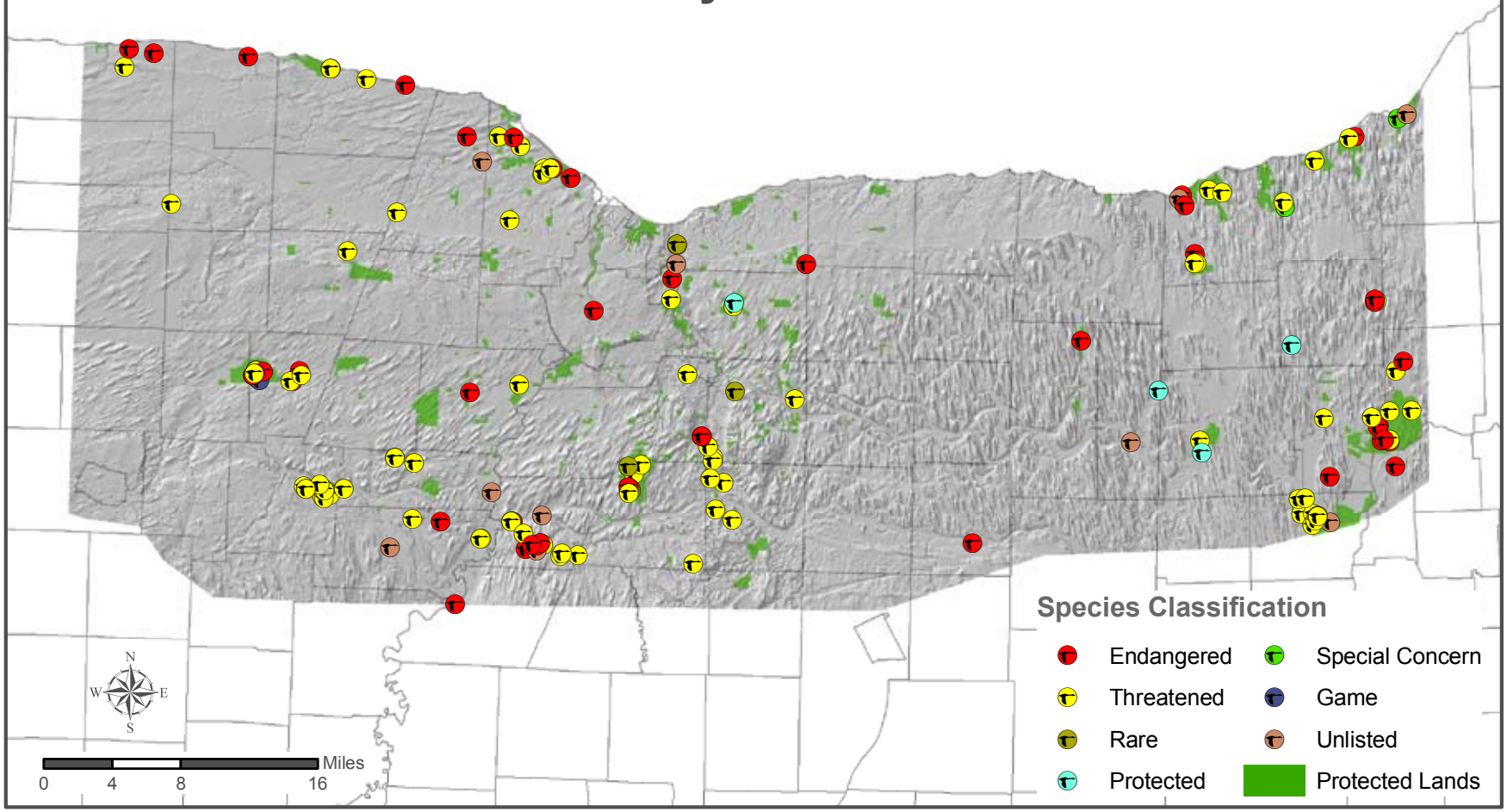
Map 2.8: Rare, Threatened, and Endangered Species in the GLT Territory



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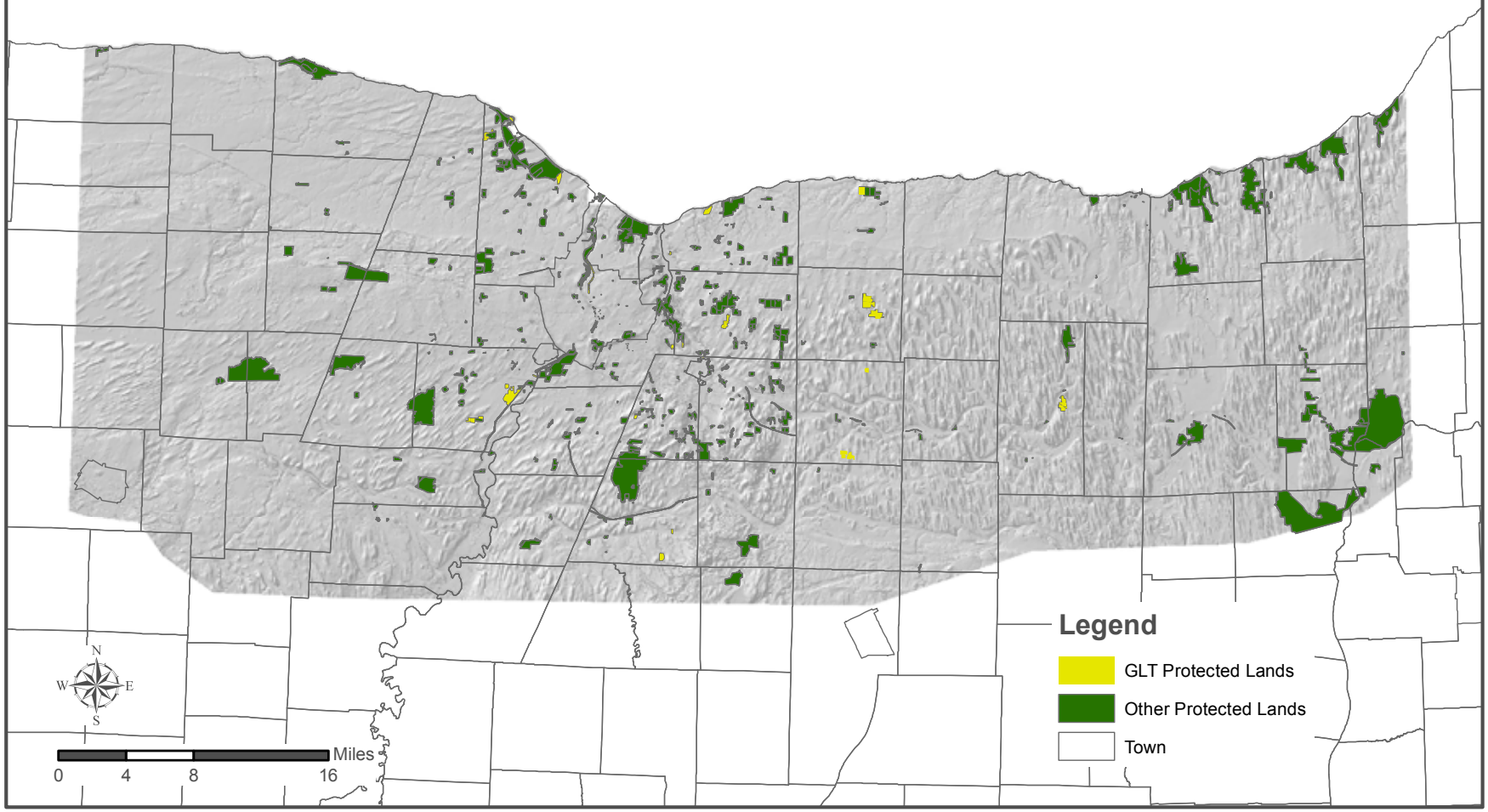
Rare and Endangered Species Data from New York Natural Heritage Program, NYSDEC. February, 2007.
Biodiversity Databases, Element Occurrence Record Digital Data Set. Albany, NY.

Map created by Strategic Conservation Planning Workshop, Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 2.9: Protected Lands in the GLT Territory, 2007



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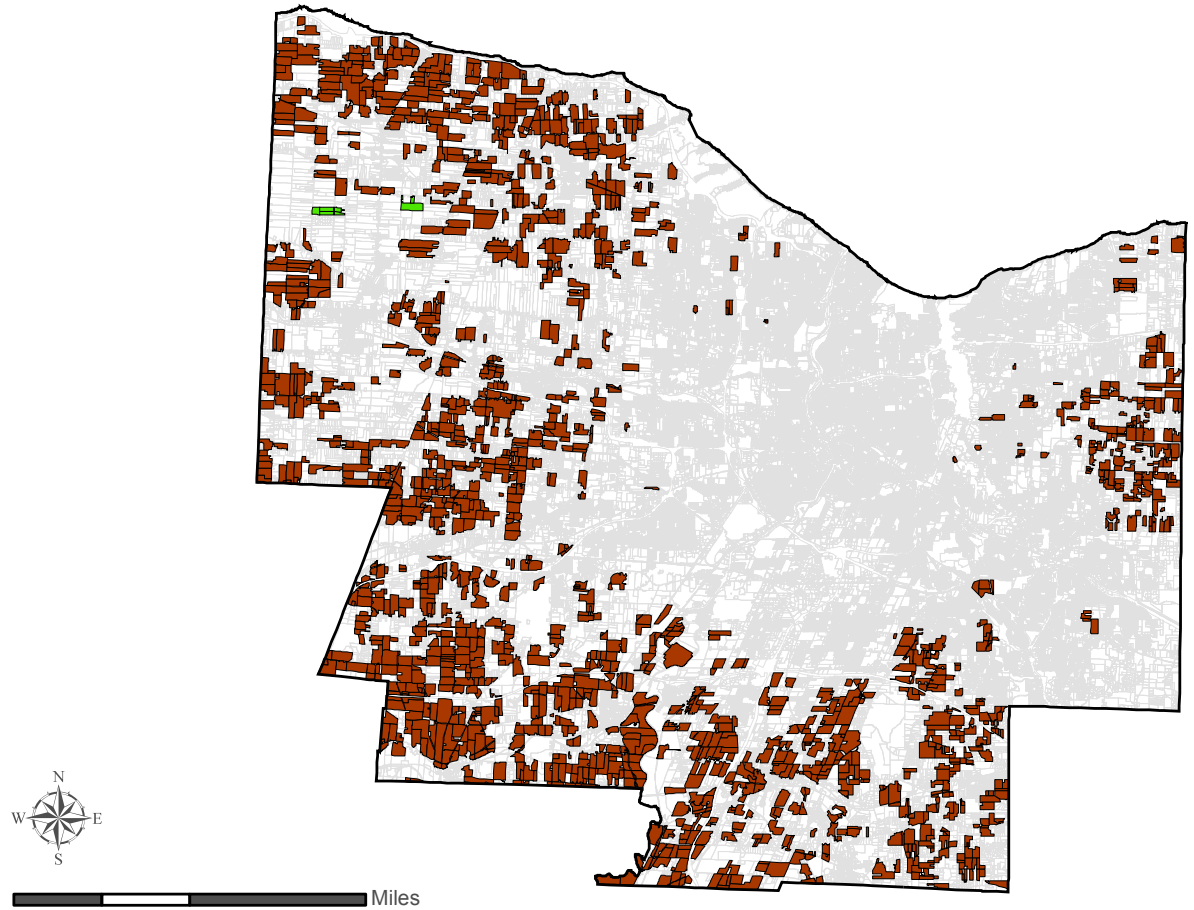
Map 2.10: Tax Abatement Parcels in Monroe County



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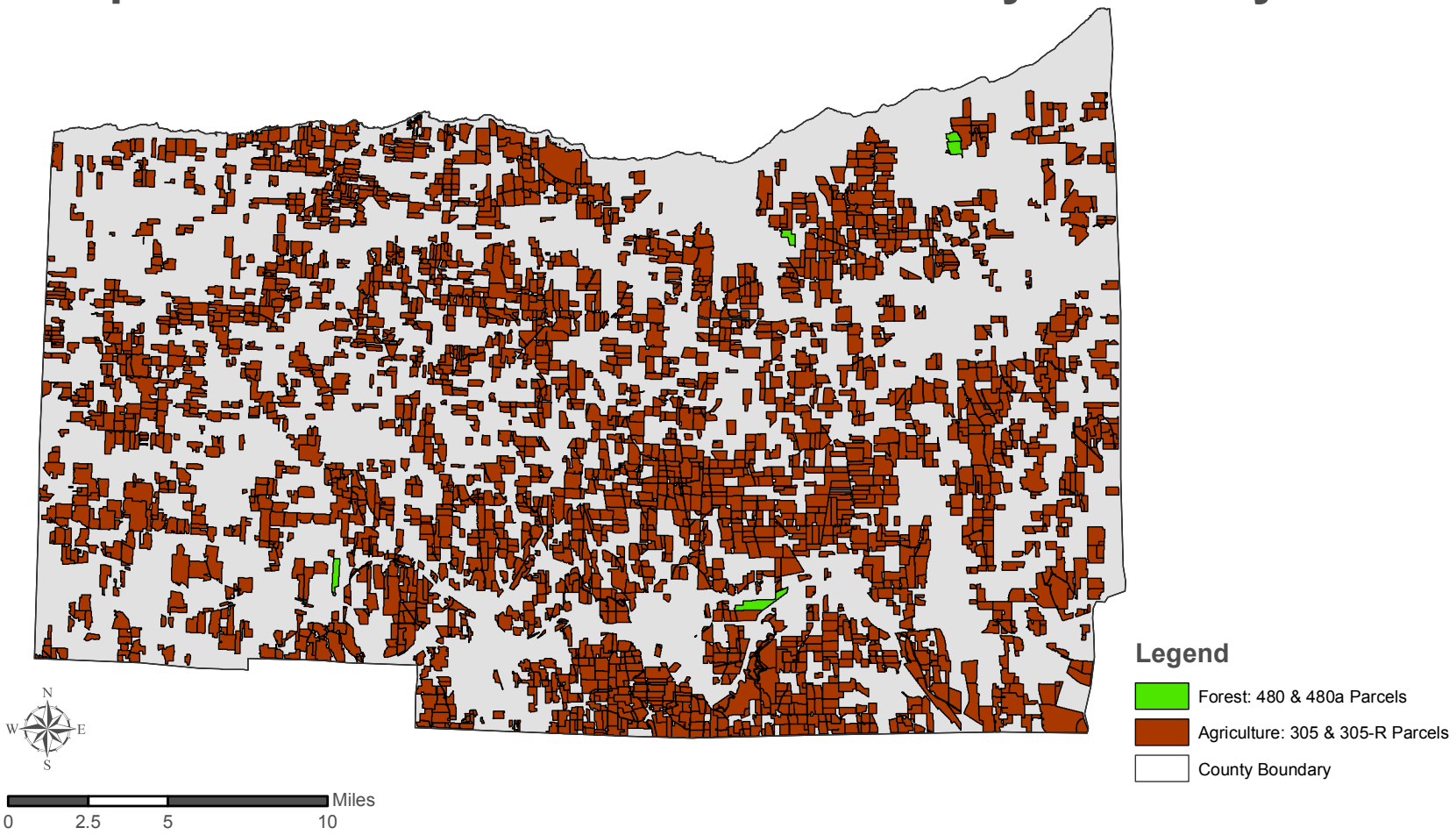
Map 2.11: Tax Abatement Parcels in Wayne County



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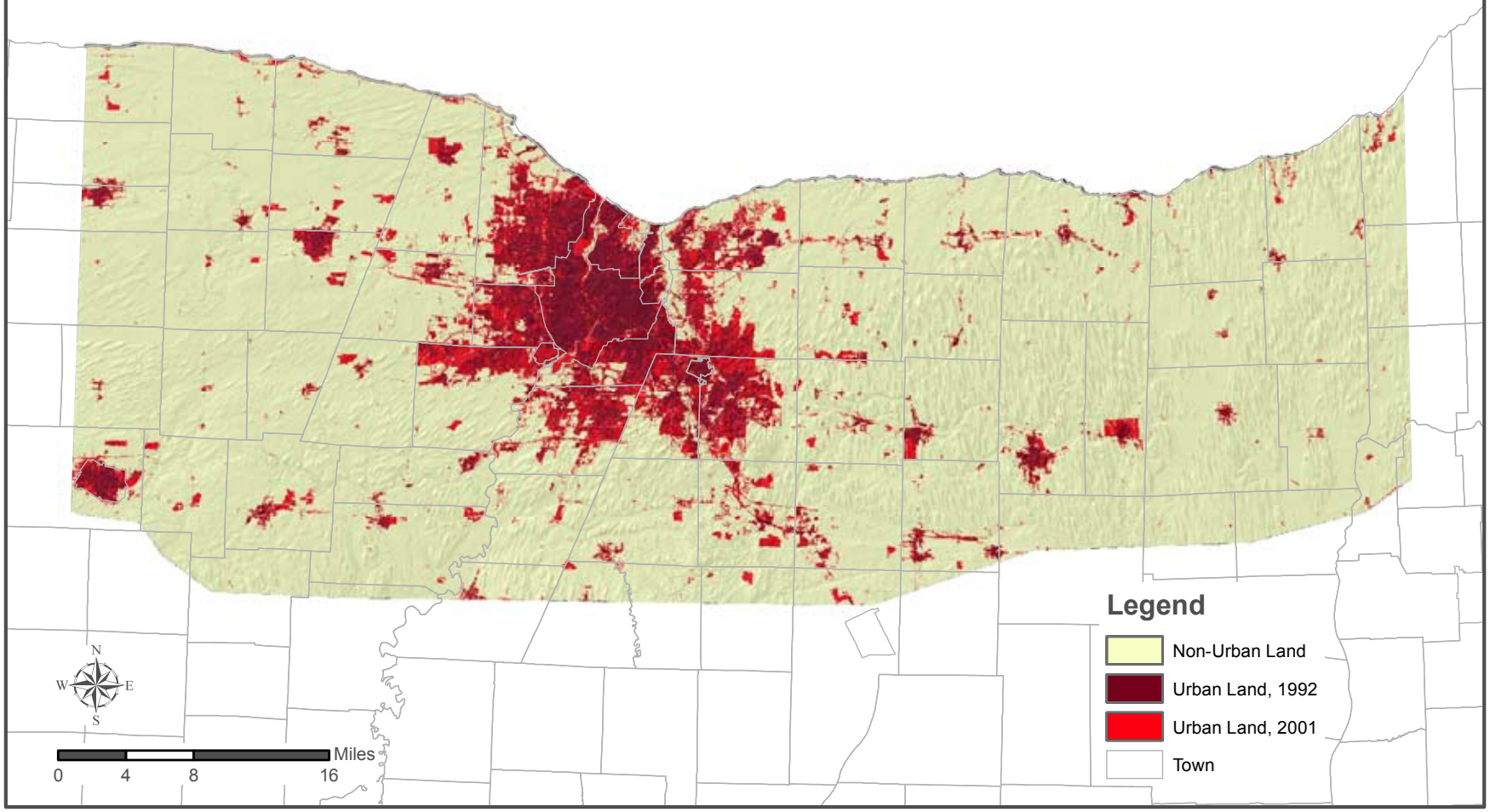
Map 2.12: Urban Growth in the GLT Territory, 1992 - 2001



