



Southern Madison Heritage Trust

Strategic Land Protection Plan



Department of City and Regional Planning
CRP 558 Workshop Fall 2005



Cornell University

Strategic Land Protection Plan for the Southern Madison Heritage Trust

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Department of City and Regional Planning
CRP 558 Workshop

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Cornell University
College of Architecture,
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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 2005, 12 graduate students undertook the task of creating a Strategic Land Protection Plan for the Southern Madison Heritage Trust (SMHT), a land trust based in Hamilton, NY. SMHT was founded in 1999 as a direct result of the comprehensive planning process undertaken by the village of Hamilton. Citizens formed a land trust as a way to maintain the momentum for natural resource protection and farmland preservation that the municipal planning process had generated.

The Strategic Land Protection Plan for the Southern Madison Heritage Trust (SMHT) is a bold vision. The plan is based on demographic research and inventories of both natural and scenic resources. Using these inventories, suitability models in GIS were created to display various land protection scenarios. Taking advantage of the New York State Canal Corporation's recently announced proposal for an Empire State Greenway building on the historic Erie Canal network, the students crafted a proposed greenway for recreational uses, natural resource functions and growth management. As the Chenango Canal is an integral part of the proposed greenway, the long term protection of this corridor is major concern for SMHT. Within the proposed greenway, the students modeled a greenbelt surrounding the four major municipalities that is designed to allow growth while protecting the gateways to the villages, surrounding farmland and biodiversity of the region. The conservation of the proposed 16,000 acre greenbelt can be achieved through the use of regulatory tools, transfer of lands from key partners to SMHT, improved land management by private landowners as well as the exercise of real estate tools used by SMHT such as securing easements through outright purchase or donation from willing landowners.

As Benton MacKaye, founder of the Appalachian Trail, stated in *The New Exploration – A Philosophy of Regional Planning*: “We shall take a pattern from Magellan, who first visioned where it was he wished to go, and then discovered how to get there”. For several years, SMHT board members have had a general sense of the land conservation goals for southern Madison County. Now the Strategic Land Protection Plan has provided several potential paths to get there. Let the voyage begin.

A handwritten signature in dark ink that reads "Ole M. Amundsen III". The signature is written in a cursive style with a horizontal line underlining the name.

Ole M. Amundsen III, Visiting Lecturer
Department of City and Regional Planning

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Photo courtesy of John Hubbard

History/ Demographics

History/Demographics

INTRODUCTION - HISTORY

The Southern Madison Heritage Trust serves six towns in Madison County. The development of southern Madison County, which consists of the towns of Hamilton, Madison, Eaton, Georgetown, Lebanon, and Brookfield (figure A1), has always been linked with the landscape. Located at the geographic center of New York, the area is southeast of Syracuse, southwest of Utica, and northeast of Binghamton. The Chenango, Otselic, and Unadilla Rivers flow beneath the steep hills that typify the Appalachian Uplands. This unique landscape was created by glacial advancements that affected the northern United States. The sedimentation that resulted from the last glacial shift consisted of a mixture of soil types and plant seeds that spread across the area to form thick forests of spruce, deciduous hemlock, and pines.¹

Early Settlement

The Oneida Indians are native to southern Madison County and relied on the thick forests and fresh streams for food and other necessities. These qualities made the land attractive to newcomers arriving from Europe. The state of New York began acquiring American Indian land in 1768, and in 1788 Governor George Clinton bought what is now southern Madison County as part of a purchase that included land on both sides of the Chenango River. The land purchased by Clinton was surveyed and divided by 1790 and became known as the Chenango Twenty Towns. The towns were sold at an auction to speculators and investors looking to make a profit. The settlers of southern Madison County, many of whom hailed from New England, came in search of better farmland. The influence of New Englanders on the development of southern Madison County can be seen at the village of Hamilton that developed around a central green space.²

The region's first settlers arrived in what is now Brookfield in 1791. The steep hills, thick forests, and rich valley soil they encountered could be found all across southern Madison County. In fact, those who scouted the land in what is now the Town of Madison had to climb trees in order to see the surrounding hills and streams. The early pioneers cleared the forests to build log cabins and plant crops among the stumps.³

As the area became more populated a formal governmental structure emerged. Madison County, named for the nation's fourth president, was officially formed on

March 21, 1806. At this time Southern Madison County consisted of Brookfield, Hamilton, and DeRuyter. Hamilton was divided into Eaton, Hamilton, Lebanon, and Madison in 1807 and Georgetown was created from DeRuyter in 1815.⁴

Agriculture and Transportation

From the first days of settlement, agriculture has been central to the history, economy, and cultural heritage of southern Madison County. The first major crops were corn, flax and wheat.⁵ Towards the middle of the nineteenth century flax and wheat progressively declined and the production of wool, barley, milk, cheese and butter became more prominent. In 1810, Curtis Hoppin introduced the first sheep into Madison County from Massachusetts. Woolen factories were built in the county and winters were spent in the farmhouse spinning fabric⁶. The towns of Brookfield and Madison quickly became the county leaders in the production of wool.⁷ Sheep did not remain popular for long and by the 1860s dairy farming and hops had become the dominant sectors of agriculture.

During the nineteenth century New York State became nationally known for the production of hops. Accounting for five-sevenths of national hop output, New York State had become the nation's leading producer of hops by 1849. This flower, which adds bitterness to malt liquor, was first introduced to Madison County in 1808 by James W. Cooledge.⁸ Brookfield, Eaton, and Hamilton were among the county's leading producers of hops, and by 1879 Madison County produced nearly four million pounds of hops to become the third largest producer in New York State.⁹

Table A1. Population and Housing, Madison County, NY, 1990-2000

	Population		Percent Change in Population	Population Density per square mile		Housing Units		Housing Growth (%)	Housing Density
	1990	2000		1990	2000	1990	2000		
Madison County	69,120	69,441	0.46	105.4	105.9	26,641	28,646	7.53	43.7
Brookfield	2,225	2,403	8.00	28.5	30.8	890	1,041	16.97	13.4
Eaton	5,362	4,826	-10.00	119.9	107.9	1,682	1,798	6.90	40.2
Georgetown	932	946	1.50	23.3	23.6	287	315	9.76	7.9
Hamilton	6,221	5,733	-7.84	150.4	138.6	1,820	1,725	-5.22	41.7
Lebanon	1,265	1,329	5.06	29.1	30.6	581	631	8.61	14.5
Madison	2,774	2,801	0.97	67.8	68.5	1,239	1,325	6.94	32.4

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3). Online at http://factfinder.census.gov/home/saff/main.html?_lang=en

History/ Demographics

Figure A1. Southern Madison County



Legend

- BROOKFIELD
- EATON
- GEORGETOWN
- HAMILTON
- LEBANON
- MADISON
- Lakes
- Streams



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Sources: Town boundaries, village boundaries, lakes, and streams provided by Madison County Planning Department. NY county boundaries from GEDD eS Lab server, Cornell University. September 2005.

A1

History/Demographics

As the economy of the United States grew, canals were built as a more efficient means of transporting goods. The Erie Canal, which opened in 1825 and passed through northern Madison County, was very profitable for New York producers. As a result residents all across the state clamored for their own local canal. The residents of Madison County got their wish when the Chenango Canal was built in 1837. The Chenango Canal linked Utica to the northeast with Binghamton to the southwest and passed through Madison, Hamilton, Eaton, and Lebanon. Unlike the Erie Canal, the tolls collected could not cover the cost of repairs, and because streams were dammed or rerouted to create a feeder system for the canal, some mills were forced to close due to lack of water power. By 1878 the canal was no longer used, but the man-made components of the feeder system in southern Madison County were retained to provide water for the Erie Canal.¹⁰

The Chenango Canal also suffered from competition with railroads. The region’s most prominent railroad, the New York & Oswego, opened in 1870 and passed through Eaton, Lebanon, and Hamilton to connect the Great Lakes with the Hudson River. The Utica, Clinton, and Chenango Valley Railroad and the Syracuse and Chenango Valley Railroad passed through southern Madison County and connected to the New York & Oswego Railroad. By the end of the nineteenth century every village and hamlet in southern Madison County had easy access to a railroad line.¹¹

Throughout the second half of the nineteenth century a number of professional organizations, publications, and new technology played an important role in fostering the growth of agriculture. In 1841 the Madison County Agricultural Society was created. Publications like Rural New-Yorker, Genesee Farmer, and American Agriculturalist were utilized by farmers. In 1878, Charles Osborne and H. Niles Harrington created a machine that both picked and separated hops flowers. However, the beginning of the twentieth century saw the gradual decline of hops in Madison County from the blue mould infestation and successful competition from western states.¹² Some hop kilns, recognizable by the distinctive conical roofs, still stand as a reminder of the area’s vanished industry.¹³

Whereas the hops industry declined at the beginning of the twentieth century, dairy production overcame fluctuations in the nineteenth century and is a leading industry today. A number of cattle breeds were introduced at the beginning of

Table A.2. Commuting and Income, Madison County, NY. 1990-2000

	In Labor Force (population 16 years and over)	Workers worked outside county of residence		% Change	Mean travel time to work (in minutes)	Per Capita Income (in dollars)		Median Household Income (in dollars)	
	2000	1990	2000			1989	1999	1989	1999
Madison County	35,174	14,744	17,376	17.9	22.6	12,334	19,105	29,547	40,184
Brookfield	1,229	564	807	43.2	28.8	9,721	13,719	23,811	31,556
Eaton	2,405	722	777	7.6	20	8,273	14,538	28,807	36,229
Georgetown	389	82	196	139.6	33.9	8,462	11,825	25,000	37,963
Hamilton	2,659	489	558	14.2	15	11,359	15,564	28,594	38,917
Lebanon	651	184	241	30.9	24.8	10,949	15,690	26,359	34,643
Madison	1,434	460	480	4.4	22	12,318	18,468	29,779	35,889

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3). Online at http://factfinder.census.gov/home/saff/main.html?_lang=en

the nineteenth century. Madison County became nationally known in 1869 when Gerrit Smith Miller created a new Holstein-Friesian breed of cow, the first breed unique to Madison County.¹⁴ In 1874 Brookfield had the most cows of any Madison County town and the county ranked high in many statewide dairy production categories. The Town of Madison ranked high in butter production and Brookfield, Eaton, and Hamilton were leading cheese producers.¹⁵ Nevertheless, milk production dominated agriculture in the twentieth century. Since the 1950s “milk sales have made up two thirds of all agricultural sales from all county farms.”¹⁶

Vegetables were also important crops during the twentieth century. Pea production was a staple in Earlville, Hamilton, and Morrisville during the 1910s before plant lice and west coast competition made farmers look to other agricultural products. Beans, beats, and corn were common crops in Eaton, Hamilton, and Madison. Today, Madison County is known as a potato and dairy producer. In addition, hay, small grains, poultry, and sheep have played a role in Madison County agriculture.¹⁷

Agriculture – in particular hop production – has always played an important role in Madison County’s cultural heritage. During the late 1800s the Hop Growers Association annual picnic sometimes drew more than 35,000 people.¹⁸ In the

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heyday of hops, residents would take a vacation and leave their jobs for weeks to participate in the annual social event of hops picking.¹⁹ Today, the Madison County Hops Festival raises awareness and celebrates the history of hop growing in New York State.

Development of Planning

Until the 1970s Madison County had no building ordinances or planning documents. Beginning in 1972, the Madison County Planning Board published a number of studies that pertained to various planning issues such as land use and housing. As farming declined and land development pressures grew, the townships began writing planning documents and passing ordinances to protect farmland and preserve their scenic, rural character. Development ordinances, such as the one passed by the Town of Georgetown, became more common during the



Photo courtesy of John Hubbard

1970s because such ordinances were required in order to receive subsidized flood insurance in pursuance of the Flood Disaster Protection Act of 1973.²⁰ Over the next few decades, the Towns of Lebanon, Eaton, and Brookfield adopted land use ordinances requiring residents to acquire building permits before beginning new construction and when altering, converting, or adding to existing structures. Some ordinances, like that of Georgetown, mandated specific development requirements that had to be met before the development could proceed. Other ordinances, like the Building Ordinance for the Town of Brookfield, mandated the payment of specific fees to acquire different types of permits but did not issue development requirements such as minimum lot size, minimum dwelling size, minimum number of off street parking spaces, or flood requirements.²¹ The Town of Hamilton Zoning Law, which is one of the oldest and most extensive ordinances in the region, created separate requirements for parcels depending on their designation as residential, agricultural-residential, or planned development district. This zoning and its subsequent amendments addressed issues such as the obstruction of vision, open burning, mobile home regulations, and fuel supply and storage. The Town of Eaton Land Use Law adopted in May 1997 followed the structure of the Town of Hamilton Zoning Law.

The Town of Hamilton completed its first comprehensive plan in 1972 and the Town of Madison followed suit in 1989. Although specific aspects of the plans differ, they have common objectives and use similar language. For example, the Town of Madison Comprehensive General Plan seeks to “encourage future development consistent with the goals of preserving and enhancing the natural beauty of the Town.”²² In January of 2000, a number of concerned citizens met to discuss how to support agriculture and natural resource conservation as laid out in the Town of Hamilton updated Comprehensive Plan of 1998. In October of 2000 the board of the Southern Madison Heritage Trust voted for incorporation and approved the mission “to conserve for public benefit the natural resources in and around the townships of Brookfield, Eaton, Hamilton, Lebanon and Madison in Madison County, New York.”

The preservation of agriculture and historic resources is also an important part of planning in southern Madison County. Over the past seven years the Madison County Farmland Protection Board has worked in collaboration with the Madison County Planning Department, Madison County Board of Supervisors, Cornell Cooperative Extension, United States Environmental Protection Agency, New

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York State Department of Agriculture and Markets, and the Southern Madison Heritage Trust to write the Madison County Agriculture and Farmland Protection Plan. The goal of this plan is to protect viable agriculture and promote the economic health and development of agriculture in Madison County.

The Madison County Historical Society and the Madison County Planning Department have provided technical assistance to the localities to promote rural, architectural, and historic preservation.²³ Preservation has been pushed by organizations like the Village of Hamilton Planning Commission, which since 1978 has been working with the historical society to nominate buildings and other sites to the National Register of Historic Places. Thanks to these efforts, the unique history of southern Madison County will be known by future generations.

INTRODUCTION - DEMOGRAPHICS

History is never static, for changes in the development of a certain population at a certain place are always occurring. Demographic analysis is useful because it exposes these changes. Whereas historical analysis informs a population of its past, demographic analysis highlights significant trends that should be acknowledged when planning for the future.

Population and Housing

The population of Madison County has grown slowly during the twentieth century (see Table 1A). In the 1990s, the population increased from 69,120 to 69,441; the growth rate was less than 0.5%. In contrast, the total population of the six towns of southern Madison County decreased 4% between 1990 and 2000. This change was mainly due to substantial population losses in the Town of Eaton and the Town of Hamilton. The Town of Brookfield, on the other hand, gained 178 residents; the growth rate was 8%.

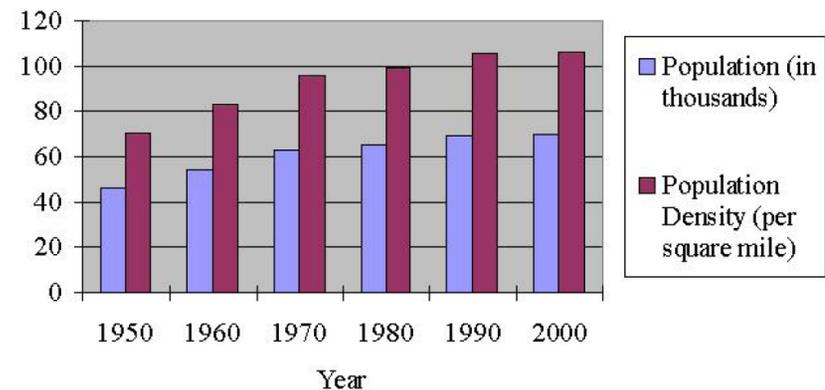
Although Eaton and Hamilton experienced population decreases, the towns maintained high population densities compared to other towns within Madison County. While the population density was 105.9 people per square mile at the county level in 2000, the Towns of Eaton and Hamilton both had higher population densities of 107.9 and 138.6, respectively. The population density of the other four towns ranged from 23 people per square mile to 68 people per square mile. These densities were relatively lower than the county average.

The Town of Brookfield experienced a significant increase in population and housing units. The Town of Brookfield added 151 housing units in 2000. This growth rate of 17% is greater than the county wide increase of 8%. Overall, the housing density of the six towns is significantly less than the county average.

Commuting Patterns

Nearly half of Madison County residents worked outside the county in 2000. Among the six towns, Brookfield and Georgetown had a slightly higher percentage of their labor force working outside the county than the county as a whole. Between 1990 and 2000, the number of employed residents working outside the county increased in all six towns (see Figure A3). On one hand, the extremely high increase in the number of Georgetown residents working outside the county should not be seen as a serious problem because the number of working residents (82) in 1990 was small. On the other hand, the increase in residents working outside the county for all six towns merits attention because out-migration of workers could be a sign of a weakening economy.

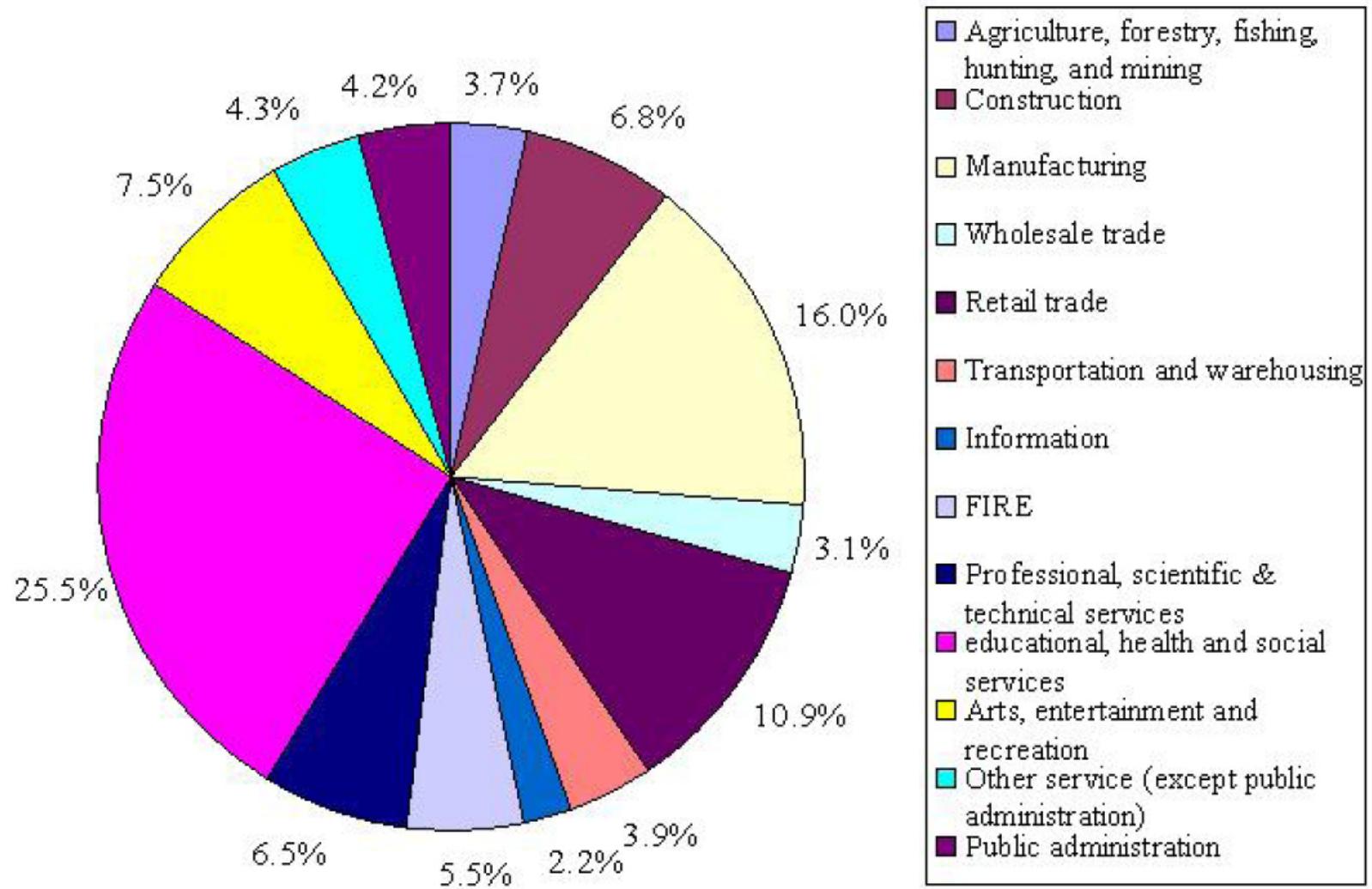
Figure A2. Population and Density Changes, Madison County, NY. 1950-2000



Source: U.S. Census Bureau. Online at http://factfinder.census.gov/home/saff/main.html?_lang=en

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Figure A4. Employment in sectors, Madison County, 2000



Source: U.S. Census Bureau. Census 2000. Online at http://factfinder.census.gov/home/saff/main.html?_lang=en

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Employment and Income

Madison County has historically been classified as having an agrarian-based economy. However, only 3.7% of the county's labor force in 2000 worked in the sector of agriculture, forestry, fishing, hunting, and mining (see Figure A4). Over 25% of total employment in the county is provided by the educational, health and social services sector. The services sector, manufacturing sector, and retail trade sector altogether employed 17,118 workers, which is 52% of total employment in Madison County.

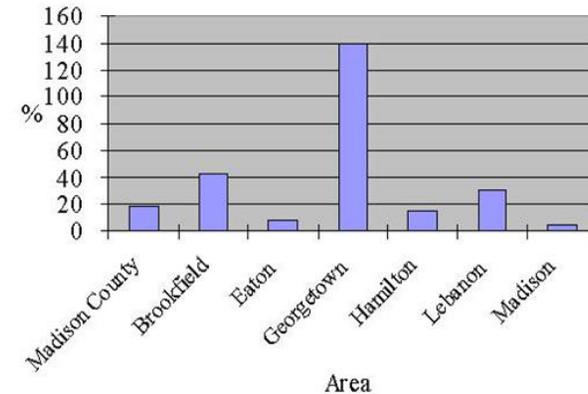
In 2000, the six towns had a total of 8,767 people in the labor force. This figure accounted for approximately 25% of the county's total workforce. The national unemployment rate of 5.8% in 2000 was lower than Madison County's unemployment rate (7.1%) in 2000. With the exception of Eaton, every town within southern Madison County had an unemployment rate that was lower than the county unemployment rate. The unemployment rate in Eaton (15.3%) was double that of Madison County.

The median household income for Madison County in 1999 was \$40,184. The median household income for each of the six towns trailed that of the county. Among the six towns, Hamilton had the highest median household income (\$38,917) and Brookfield had the lowest median household income (\$31,556).