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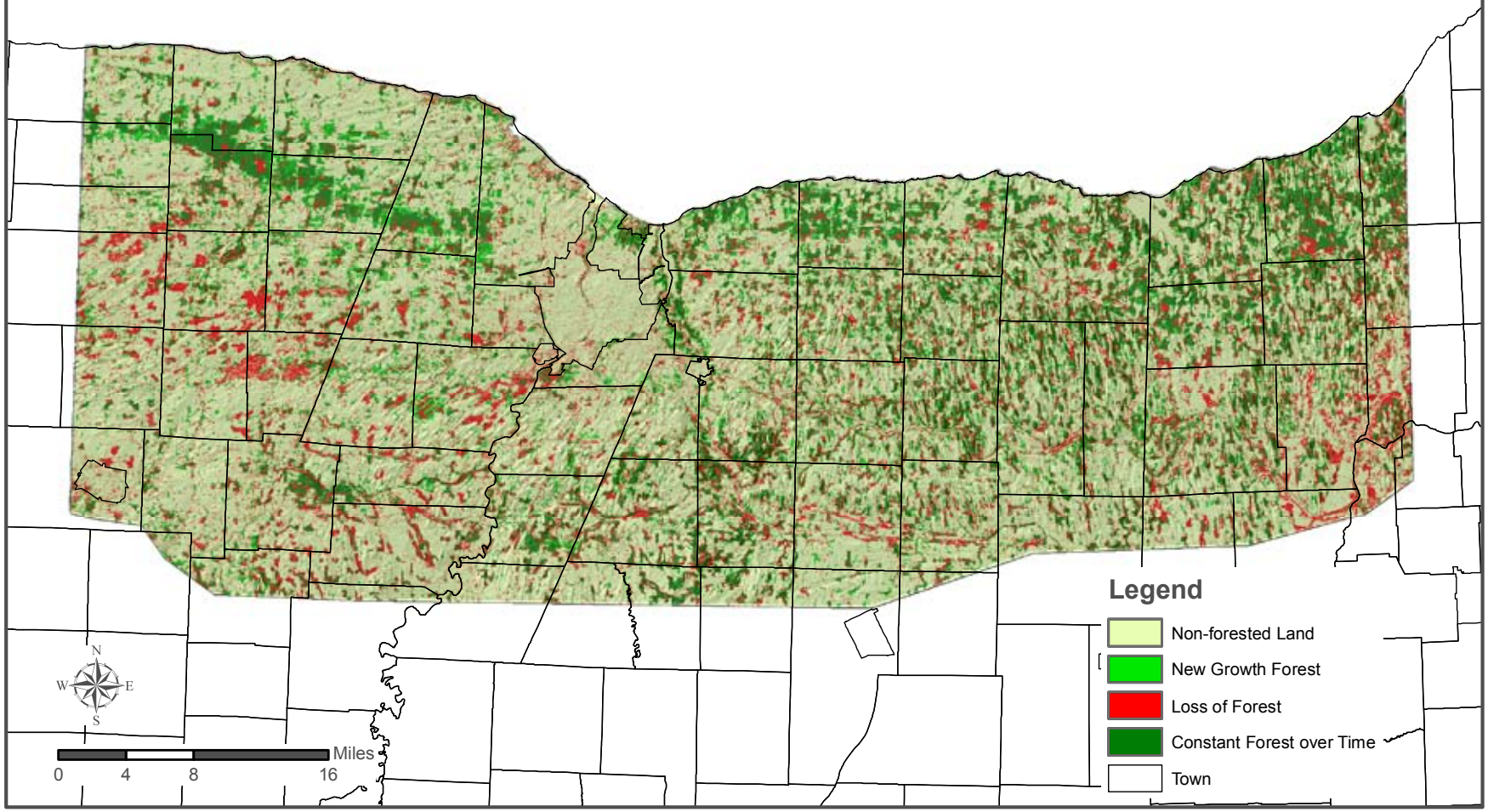
Map 2.13: Forests in Flux in the GLT Territory, 1992 - 2001



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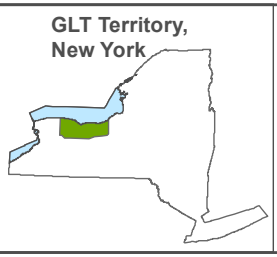

Map created by Strategic Conservation Planning Workshop,
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Projection: NAD 1983 UTM Zone 18N Map units: Meters

Scenic Resources

Figure 3.1 A working landscape which includes agricultural land with row crops.

Introduction

Residents and visitors of upstate New York highly value the region's compact settlement pattern interspersed with natural habitat and bucolic agricultural lands.[1] This settlement pattern facilitates the conservation of natural resources, while simultaneously creating and protecting a variety of distinctive scenic resources across the landscape.

Of all land resources, scenic resources are the most widely recognized and appreciated by the public. Unwise land use decisions that squander such lands are felt by everyone. Scenic resources provide inspiration to present and future generations, reduce stress and enhance physical and psychological well-being, and are a critical part of economic development and tourism. Moreover, scenic resources integrate other important resources, such as unique habitat types, agricultural lands, and water bodies.[2] Areas where scenic and natural resources overlap are prime candidates for conservation. The ability to justify conservation decisions is important when a land trust chooses to protect a piece of land. The process can be particularly difficult when land is protected for such a seemingly subjective aspect as "scenic value." Because tax benefits are involved, the Internal Revenue Service (IRS) periodically audits conservation easement donations that property owners make to land trusts. This process includes assessing easement properties in terms of the IRS "Scenic Enjoyment Criteria," which are notoriously vague. To ensure that scenic resource lands can be justified to the IRS, land trusts often hire a third party to prepare a Scenic Resources Inventory for their territory. Such inventories establish relatively objective guidelines for identifying scenic resources, and produce a detailed survey documenting scenic areas in the region. Going through this process enables land trusts and landowners to justify to the IRS the criteria and merits by which they deem a piece of land "scenic" and worthy of protection.

The inventory conducted by the Cornell Team for this report is the GLT's first effort to classify and record scenic resources in their territory. In addition to aiding compliance with IRS criteria, the Scenic Resources Inventory will be useful for directing future land conservation decisions.

Background

The current process for surveying scenic resources can be traced to the Massachusetts Landscape Inventory of 1982. Massachusetts's methodology combined the U.S. Forest Service's "National Forest Landscape Management Handbook" offerings of specific visual criteria to assess visual resources with the Countryside Commission of Scotland's method of addressing the value of the cultural landscape. Through clearly defined physical criteria, Massachusetts's Inventory systematically aided and justified the subjective opinion of professionals.[3] The Cornell Team employed a similar process.

A portion of one previously documented scenic corridor, the Seaway Trail, exists in the GLT Territory. Designated by Congress in 2005 as a National Scenic Byway, the route is also a New York Scenic Byway. That same year the Great Lakes Seaway Trail, Inc. wrote a Corridor Management Plan, hiring Peter J. Smith & Company to undertake a Scenic Resources Inventory along the route.[4] Peter J. Smith and Company identified scenic views and sightlines along the Seaway

Trail, including 39 scenic viewpoints within the GLT Territory. The Great Lakes Seaway Trail, Inc. hired the consultant to evaluate and document scenic character in an attempt to protect and enhance these resources and improve the functional quality of the corridor.

Methodology

The intent of the Cornell Team's research was to create a process by which the GLT could evaluate the scenic qualities of their territory in preparation for or as a complement to conservation. This evaluation of the scenic qualities of the GLT Territory is a sampling of its beauties and is best used as a demonstration of a process of evaluation in action. The survey and viewshed analysis could be replicated for other routes in the region to further develop the GLT's scenic resources inventory.

> "...scenic resources are the most widely recognized and appreciated by the public. Unwise land use decisions that squander such lands are felt by everyone."

Route Determination

The Cornell Team inventoried scenic resources in Monroe and Wayne Counties along a driving route developed based on GLT recommendations. GLT Executive Director, Gay Mills, and Vice President of the Board of Directors, Connie Ehindero, used an area road map to mark locations that GLT board members consider scenic in their territory. Using these locations as a basis, the team consulted a *New York Atlas and Gazetteer* and employed a Geographic Information System (GIS) to evaluate elevation changes of various driving routes. The team selected meandering driving routes of approximately 200 miles in length within both Monroe and Wayne Counties in an attempt to visit a variety of landscapes.

Because Peter J. Smith and Company already documented the federally-designated Seaway Trail, the Cornell Team did not survey along the shore of Lake Ontario. The team also excluded the Erie Canalway, as the National Park Service already designated this cultural resource as a National Heritage Corridor. Development and maintenance of these resources is overseen by state and federal agencies as a result of their designations as areas of natural or scenic importance.

Data Collection

To initiate the GLT's first scenic resources inventory, the Cornell Team drove approximately 430 miles throughout the GLT Territory and identified 56 scenic vistas, 33 in Wayne County and 23 in Monroe. Surveyors marked the scenic vistas using a Global Positioning System (GPS) unit, which calculates latitude and longitude of a point from satellite positioning. The team also completed a qualitative inventory (Technical Appendix) and took digital photographs. The scenic inventory identified site accessibility, view qualities, geography/topography of the site, and cultural features.

Figure 3.2 Small water feature.

Classification

Typology

Corridors

Linearity is the defining characteristic of corridors. Scenic views may vary across the corridor. The act of viewing or traveling in a linear motion determines a corridor and may be present on footpaths, rail trails, canals, roadways, or creeks.

Roadways

Waterways

Topography

Landscapes dominated by topography have visible changes in grade or dominant geologic elements. Although components of other features (agriculture, water, or cooridor) may be present, the dramatic qualities of the landscape determine the quality of the scenic type.

Grade Change

Geologic Elements

Water

Landscapes including water as the predominant characteristic are included in this typology. Water may be in the form of creeks, marshes, ponds, small lakes, embayments, or Lake Ontario. The scale of the water feature determines its impact upon the eye and its typological association.

Small Water Feature

Large Water Feature

Beach

Working Land

Monroe and Wayne Counties have many areas where agricultural lands are the predominant land use. The scenic qualities of working lands can be broken down into five general categories. The dominant quality of agricultural land use determines its typology.

Mixed Agriculture

Orchards

Field Crops

Row Crops

Fallow/Abandoned

Figure 3.3 The creation of typologies involves classifying a complicated landscape into a series of characterized elements. In Wayne County and Monroe County landscapes, the following types of landscapes are typical of scenic vistas and view corridors.

GIS Analysis

After completing the fieldwork, the Cornell Team uploaded viewpoints from the GPS unit to the GIS, and overlaid this data on a Digital Elevation Model (DEM) of the GLT Territory. The team identified viewsheds, the maximum extent of land visible from each viewpoint, using the viewshed analysis tool in the GIS Spatial Analyst extension. After overlaying each viewshed onto a single map, the team measured the degree of viewshed overlap using the Raster Calculator in the Spatial Analyst extension.

Based on the degree of viewshed overlap the Cornell Team classified the GLT landscape as Critical, High Priority, Priority, and Not Visible. Map 3.1 shows the incidence of viewshed overlap in the GLT Territory categorized by priority. Because the GLT territory is relatively flat, the team was unable to identify many broad, sweeping vistas of the landscape. As a result, the team manually categorized the incidence of overlap to compensate for the area's characteristically low topographical relief and minimal viewshed overlap. Lands categorized as Critical are those with higher incidence of viewshed overlap, visible from 6 to 13 viewpoints (the highest incidence of viewsheds overlapping is 13). The team categorized High Priority lands as those where viewsheds overlap 4 or 5 times, and Priority lands as those where viewsheds overlap 1 to 3 times. Areas not visible from the viewpoints collected by the survey teams are categorized as not visible.

> "The most recent Empire State Poll data reveals that New York State residents 'overwhelmingly believe that agriculture is important to their communities."

Qualitative Analysis

Landscape types vary according to region. Four primary classifications of scenic vistas are present in the GLT Territory: views of working lands, views with grade change or geologic elements, views with water features, and corridors (Figure 3.3). The team used typologies (characterization of types) as a method for describing the qualities of these scenic landscape classifications. Using the scenic inventories and viewpoint photographs, the team developed 12 typologies of scenic landscapes present in the GLT Territory. The 12 typologies of scenic vistas are specific to the GLT Territory and typical of the unique and dynamic topography, geology, ecology, hydrology, cultural elements, and social development of the southern shore of Lake Ontario and Monroe and Wayne Counties.

Additional data from the inventories evaluated accessibility of the viewpoint, spatial and directional qualities of the view, geography, and cultural features.

Findings

Viewshed Analysis

The majority of scenic viewpoints identified by the Cornell Team are located in the eastern three-quarters of Wayne County and the southern and westernmost portions of Monroe County. This is primarily due to the urbanization of land surrounding the City of Rochester (See Map 3.1). The team's viewshed analysis revealed that just over 161,600 acres in the GLT Territory fall within scenic viewsheds. Table 3.1 details the lands of scenic priority in the GLT Territory by acre and percentage. The comparatively small number of scenic viewpoints collected in the vast GLT Territory, comprising over 1.3 million acres, resulted in a classification of 88 percent of the region as Non-Priority. As a result of the minimal topographical relief in this region, less than 1 percent of the surveyed area is visible from 6 or more viewpoints. Yet, these viewsheds are critical for the protection of the region's scenic landscape due to their visibility from multiple viewpoints. Viewsheds visible from 1 to 5 viewpoints make up just over 12 percent of the GLT Territory. Due to the nature of viewsheds, these areas tend to be grouped close together.

Table 3.1 Acreage and Percentage of Priority Areas in the GLT Territory, 2007

Classification	Acres	% of Total
Non-Priority (0)	1,140,612.47	88.59
Priority (1-3)	154,337.76	11.85
High Priority (4-5)	6,265.22	0.48
Critical (6-13)	1,050.29	0.08
Total Acres in GLT Territory	1,302,265.74	100.00
Total Acres in Viewshed	161,653.27	12.41

In addition to scenic viewpoints, the Cornell Team identified scenic roadways. These roadways offer stretches of visually significant and bucolic views to travelers (Map 3.2). The relatively uniform topography and development pattern of the GLT Territory features more scenic roadways than points offering sweeping vistas. The Cornell Team identified eight scenic roadways and defined a one-half mile buffer around each resource in order to guide protection. This resulted in the identification of 22,353 additional acres as scenic resources. Based on the large amount of acreage identified as scenic along roadways, the team recommends that the GLT not devalue scenic resources simply because they are not visible from a multitude of viewpoints.

Table 3.2 Scenic Viewpoint by Classification in the GLT Territory, 2007

Classification	Incidence	% of Total
Corridor	8	14
Working Landscape	37	66
Topography	5	9
Water Feature	6	11
Total	56	100

The Cornell Team also noted a prevalence of agricultural landscapes in the analysis of viewsheds and classifications. Working (agricultural) landscapes were identified as the predominant classification of the inventoried scenic resources (Table 3.2).

Emerging and Current Threats

Upstate New York is slowly losing population, yet urbanization of land is dramatically increasing (See Chapter 1). This trend is particularly apparent in the suburbanizing municipalities surrounding Rochester. Increasing land consumption, coupled with decreasing density, is often referred to as sprawl. Sprawl can degrade wildlife habitat, threaten agricultural productivity, and increase public service and infrastructure costs. A sprawling land use pattern also impacts the scenic beauty of upstate New York in places such as Monroe and Wayne Counties.

Climate change presents another potential threat to the scenic resources of the GLT Territory. Altered precipitation patterns could lead to drought, which may combine with warmer autumns to cause a muting of fall foliage colors, as well as earlier leaf drop. The recession of sugar maples to the north could also affect fall foliage, as these trees provide some of the most vibrant colors each autumn. Higher temperatures could also increase levels of ground-level ozone (smog) developing over upstate New York, decreasing the visibility of long, scenic views.[5] Although agriculture may experience the benefits of longer, hotter growing seasons, the crop mix may change.[6] This may be of concern with New York being the second largest apple producer in the country and Wayne County providing at least one-third of this crop.[7] Still, northern cool weather crops are likely to be an exception.[8]

Agricultural abandonment poses another threat to the GLT Territory's scenic resources. As a result of changing economic conditions, particularly globalization, and changing family values, local family farms are increasingly being abandoned. Local farmers are encountering increased competition from imported food producers who operate at lower costs, and many farmers' children do not wish to carry on the family farm. Moreover, as sprawl brings residential developments closer to agricultural lands, farmers increasingly face nuisance complaints from suburban neighbors.