Farmland

Over the twentieth century, Madison County farms have been decreasing in number, increasing in size, and accounting for less of total land use. Between 1950 and 2002, the number of farms in the county decreased from 2,360 to 734. The number of farms that occupy between 500 acres and 999 acres more than doubled over the same time period.²⁵ In 1851, over 250,000 acres of farmland existed in the county; this was approximately half of the county's total area. Farmland occupied 70% of the county's area by 1875 and more than 90% by 1900. Yet as national and international competition increased and more workers migrated to cities, the amount of farmland decreased. Farmland occupied 75% of the county's area by 1949 and just 40% of the county's area in 2002. At the same time, forest cover has increased in the county thanks to the State Reforestation Law of 1929. The creation of the Civilian Conservation Corps in 1933 as a response to the Great Depression provided labor for the task of reforestation.²⁴

Figure A3. Percent change in workers worked outside county, Madison County, 1990-2000



Source: U.S. Census Bureau. 1990 Census, STF3; 2000 Census, SF3. Online at http://factfinder.census.gov/home/saff/main.html?_lang=en



Lake Road early 20th Century

Lake Road Present Day
Photo Courtesy Jim Ford

History/ Demographics

These statistics, coupled with the relatively high average age (53) of Madison County farmers, cause concern because they indicate a significant threat to farmland conservation.²⁷ As farmers retire, they may sell their farm to finance their retirement. The land is likely to be purchased by affluent Americans who seek a second residence in Madison County. The affordable real estate, rural landscape, and cultural amenities make Madison County attractive as a secondary place of residence. These development interests pose a threat to Madison County's rural character.²⁸

Education

Public education is a means by which the Southern Madison Heritage Trust may accomplish its conservation goals. Therefore, the general education level within the six townships is worth noting. Figure A5 shows how education levels in the six towns compare with education levels of Madison County and the United States. In Madison County, 83 percent of residents are high school graduates; this is higher than the national level of 80 percent and reflects the educational climate of southern Madison County, which is home to Colgate University in Hamilton and Morrisville State College in Eaton. Brookfield and Georgetown are the only two townships within the region that have lower education levels than the nation as a whole. Among the six towns, Hamilton has the highest education levels in both the high school graduate and bachelor's degree categories (see Table 3). As shown in Figure 4, 35% of Hamilton residents have a bachelor's degree. This is considerably higher than the county level of 22% and the national level of 24%. These high levels of education in Hamilton are likely the result of the presence of Colgate University. Hamilton's reputation as "village of schools" has always contributed to its uniqueness.²⁷

Conclusion

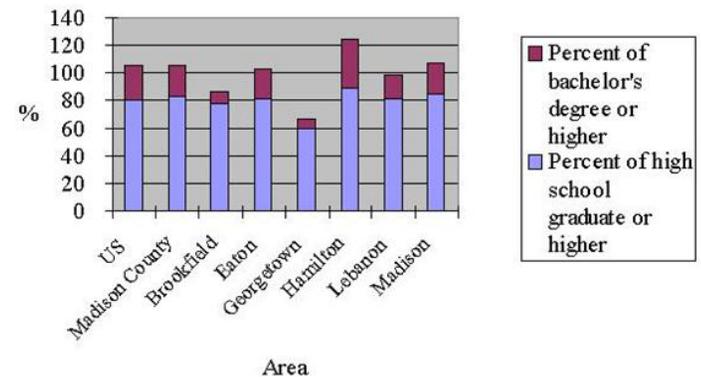
As a result of the importance of agriculture and the distinctive topography, the land itself is of primary importance to the viability of southern Madison County. Therefore, land conservation should be among the region's main priorities. The changes in farming, variable population growth, increase in housing units, increasing number of residents working outside the county, and lower incomes all pose threats to the success of land conservation. The presence of the Southern Madison Heritage Trust, however, signals great hope for the future of southern Madison County.

Table A3. Education level in Madison County, NY, 2000

	Population 25 years and over	High School Graduate or higher	% of total	Bachelor's Degree or higher	% of total
Madison County	43,762	36,471	83.3	9,455	21.6
Brookfield	1,526	1,182	77.5	141	9.2
Eaton	2353	1,914	81.3	509	21.6
Georgetown	725	430	59.3	53	7.3
Hamilton	2486	2213	89	854	34.8
Lebanon	859	703	81.8	139	16.2
Madison	1900	1,607	84.6	425	22.4

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3).
 Online at http://factfinder.census.gov/home/saff/main.html?_lang=en

Figure A5. Education profile of Madison County, 2000



Source: U.S. Census Bureau. 1990 Census, STF3, 2000 Census, SF3. Online at http://factfinder.census.gov/home/saff/main.html?_lang=en

History/Demographics



Photo courtesy of John Hubbard

Natural Resources



Photo courtesy of John Hubbard

December 2005

Natural Resources

INTRODUCTION

Southern Madison County’s modern ecological footprint began 10,000 years ago with the retreat of the Wisconsin ice sheet that once covered most of North America. At the end of the Pleistocene Epoch, the glacier melted and retreated. During the process, glaciers carved out the region’s sloping valleys and rolling hills, establishing a drainage system for three major northeastern watersheds. The glacier deposited till that would eventually develop into fertile soils that today support the region’s rich biological diversity and predominant dairy and forestry industries.

Southern Madison County’s landscape continues to change under the influence of development. Land development has intensified in some areas, particularly on the hilltops around the Village of Hamilton. However, much of the regional natural landscape remains rural, undeveloped and isolated from these pressures.

Complex socioeconomic forces are the primary influence on long-term viability of the region’s extractive land use activities. The agricultural industry is threatened by increasing production costs, diminished market prices for farm products, and an aging farmer population. Market forces that favor non-local processing of harvested timber are stunting the regional economic impact of the forest industry¹. Although these issues may surpass the scope of this strategic conservation plan, it is important to have an awareness of them when thinking critically about protecting Southern Madison County’s natural and cultural resources.

EXISTING ECOLOGICAL CONDITIONS

Water Resources

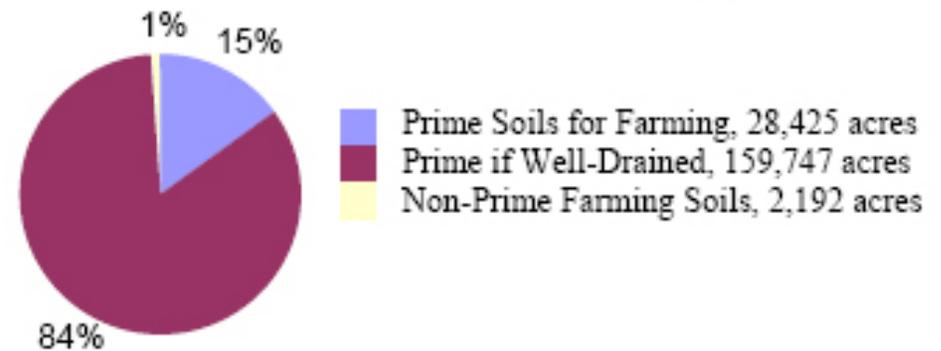
The total acreage of the six townships that make up the Southern Madison Heritage Trust territory equals 186,074.5 acres. Rivers drain through the area and form dissected plateaus. As a result, most of ridges run from south to north. The Chenango, Otselic, and Oneida rivers have their sources in this area and each flow to adjacent counties (See Map B1). The Chenango watershed, for instance, covers several southern counties including Cortland, Onondaga, Broome, Cayuga, Tioga, Oneida, and Chenango. The headwaters of the Otselic River are northeast of Georgetown and drains south to Broome County. The Oneida river

flows to the north. The Unadilla River serves as the eastern boundary of the town of Brookfield in the southeastern part of the county. There are also many smaller tributaries. They are of great importance in watering and draining the territory. Finally, there are 12 reservoirs, ponds and lakes within the region, several of which formerly served as reservoirs for the Chenango Canal.

The New York State Department of Environment Conservation (DEC) maps wetlands that are 12.4 acres or more in size. DEC-designated wetland areas are protected under the New York State Freshwater Wetlands Act of 1975. These wetlands are ranked in one of four categories, class 1 providing the most environmental benefits and class 4, the fewest. Table B1 provides a breakdown of classified wetlands in Southern Madison County.

Class	% of Total
1	67.2%
2	30.3%
3	1.8%
4	0.7%

Figure B1. % Prime Farmland in Southern Madison County



Natural Resources

Land Cover Type	% of Total
Cropland	40.3
Evergreen-northern hardwood	21.1
Sugar maple mesic	16.7
Successional hardwoods	11.1
Old field/pasture	4.5
Open water	3.4
Mixed wetland	1.1
Roads	0.8
Successional shrub	0.5
Evergreen plantation	0.3
Deciduous wetland	0.2
Emergent marsh/open fen/wet meadow	0.1
Shrub swamp	0.0

Environmental Inventory

New York State is divided into eleven major eco-zones. These eco-zones are broad categorizations of biological communities based on landforms, climate, soils, and natural vegetation. Southern Madison County is located in the northeastern portion of the Appalachian Plateau eco-zone. The Appalachian Plateau is a large, ‘uplifted’ region known as a dissected plateau and extends from southern New York to western Pennsylvania, West Virginia, and eastern Ohio. This eco-zone is largely characterized by a) sugar maple mesic, evergreen-northern hardwood, successional hardwood, and oak forest types, b) cropland, and c) old field/pasture.²

Land Cover and Species Richness

Rolling hills with cropland and forest are the major scenic features of the region (Map B-2 and Table B2). Dairy farms and forestry drive the local economy and define the landscape. The major four land cover types are cropland, evergreen-northern hardwood, sugar maple mesic and successional hardwoods. Cropland covers 40.3% of the area; evergreen-northern hardwood 21.1%; sugar maple mesic covers 16.7%; and successional hardwoods 11.1%.

Species Richness is determined using a predictive model based on how many vertebrate species are expected to live within a particular land coverage area.

Total vertebrate species richness in the Southern Madison County region ranges from 68 to 162 species per land cover type (Map B-3 and Table B3). Sugar maple mesic supports the highest biodiversity, providing habitat for a predicted 162 species. Evergreen-northern and successional hardwoods provide habitat for 148 and 143 species, respectively. Cropland, which is the largest coverage, has a total vertebrate species richness of 97. Over 83% of the region is comprised of land coverage types that support over 100 vertebrate species - providing a rich ecological tapestry in which biodiversity can thrive.

Soil Series Profile

Southern Madison County has 65 distinct soil series. Mardin silt loam and Lordstown channery silt loam are the most prevalent at 20.47% and 11.74%, respectively. These are located in the central part of the six townships and are not considered prime agricultural soils. Over 14 % of the region’s land area, or 28,425 acres, consists of prime agricultural soils. These productive farm areas are found along the rich alluvial floodplains of the region’s waterways, particularly near the Chenango River (see figure B1 and map B2).

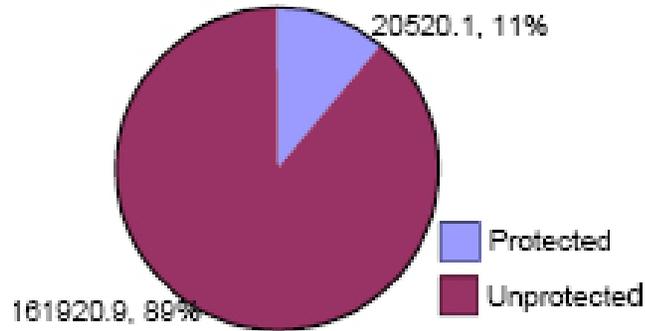
Land Cover Type	Species Richness	% Total	Cumulative Total
Sugar maple mesic	162	10.6	10.6
Evergreen-northern hardwood	148	9.7	20.3
Successional hardwoods	143	9.4	29.7
Deciduous wetland	143	9.4	39.1
Mixed wetland	125	8.2	47.3
Successional shrub	125	8.2	55.5
Emergent marsh/open fen/wet meadow	114	7.5	63.0
Old field/pasture	112	7.3	70.3
Roads	104	6.8	77.2
Shrub swamp	103	6.8	83.9
Cropland	97	6.4	90.3
Evergreen plantation	80	5.2	95.5
Open water	68	4.5	100.0
Total	1524	100	

LAND OWNERSHIP ANALYSIS

Protected Conservation Lands

Southern Madison County is comprised of 11,159 parcels and 182,000 acres of land. Over 11% of the County is protected lands. These protected lands have a diverse ownership including; New York State (95.5%), Madison County (1%), local municipalities (2.4%), and private land trusts (1.1%). SMHT owns one parcel in fee and holds conservation easements on two adjacent parcels. The Nature Conservancy owns seven parcels totaling 70.69 acres (see figure B3).

Figure 2. Protected Acreage in Southern Madison County



Unprotected Open Space

89% of Southern Madison County’s land area is unprotected. Over half this acreage is either residential or agricultural (Table 4, Figure 4). There is also a significant amount of vacant agricultural land (19.7%) and non-agricultural land (25.8%) in the region.

Figure B3. Ownership of Protected Lands

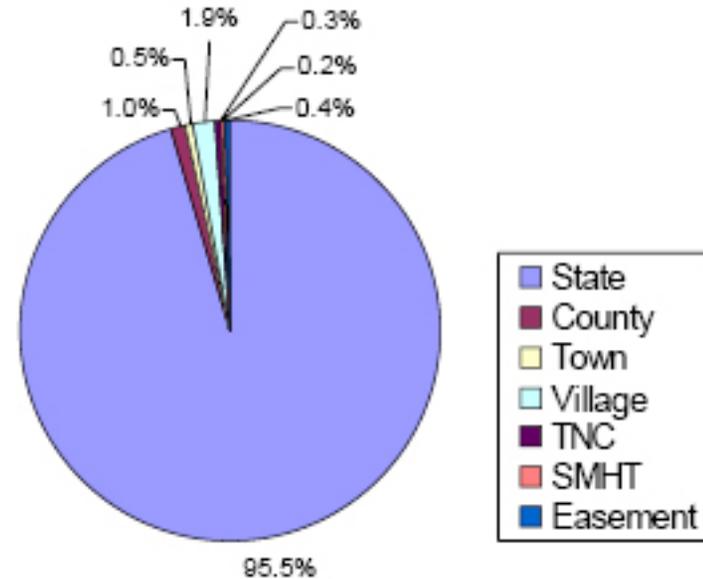
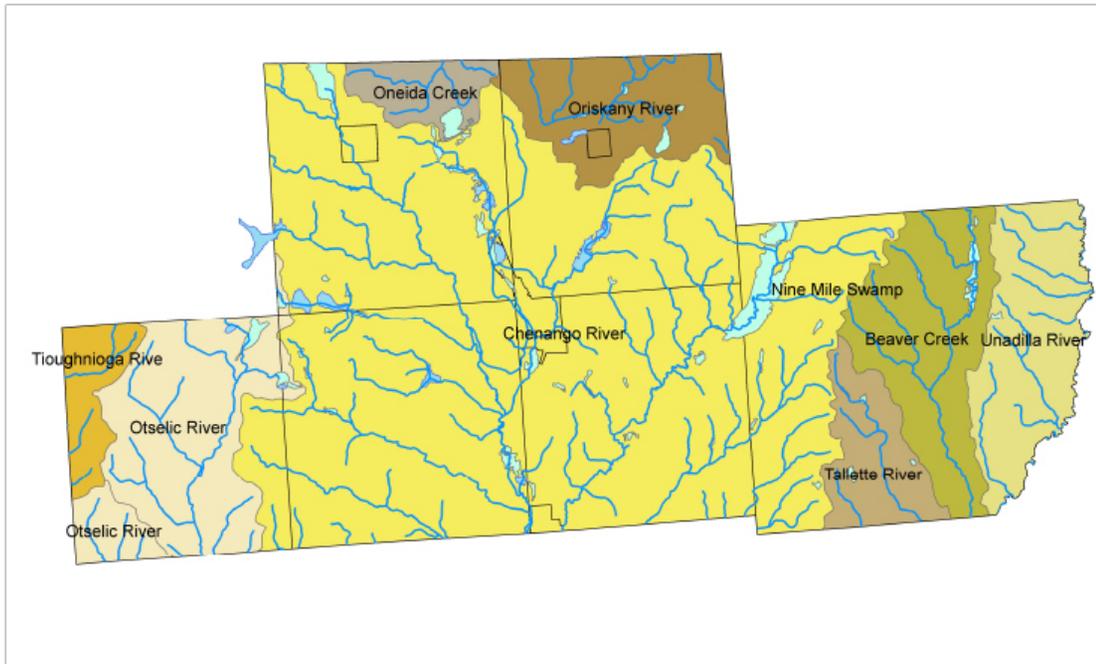


Table 4. Unprotected Land in the Target Area

Land Use Type	Number of Parcels	% of Total	Number of Acres	% of Total
Agricultural	579	5.5	38,187	23.6
Commercial	368	3.5	1,274	0.8
Community Service	164	1.6	882	0.5
Forested	74	0.7	2,260	1.4
Industrial	8	0.1	38	0.0
Public Services	36	0.3	118	0.1
Recreational	23	0.2	578	0.4
Residential	5,900	55.8	44,991	27.8
Vacant Agricultural Lands	709	6.7	31,992	19.7
Other Vacant Land	2,718	25.7	41,784	25.8
Total:	10,579	100.0	162,104	100.0

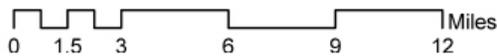
Natural Resources

Water Resources (Southern Madison, NY, 2005)



Legend

Major Stream Watersheds	Oriskany River	Major Streams
NAME	Otselic River	DEC Wetlands
Beaver Creek	Tallette River	Lakes
Chenango River	Toughnioga River	Municipalities
Oneida Creek	Unadilla River	



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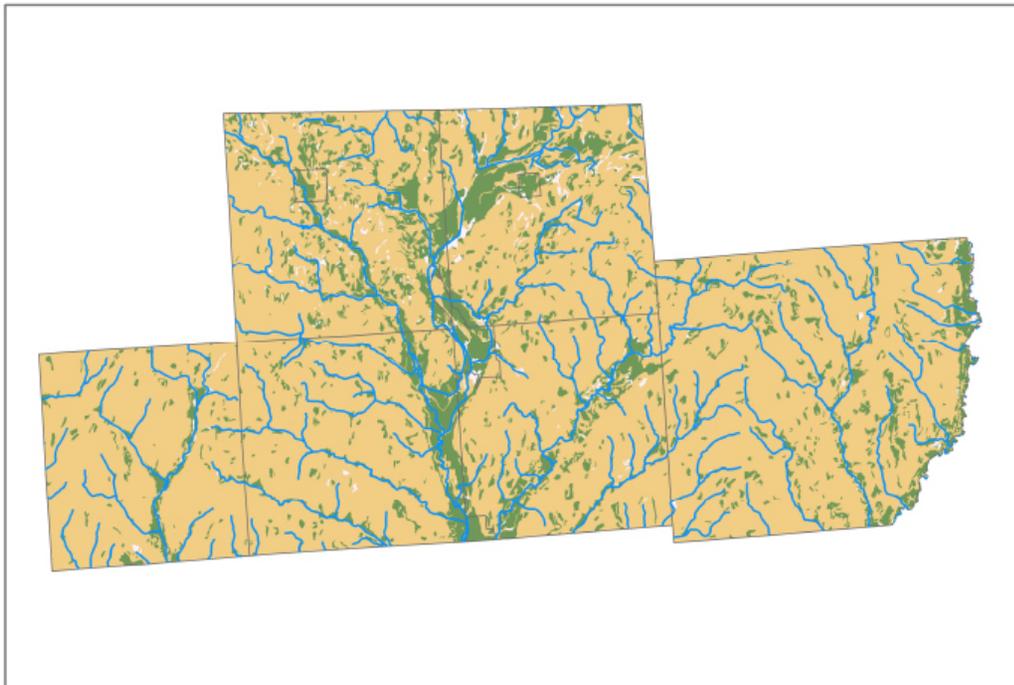


Cornell University

Sources: Watershed, Major Streams, Lakes, and Municipalities date are provided by Madison County, NY. NY county boundaries is provided by GEDDeS Lab server, Cornell University. September 26 2005.

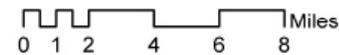
B-1

Soils Good For Agriculture (Southern Madison, 2005)



Legend

- Soil Value
- ALL AREAS ARE PRIME FARMLAND
 - NOT PRIME FARMLAND
 - ONLY DRAINED AREAS ARE PRIME FARMLAND
 - Major Streams
 - Municipalities



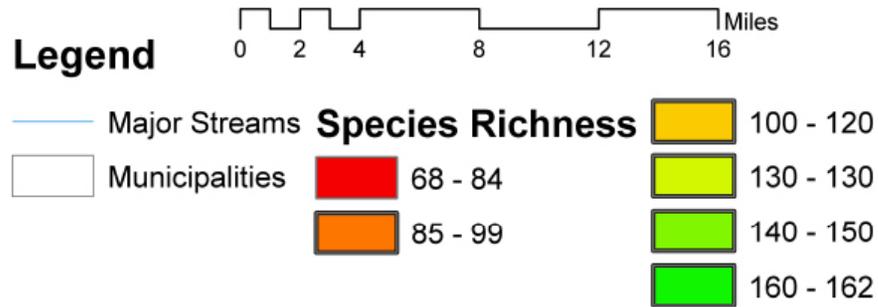
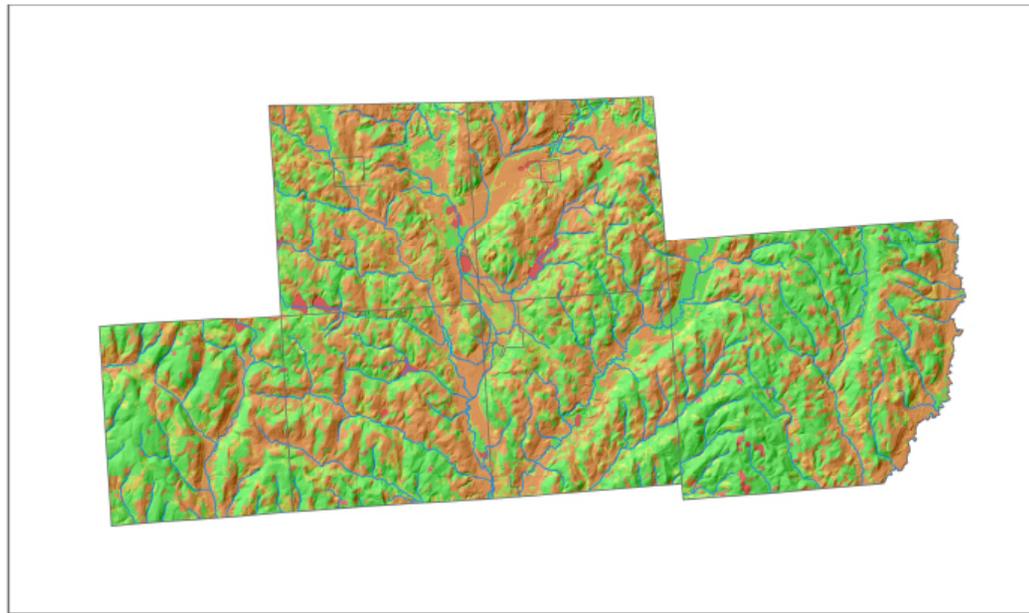
Cornell University

Sources: Soil data come from NY State GAP data. Major Streams and Municipalities boundaries provided by Madison County. NY county boundaries from GEDDeS Lab server, Cornell University. September 26, 2005.