Both Monroe and Wayne Counties have enacted Agricultural Districts to protect farmers; nearly all of Wayne County is designated as Agricultural District land.

The GLT considers the Genesee River and the Erie Canal to be their most scenic urban resources. Yet, in Rochester, water pollution and unplanned development along these water courses threaten their scenic appearance. Also, the private ownership of land at the few points that offer scenic views threatens opportunities to make these urban assets accessible to the public.

Figure 3.4 Mixed Agriculture includes animal structures and farm buildings.

Opportunities and Recommendations

The eastern three-quarters of Wayne County and the southern and westernmost portions of Monroe County exhibit a pattern of dispersed villages with edges defined by surrounding natural or agricultural land. This bucolic settlement pattern is a treasured assett unique to upstate New York, and the GLT has the opportunity to proactively conserve this landscape. The GLT can use this historic precedent to promote compact settlement and raise awareness of the negative effects of sprawl.

Scenic roadways and viewpoints near the Seaway Trail or the Erie Canalway could be incorporated into side routes to these nationally recognized scenic corridors. Largely agricultural in character, these local scenic roadways could become part of a county-wide agri-tourism route primarily in Wayne County, but also in Monroe. Agri-tourism is a successful tourism approach rising in popularity in agricultural regions, such as parts of upstate New York, Pennsylvania, and Vermont. Linking two of the most important upstate New York economic generators – agriculture and tourism – agri-tourism also promotes the connection between the public and food production through direct marketing efforts, educational venues, entertainment, lodging, and dining.

The GLT could develop a public/private partnership with local governments to conserve, develop, and promote an agri-tourism trail. The GLT may be eligible for as much as $50,000 from an Agri-tourism Project matching grant from the New York State Department of Agriculture and Markets (NYSDAM). In 2006, the first year of the program, the NYSDAM awarded more than $970,000 to 44 different agri-tourism projects throughout the State.[9] Now is an apt time to seize upon this opportunity. The most recent Empire State Poll data reveals that New York State residents "overwhelmingly believe that agriculture is important to their communities." Moreover, the number of state residents reporting that they go out of their way to purchase local food increased by nearly 7 percent between 2004 and 2007 to just over 44 percent of residents polled.[10]

Scenic resource conservation need not be limited to rural areas. Increasingly, landscape and urban ecologists are recognizing the importance of urban conservation. With the GLT's foray into urban conservation with the El Camino Trail, the organization is poised to continue conservation projects through public/private partnerships that provide habitat and green space for both wildlife and residents of Rochester. Urban conservation projects will help Rochester residents connect to the environment and understand how their actions affect the regional ecology.

Conservation measures that incorporate large areas of land, characteristic features, and long views are critical to retaining the rural and agricultural scenic qualities of the GLT Territory. Although a large portion of the region has been urbanized in recent decades, much of upstate New York still embodies the compact settlement pattern and natural areas that make the area attractive to both residents and tourists. Yet, this scenic beauty may not exist if demographic and housing trends persist. In an effort to promote scenic resource conservation, the GLT should maintain, refine, and build on the scenic resource inventory provided with this report to inform landowners of the potential to receive federal income tax incentives through scenic easement donations.[11] The GLT should advise potential donors to consult with accountants or lawyers familiar with the IRS Scenic Enjoyment Criteria when considering such a donation.

Conclusions

The GLT should consider scenic viewsheds when evaluating lands to purchase or obtain through easements. Scenic resources are a critical aspect of a region's vitality. Land conservation for both natural habitat and human enjoyment is essential to the economic and ecological health of the GLT Territory.

Endnotes

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[2] Amundsen, Ole. 2007. Lecture notes: Scenic Landscape Assessment, 30 August.

[3] Massachusetts Department of Environmental Management. 1982. Massachusetts Landscape Inventory: A Survey of the Commonwealth's Scenic Areas.

[4] Peter J. Smith & Company. 2005. Great Lakes Seaway Trail Corridor Management Plan.

[5] Barron, Eric. 2001. "Potential Consequences of Climate Variability and Change for the Northeastern United States" in *Climate Change Impacts on the United States* by National Assessment Synthesis Team, US Global Change Research Program. Online. http://www.usgcrp.gov/usgcrp/Library/nationalassessment/04NE.pdf, accessed 22 September 2007, 125.

[6] Barron,111, 127.

[7] New York State Department of Agriculture and Markets. 2007. Department of Agriculture and Markets. Online. http://www.agmkt.state.ny.us/AD/release.asp?ReleaseID=1642, accessed 21 September 2007.

[8] Barron, 111.

[9] New York State Department of Agriculture and Markets. 2007. Department of Agriculture and Markets News, Press Release, Commissioner Announces Funding for Agri-Tourism Projects. 30 August. Online. http://www.agmkt.state.ny.us/AD/release.asp?ReleaseID=1642, accessed 21 September 2007.

[10] Hilchey, Duncan. 2007. Community and Rural Development Institute Senior Extension Associate, Personal Communication. 21 September.

[11] The current federal income tax incentives are due to expire this year and return to a more restrictive incentive program. Congress, however, may elect to extend this program.

Scenic Resource Inventory Form

Genesee Land Trust

Recorders:_____ **Date:**_____

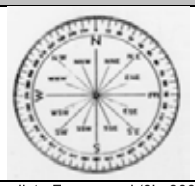
Weather:_____ **GPS Viewpoint(s) #:**_____

Road:_____ **Longitude/Latitude:**_____

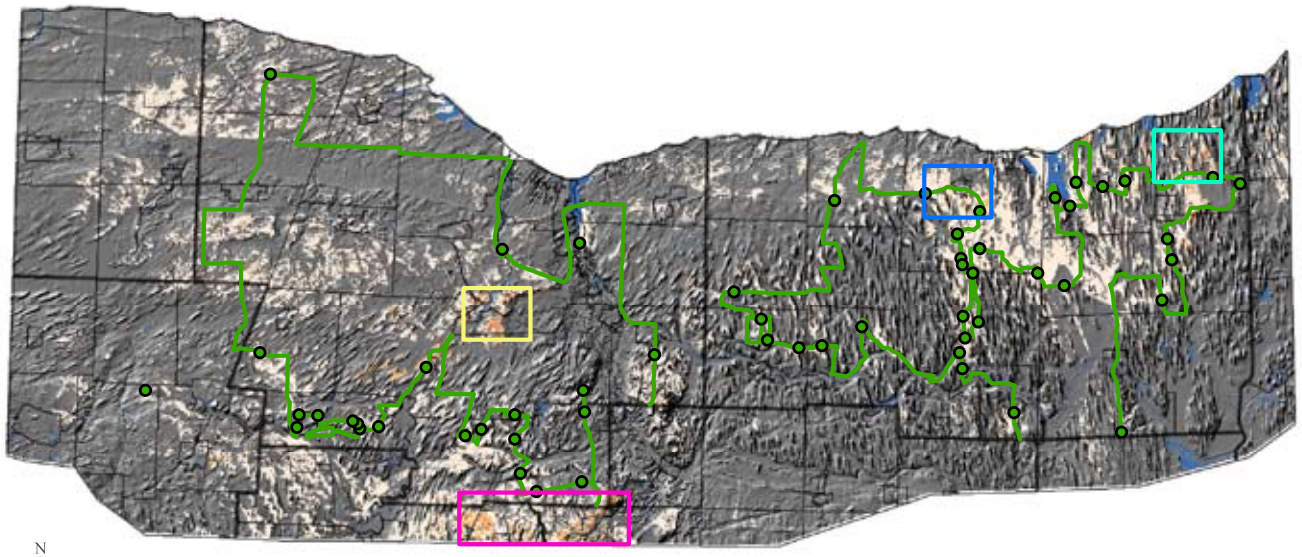
County:_____ **Municipality:**_____

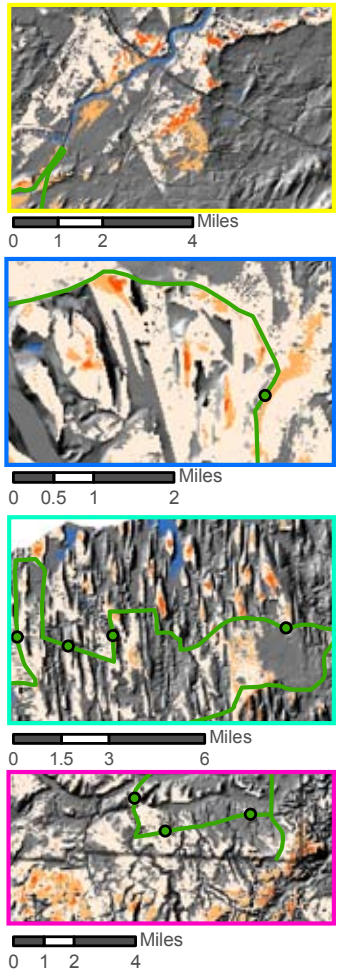
Type of Resource (circle one): Viewpoint Corridor **(estimate length)** **Photo #(s):**_____

Predominant Landscape Type (circle one): Agricultural Forest Field Water Feature Settlement Mixed Other

1 Accessibility		Check if YES	**Comments/Brief Description**
Mode of Access/ Accessibility	Automobile		Note if pull-offs or public access points exist.
	Public Transportation		
	Hiking, Biking, Horseback Riding, Snowmobile		
Setting	Isolated, Rural, Suburban, or Urban		
Type of access	Dirt, Municipal, State, or Interstate Road		
2 View		Check if YES	**Comments/Brief Description**
View Direction & Degree (Shade compass to correspond with view)			
Length of View	Immediate Foreground (0' - 300')		
	Foreground (300' - 1/2 mile)		
	Middle ground (1/2 mile - 4 miles)		
	Background (4 miles to horizon)		
Type of View	Vista (wide, open, full)		
	Overlook (high point, open)		
	Distant View (unimpeded to horizon)		
	Sheltered View (enclosed on at least two sides)		
	Enclosed View (enclosed on three sides)		
	Tunnel Effect (overhead trees/structures)		
	Intimate Aspect (fully enclosed, private)		
	Untouched wilderness		
View Characteristic	Human intervention upon landscape		
	Settled landscape		
	Urban landscape		
Contrast	Variety of topography		
	Variety of landforms		
	Variety of land uses		
	Variety of architectural styles/eras		
	Variety of textures		
	Change in view quality (i.e. view suddenly opens)		
3 Geography		Check if YES	**Comments/Brief Description**
Landform	Bluff		
	Escarpment		
	Rolling Hill		
	Gorge		
	Valley		
	Drumlin/Drumlin Field		
	Esker		
	Dunes		
	Other		
Water Feature	Ditch/ephemeral stream		
	Stream/brook/creek		
	River		
	Erie Canal		
	Waterfall/feature		
	Natural lake		
	Wetland/marsh		
	Embayment (marsh off Lake Ontario)		
	Lake shoreline		
	Other		
Vegetation	Coniferous (note predominant type)		
	Deciduous (note predominant type)		
	New growth		
	Old growth		
	Grass land/field		
4 Cultural Features		Check if YES	**Comments/Brief Description**
Historic	Land Use (i.e. cemetery)		
	Building/Collection of Buildings (i.e. farmstead)		
	Structure (other than building)		
	Settlement (crossroads, hamlet, village)		
	Corridor		
Unique to GLT Service Area	Land Use (i.e. orchards, muckland farms)		
	Building (i.e. cobblestone construction)		
	Structure (i.e. canal related)		
	Settlement		
	Corridor (i.e. Erie Canal)		

Map 3.1: Scenic Viewsheds in the GLT Territory





N
W E
S

Miles
0 5 10 20

This map shows scenic viewsheds based on the 2007 GLT Scenic Resource Inventory. Some areas included in this viewshed analysis are already under protection. Although the teams only drove routes in Monroe and Wayne Counties, viewsheds extended beyond these municipal borders into the entire GLT Territory. These viewsheds are included in acreage calculations.

Legend

Combined Viewsheds
- Not Visible
- 1- 3: Priority (154,388 acres)
- 4 - 5: High Priority (6,265 acres)
- 6 - 13: Critical (1,050 acres)

- Scenic Viewpoints
- Scenic Route
- County Boundary
- Municipal Boundary
- Major Water Feature

Elevation
High : 254 m
Low : 0 m

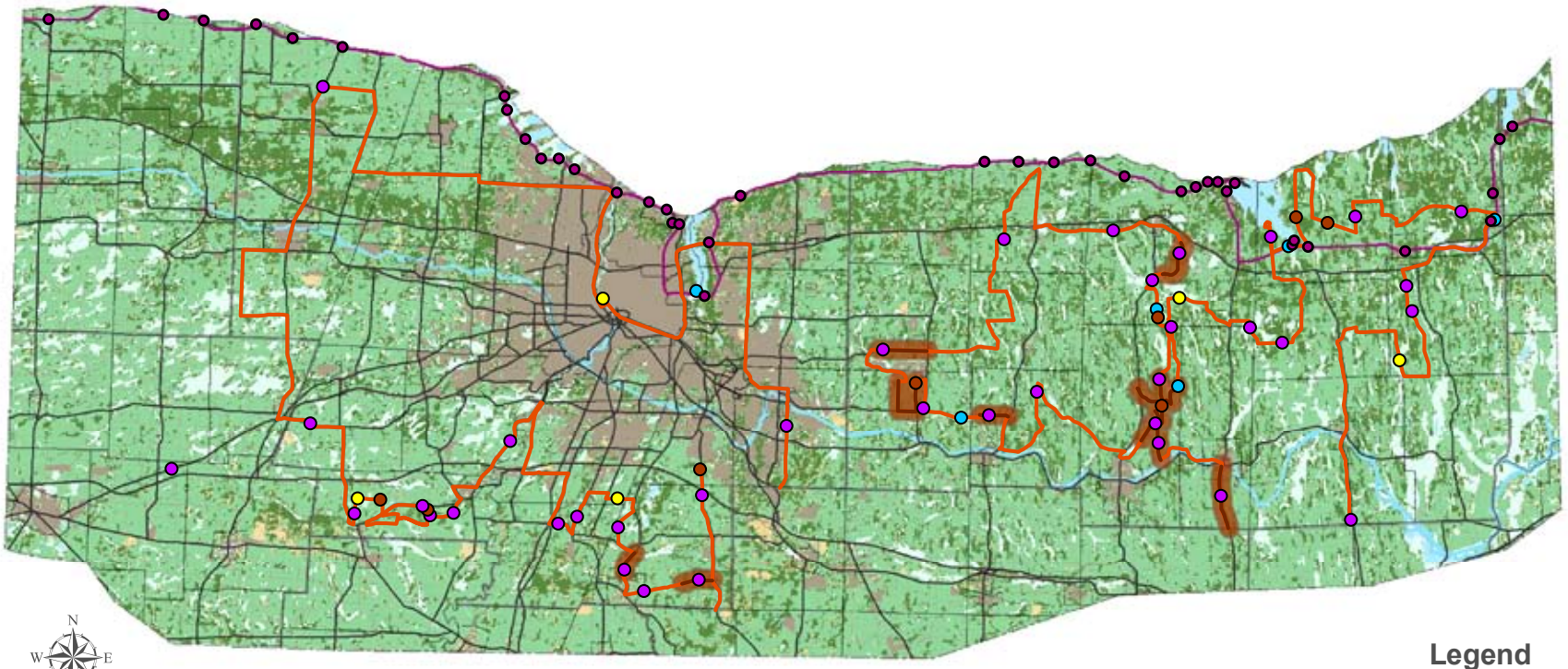
Genesee Land Trust

Cornell University

GLT Territory, New York

Map created by Strategic Conservation Planning Workshop, Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 3.2: Scenic Viewpoints by Type in the GLT Territory



N
W E
S

0 5 10 20 Miles

This map shows scenic viewpoints by categories identified during the 2007 GLT Scenic Resource Inventory. The buffer extends 1/2 mile on both sides of scenic roadways. The viewpoints and route are overlaid atop a land cover map to further illustrate what makes these resources scenic.

Legend

Viewpoint Types
- Corridor
- Topography
- Water Feature
- Working Land

- Scenic Roadway
- Roadway Buffer
- Seaway Trail
- Seaway Viewpoints
- Erie Canal

- Major Roads
- Municipal Boundary
- County Boundary
- Survey Route

- Open Water
- Urbanized Land
- Forests
- Barren, Shrub, Grass
- Crops/Pasture
- Wetlands

Genesee Land Trust

Cornell University

GLT Territory, New York

2001 Land Cover from USGS. GLT Boundary from Town of Greece, NY.
Roads from Federal Highway Commission. Municipal boundaries from CUGIR. Seaway Trail from Peter J. Smith and Co.
Erie Canal from Tug Hill Commission.
Scenic points, roadways and routes by Cornell University.

Map created by Strategic Conservation Planning Workshop, Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Suitability Model

Introduction

The strategic land conservation plan developed by the Cornell Team provides two methods of conservation suitability analysis, overlay analysis and a suitability model. The overlay analysis provides the GLT with subject-specific data overlaid on a series of individual maps. These overlay maps will allow the GLT to quickly evaluate parcels based on specific conservation goals. The suitability model provides the GLT with a guide to prioritizing and focusing protection efforts based on the overall conservation suitability of the land. Using the suitability model, the Cornell Team ran two scenarios using different conservation priorities, and compared the results. Based on the results of both suitability model scenarios, as well as the overlay analysis, the team made conservation recommendations for the GLT.

Figure 4.1 A mix of row crops and old growth trees provide a variety of texture to enhance the scenic beauty of this site.

Why Use a Suitability Analysis?

A complex and interconnected array of environmental, regulatory, quantitative, and qualitative factors determines the suitability of a given parcel for land conservation. This complex interconnection of factors makes it difficult to quickly and consistently evaluate the conservation value of a parcel of land. Identifying in advance the conservation suitability of lands serviced by a land trust can assist the organization in making informed acquisition decisions and directing their protection efforts. The ability to demonstrate the reasoning behind land conservation decisions makes a land trust's objectives and acquisitions more transparent to its board and donor base, as well as the general public.

Overlay Analysis

Overlay analysis is a fast and simple method to evaluate land conservation suitability. Developed in the 1960s by Ian McHarg, a landscape architect and author of *Designing with Nature*, the method first involved overlaying transparencies representing a variety of physical factors, such as slopes and floodplains, that affected the same land area. Today, technological advances and GIS software allow the creation of more complex overlay maps with relative ease.

The GLT requested that the Cornell Team create a series of four overlay maps of Monroe and Wayne Counties. The overlay maps include Migratory Bird Habitat, Protected Land Connectivity, Species Specific Protection, and Agricultural and Scenic Resources. Due to the scale of these maps, the ability to zoom in on specific areas makes them more functional. Thus, the Cornell Team has provided the GLT with each of the five maps in PDF format.

Conservation Suitability Model

Another method of using multiple criteria to make a decision is to develop a suitability model. A suitability model helps identify lands that have the highest conservation value relative to the value of the study area. The model calculates the conservation value using pertinent data that can be spatially represented in GIS. The analysis can prioritize lands for conservation using different weighting schemes, such as the GLT's conservation priorities. Due to its transparent and analytical process, suitability models gain respect among decision makers with competing objectives and interests.[1] A brief explanation of the model development process follows and a more detailed description is provided in the Technical Appendix.

Methodology

Developing the Model

A conservation suitability model employs ranked and weighted data sets that spatially represent a series of land protection priorities. Using the GLTs mission statement and results of a priority setting session held in June 2007, the Cornell Team developed a set of criteria for incorporation into the suitability model. The team identified five major criteria: water resources, farmland, habitat, land assemblage, and scenic/recreational/historic resources. Next, the team selected data sets, or sub-criteria, that spatially represented each criterion in GIS.

Once the Cornell Team identified appropriate criteria and sub-criteria for the conservation suitability model, the team ranked the data sets representing each sub-criterion. A similar ranking scheme standardizes the sub-criteria so that each data set is equally represented in the suitability model. The team used a ranking scheme of 1 to 4 with 4 representing the most suitable aspect of the data set and 1 representing the least desirable aspect (Table 4.1).

The final step in developing the model is to weight the sub-criteria relative to the other sub-criteria. The weight assigned to each sub-criterion is relative to its importance or value. Equal weights can be assigned to the criteria if the criteria are equally important. In order to provide the GLT with two conservation options, the team developed two weighting systems, one equally weighted and the other using the GLT conservation priorities. In the equal weighting system the team assigned 20 points to each of the five main criteria and divided the points evenly among the sub-criteria. For the GLT Priorities system, the Cornell Team assigned weights ascertained using the Analytic Hierarchy Process. Table 4.2 shows both weighting systems by criteria and sub-criteria.

Table 4.2 Weighting System for Suitability Analysis Criteria

Criteria and Sub-criteria	Evenly Weighted		GLT Priorities	
Water Resources	20		35.48	
Riparian Corridors (Stream Buffers)		10		17.74
Wetlands		10		17.74
Farmland	20		11.9	
Prime Farmland		6.7		4.76
Soils		6.7		4.76
Agricultural Districts		6.6		2.38
Land Assemblage	20		15.94	
Proximity to Protected Land		6.7		5.31
Tax Abatement Parcel		6.7		5.31
Large Parcels		6.6		5.32
Habitat	20		28.81	
Important Bird Area (IBA)		4		6.13
Migratory Bird Habitat		4		6.13
Species Richness		4		3.53
Rare, Threatened, and Endangered Species		4		9.48
Forest		4		3.53
Scenic, Recreation, and Historic Resources	20		7.86	
Tax Abatement Parcel		4		2.34
Trails (1/2 Mile Buffer)		4		1.71
Scenic Roadways (1/2 Mile Buffer)		4		2.06
Scenic Viewsheds		4		1.26
Historic Resources		4		0.48
TOTAL	100	100	99.99	99.97

Table 4.1 Description and Ranking of Criteria and Sub-criteria for Conservation Suitability Model

Water Resources		In its mission statement, the GLT states its objective to "preserve and protect…waterways and wetlands." According to the June priority-setting session, the group is also interested in protecting Riparian Corridors.
Stream Buffers (and Riparian Habitat)		
Rank	*Description*	*Explanation*
4	Within 100' of rivers and streams	Protecting land along streams is important to maintaining water quality and protecting riparian habitat. A 100' buffer is the accepted standard best practice for protecting water quality and riparian habitat.
1	Greater than 100' from rivers and streams	
Wetlands		
Rank	*Description*	*Explanation*
4	Class I Wetland	Protecting wetlands is important to maintaining water quality and protecting habitat. "The NYSDEC ranks wetlands according to their ability to perform wetland functions and provide wetland benefits. Class I wetlands have the highest rank, and the ranking descends through Classes II, III and IV" (6 NYCRR Part 664.4).
3	Class II or III Wetland	
2	Class IV Wetland	
1	Not a wetland	
Farmland		In its mission statement, the GLT states its objective to "preserve and protect… farmland." An interest in protecting farmland was also expressed by the group in this spring's priority-setting session.
Prime Farmland		
Rank	*Description*	*Explanation*
4	Prime Farmland	The Natural Resources Conservation Services uses soil type, land use, frequency of flooding, and many other criteria to identify different classes of farmland. According to the *National Soil Services Handbook*, Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. Farmland of Statewide Importance is land that is prime within the state, but would not necessarily be as significant nationwide. Farmland that is Prime if Drained is naturally too wet to be considered prime, but could be prime if artificially drained.
3	Farmland of Statewide Importance	
2	Prime if Drained	
1	Not Prime Farmland	
Soils		
Rank	*Description*	*Explanation*
4	Well-drained	The Natural Resources Conservation Service classifies soil according to drainage conditions. Per the *National Soil Services Handbook*, Drainage Class considers the frequency and duration of wet periods to assess the natural drainage condition of an area's soil. Well-drained soils are healthy, aerated soils, which is critical to good agricultural land.
3	Moderately-drained	
2	Poorly-drained	
1	Very poorly drained	

Agricultural District		
Rank	*Description*	*Explanation*
3	In an Ag District	Article 25-AA of the federal Agriculture and Markets Law authorizes the creation of local agricultural districts. These districts are identified locally as areas where agricultural uses are to be encouraged. It is assumed that the protection of farmland within these districts should be prioritized over land that is outside of the districts.
1	Not in an Ag District	
Land Assemblage		The June priority-setting session suggested that the GLT is interested in assembling large areas of protected land, and adding to such assemblages when possible. This is consistent with a general understanding that large interconnected areas of protected land are most effective for protecting habitat, water quality, and other ecological aspects.
Proximity to Protected Land		
Rank	*Description*	*Explanation*
4	Within ¼ mile of protected land	Land that is adjacent to or within ¼ mile of land that is already protected is assumed to be most desirable for contributing to protected land assemblages. Land that is greater than one mile from protected land is assumed to contribute less toward this goal. Protected land data came from the Wayne and Monroe County Tax Assessors, as well as the Nature Conservancy, Trust for Public Land, DEC, and the GLT.
3	Between ¼ - ½ mile from protected land	
2	Between ½ - 1 mile from protected land	
1	Greater than 1 mile from protected land	
Tax Abatement Parcels		
Rank	*Description*	*Explanation*
3	Is a tax abatement parcel	Tax abatement parcels are a form of protected land. Owners receive tax benefits in exchange for commitments to limit development over a specified time period. It is assumed that such owners might be predisposed to considering longer-term protection options for their land. Still, since property owners may significantly change the land use of their property once the abatement period ends, the Cornell Team did not apply the highest rank to these parcels. Tax abatement data came from the Wayne and Monroe Tax Assessors.
1	Is not a tax abatement parcel	
Large Parcels		
Rank	*Description*	*Explanation*
4	Is greater than the average farm size	Protecting larger parcels is consistent with the goal to create large assemblages of protected land. The highest ranked parcels are those that exceed the average farm size for their respective counties. In Monroe County, the average farm acreage is 169. In Wayne County, the average farm acreage is 183.
3	Is between 100 acres and the average farm size	
2	Is between 50 and 99 acres	
1	Is less than 50 acres	

Habitat		In its mission statement, the GLT states its objective to “preserve and protect . . . fish and wildlife habitat." The GLT has also proposed a mission statement revision that would incorporate Habitat/Trail Connections. In the June priority-setting session, Migratory Bird Habitat and Forests were identified as priorities for protection.
Important Bird Area (IBA)		
Rank	*Description*	*Explanation*
4	Listed as an IBA	Important Bird Areas (IBA) are officially designated sites that provide critical habitat for the survival and conservation of birds. There are nine such areas designated within the GLT territory. Protection of land in IBAs furthers the GLT goal of protecting habitat.
1	Not listed as an IBA	
Migratory Bird Habitat (Lake Ontario Buffer)		
Rank	*Description*	*Explanation*
4	Within 1/8 mile of Lake Ontario	Land along Lake Ontario provides particularly important migratory bird habitat. This analysis assumes land within 1/8 of a mile of the lake to be most valuable to migrating birds. Migratory bird habitat is assumed to diminish with increasing distance from the lake.
3	1/8 to ¼ mile from Lake Ontario	
2	¼ to ½ mile from Lake Ontario	
1	Greater than ½ mile from Lake Ontario	
Species Richness		
Rank	*Description*	*Explanation*
4	150-162 species	The potential species richness of a given area can be inferred based on land cover type. It is assumed that land featuring cover types that can support high numbers of species should be given high priority for protection.
3	126-149 species	
2	105-125 species	
1	Less than 105 species	
Rare, Threatened, and Endangered Species		
Rank	*Description*	*Explanation*
4	Within one mile of endangered species	Land that supports rare, threatened, or endangered species is generally considered to be important habitat with high priority for protection. This analysis gives highest value to land where endangered species have been identified, followed by threatened species, then rare, protected, and special concern species, then unlisted and game species.
3	Within one mile of threatened species	
2	Within one mile of rare, protected, and special concern species	
1	Within one mile of unlisted and game species	
Forest		
Rank	*Description*	*Explanation*
4	Constant forest over time	It is assumed that established forest provides more habitat value than new growth forest. New growth forest is defined as land that was not forested at the time of the 1992 USGS Land Use survey, but was forested at the time of the 2001 survey.
3	New growth forest	
1	Not forested	

Scenic, Recreational, and Historic Resources		In its mission statement, the GLT states its objective to "preserve and protect…scenic or recreational areas." The GLT has also proposed revisions to its mission statement revision that would incorporate an emphasis on protecting "Habitat/Trail Connections."
Erie Canal		
Rank	*Description*	*Explanation*
4	Within ½ mile of Erie Canal	The Erie Canal is an important scenic, recreational, and historic resource in the GLT Territory. It also provides valuable habitat. It is assumed that the protection of land within a ½ mile buffer of the Canal can help to maintain its many beneficial aspects. Land outside of the ½ mile buffer is assumed to be less valuable for this purpose.
1	Greater than ½ mile from Erie Canal	
Trails (includes hiking, biking, and snowmobile trails, existing and planned)		
Rank	*Description*	*Explanation*
4	Within ½ mile of trail	It is assumed that the protection of land within a ½ mile buffer of trailways can help to maintain the scenic and recreational value, as well as the habitat value, of these trails.
1	Greater than ½ mile from trail	
Historic Resources		
Rank	*Description*	*Explanation*
4	Historic Site	It is assumed that the protection of land within a ½ mile buffer of historic sites can help to maintain the experience of visiting historic sites, as well as their historic value. Moreover, if property owners have made the effort to have their properties designated as historic, they may be interested in additional conservation measures.
3	Within ½ mile of a historic site	
1	Greater than ½ mile from a historic site	
Scenic Viewsheds		
Rank	*Description*	*Explanation*
4	6 to 13 combined viewsheds	Land that is visible from a given scenic viewpoint is considered to be part of a scenic viewshed. Land that falls in several viewsheds, and therefore contributes to several different scenic viewpoints, is considered to be most important to the protection of an area's scenic resources.
3	4 to 5 combined viewsheds	
2	1 to 3 combined viewsheds	
1	No viewsheds	
Scenic Roadways (includes Seaway Trail)		
Rank	*Description*	*Explanation*
4	Within ½ mile of scenic roadway	It is assumed that the protection of land within a ½ mile buffer of scenic roadways is necessary to maintain the scenic nature of these roadways.
1	Greater than ½ mile from scenic roadway	

Analytic Hierarchy Process

A land trust may value certain criteria more highly than others. For example, they might feel that protecting habitat is more important than protecting scenic resources, and protecting water resources is more important than protecting habitat. In this case, the land trust would want to weight data associated with water resources more highly than data associated with scenic resources.

To explore and develop a better understanding of their priorities, land trusts can take advantage of academic models and tools designed to aid complex decision-making. One such model is the Analytic Hierarchy Process (AHP), developed by Dr. Thomas L. Saaty, of the University of Pittsburgh, in the 1970s. The model is designed to help users consider all relevant factors, both tangible and intangible, in making the best decisions.[2] The Cornell Team used AHP software, SuperDecisions developed by Dr. Saaty, to fine-tune and quantify the GLTs priorities.[3] A more detailed explanation of the AHP process is provided in the Technical Appendix.

Classification Method

Upon assigning both weighting systems to the conservation criteria, the Cornell Team ran the suitability model in GIS. The resulting "suitability score" indicates the conservation value of the land when all criteria are considered. The Team ran the conservation suitability model using the two previously described weighting systems, Equal Weight and GLT Priorities. The suitability scores ranged from 32 to 87 on a scale of 1 to 100, with 100 being the most important, for the Equal Weight system and 30 to 87 for the GLT Priorities system.

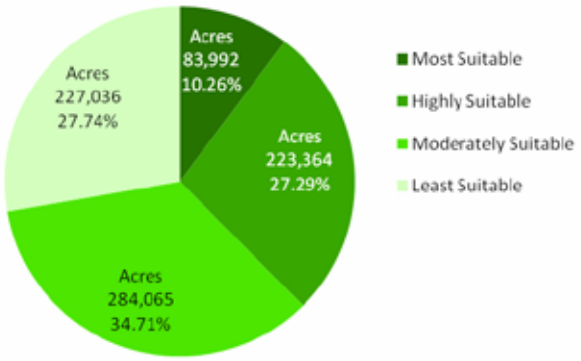
After running the conservation suitability model, the Cornell Team classified the suitability scores in order to represent the conservation suitability of the land. The team classified the results of the Equal Weight model into four categories using natural breaks. The natural breaks classification method sorts data values using "apparent natural groupings."[4] The team assigned the same natural breaks to the GLT Priorities suitability scores in order to compare the two models. The Cornell Team designated the values in the top category, above 58, as Most Suitable; values between 52 and 57 as Highly Suitable; values between 46 and 51 as Moderately Suitable; and values in the bottom category, below 45, as Least Suitable.

Findings

Conservation Suitability Model Results

The Cornell Team mapped the results of the Equal Weight and GLT Priorities weighting systems using GIS (Maps 4.1 and 4.2). The mapped results demonstrate the variation in suitability that occurs when applying different weighting systems in a conservation suitability model. The equally weighted system revealed that 10 percent, or nearly 84,000 acres, are Most Suitable for conservation and another 27 percent of the land in Monroe and Wayne Counties, or 223,300 acres, is Highly Suitable. Nearly 35 percent of the land in these counties, comprising 284,000 acres, is classified as Moderately Suitable for conservation and another 28 percent, nearly 227,000 acres, is Least Suitable (Chart 4.1).

Chart 4.1 Conservation Suitability Distribution Using Equal Weighting System, Monroe and Wayne Counties

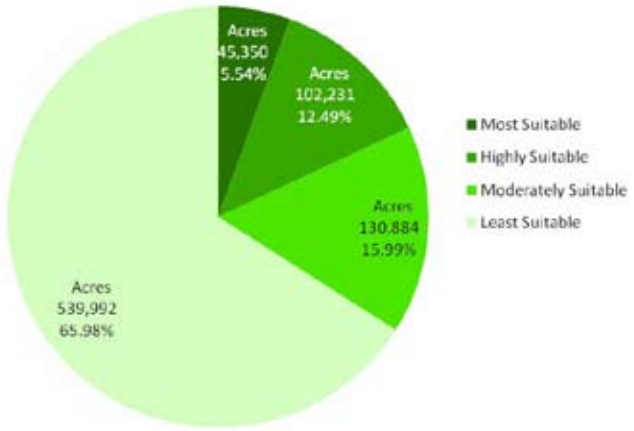


In general, the Equal Weight map shows that the conservation suitability of lands fluctuates widely across Monroe and Wayne Counties (see Map 4.1). One reason for the varying distribution may be the counties' characteristic geography of forested drumlins interspersed with agricultural lands and stream corridors. Still, a few patterns emerge upon closer analysis. A concentration of Most and Highly Suitable lands is located in the southeast corner of Wayne County, the northwestern portion of the Montezuma Wetlands Complex. Another concentration appears in the Town of Arcadia in Wayne County, where stream corridors, prime agricultural lands, wetlands, scenic resources, trails, and protected land converge. In addition, Most and Highly Suitable lands occur along the numerous stream corridors in both counties. Each concentration demonstrates the relatively high conservation value of riparian corridors and wetlands. Conversely, the urbanized area in and around Rochester is generally characterized as having Least or Moderately Suitable lands for conservation. With poor soils, little forests and wetlands, and few large parcels, among other factors, it is not surprising that conservation suitability is low in this built-up area.