B-2

Natural Resources

Species Richness (Southern Madison, NY, 2005)

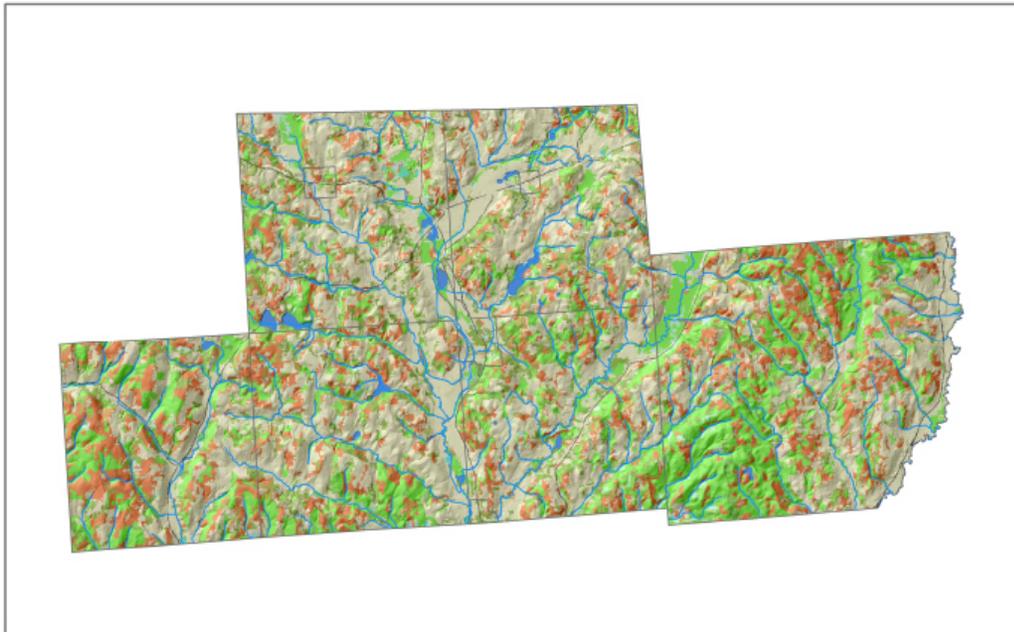


Cornell University

Sources: Major Streams, Municipality Boundaries are provided by Madison County, NY. Species Richness from GAP data. NY county boundaries from GEDDeS Lab server, Cornell University.
September 26, 2005.

B-3

Land Cover (Southern Madison, NY, 2005)



Legend

Major Streams	Old field/pasture
Municipalities	Open water
Cropland	Roads
Deciduous wetland	Shrub swamp
Emergent marsh/open fen/wet meadow	Successional hardwoods
Evergreen plantation	Successional shrub
Evergreen-northern hardwood	Sugar maple mesic
Mixed wetland	



Cornell University

Sources: Land Cover data from NY State GAP data. Major Streams and Municipalities boundaries provided by Madison County.?? NY county boundaries from GEDDeS Lab server, Cornell University. September 26, 2005.

B-4

Natural Resources

Largest Landowners in the Region

Collectively, 30 landowners own 23% of the region's total acreage (41,098 acres). Nearly half this land (45%) is classified as wild, forested, conservation land or public park and is owned almost exclusively by the State – the region's largest landowner at nearly 19,000 acres. Agriculture lands accounts for another 38%, vacant lands for 11%, and the remaining 6% is split among residential, community services, recreation/entertainment and commercial use.

Map B-5 depicts the spatial distribution of unprotected land among the region's largest landowners. SMHT may wish to approach these landowners for conservation easements, to affect significant acreage through targeted effort. Table 5 lists landowners who own more than 500 acres. Although names are not provided in this plan, a confidential list of each property owner by name and acreage is provided as a separate document to SMHT.

Semi-Protected Lands: Special Assessment

Roughly 20% of all acreage within the region, or 46,265 acres are receiving special assessment through one of New York's four forestry or agricultural tax reduction programs, as follows:

480 Program (1959). Owners of 15 acres or more of forestland were eligible to apply for partial exemption. The Department of Environmental Conservation was responsible for determining whether the tract was eligible for certification. This program has been closed to new applicants since 1974; tracts certified prior to this date are allowed to continue to receive tax benefits.

480-a Program (1974). Owners of 50 or more contiguous acres of forest may apply for exemption. They must commit to managing the forest in accordance with an approved management plan prepared by a professional forester for a ten-year period. Failure to follow the plan or conversion of the committed land from continued forest crop production triggers tax penalties.

305 Program (1971). As part of the NYS Agricultural District Program, owners within a State-certified agricultural district are eligible to apply annually for special tax assessment on working farmland. Landowners must satisfy gross sales and acreage requirements, and must commit to non-conversion of agricultural land for five years, or pay penalties. The NYS Agricultural District Program was

Figure 4. Unprotected Land by Land Uses

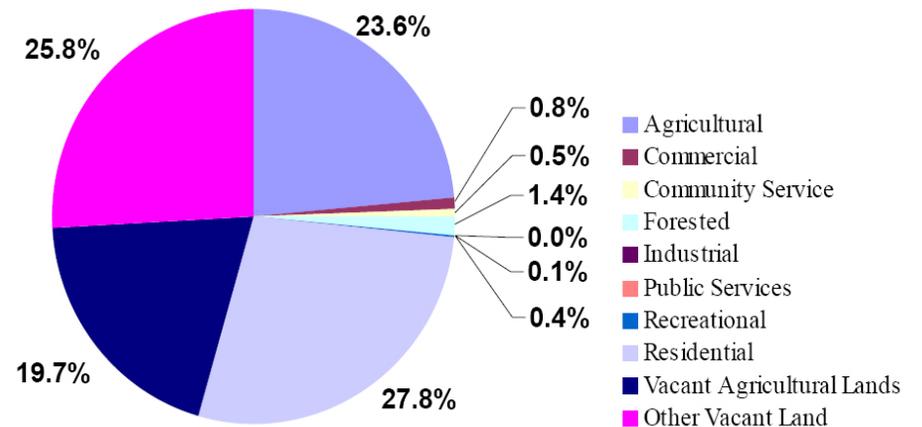


Table 5. Major Landowners who owns more than 800 acres

Names	Acreages
State of New York	19,602
Colgate University	1,884
Private Owner A	1,709
Gutchess Timberland	1,220
Private Owner B	1,218
Private Owner C	1,187
Private Owner D	964
Private Owner E	970
Maple AVE Farms	969
Gutchess Lumber	948
Private Owner F	824
Private Owner G	838

established to counteract the impact of non-farm development on the viability of farming operations. In addition to special assessments, the program affords farmers [within certified districts] some protection against unreasonable local regulation of farm practices, use of eminent domain, and publicly funded infrastructure investments that encourage development.

306 Program (1995). The 306 Program applies to land being farmed outside NYS certified agricultural districts. It offers the same special assessment described under the 305 Program. The primary difference is that landowners under 306 must commit to non-conversion for eight years. SMHT may wish to target farmland in this category, which may be viewed as susceptible to future development since it lacks the protection that NYS agricultural districts afford.

Semi-Protected Lands

‘Gray-area’ groups that *may* be interested in land preservation own about 3% of region’s acreage; including Colgate University and private trusts. (see figure-6) Private trusts are often formed to secure ownership of an individual’s assets during that person’s lifetime, and to then distribute those assets after death. They present an opportunity for SMHT to obtain conservation easements and Table 6 depicts current use of private trust lands.

As the second largest landowner in the region, Colgate owns a greater percentage of land categorized as ‘rural, vacant land’ than current, developed University property. The university also owns significant agricultural acreage (Table 7).

Other ‘gray area’ groups include camps, public schools, rod and gun clubs, religious groups, and fire districts. These groups comparatively own a small amount of unprotected acreage, but they may have an interest in land conservation (Table 8).

Figure 5: Acreage Enrolled in Special Assessment Tax Programs

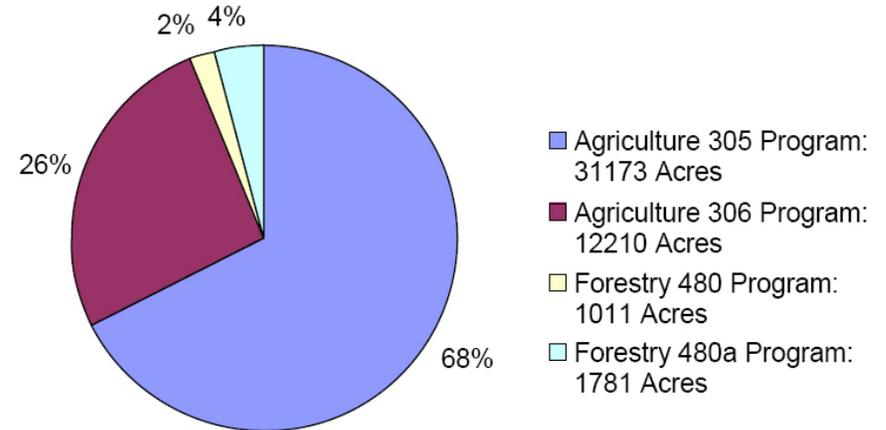
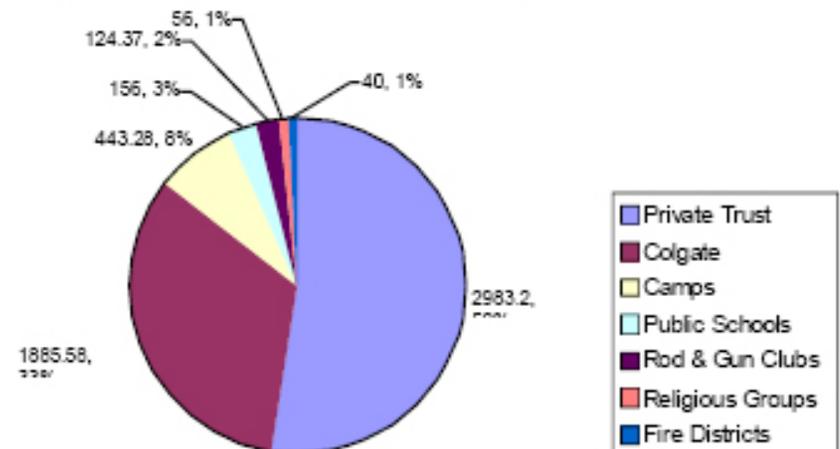


Figure 6. Unprotected Lands with 'Gray' Landowners



Natural Resources

Table 6. Land Uses of Private Trusts

PC codes	Land Uses	Number of parcels	Sum of Acreage	% of total
240	Rural Residence with Acreage	14	832.3	27.9
112	Agricultural - Dairy	5	491.2	16.5
105	Vacant Agricultural Land	10	395.6	13.3
110	Ag. - Livestock and Products	3	255.4	8.6
416	Mobile Ho. Park	4	242.3	8.1
323	Other rural vacant land	7	155.1	5.2
	Other Land Uses	172	611.4	20.5
Total		215	2983.2	100.0

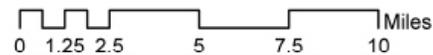
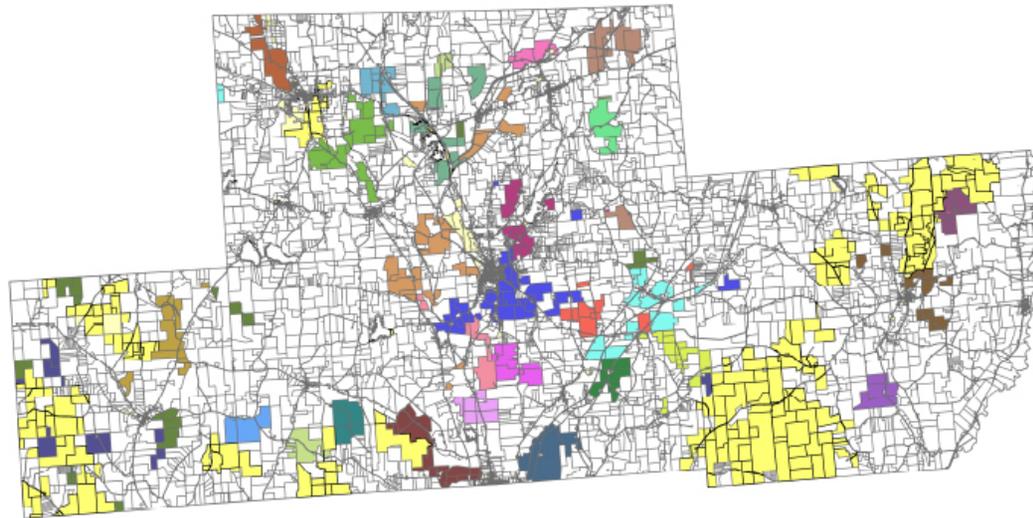
Table 7. Land Uses of Colgate University