The conservation suitability results were very different when the Cornell Team applied the GLT Priorities weighting system to the model. In this scenario, just 5.5 percent of the land in Monroe and Wayne Counties, 45,350 acres, are Most Suitable for conservation; another 12 percent, 102,231 acres, are Highly Suitable; and 16 percent of the area, 130,884 acres, is Moderately Suitable. The majority, 66 percent, of Monroe and Wayne Counties under the GLT Priorities weighting system is classified as Least Suitable (Chart 4.2). Chart 4.3 compares the two weighting systems by acreage.

Analysis of the GLT Priorities map reveals a quite different pattern of conservation suitability as compared to the Equal Weight map. The Most and Highly Suitable lands are heavily concentrated in the wetlands and along the stream corridors. This concentration is the result of the very high priority that the GLT placed on riparian corridors and wetlands in the AHP (see Table 4.2). Not surprisingly, a similar concentration of Most, Highly, and Moderately Suitable lands emerged in the Montezuma Wetlands Complex. Although not as apparent as these wetlands, the area in central Arcadia north of Newark also showed up as more suitable.

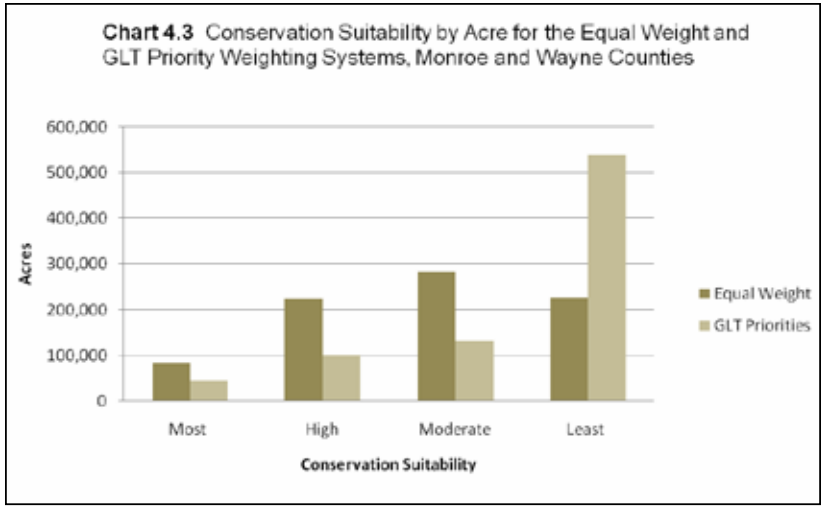
Chart 4.2 Conservation Suitability Distribution Using GLT Priority Weighting System, Monroe and Wayne Counties



Since the highly suitable area in central Arcadia surrounds the GLT's Peacework Farm and several other protected lands, the Cornell Team decided to further analyze this concentration as the Arcadia Focus Area. The Cornell Team also further evaluated the City of Rochester as the Rochester Urban Focus Area. It is important to note that this area did not rank highly in the suitability analysis, however it should not be assumed that the area has low conservation value. The GLT conservation priorities for urban areas simply differ from those for the rest of its territory. Both the Arcadia and Rochester Focus Area analyses are presented in Chapter 5.

Test Parcels

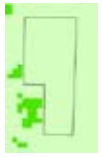
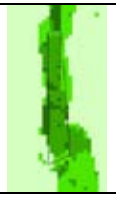
In order to test the conservation suitability model, the GLT identified seven parcels along with their perceived protection value for the Cornell Team to evaluate using the model. Table 4.3 shows the test parcels. The team calculated an average suitability score for each parcel.[5] When the team evaluated these average parcel scores against each other using the two weighting systems, Equal Weight and GLT Priorities, the suitability value of five of the seven parcels matched. For one parcel, Parcel 3, the difference was nominal with the GLT



Priorities score falling 0.03 points short of being classified the same as the Equal Weight score. The range of scores for the remaining parcel, Parcel 1, was somewhat wider, but the GLT Priorities score still fell only one classification below than the Equal Weight score.

When comparing the average suitability scores with the values that the GLT intuitively placed on the test parcels, the results were more varied. Three, or 43 percent, of the test parcels, Parcels 4, 5, and 6, matched the GLT's value exactly. Two of the parcel scores, scores for Parcels 1 and 3, and the GLT values modestly matched. For Parcel 1 the Equal Weight system resulted in a value similar to the GLTs, yet the GLT Priorities weighting did not. For Parcel 3, the GLT valued the parcel one classification above both average suitability scores. Finally, the GLT valued two parcels, Parcels 2 and 7, entirely opposite from the average suitability scores. While the GLT considered Parcel 2 good for acquisition, both weighting systems ranked it

Table 4.3 Test Parcel Comparison between Equal Weighted and GLT Priorities Weighting Systems and GLT Assessment Values

	Parcel 1 258.25 Acres Town of Williamson Wayne County	**Parcel 2** 45.8 Acres Town of Ontario Wayne County	**Parcel 3** 31.53 Acres Town of Chili Monroe County	**Parcel 4** 115.3 Acres Town of Clarkson Monroe County	**Parcel 5** 13 Acres Town of Penfield Monroe County	**Parcel 6** 6.3 Acres Town of Henrietta Monroe County	**Parcel 7** 36.76 Acres Town of Macedon Wayne County
	GLT Value: Yes	GLT Value: Yes	GLT Value: Maybe (+)	GLT Value: Maybe (-)	GLT Value: No	GLT Value: No	GLT Value: No
EQUAL							
	Highly Suitable (54)	Least Suitable (45)	Moderately Suitable (50)	Moderately Suitable (50)	Least Suitable (43)	Least Suitable (43)	Highly Suitable (52)
GLT							
	Moderately Suitable (47)	Least Suitable (39)	Least Suitable (45)	Moderately Suitable (47)	Least Suitable (39)	Least Suitable (38)	Highly Suitable (56)

as Least Suitable. The converse happened for Parcel 7, wherein the GLT considered this parcel inappropriate for acquisition, but both weighting systems classified the parcel as Highly Suitable.

The results of the test parcel analysis reveal that either model will assist the GLT in making conservation and acquisition decisions. However, the test vividly demonstrates that because the factors affecting conservation value are so varied and numerous, the assistance of the suitability model in the decision-making process could help guide the GLT away from poor projects and toward important conservation parcels. Using the suitability model as an evaluative tool does not negate the need for site specific project evaluations and field visits, or preclude the incorporation of data that cannot be spatially represented in GIS into the evaluation process.

Figure 4.2 Row crops like this field of corn add color to the fall landscape.

Conclusions and Recommendations

The overlay maps and conservation suitability model presented above are useful in that they spatially represent the land trust's mission statement and conservation priorities. The GLT can incorporate and expand on this information in a variety of ways. The maps provide the GLT with a tool to make quick, informed, and systematic conservation decisions, as well as act as a catalyst for developing goal-oriented land protection projects. This proactive approach will allow the GLT to more efficiently use their limited funding and staff resources while making directed progress toward conservation targets. Moreover, the analytical methodology and spatial representations of conservation factors in these suitability analyses provide a degree of legitimacy to the land trust's protection goals with its constituents and potential partners in the GLT Territory. Five recommendations for further incorporating the two suitability tools into the GLTs conservation endeavors follow:

- Use the results of the suitability models to identify additional concentrations of Most or Highly Suitable land as focus areas in Monroe or Wayne Counties, similar to the Arcadia Focus Area (see Chapter 5). Develop strategies to conserve these resource-rich lands using the overlay maps to locate goal-oriented characteristics, such as large parcels, habitat, connections, stream buffers, and prime agricultural soils.
- Use the overlay and suitability maps to develop territory-wide strategies, such as pinpointing all parcels over 100 acres with Most or Highly Suitable land and cultivating relationships with these landowners.

- Use the overlays and suitability model to build upon the results of other conservation studies in Monroe and Wayne Counties. For instance, in 2003 the Trust for Public Lands (TPL) evaluated counties abutting the Great Lakes for conservation suitability and identified parcels, called Greenprint Parcels, for protection. The GLT could pursue Greenprint Parcels that are also identified as Most or Highly Suitable by the model in order to partner with the TPL. Conversely, the GLT could protect parcels not identified as Greenprint parcels to broaden conservation efforts in the GLT Territory.
- Use the overlays and suitability model to build upon municipal conservation goals in Monroe and Wayne Counties. Partnerships could be formed with municipalities that identify conservation areas or goals in their comprehensive plans that match lands identified as Most or Highly Suitable in the model. The results of the suitability and overlay maps would also serve as a rational and transparent entrée into a dialogue about conservation partnerships between the GLT and local governments.
- Consider using the Equal Weight model rather than the GLT Priorities model. The equally weighted model highly ranks riparian corridors and wetlands, which are most important to the GLT, but does not diminish the importance of farmland, forest, and other conservation values, which the GLT also considers important for protection in the GLT Territory. The parity between the models is demonstrated in the test parcel analysis, wherein 70 percent of the average suitability scores resulted in the same classification value, even though the concentrations of highly suitable land varied.

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[1] Longley, Paul A., Michael F. Goodchild, David J. Maquire, and Daid W. Rhind. 2005. *Geographic Information Systems and Science*. West Sussex, England: John Wiley and Sons, 381.

[2] University of Pittsburgh. 2007. Thomas L. Saaty Faculty Profile. Online. http://www.business.pitt.edu/faculty/saaty.html, accessed 13 November 2007.

[3] Creative Decisions Foundation. 2007. SuperDecisions. Online. http://www.superdecisions.com, accessed 13 November 2007.

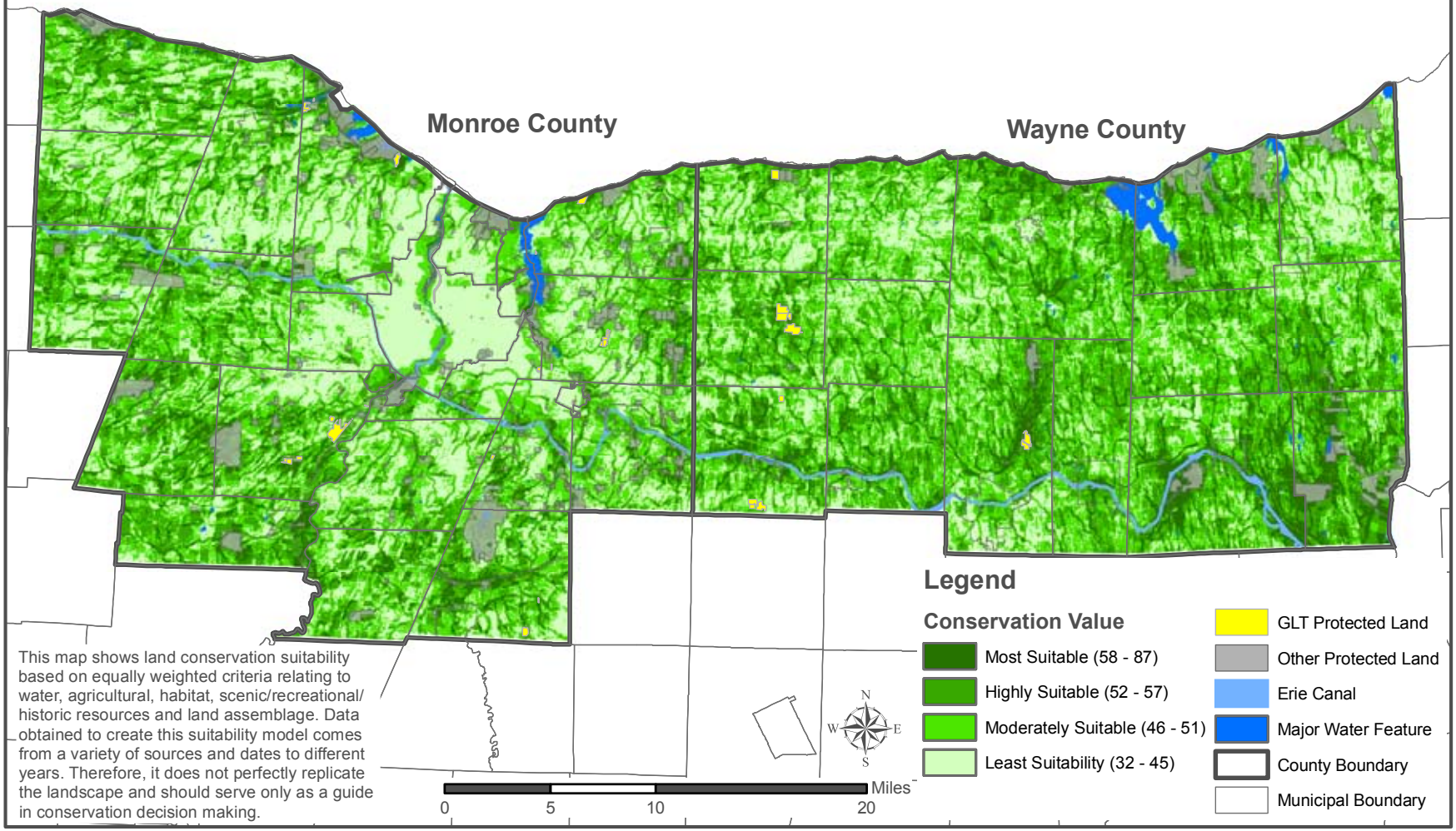
[4] Longley et al, 277.

[5] The Cornell Team calculated an average suitability score by dividing the sum of the individual raster cell scores by the total number of rasters in each parcel.

[6] Trust for Public Land. 2003. Great Lakes Greenprint. On-line. http://www.tpl.org/tier3_cdl.cfm?content_item_id=12324&folder_id=2426, accessed 15 November 2007.

Figure 4.3 Abondoned and fallow agricultural fields are a vital habitat for meadow bird species.

Map 4.1: Land Conservation Suitability Model with Evenly Weighted Criteria for Monroe and Wayne Counties



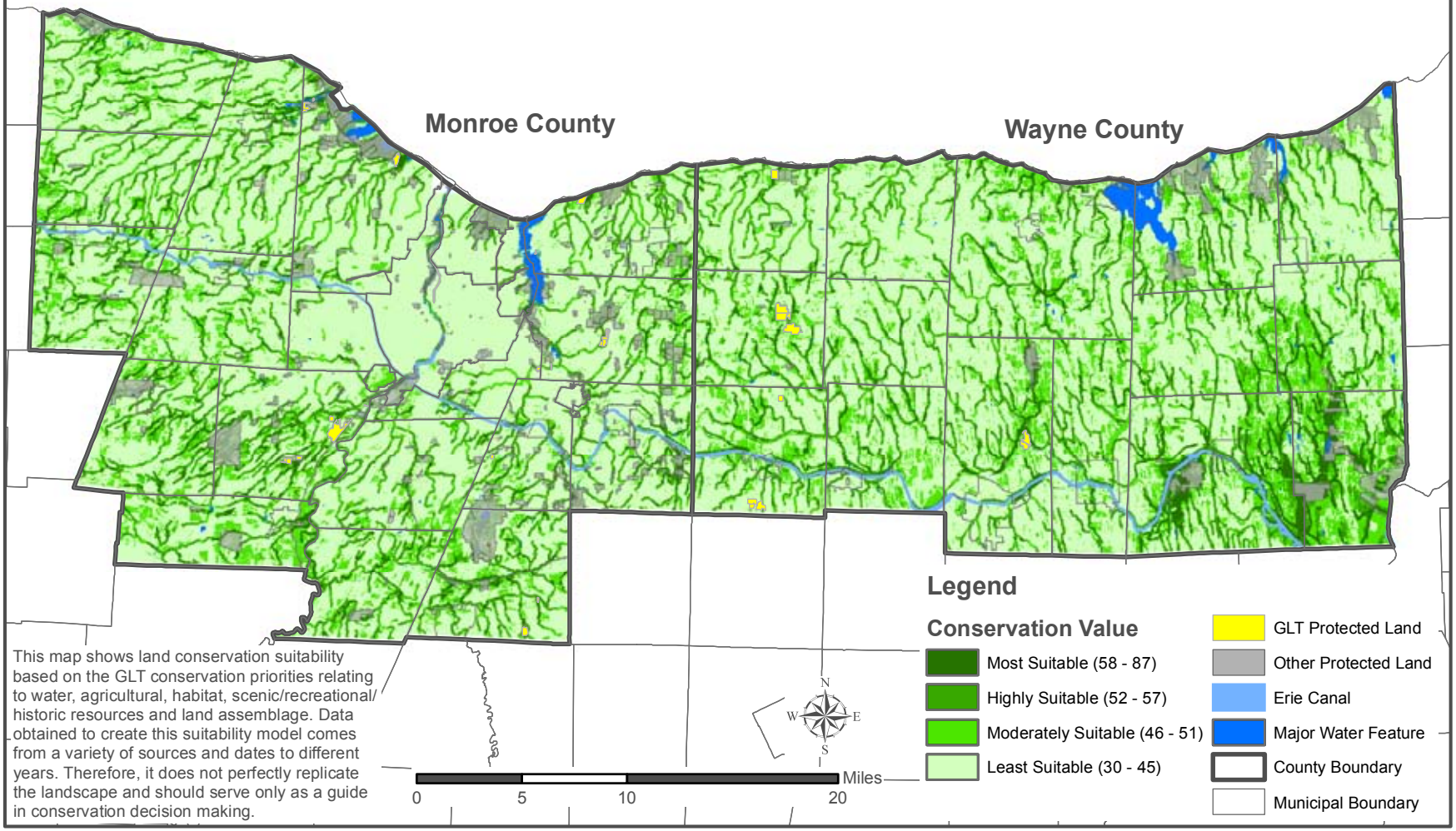
This map shows land conservation suitability based on equally weighted criteria relating to water, agricultural, habitat, scenic/recreational/ historic resources and land assemblage. Data obtained to create this suitability model comes from a variety of sources and dates to different years. Therefore, it does not perfectly replicate the landscape and should serve only as a guide in conservation decision making.

Genesee Land Trust

Cornell University

Map created by Strategic Conservation Planning Workshop, Cornell University, November 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Map 4.2: Land Conservation Suitability Analysis Weighted by GLT Priorities for Monroe and Wayne Counties



Genesee Land Trust

Cornell University

GLT Territory, New York

Conservation values classified manually using same natural breaks determined for the evenly weighted criteria in Map 4.1.
Map created by Strategic Conservation Planning Workshop, Cornell University, November 2007.
Projection: NAD 1983 UTM Zone 18N Map units: Meters

Focus Area

Introduction

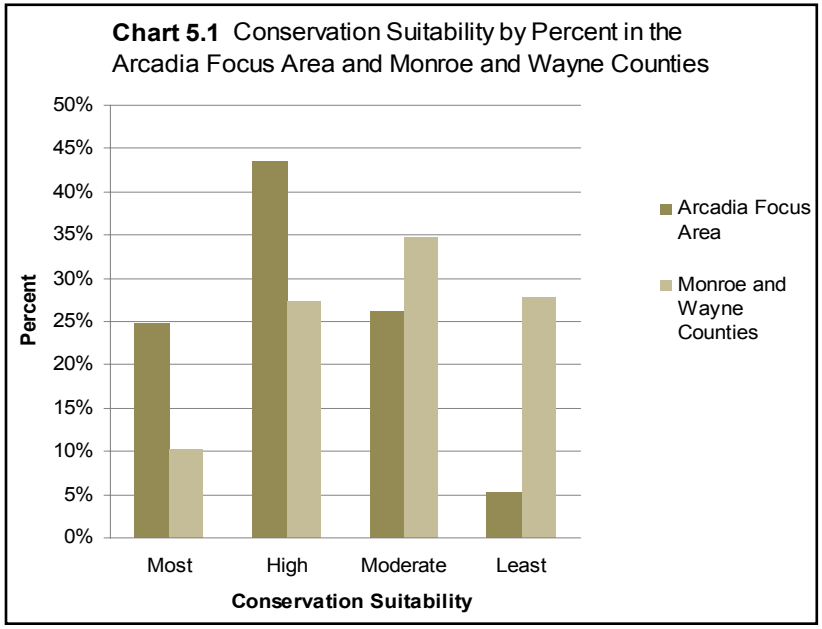
Land trusts with large territories often concentrate their resources on the protection of a specific portion of their service area, generally one with particularly high conservation value. Within this Focus Area, land trusts can more carefully analyze local conditions and begin to identify landowners with whom to develop relationships. This report presents two focus areas, the Arcadia Focus Area and the Rochester Urban Focus Area. The same methodology could be applied to any other area in the GLT territory.

The Arcadia Focus Area

Background

The Arcadia Focus Area lies primarily in the eastern half of the Town of Arcadia in Wayne County, and has an area of approximately 10,000 acres. The Cornell Team selected this area based on the Equally Weighted Conservation Suitability Model presented in Chapter 4. This suitability model ranked over 68 percent of the lands in the focus area either Most or Highly Suitable for conservation (Chart 5.1). This unique region features a convergence of several important conservation factors, including high quality farmland, connectivity of protected lands, water and scenic resources, and forests. With the acquisition of Peacework Farm and the Crowfields Conservation Easement, the GLT recognized this high conservation value and has a prime opportunity to build on the protection work they have already initiated in the area. To establish the Arcadia Focus Area boundary, the Cornell Team placed a one mile buffer around the GLT protected lands, two Wayne County-owned protected parcels, and Zurich Bog, a National Natural Landmark protected by the Bergen Swamp Preservation Society. The Focus area includes all parcels inside and intersecting with the buffer (Map 5.1).

Chart 5.1 Conservation Suitability by Percent in the Arcadia Focus Area and Monroe and Wayne Counties



This section presents two maps for the Arcadia Focus Area. The Cornell Team also produced two additional maps, the Arcadia Focus Area Suitability Analysis, and Land Use in the Arcadia Focus Area. The team has provided these maps to the GLT in digital format.

Conservation Value

Farmlands

Chapter 2 of this report emphasizes Wayne County's diverse and excellent agricultural opportunities. The Arcadia Focus Area is no exception (see Map 5.1). The entirety of the focus area falls within Wayne County Agricultural District 4. Approximately 6,616 acres of this land is protected in agricultural tax abatement programs. Further, over half, or 5,714 acres, of the focus area is considered prime farmland by the United States Natural Resource Conservation Service. This agricultural landscape is a microcosm of the greater GLT Territory's rich history of farming.

Connectivity of Protected Lands

A land trust can help create better habitats by conserving parcels adjacent to or near protected lands rather than fragmented parcels. Therefore, the GLT has a strong desire to connect currently protected lands with future conservation projects. Currently, the GLT owns outright the Peacework Farm, a working organic farm and nature preserve, and holds the Crowfields Conservation Easement on a nearby farm. The Zurich Bog and two county-owned protected parcels are also included in the Arcadia Focus Area.
There are several opportunites to connect these protected lands within the Arcadia Focus Area. The planned Wallington to Newark

Trail will run north-south through the two county-owned parcels, Peacework Farm, and Zurich Bog. This trail also intersects with the planned, east-west running Wayne County Power Corridor Trail and the Erie Canal, located a short distance to the south. Ganargua Creek, which winds through the southern portion of the focus area, presents another potential corridor for connectivity. Each of these corridors provides an opportunity for conservation and connectivity. Map 5.2 demonstrates the highly connected system of protected lands in the focus area.

Figure 5.1 Mature woodlands offer a patchwork of microhabitats.

Scenic Resources

This report's scenic resource analysis identified both viewshed and roadway resources in the Arcadia Focus Area. The focus area's picturesque character serves as a reminder of the region's history of glaciation. Its glacially-formed steep, repeating hills, or drumlins, are ideal scenic resources, and are prevalent throughout the area (see Map 5.2). Finally, several viewpoints emerge while driving through the focus area. The viewpoints present a rich palette of farming, forests, and waters which compose the focus area.

Landowner Analysis

The Cornell Team conducted a parcel analysis of the Arcadia Focus Area assessing every parcel within a one mile buffer of the aforementioned protected lands. Using Wayne County Parcel data, the team calculated the acreage of individual parcels in GIS. The team identified the 10 largest landowners and included their contact information in Table 5.1 in the Technical Appendix.. Map 5.2 displays all parcels over 50 acres in size in the focus area. A corresponding table, Table 5.2 in the Technical Appendix, provides contact information for these landowners and could serve the GLT for future conservation efforts in the focus area. Finally, an analysis of the property tax codes revealed an agricultural working landscape; parcels are primarily agricultural, abandoned agricultural, and residential land uses.

Recommendations

- As the Wallington to Newark Trail is still in planning stages, the GLT can become involved in the process to ensure that it connects already protected lands and focus conservation projects along this trail system.
- As Wayne County continues to face the pressure of Rochester's changing urban landscape, the GLT has the opportunity to protect highly productive and historic agricultural landscapes in the focus area.

- Using the landowner analysis and large parcel analysis, the GLT can begin contacting individual parcel owners on a regular basis to develop relationships and build upon the success of Peacework Farm and the Crowfields Conservation Easement.

The Rochester Urban Focus Area

Background

Priorities for urban land conservation often differ from those for conservation in more rural areas. Within the city, parcel sizes are smaller and opportunities to protect "pristine habitat" are few. Rather than focusing primarily on protecting land for wildlife, conservation efforts in urban areas may also emphasize protecting green space for people.

To date, the GLT has been involved in one urban conservation project: the El Camino Trail north of the city center. For future projects, the group is interested in opportunities to protect land along the city's prominent natural features (namely the Genesee River, Irondequoit Bay, the Erie Canal, and any topographical high points, such as Pinnacle Hill). The group is also interested in creating connections between these natural features and the city's low-income neighborhoods. Such connections might follow streams, old trolley lines, abandoned railroads, or the former Erie Canal bed.

Figure 5.1 Shorelines are access points to scenic waterways and vital for wildlife.

Boundaries

As is the case in many cities, Rochester's urban development is not limited to the official city boundary. To address this, the GLT has defined its Urban Focus Area as the area bounded by Interstates 390 and 590 to the west and south, and the eastern border of Irondequoit in the east. Lake Ontario forms the northern boundary.
The most prominent feature in the Urban Focus Area is the Genesee River gorge, cutting north through the center of the city. Other significant features include the wetlands and marshes to the northwest, stream gorges and Irondequoit Bay to the northeast, the Erie Canal to the southwest, and a notable ridge to the southeast (Map 5.3).

Overlay Analysis

Because the GLT's urban conservation priorities differ from its priorities for the rest of the Territory, the group could theoretically benefit from a customized conservation suitability model using different weighting values and incorporating additional criteria such as Neighborhood Income, Isolation from Existing Parks, and Proximity to Potential Connection Corridors. However, because the GLT's urban priorities are still under development, the Cornell team decided instead to provide a more basic overlay analysis. Although an overlay analysis will not calculate conservation suitability values for parcels, working with the data in this format will help the GLT continue to explore its goals for urban land

conservation within the city. Because the focus area is relatively small, the overlay analysis will allow the group to identify specific projects they may be interested in pursuing.

This report presents two overlay maps for the Rochester Urban Focus Area. The Cornell Team produced several others that have been provided to the GLT in digital format.

Natural Features and Land Cover

One priority expressed by the GLT is a desire to protect land along Rochester's prominent natural features. Map 5.3 displays the topography, water resources, and land cover of the Urban Focus Area. Areas of high relief along water bodies may present opportunities to protect both habitat and scenic vistas. Dark green patches, representing forest, and yellow patches, representing grassland, may support the types of open space and habitat the GLT seeks to protect.

Figure 5.3 Scenic rural outbuildings like this building on a pasture are typical of Monroe and Wayne Counties.

Income and Park Access

Having identified the city's significant natural features, the GLT can begin to identify opportunities to develop corridors that will connect them to urban neighborhoods. The GLT is particularly interested in developing these types of connections for low-income neighborhoods that do not currently have easy access to parks or other natural resources. Map 5.4 displays neighborhood (census block group) income along with parks and trails (existing and proposed). This overlay allows for the identification of areas that are both low-income and lacking in parks.

An initial review of Map 5.4 reveals three "sub focus areas" within the city that represent potential conservation projects. First, on the west side of the city, a string of long, narrow vacant parcels fall along the former path of the original Erie Canal bed. These parcels could be combined to create a linear connecting feature between the present Erie Canal and the Genesee River. Second, immediately north of the city center, several large vacant or underutilized parcels present an opportunity to protect a stretch of the Genesee River Gorge and increase its accessibility to local residents. Third, on the east side of the focus area, a series of smaller vacant parcels along Densmore Creek could be protected to create a connecting feature between city neighborhoods and Irondequoit Bay.

Vacant Parcels

The most feasible opportunities for land conservation within the city will be on parcels that are vacant. Map 5.4 presents these parcels, and highlights areas in which adjacent vacant parcels could be combined to cover an area greater than 10 acres. This allows the GLT to exclude projects that might be considered "pocket parks." The overlay also reveals some interesting patterns. For example, many 10-acre plots could be formed in the area north of the city center, which has already been identified as a low-income area with few parks. Another noteworthy pattern is a string of large vacant parcels west of the city, forming a linear corridor from the city center toward the Erie Canal. These properties fall along the former Erie Canal bed, the path it originally took before being diverted around the city. A similar string of vacant corridors stands out in the east, along Densmore Creek and the proposed Irondequoit Bay Connector Trail.

Landowner Analysis

In November 2007, a sub-set of the GLT Board met with the Cornell Team to discuss its urban conservation priorities and identify potential conservation projects within the City of Rochester. During this meeting, several areas of interest were identified. The Cornell Team has developed a series of maps presenting detailed information for these areas. These maps have been provided to the GLT in digital format.

Recommendations

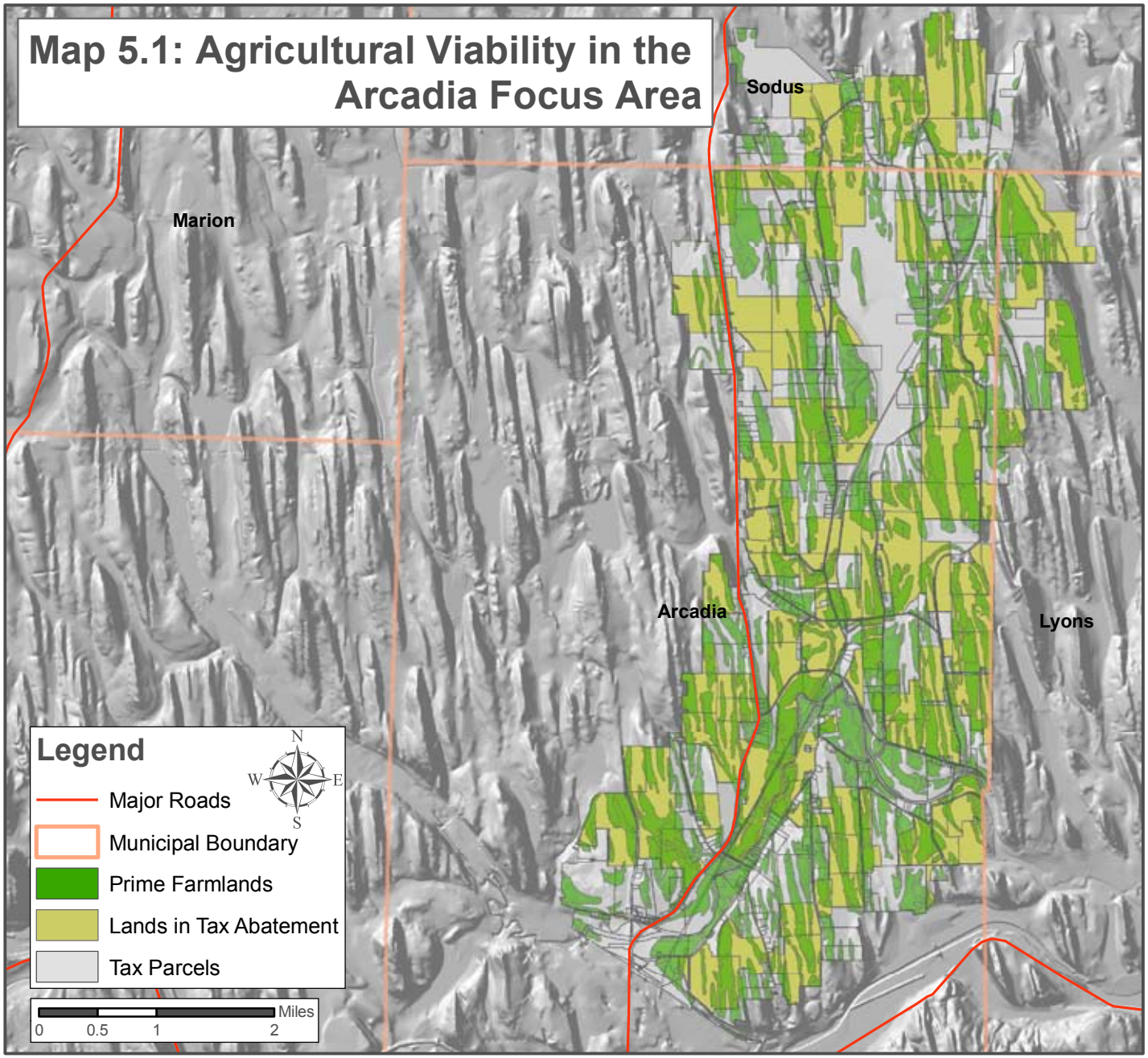
- Use the overlay maps to identify additional opportunities to protect natural features within the city and create connections to low-income neighborhoods.
- Begin approaching property owners identified in the landowner analysis to determine the feasibility of developing conservation projects in those areas.

Conclusion

The two focus areas presented above feature many valuable conservation opportunities for the GLT. Zooming in on these areas allows for a more detailed assessment of local resources and landowners. Using the suitability analysis presented in Chapter 4, the GLT can identify other areas of high conservation value and duplicate the focus area methodology employed here to develop a more thorough understanding of conservation opportunities within their territory.

Figure 5.4 A field of golden soybeans contrasts with the dark greens of a mixed hardwood forest.