PC codes	Land Uses	Number of parcels	Sum of Acreage	% of total
323	Other Rural Vacant Lands	12	492.8	26.1
613	College and University	4	252.6	13.4
120	Agriculture -Field Crop	6	244.0	12.9
312	Residential Vacant Land with small Improvement	3	172.9	9.2
552	Public Golf	5	161.7	8.6
105	Agricultural Vacant Land	4	151.6	8.0
682	Recreational Facilities	2	118.7	6.3
910	Private Wild & Forest Lands	1	116.5	6.2
321	Abandoned Agricultural Land	1	105.0	5.6
	Other Land Uses	58	69.9	3.7
Total		94	1885.6	100.0

Table 8. Land Uses of other 'Gray' Groups

PC codes	Land Uses	Number of parcels	Sum of Acreage	% of total
582	Camping Facilities	3	170.59	20.8
323	Other rural vacant land	3	123.37	15.0
534	Social Organization	2	118.05	14.4
105	Vacant Agricultural Land	1	110.71	13.5
612	Schools	11	95.52	11.8
581	Camps	2	78.69	9.6
620	Religious	36	54.15	6.6
	Other Land Uses	4	69.36	8.5
Total		62	820.4	100.0

Largest Landowners: 500+ Aggregate Unprotected Acres)

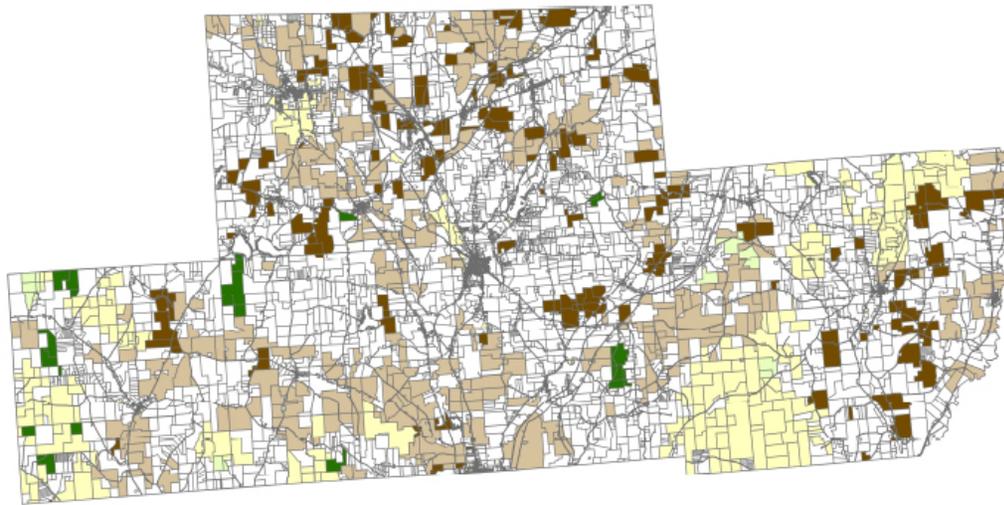


Cornell University

Sources: Southern Madison County boundaries and tax parcel data provided by Southern Madison Heritage Trust, September 2005.

B-5

Special Assessment: Ag & Forestry Exemptions



0 1.25 2.5 5 7.5 10 Miles

Legend

- Protected Lands
- 480 Forestry Program
- 480a Forestry Program
- 305 Ag Program
- 306 Ag Program



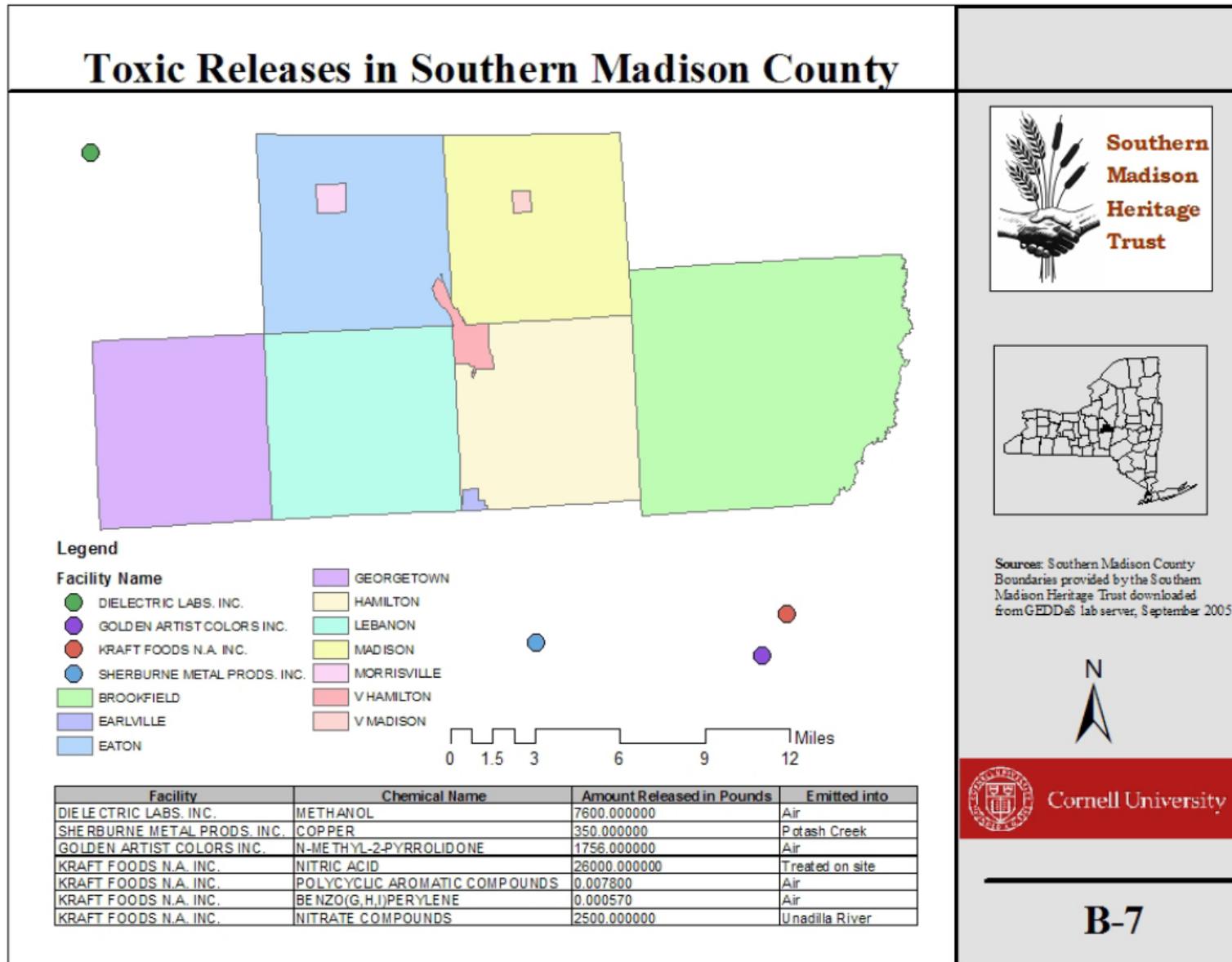
Southern Madison County



Cornell University

Sources: Southern Madison County boundaries provided by Southern Madison Heritage Trust. Tax Parcel and Special Assessment data provided by Madison County Real Property Tax Office, September 2005.

B-6



Natural Resources

ENVIRONMENTAL PROBLEMS

Toxic Releases

The US Environmental Protection Agency's 2003 Toxic Release Inventory indicates that Southern Madison County has had no direct toxic releases. Madison County ranks among the top 10% of counties nationwide for clean air quality. However the region has been impacted by point source industrial pollution from nearby facilities including Kraft Foods, which discharged 2,600 pounds of nitric acid into the Unadilla River, and Sherburne Metal Products, which discharged 350 pounds of copper into Potash Creek.

Non-Point Source Pollution

Madison County has many Concentrated Animal Feeding Operations (CAFO) which are required by law to collect and store their animal waste. Typically this manure is used to fertilize cropland on which the CAFO is situated. If best practice guidelines are not observed, the manure and its 'problem nutrients' (e.g. phosphorus) can runoff into the waterways, causing algae blooms, diminished oxygen supply and degraded aquatic habitats in the environment. Agricultural runoff can also contaminate local well-water supplies and create public health hazards. There are currently no regulations controlling where, when or how CAFOs may apply their manure. Each farmer must take personal responsibility to follow best management practices and because this is a voluntary system, there is the potential for abuse and environmental contamination.

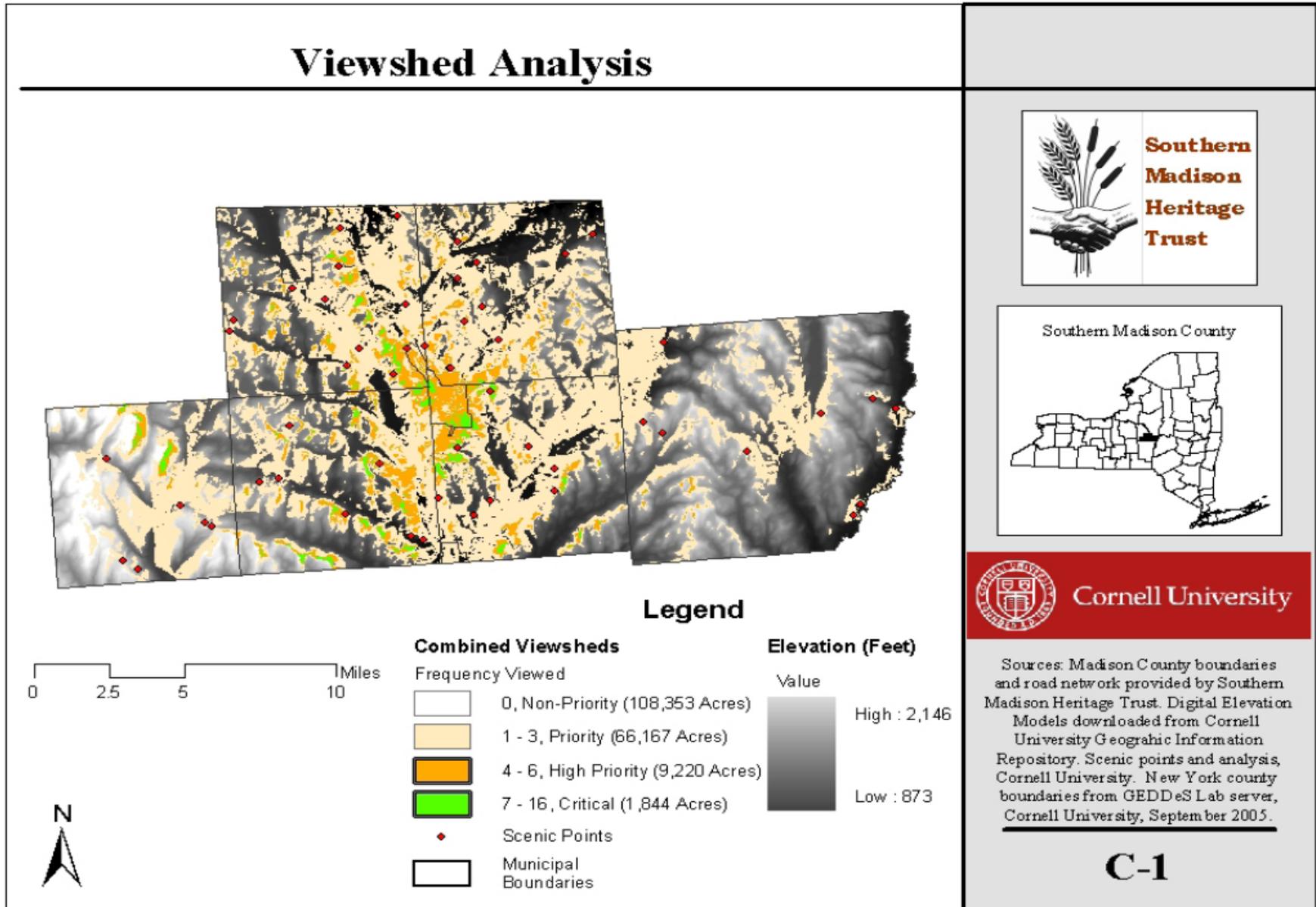
CONCLUSION

Southern Madison County's rich natural resources define the region's economy and rural character. Although 11% of the region's land is protected through public ownership or land trust intervention, 89% is still vulnerable to development or fragmentation. It is recommended that SMHT cultivate relationships with 'gray-area' property owners that may already have a strong land ethic in an effort to help advance the Trust's conservation goals. Opportunities also exist to work with property owners participating in tax exemption programs who make a living off the land, and with the larger landowners in the region, to protect the natural resources of the area.



Photo courtesy of John Hubbard

Scenic Inventory & Analysis



Scenic Inventory & Analysis

INTRODUCTION

Scenic quality is a cornerstone in the quality of life for people who live in and visit rural communities. From one angle, we can understand the importance of scenic resources as a source of community pride and connection to place for the spiritual and aesthetic qualities they offers residents and visitors alike. From another angle, we can see that scenic resources lie at the foundation of the rural economy on account of its direct ties to agricultural production as well as the generation of cultural and recreational tourism opportunities. The preservation of scenic quality and rural character, then, lies at the heart of the work done by many land trusts in the United States.

Though assessing scenic landscape is certainly one of the most important tasks undertaken by land trusts, it can also be one of the most elusive, as a precise definition of “scenic” can be difficult to pin down. Aesthetic valuation is far from an objective measure, varying from person to person based on differing backgrounds, experiences, orientations, and outlooks, among other things. Recognizing the highly subjective nature of the task at hand, employing a methodology to guide the process of evaluating and cataloging scenic landscapes was a critical first step in undertaking a scenic inventory of southern Madison County.

Methodologies Available

There are a number of methodologies for building an inventory of scenic resources. As with an inventory of any resource, the investigator must first answer several important questions. What is the scale and scope of the landscape in question – what features and classes of scenery exist? To what degree is it developed or untouched by human hands? Who are the stakeholders that live in or use this landscape? What is the purpose of the scenic inventory – what does the investigator hope to do with the information generated through the evaluation? These are just a few of the questions one should take into consideration when developing or selecting a methodology.

Most scenic inventories can be classified into one of four types – expert techniques, quantitative surveys, focus groups, and individual experiential approaches.¹ Expert techniques rely on experienced practitioners, often in a field such as landscape architecture, who draw on formal landscape theory

Strategic Land Protection Plan for the Southern Madison Heritage Trust.

(identifying variations in line, form, color, and texture) to make determinations and judgments about the quality of scenic landscape. Quantitative surveys attempt to “scientifically” quantify people’s visual preferences by showing them photographs and slides and measuring their responses. Focus groups are a forum in which social science research methods (often steeped in some form of psychological analysis) are used to gain a deeper understanding of community members’ attitudes and emotions about their landscape. Individual experiential approaches place detailed individual subjective investigation and personal experience/valuation of landscape at the forefront of the analysis. There are strengths and weaknesses in each of these methods on both a theoretical and practical basis – an ideal approach would likely draw on elements from a combination of each.

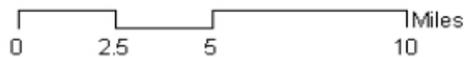
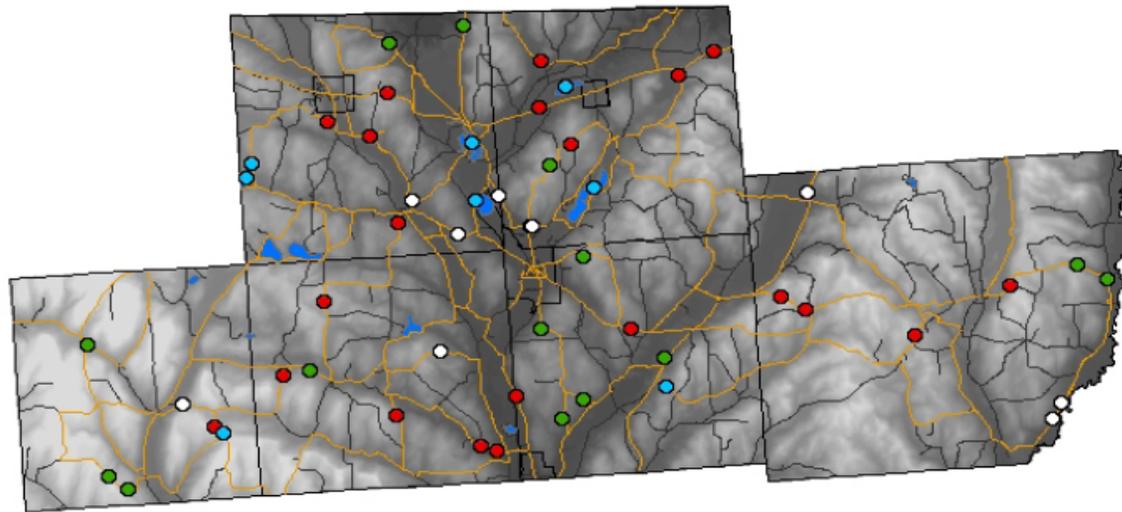
Figure C-1. Scenic Viewpoint Criteria

Criteria	Characteristics
Accessibility by Car	Car Accessible, Hiking or Biking Trail/Route Nearby or Present
Presence of Water	Stream, River, Pond, Reservoir, Lake, Waterfall
Landform	Variety and Contrast in Topography, Slope, Contour, Line, Height
Landcover	Variety of Vegetation, Color, Texture, Pattern, Presence of Wildlife
Vista	Breadth and Depth of View, Wide-Angle Views
Rural Vitality	Barns, Silos, Farmhouses, Livestock, Haystacks, Farm Fields, Windy Roads
Built Environment	View of Village, Hamlet, University Campuses, Cemeteries, Bridges, Railroads, Architecture that honors local history

The grandfather of scenic landscape assessment in the United States is the Massachusetts Landscape Inventory, first conducted by the Trustees of Reservations (the oldest continuously operating Land Trust in the United States) in 1933 and subsequently updated in 1982 by the Commonwealth of Massachusetts. This landscape analysis is an excellent model for the SMHT to consult, as its goal, to conserve “important natural features,” and physical,

Scenic Inventory & Analysis

Scenic Viewpoints by Landscape Type



Legend

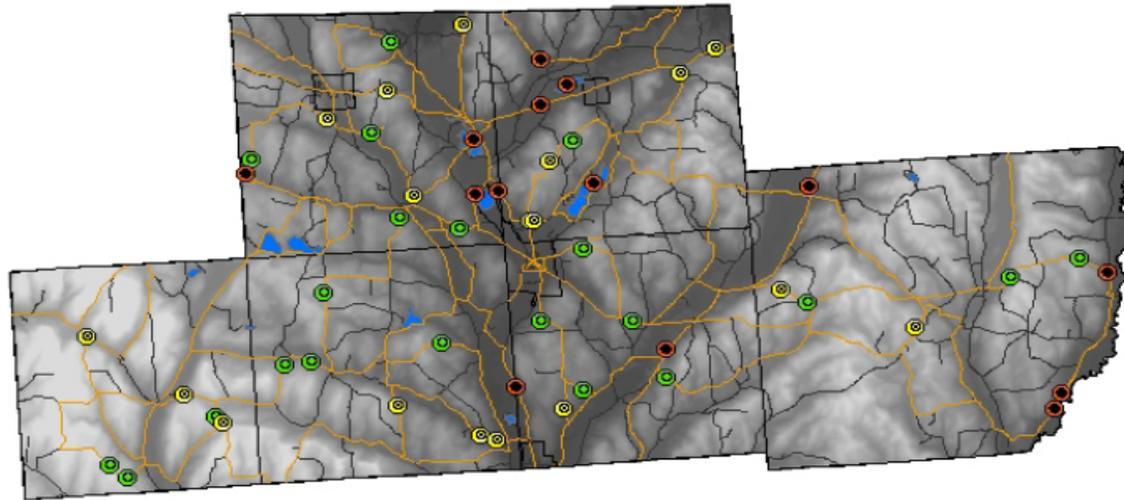
- | Viewpoint Type | Elevation (Feet) |
|------------------------|------------------|
| ● Farmscape | Value |
| ● Forest and Field | High : 2,146 |
| ○ Villagescape | Low : 873 |
| ● Water Feature | — All Roads |
| ■ Water Bodies | — Roads Driven |
| □ Municipal Boundaries | |



Sources: Madison County boundaries and road network provided by Southern Madison Heritage Trust. Digital Elevation Models downloaded from Cornell University Geographic Information Repository. Scenic points and analysis, Cornell University. New York county boundaries from GEDDeS Lab server, Cornell University, September 2005.

C-2

Scenic Viewpoints by Elevation



0 2.5 5 10 Miles



Legend

Elevation Type		Elevation (Feet)	
	Hilltop	Value	
	Intermediate		High : 2,146
	Valley		Low : 873
	Water Bodies		All Roads
	Municipal Boundaries		Roads Driven



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Sources: Madison County boundaries and road network provided by Southern Madison Heritage Trust. Digital Elevation Models downloaded from Cornell University Geographic Information Repository. Scenic points and analysis, Cornell University. New York county boundaries from GEDDeS Lab server, Cornell University, September 2005.

C-3

Scenic Inventory & Analysis

cultural, and historic context are relatively akin to those found in southern Madison County.² The Massachusetts Inventory analysis drew on expert techniques, individual experiential approaches and focus groups to develop their methodology. A team of experts classified all the land in the state into six physiographic regions, developed a list of scenic features (categorized within Landform, Landcover, Glacial Features, Rivers & Streams, Lakes & Ponds, Vistas, and Cultural Features), and conducted multiple site visits to assess the existence and quality of scenic features across regions. Points were categorized along a scenic classification continuum of “Common,” “Noteworthy,” and “Distinctive” landscapes.³ Preliminary findings were reviewed by an “advisory committee, conservation groups, professionals, and concerned citizens.” This public feedback was then incorporated to refine the inventory and prepare final maps and analysis.

Methodology Employed

Of the four approaches mentioned above, the methodology employed for the SMHT inventory combined both expert techniques and individual experiential approaches. Though the Massachusetts Landscape Inventory served as an excellent base model in developing a scenic inventory methodology for this project, a number of revisions were made to tailor the approach to the specific needs and constraints of the SMHT. Rather than developing a taxonomy with multiple gradations of scenic amenity, we decided the most pragmatic approach would be to classify points as “scenic” or “not scenic.” The next step was to develop criteria for what constitutes a “scenic” view. Drawing on the list of features used in the Massachusetts Landscape Inventory, conversations with members of the SMHT Board, and the experiences of Cornell Master’s students conducting the inventory, a list of seven criteria was established to evaluate the scenic quality of landscapes in southern Madison County. These criteria are outlined in Figure C-1. If a given scene was rich in the characteristics corresponding to at least five of the seven criteria listed in this chart then that point was said to achieve the threshold definition for “scenic.” With criteria established, the Cornell team members began work in the field to explore the service area and identify scenic viewpoints. In the interest of identifying views with the greatest potential for visitation by the general public, all points were identified by car. Routes were determined on the recommendation of SMHT board members, as well as in consultation with topographic maps and by identifying the existence of “scenic byways” (such as US Route 20) in the

service area. Over the course of two days Cornell team members traveled nearly 400 miles⁴ in search of scenic viewpoints. Once found, the precise location of viewpoints were recorded using a Global Positioning System (GPS) unit. Digital photographs were catalogued for each site and brief descriptions of the views were recorded in an excel spreadsheet to create a database of viewpoint qualities. A total of 53 scenic points were compiled by completion of the field investigation.