Map 5.1: Agricultural Viability in the Arcadia Focus Area



Genesee Land Trust

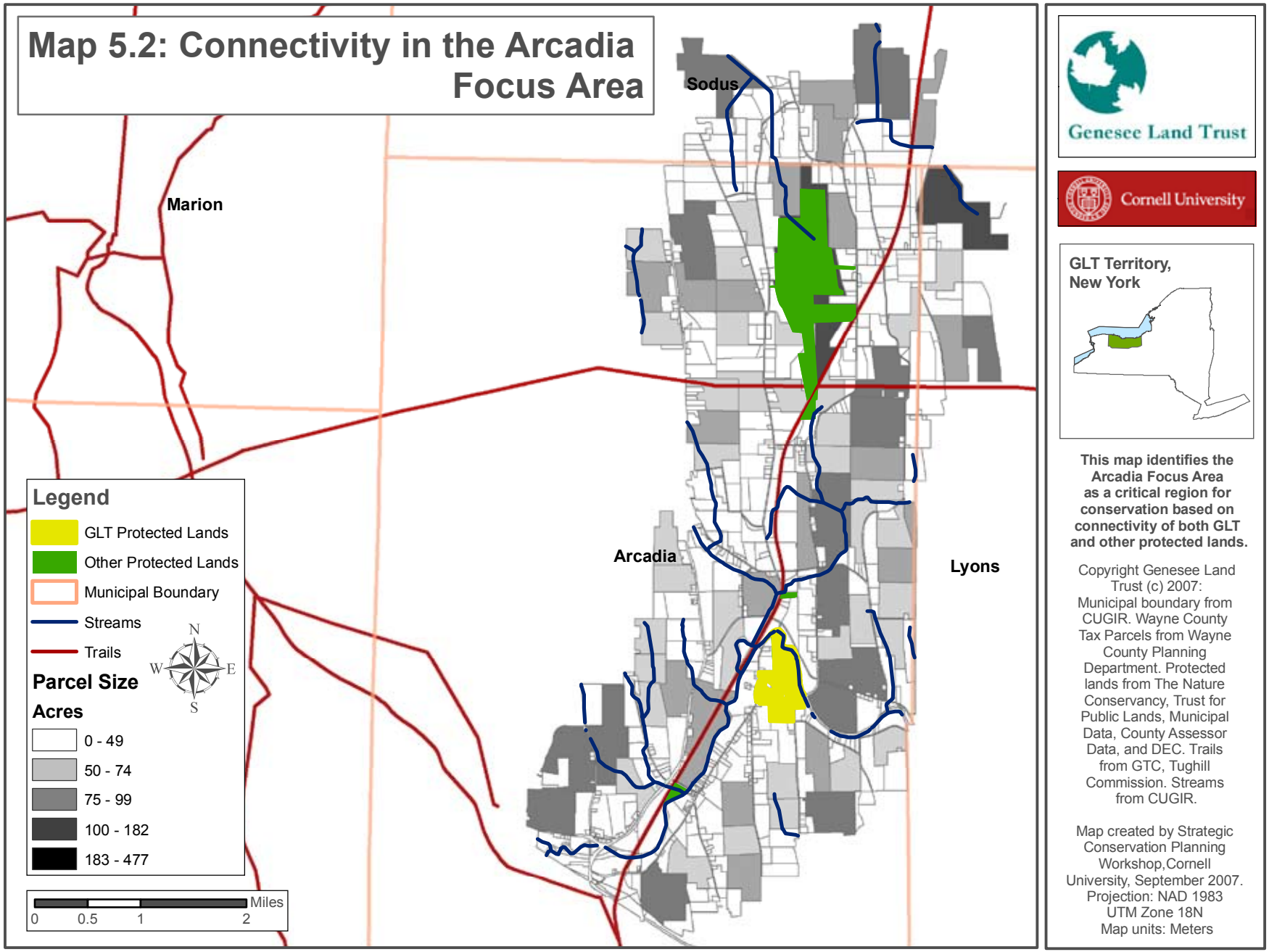
Cornell University

GLT Territory, New York

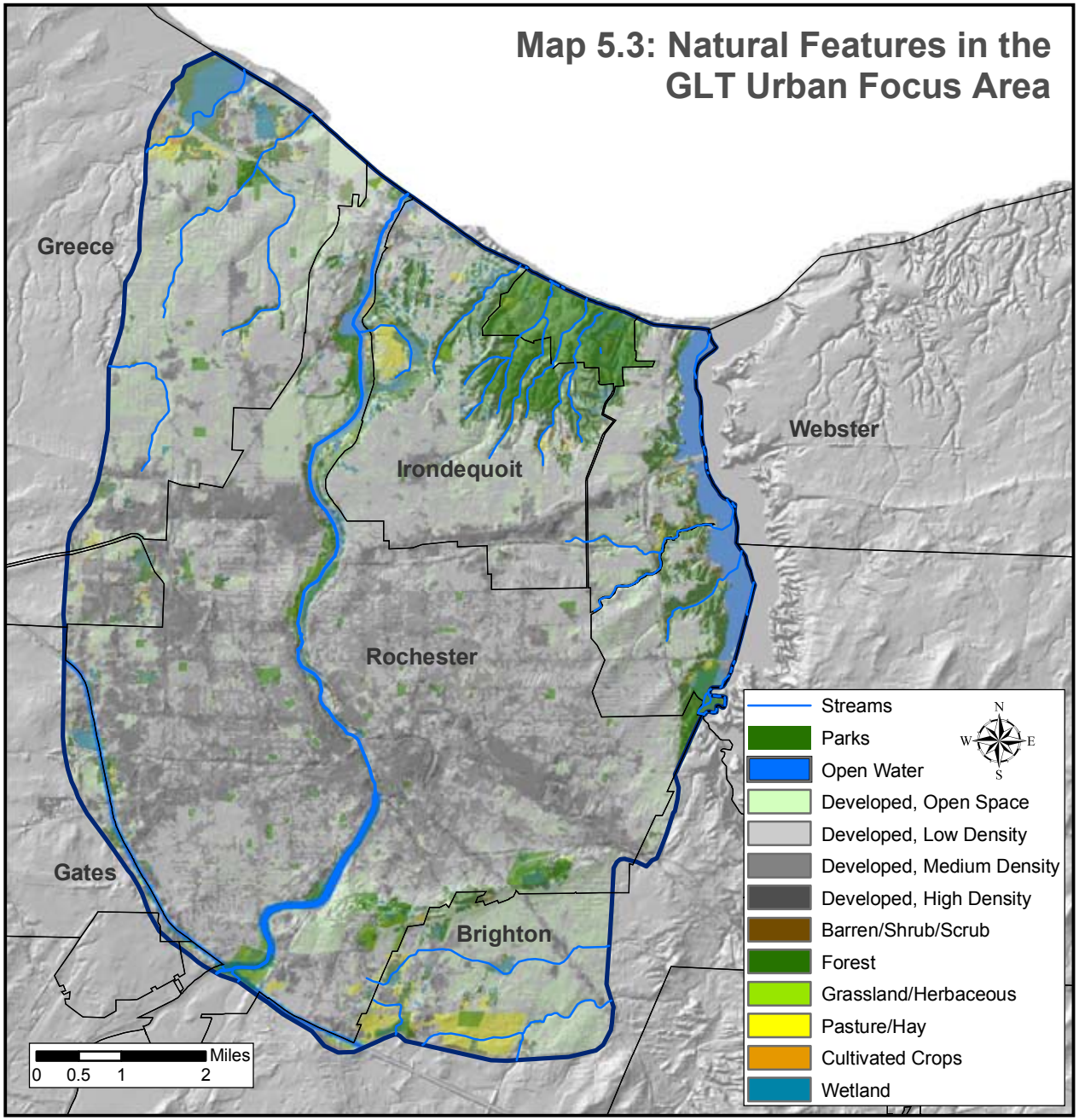
The Arcadia Focus Area emphasizes the importance of agricultural resources of the GLT Territory. Both policy-oriented resources as well as natural resources indicate high conservation value.

Municipal boundary from CUGIR. Wayne County Tax Parcels and Tax Abatement from Wayne County Planning Department. Prime soils data from Natural Resource Conservation Service.

Map created by Strategic Conservation Planning Workshop,Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N
Map units: Meters


Map 5.2: Connectivity in the Arcadia Focus Area
Sodus
Marion
Arcadia
Lyons
Legend
GLT Protected Lands
Other Protected Lands
Municipal Boundary
Streams
Trails
Parcel Size
Acres
0 - 49
50 - 74
75 - 99
100 - 182
183 - 477
N
W
E
S
Miles
0
0.5
1
2
Genesee Land Trust
Cornell University
GLT Territory, New York
This map identifies the Arcadia Focus Area as a critical region for conservation based on connectivity of both GLT and other protected lands.
Copyright Genesee Land Trust (c) 2007: Municipal boundary from CUGIR. Wayne County Tax Parcels from Wayne County Planning Department. Protected lands from The Nature Conservancy, Trust for Public Lands, Municipal Data, County Assessor Data, and DEC. Trails from GTC, Tughill Commission. Streams from CUGIR.
Map created by Strategic Conservation Planning Workshop,Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N
Map units: Meters

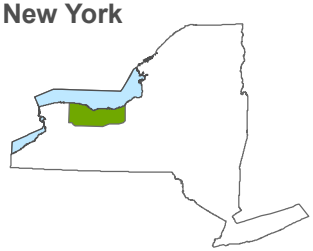
Map 5.3: Natural Features in the GLT Urban Focus Area



Genesee Land Trust

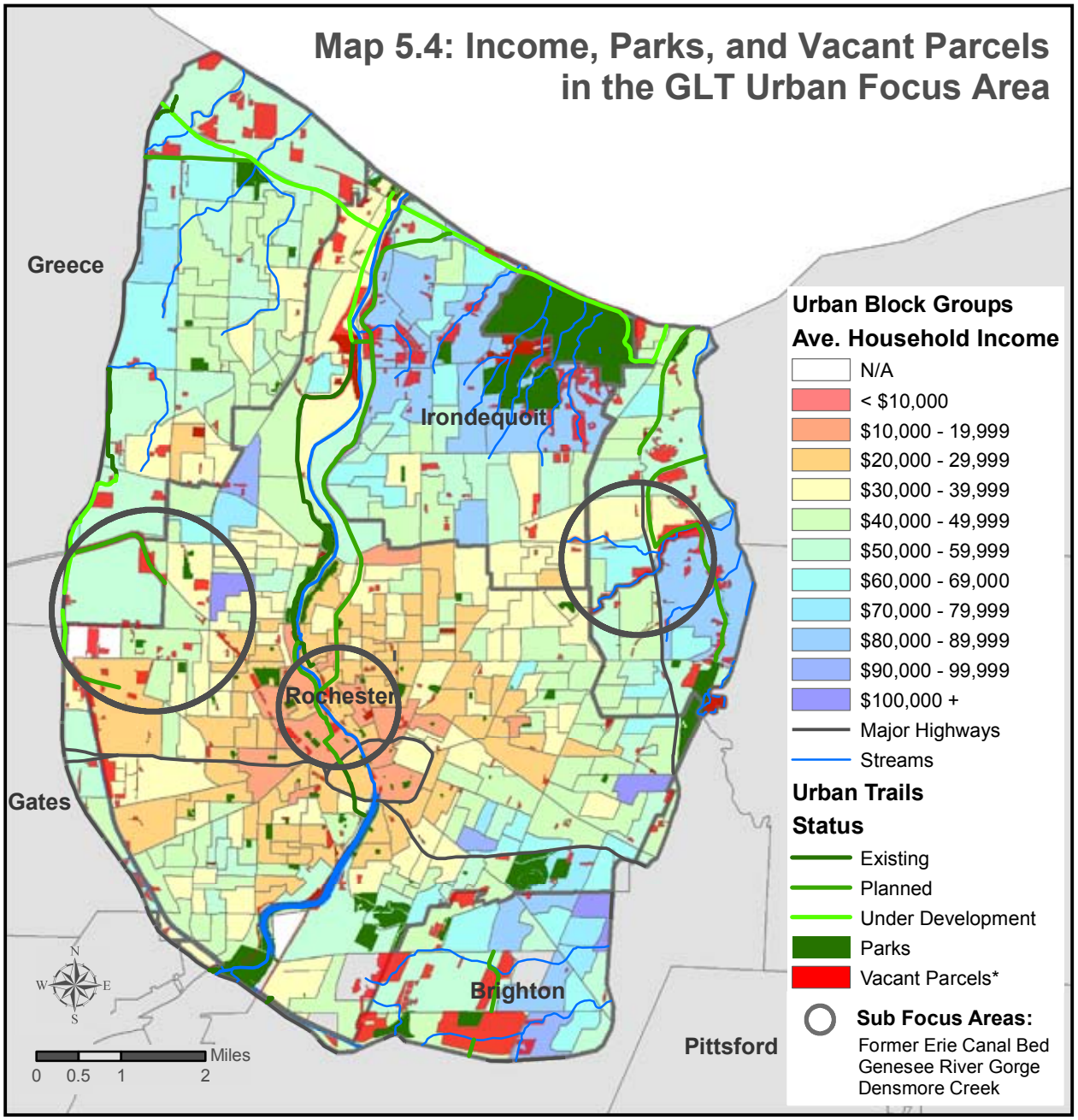
Cornell University

GLT Territory, New York



This map presents the boundaries of the GLT Urban Focus Area. Overlaying land cover and hillshade data, it allows for the identification of Rochester's significant natural resources.

Map created by Strategic Conservation Planning Workshop, Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N
Map units: Meters



Genesee Land Trust

Cornell University

GLT Territory, New York

This map presents the neighborhood income, vacant parcels, and existing parks and trails, allowing for the identification of potential future park locations.

Census block groups from CUGIR
Income data from US Census 2000
Municipal boundaries, highways, streams from CUGIR
Trails from Genesee Transportation Council
Parcel Data and Parks from Monroe County

*Parcels presented are vacant parcels that could be combined to create areas of 10 acres or more.

Map created by Strategic Conservation Planning Workshop, Cornell University, September 2007.
Projection: NAD 1983 UTM Zone 18N
Map units: Meters

IMPLEMENTATION

Introduction

This chapter presents alternative tools for conservation, methods for measuring success, and considerations for the GLT to improve its structure and ultimately achieve its goals. Improving fundraising efforts will be critical to the GLT in achieving its conservation goals, however this effort alone will not suffice. Alternative conservation strategies will allow the GLT to expand its protected land base, which currently covers only 0.1 percent of the land in its territory. Prioritizing conservation efforts within focus areas such as those discussed in Chapter 5, and collaborating with other similarly-minded organizations could enhance the GLT's conservation efforts. As the GLT progresses, measuring success will lead to better fundraising, stewardship, improved land management, and more efficient use of limited resources.[1] The use of Alternative funding sources and conservation tools will help the GLT achieve its conservation goals.

Figure 6.1 A hedgerow separates an active field and pastures, and provides a travel corridor for wildlife.

Non-Acquisition Conservation Tools

Besides the expensive prospect of acquiring land outright, purchasing or accepting the donation of easements is the most popular land conservation tool. The GLT is familiar with easements, holding many in their territory. Easements are a cost efficient and versatile acquisition tool because acquiring an easement does not require purchase of the underlying fee estate and because conservation easements are well-suited to any location. Still, as part of a comprehensive conservation strategy, easements are best used in conjunction with non-fee-acquisition tools since, as a singular strategy for protection, they may be cost prohibitive.

In New York, the state's constitutionally derived power to regulate the use of land has been legislatively delegated to local governments: counties, cities, towns, and villages. Although towns, villages, and cities have authority to adopt and enforce zoning regulations, counties do not. A fundamental weakness of local land use control is a lack of coordination among municipalities and a simultaneous failure to plan for the broader needs of the region. This is due in part to New York's regulatory framework, but also results from an historical failure in planning practice to plan comprehensively across geographic and political boundaries. While local governments do not have unfettered power to regulate the land use, a variety non-acquisition conservation tools are permissible within the zoning and general regulatory framework. Examples of several non-acquisition conservation tools follow.

Conservation Limited Development Protection

Conservation or Limited Development Protection (CLDP) is a non-acquisition tool that focuses on protecting resources rather than particular parcels.[2] The implementation of CLDP recognizes that effective conservation does not always require outright protection of entire tracts of land. It may involve some degree of development, even full build-out under local zoning, that includes preservation of targeted or high-priority environmental resources.

In one study, a researcher found CLDP extremely effective in preserving targeted lands.[3] Four types of CLDP, which vary in terms of scale, participants, impacts, and economics, include: Conservation Buyer Projects, Conservation and Limited Development Projects, Conservation Subdivisions, and Conservation-Oriented Master Planned Communities.[4]

Recognizing that development is sometimes inevitable, CLDP is most appropriately used where targeted conservation resources are unevenly distributed across a single parcel or many parcels that also include developable land.[5] It is not an appropriate strategy where connectivity, especially for wildlife, is a goal since any development could alter the ecological integrity of a wildlife corridor. Discretion is necessary with CLDP projects, which can diminish scenic vistas or disrupt operational farms with prime agricultural soils if not well implemented. Once appropriate zoning or other land use regulations are in place, CLDP is an effective tool for use in both urban and rural settings. Since it embraces both development and protection of small and large tracts of land, it appeals to both conservation groups and development companies. Towns, cities, and villages could incorporate CLDP language into their zoning ordinances since municipalities in New York are specifically authorized to adopt incentive zoning, a system whereby bonuses are granted on the condition that certain cultural benefits or amenities, such as open space, are provided.[6]

Land trusts can actively participate in CLDP. Through traditional means the GLT can hold an easement and act as steward for the preserved land within a conservation development. As an advocate the GLT can work with developers to achieve conservation of highly suitable lands within a development. It can also work with local governments to improve the site plan review process or adopt a CLDP zoning ordinance. As a consultant the GLT can bring together other actors to develop CLDPs. The GLT can even act as a developer by acquiring and developing a parcel.[7]

Figure 6.2 Harvested hay fields accentuate the low relief of the landscape.

Fixed Ratio Zoning[8]

Fixed ratio zoning (FRZ) protects contiguous swaths of agricultural land from subdivision into non-agricultural uses by limiting the landowner's ability to subdivide based on a ratio such as "1 lot for every 10 acres." By clustering developable lots, FRZ easily preserves aggregated productive agricultural land and encourages agricultural landowners to sell less land to developers.

Some property owners perceive FRZ as a major infringement of property rights. Since FRZ limits development rights, property values may decline by as much as 15 percent, ultimately causing abandonment of agricultural land. Farmers may be resistant to reducing the development potential of their land because FRZ can reduce land equity, thereby limiting a farmer's ability to borrow and raise working capital to support agricultural operations.

As a non-acquisition tool, FRZ is most suitable where development pressure to convert agricultural land to non-agricultural uses is high, which is true of most of Monroe County and parts of Wayne County. Used in conjunction with donated or purchased easements, this tool can satisfy the farmer's need to raise capital, while protecting important and productive agricultural lands. However, FRZ may reduce the attractiveness of easements on remaining agricultural landholdings since development is already limited. Thus, in areas with a large percentage of agricultural land, such as Wayne County, the GLT could advocate for such zoning regulations.

Transfer of Development Rights

Transfer of development rights (TDR) is a type of land use regulation that allows a landowner to sell the development rights on his or her property, known as a sending parcel, usually to a developer. The development right purchaser uses the TDRs on a receiving parcel in the form of increased density or floor-area ratios. Two drawbacks of TDR programs are that TDRs are complicated to administer and require an active real estate market. They are most suitable in areas with strong development pressure, but also rigid zoning regulations since easy approval of variances will defeat the TDR scheme. Under the right circumstances, such as the growing suburban areas around Rochester, a TDR scheme could be an effective conservation tool. In this situation planners can direct dense development to desired areas and away from areas targeted for conservation. The GLT may consider advocating a TDR program in Monroe County.

Figure 6.3 A series of agricultural buildings with their brilliant colors brightens a rural scene.

Agricultural Districts

First enacted in 1971, New York State's Agricultural Districts Law provides mechanisms for keeping land in agricultural production. Under Article 25AA, Section 301 farmland owners within and outside of agricultural districts receive real property tax assessments based on the value of land for agricultural production, not on its highest and best use, or development, value. This value is derived from soil classifications and development is penalized by subjecting the landowner to roll-back tax liability.[9] A significant amount of acreage has been preserved in the GLT Territory under the agricultural tax reduction program (see Semi-Protected Land and Maps 2.10 and 2.11 in Chapter 2).[10] Since landowners must apply annually for this special assessment and can choose to discontinue participation in the tax reduction program, working with landowners to obtain conservation easements on land enrolled in the program will permanently protect this land.

Right to Farm

The Agricultural Districts program prohibits unreasonable restrictions by local governments when regulating farm operations.[11] Right-to-farm protection insulates farmers from nuisance complaints that arise when farm operations conflict with non-agricultural land uses.[12] To encourage farmers not to sell out to developers, the GLT might consider advocating adoption of right-to-farm laws that dovetail with appropriate local land use regulations and strengthen state protection. Local right-to-farm laws can also protect agricultural lands not enrolled in the Agricultural Districts program.

Agricultural Commerce

Adopting a zoning ordinance enabling agricultural commerce would allow farmers to engage in wholesale or retail commercial sales from their property, including the sale of produce from a roadside stand and larger commodities, such as gravel mined on-site. Agricultural commerce language may also include provisions for agriculturally-related small businesses, such as commercial stables or farm equipment repair. Appropriate development standards and site plan review procedures, such as location and size of a roadside farm stand, are essential for smooth operation of agricultural commerce zoning provisions. The purpose of agricultural commerce zoning provisions is to protect the farmer's ability to realize immediate profit from agricultural production and allow agriculturally-related operations that can be critical to making agriculture economically sustainable. Furthermore, such zoning encourages farmers to maintain agricultural uses on their land for the long term. With long term sustainability ensured, farmers may be more amenable to donating a conservation easement; thus, the GLT might consider advocating such language to local governments.

Figure 6.4 An agricultural view corridor contains lovely mixtures of pastures, fields, and woodlands.

Measures of Success

This section offers the GLT a guide to creating a robust, annual self-review. One of the more difficult components of implementation is measuring an organization's success. The GLT handles real, tangible assets, such as land and donations, but it also seeks to protect intangible entities such as the character of the landscape, wildlife habitats, ecological diversity, and community support for conservation. Does the protection of tangible resources outweigh the protection of the intangible when measuring achievement? How can the GLT gauge its presence within its territory? These can be difficult questions to answer; however, thinking about measures of success places the GLT ahead of many of its land trust contemporaries. An introspective appraisal will hone the GLT's efforts and help it achieve future conservation benchmarks.

It is crucial to recognize that these measures are not mutually exclusive and may be inappropriate if treated as stand-alone benchmarks. Setting an annual acreage goal might be an arbitrary decision. Therefore, it is important to have different goals for different purposes, but the GLT could aggregate its measures as opposed to treating them separately.

Quantitative Goals

The most common goal stated by board members and staff at the workshop conducted by the Cornell Team on November 3, 2007 was increasing acreage. Setting an acreage goal as a percentage increase from the previous year using historical numbers as the starting point is a more realistic way of achieving said goal than setting a threshold number. If the GLT protected 100 acres during the previous year, protecting 5 percent more the next year is an easy indicator of progress. In addition, the GLT can easily apply this percentage benchmark toward fundraising, number of donors, number of members, and so forth. Having a similar percentage benchmark for each category allows the GLT to recognize where it is achieving its goals and where it is falling short. Setting hard figures for these areas makes this cross-category comparison much more difficult.

The second most common goal stated at the Cornell Team's fall workshop was the need to increase staff. The percentage growth model also allows the GLT to gauge staffing requirements. For example, the GLT currently employs three staff members who help oversee the GLT's 1,600+ acres. If this acreage is treated as the base total of 100 percent of staff capacity, then acquiring 30 percent more land would act as the indicator to hire another staff member. Using this percentage benchmark model makes it easier to gauge when this increase should occur.

With this conservation plan in hand, the GLT can set percentage growth requirements for a variety of land protection factors. The GLT might want to increase its protection of species rich land by 5 percent a year, prime farm soils by 10 percent a year, or lands abutting IBAs by 15 percent a year.

Growth requirements allow the GLT to create a timeframe for achieving its long term land protection goals. For example, if the GLT ultimately wanted to protect 5,000 acres within its territory, using a 5 percent growth model results in a realistic timeframe of about 28 years. If the GLT wanted to conserve 5,000 acres within 20 years, it would need to follow a 10 percent growth rate to achieve these goals. The number of new acres protected will vary year to year, creating an irregular growth record. However, if the overall trend meets the GLT's growth rate, even low acreage years fit within the measure of success.

Figure 6.5 Marshes and meadows provide habitat for many forms of wildlife.

Qualitative Goals

Qualitative measures of success are arguably just as important as quantitative measures, but they are much more difficult to appraise. To measure qualitative success, the Cornell Team recommends that the GLT focus on two goals: increasing public awareness and the political presence of the GLT and developing a stronger network of relationships.

When a resident of Monroe or Wayne County thinks about land conservation, does he or she think of the GLT? Sponsoring local events will create name recognition contributing to the public perception that the GLT is the area's "brand name" for conservation. This branding could be beneficial for conservation and fundraising, as well as attracting new volunteers and members. One way to increase local exposure is to co-sponsor a local fair or farm stand. Also, the GLT could organize public outreach events on a formal (public meetings, newsletters, etc.) or informal (live web chat, booth at the local mall, etc.) basis. The GLT could set a goal of participating in three such community events per year.

Another way to increase exposure is by forming regional alliances with other organizations whose mission is related to conservation. For example, the GLT could connect its work to broader community concerns such as protecting potable water supplies, increased consumption of locally grown food, and combating global warming. Protecting the prime agricultural lands of Monroe and Wayne counties and the clean waters of the Lake Ontario watershed are two wide-ranging goals important to many segments of the community. These connections will resonate with the public who may otherwise view the workings of a land trust as unfamiliar, obscure, or not compatible with larger community concerns.

Connecting to other organizations will also facilitate the protection of more land. Connections can be made through referrals from current members. Because many hunting and sporting clubs rely on land conservation, these groups may make good partners. Wildlife conservation groups dedicated to fishing, birding, or flora may be very interested in connecting with the GLT. Through creative partnerships, the GLT would be able to expand their capacity for growth and involvement in community actions.

By incorporating a regional context for conservation, the GLT can further flesh out its qualitative measures. For example, if a town was pondering a bond initiative for open space preservation, the GLT can write letters of support to the town administration or perhaps speak in support of the bond at a public hearing. Passage of the bond would result in the protection of more land, bolstering the GLT's work. While the GLT would not facilitate or participate in the program, its support for successful initiatives is another indicator of success, particularly at the regional level which is the most difficult arena in which to plan and measure.

During the Cornell Team's fall workshop, GLT board members and staff expressed an interest in increasing the political presence and activity for the GLT. Increasing the clout of the GLT may be possible through activities such as:

- sponsoring conservation minded ordinances (alternative lawn ordinances, recycling ordinances)
- supporting zoning initiatives that would protect agricultural lands or sensitive soils
- attending city, town, and village council meetings
- encouraging active board involvement with community government programs such as, adopt-a-park and Tree City USA
- co-operating with compatible conservation or environmental organizations in political activities
- lobbying for grant monies, public policy changes, or endorsement of local political candidates

A strong public presence for the GLT, in addition to an enhanced network of community partners would strengthen the impact of the organization upon the service area.

Increasing membership is a clear quantitative measure, but the motives underlying new memberships can be important qualitative indicators of the GLT's public presence. Currently, the GLT website does not have a "How did you hear about us?" input on its membership form. Understanding what motivates new members to join the GLT will help focus future development efforts.

In short, most quantitative evaluations bear a qualitative undertone. For example, the GLT may secure a new easement on a 100-acre parcel that also abuts a publicly protected forest, creating contiguous protected space. It is important to recognize these qualitative measures along with the quantitative.

Figure 6.6 Round hay bales accentuate a pasture's bright new green growth.

Bringing it Together

A helpful, annual measure of success can be the overall number of benchmarks achieved. Table 6.1 is a hypothetical demonstration of this type of evaluation.

These hypothetical tables demonstrate that a single year may contain some shortfalls. However, the two-year comparison demonstrates that overall the GLT is meeting more of its benchmarks – a clear sign of progress. This is a helpful way to get beyond isolated goals and evaluate the GLT as a whole. It is also an easy way to unite qualitative and quantitative measures.

In sum, the Cornell Team recommends that the GLT perform an annual self-review, and this section endeavors to offer ideas to formulate this review. With time, the GLT can hone on-target and personal benchmarks and add long-range planning to the process of recording conservation efforts.

Finance

Almost all of the goals articulated by the GLT Staff and Board of Directors require greater financial resources and stability. Currently, the GLT does most of the fundraising activities that land trusts typically do. However, there are certainly ways to improve its financial functioning and structure.

The GLT could consider increasing the number of acquisition mailings per year to attract more and retain existing donors. Presently, its total donor base is small. The GLT's Board of Directors revealed at the Cornell Team's fall workshop that a major reason for acquisition deals falling through was that the GLT did not have sufficient funds or other financial resources to tap into to finalize these transactions. To be in an optimal position for purchasing land, the GLT must establish a large donor base and have prospects that will write a check at a moment's notice.[13] The GLT currently purchases names for direct mail acquisitions every 18 months. According to one Cornell Team member, a former non-profit development manager, non-profits have greater success of acquiring new donors and compensating for attrition when they send out a large acquisition mailing every

Table 6.1 Annual Benchmarks

2006		
Quantitative		
Category		**Benchmark Achieved?**
Acres:		
Goal	10% Increase from Last Year	
Actual	8% Increase	**No**
Fundraising:		
Goal	10% Increase from Last Year	
Actual	14% Increase	**Yes**
New Projects:		
Goal	3	
Actual	3	**Yes**
Benchmark Subtotal:		**2**
Qualitative		
Called every landowner on our target parcel list at least once		**Yes**
New project abutted existing project		**No**
At least one project contained a high level of species richness		**Yes**
At least one project contained a rare or threatened species		**No**
Sponsored a local event in the spring		**Yes**
Sponsored a local even in the summer		**No**
Sponsored a local even in the fall		**No**
At least ten referrals from current members		**Yes**
Benchmark Subtotal:		**4**
Benchmark Total:		**6**

2007		
Quantitative		
Category		**Benchmark Achieved?**
Acres:		
Goal	10% Increase from Last Year	
Actual	10%	**Yes**
Fundraising:		
Goal	10% Increase from Last Year	
Actual	12% Increase	**Yes**
New Projects:		
Goal	3	
Actual	2	**No**
Benchmark Subtotal:		**2**
Qualitative		
Called every landowner on our target parcel list at least once		**Yes**
New project abutted existing project		**No**
At least one project contained a high level of species richness		**Yes**
At least one project contained a rare or threatened species		**Yes**
Sponsored a local even in the spring		**Yes**
Sponsored a local even in the summer		**No**
Sponsored a local even in the fall		**Yes**
At least ten referrals from current members		**Yes**
Benchmark Subtotal:		**6**
Benchmark Total:		**8**

sustainable development and biodiversity projects. Finally, the Foundation Center provides an online guide that is invaluable to finding innumerable funding sources.[16]

Foundations want to see that the organizations they support are stable; therefore, the GLT could work towards securing a year's operating expenses from a foundation. Yet, foundations, including Starr, tend not to fund organizations that spend more than 25 percent of their annual expenses on administration and fundraising. According to the GLT's 990 Forms from the past several years, the GLT is in good standing. The GLT, however, should aim to improve, particularly now that its budget for salaries has increased to include another staff member.

Conservation specific legislation often allots funding to preserve the valuable resources that it aims to protect. The North American Wetlands Conservation Act is a valuable federal funding source for fee acquisitions of waterfowl and migratory bird habitats. Working in conjunction with Great Lakes stewardship agencies, financing could be sought from the Coastal Zone Management Program for conservation along Lake Ontario.[17]

Working with municipalities to launch bond initiatives to fund conservation efforts or to levy conservation taxes are proactive approaches to conservation. Successful bond initiatives or conservation tax levies demonstrates local commitment to conservation. This public commitment can then be used to leverage additional private, foundation, and public funds. Too often, acquisition targets are lost because land trusts take only a reactive approach by protecting an individually threatened parcel. In these situations land trusts function through last minute efforts to secure financing and often fail to create reliable deals. In the past, the high cost of acquisitions has prevented the GLT from closing important deals. Since the vast majority of land conservation is funded by public money, the GLT could capitalize on these two currently underutilized conservation finance mechanisms in the GLT Territory.[18]

The GLT has identified several municipalities, including Brighton, Webster, Penfield, Victor, Parma, Ontario, Sodus, and Hamlin, that are well-suited for bond initiatives. Bond initiatives are more likely to pass in municipalities that have high development pressures, particularly when residents place value on the natural resources and scenic beauty of their town.[19] Often, wealthier, higher density communities support bonds and tax increases that are intended to finance conservation efforts. Yet, even seemingly tax averse, rural areas are sometimes willing to pay for publicly funded conservation efforts, and, therefore, could also be considered as targets for bond initiatives.[20] If these municipalities are ignored, the GLT risks creating an economically uneven distribution of protected land and a greater potential for agricultural, forested, or species rich land located in and around these municipalities to be lost to unwise development.

Figure 6.7 Farm fields, woodlots, and a marshland provide rich visual variety of texture and color.

Educating communities about the negative effects of sprawl on quality of life and the positive market-based effects of conservation on property values is critical to a successful conservation bond initiative or tax levy. Even in tax averse areas of New Jersey, public education influenced voter approval of hundreds of millions of dollars in bonds and increased taxes that supported conservation initiatives.[21] Similar public educational efforts may be successful in the GLT Territory. Moreover, New York State will match money raised on the municipal level through taxes and bonds.

In order to determine the size, type, and timing of a bond initiative to advocate, the GLT could conduct thorough research and public opinion polling on the municipality for which it hopes to initiate a bond.[22] The GLT's alliance with the Trust for Public Land (TPL) is already a positive step towards achieving the GLT's general goals. The TPL could help organize advocacy efforts made by the GLT seeking support from public officials and voters for bond initiatives.

In order to financially maximize the GLT's conservation capabilities, the GLT could continue working with other organizations and encourage them to purchase lands that are not financially feasible targets for the GLT. "When a land trust is small, the board should supply valuable manpower."[23] The GLT's Board of Directors is very active and well connected; capitalizing on Board connections, particularly to public officials and regional alliances, will have tremendous impact on the GLT's conservation efforts.

Conclusion

With 1.3 million acres to oversee, the GLT should ideally take a multifaceted approach to land conservation. Incorporating some of the ideas presented within this chapter will increase the GLT's effectiveness. Many of the strategies contained in this chapter require a long-term view of land conservation. The GLT could theoretically achieve its acreage goals through easements and fee acquisition alone, but implementing broader strategies may result in the protection of more land in less time and with less effort. With a wider outlook and more conservation tools at hand, the GLT will be better equipped to target important areas, move on short-notice projects, and connect with regional programs.

[1] Amundsen, Ole. 2007 Lecture notes: Evaluation and Measuring Success, 16 October.

[2] Jeff Midler of Cornell University coined the term "Conservation Development."

[3] Midler, Jeff. 2007. Lecture notes: Conservation Land Development Protection, 23 October.

[4] See Technical Appendix, Chapter 3.

[5] Midler, 2007.

[6] Salkin, Patricia E. New York Zoning Law and Practice. 4th ed., Vol. 1, Ch. 7, § 17.

[7] See Technical Appendix, Chapter 3.

[8] Frantz, George. 2007 Lecture notes: Agricultural Lands Protection Issues in New York, 10 October.

[9] New York Office of Real Property Services. 2007. Agricultural Assessment: Q & A's, Partial Reduction in Real Property Taxes for Eligible Farmland in New York State. On-line. http://www.orps.state.ny.us/pamphlet/exempt/agassess.htm, accessed 1 December 2007.

[10] Agriculture and Markets Law Article 25AA, §§ 300-310.

[11] Salkin, Ch. 14, § 14.03

[12] Ibid.

[13] Clark, Story. 2007. A Field Guide to Conservation Finance. Washington, DC: Island Press, 5.

[14] Clark, 29.

[15] Clark, 26.

[16] Subscribing to the Foundation Center's basic plan for one month is sufficient for the GLT's needs.

[17] Hopper, Kim and Ernest Cook. 2004. Conservation Finance Book: How Communities Are Paying for Parks and Land Conservation. San Francisco, CA: The Trust for Public Land,10-11.

[18] Clark, 318.

[19] New Hampshire Public Radio. 2007. Online. http://www.nhpr.org/node/2760, accessed 6 November.

[20] Schmidt, Stephan. 2007. Lecture notes: Open Space Preservation and Social Equity, 13 November.

[21] Schmidt.

[22] Hopper.

[23] Clark, 6.