Figure C-2. Acreage and Percentage of Priority Areas in Southern Madison County, NY, 2005

Classification	Total	
	Acres	%
Non-Priority	108,352.8	58.4
Priority	66,166.7	35.7
High Priority	9,219.6	5.0
Critical	1,844.4	1.0
Total Acres of Service Area	185,583.5	100.0
Total Acres in Viewsheds	77,230.7	41.6

Viewpoints from the GPS unit were loaded into a Geographic Information System (GIS) and overlaid on top of a Digital Elevation Model (DEM). Using the Spatial Analyst extension in GIS, “viewsheds” (the areas that can be seen) from each point were created. These viewsheds were then mathematically combined using the Raster Calculator Tool to establish points of multiple overlap in scenic quality. Using the Natural Breaks classification method in GIS (which identifies natural separations or “breaks” in the data), areas were sorted by their degree of overlap. This left our viewshed analysis with four classes of scenic amenity (See Map C-1). The first includes all lands in the service area that were not visible from any of the 53 scenic viewpoints. As such, these lands are Non-Priority areas from the standpoint of scenic quality. Lands falling into any of the other three classes are included in at least one viewshed and, as such, fall under the umbrella of Priority Areas. The second group includes all lands falling in one to three viewsheds, thus designated as Priority lands. The third group includes lands where four to six viewsheds overlap, which are called High Priority lands. The final grouping, known as Critical lands, includes all places overlapped by seven to sixteen viewsheds (sixteen was the greatest degree of overlap revealed by the analysis). This classification scheme

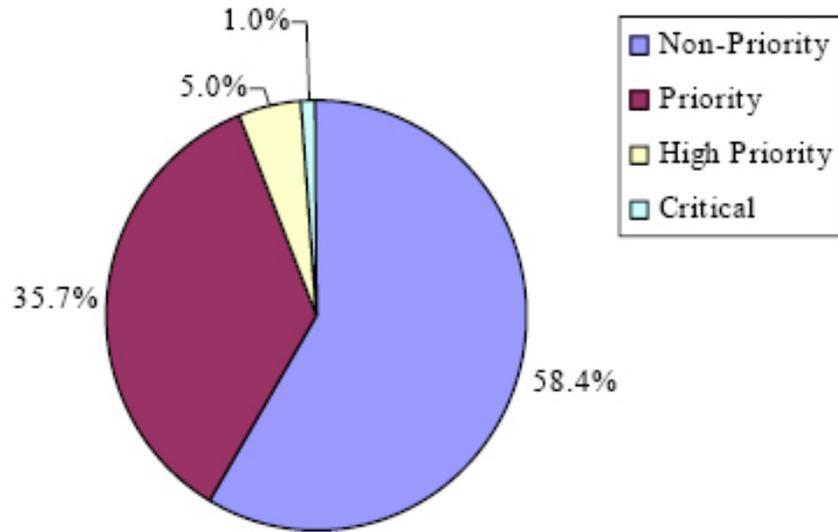
Scenic Inventory & Analysis



Photo courtesy of John Hubbard

Scenic Inventory & Analysis

Chart 3: Percentage of Land in Priority Areas in Southern Madison County, NY, 2005



reflects the assumption that the greater the degree of viewshed overlap, the more valuable a swath of land is for its contributions to scenic integrity at a landscape scale. A breakdown of these land classifications by degree of scenic priority throughout the service area can be seen on Map C-1.

For further analysis, a typology was applied for each viewpoint according to the predominating landscape type present. Each point was designated as one of the following four landscapes: Farmscape, Forest & Field, Villagescape, or Water Feature. Map C-2 shows the 53 viewpoints symbolized by view type. The viewpoints were also assigned a similar elevation typology. Each point was given one of the following labels: Hilltop, Intermediate, or Valley. Map C-3

shows these points and their locations throughout the service area.

Development Threats

Southern Madison County is a rural and agricultural area rich in pastoral and idyllic scenery. The land of southern Madison County is dominated by forests, fields, and farmland. The six town service area of SMHT also possesses great number of natural scenic resources such as lakes, which are mainly distributed in northern half of the service area, namely in the Towns of Eaton and Madison.

Two major issues should be underscored for possible negative impacts in the near future. First, the presence of two institutions of higher education, Colgate University and the State University of New York at Morrisville, have the potential to stimulate physical development in the region, in that they attract people from outside southern Madison County thus spurring housing development. Secondly, a decrease in the value of land for agricultural activities in the service area accelerates land development for other purposes. As agricultural land owners diminish their agricultural production, they have an incentive to subdivide and sell their land parcels for other development which garner a higher market price.

Challenges for Conservation

Similar to other agricultural and rural areas in upstate New York, southern Madison County faces increasing pressure from urbanization and development interests. Housing development threatens the scenic integrity of the service area, as developments to accommodate rising demand are taking advantage of the existing beautiful scenic views⁵. On an individual basis housing development may not raise alarm, but on the aggregate it contributes to the degradation of overall regional scenic values. With new housing developments come the conveniences of modern day lifestyles, such as electric poles, cell phones towers, and radio towers, which are demanded by new residents and increasingly disbursed throughout the service area. High speed highways and modern commercial development strips (most evident in the Town of Hamilton) also accompany new development. Another new player on the horizon (literally) in southern Madison county are windfarms, that are welcomed by many as an alternative and sustainable energy source, but which also gobble up once pristine hilltops and ridgelines. These trends raise new and interesting questions/

Scenic Inventory & Analysis

challenges in terms of defining and protecting scenic landscape integrity.

Windfarms and cell phone towers merit particular attention from the standpoint of preserving scenic quality in the region. Sets of windfarms have been constructed in the Town of Madison and other sets are visible in neighboring counties from several of the scenic viewpoints identified in this analysis. Windfarms provide electricity from renewable energy sources to homes in the surrounding villages but require locations receiving a maximum amount of wind, such as hilltops. Finding a balance between preserving scenic views and still allowing for renewable energy generation will be an ongoing source of discussion and debate in the region. Cell phone towers present similar questions as windfarms in terms of eroding scenic quality, though on a smaller order of magnitude. For some residents of southern Madison County the presence of a windfarm or cell phone tower can entirely ruin a scenic view. Given the demand for these services at the present time, however, it would seem that their presence is slated to increase in years to come. Avoiding scattered construction or finding creative ways to minimizing their exposure may help to alleviating the negative impacts of such trends on scenic views.

Findings

Overall – For the Southern Madison Heritage Trust Service Area

According to the viewpoint typology outlined above, views were categorized by viewshed type, as well as by rough elevation. The survey uncovered more than twice as many Farmscapes as other scenic types, with 21, followed by 10 Villagescapes, 14 Forest & Field landscapes and 8 Water Feature views. In terms of elevation, the categories were more evenly spread, with 21 hilltops, 18 intermediate views and 14 valley views. Of the 185,584 acres in the six-town service area, approximately 42 percent fall under the designation of Priority Areas from the standpoint of scenic quality (See Chart 2)⁶. Thirty-six percent of the total service area are designated Priority lands, five percent are High Priority lands, and one percent are Critical lands (See Chart 3). Nearly 60 percent of land in the service area fell outside the viewsheds, and as such is not a priority for the Trust to target from the standpoint of preserving scenic quality.

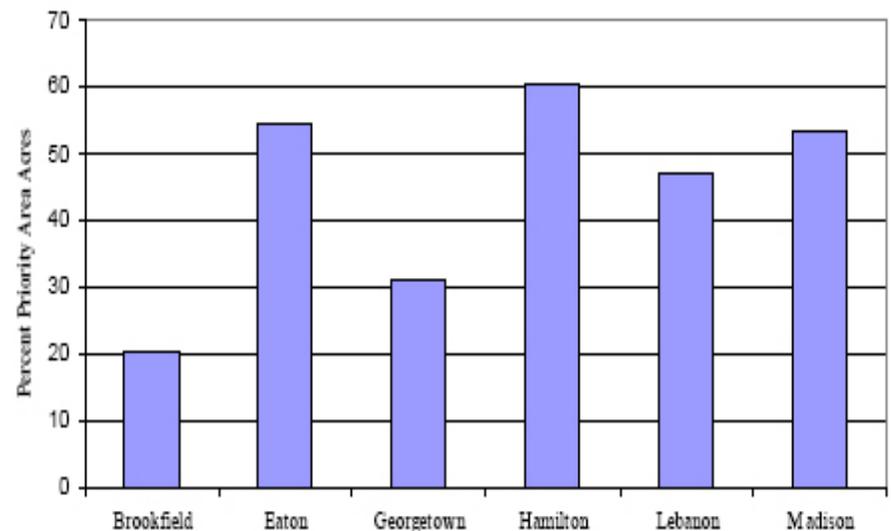
Town Comparison

In regard to the distribution of landscape types, Brookfield and Georgetown had the most views of Villagescapes, with three each. The town with the most

Farmscapes was Lebanon, with seven, and Hamilton had five Forest & Field landscapes, the most for that type of scene. The most viewpoints containing water features are found in Eaton, totaling four. In terms of the elevation of viewpoints, Madison had the most Valley and Intermediate sites with five each. Hamilton and Lebanon claimed the most Hilltop scenic points, also with five apiece.

The total distribution of scenic points was spread rather evenly across the six Towns of southern Madison County. The Towns of Madison and Eaton tied for the highest number of scenic points, with eleven each, while Georgetown had the lowest, with five. Chart 4 represents the percentage of land in Priority Areas by town. This reveals that three of the towns in the service area had more than half their acreage in Priority Areas designation. The Town of Hamilton had the largest proportion of its land in Priority Areas (60.5 percent), the Town of Eaton came in second place, with 54.3 percent, and Madison had 53.5 percent. An examination of digital elevation models reveals that these same

Chart 4: Percentage of Land in Priority Areas by Town, Southern Madison County, NY, 2005



Scenic Inventory & Analysis

Chart 5: Acreage and Percentage of Priority Areas by Town, Southern Madison County, NY, 2005

Classification (Times Viewed)	Brookfield		Eaton		Georgetown		Hamilton		Lebanon		Madison	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Non-priority (0)	39,737.4	79.7	13,325.4	45.7	17,714.8	69.1	10,461.3	39.5	14,792.9	52.9	12,320.9	46.5
Priority (1-3)	9,974.9	20.0	13,159.9	45.1	7,317.7	28.5	12,897.4	48.7	10,185.4	36.4	12,631.3	47.7
High Priority (4-6)	117.9	0.2	2,287.9	7.8	411.8	1.6	2,499.2	9.4	2,427.9	8.7	1,474.9	5.6
Critical (7-16)	6.4	0.0	402.4	1.4	209.0	0.8	624.8	2.4	549.0	2.0	52.9	0.2
Total Acres of Service Area	49,836.6	100.0	29,175.6	100.0	25,653.3	100.0	26,482.7	100.0	27,955.3	100.0	26,480.0	100.0
<i>Total Acres in Viewsheds</i>	<i>10,099.2</i>	<i>20.3</i>	<i>15,850.1</i>	<i>54.3</i>	<i>7,938.5</i>	<i>30.9</i>	<i>16,021.4</i>	<i>60.5</i>	<i>13,162.4</i>	<i>47.1</i>	<i>14,159.1</i>	<i>53.5</i>

Note: Viewsheds include "Priority (1-3)", "High Priority (4-6)", and "Critical (7-16)"; acreage calculated by GIS and thus show discrepancies to statistical data

Scenic Inventory & Analysis

three towns appear to have the highest changes in elevation in the service area. All but one town had more than 30 percent of their lands in Priority Areas. The town with the lowest proportion of land in a scenic viewshed was Brookfield, with 20.3 percent. The distribution of Critical lands is quite diverse. The town with the lowest Critical acreage was Brookfield, with only 6.2 acres while the Town of Hamilton, with the highest, had 624.8 Critical acres. The Towns of Lebanon, Hamilton, and Eaton also had more than 400 acres each of Critical scenic lands. Please refer to Map C-1 to locate these areas visually and to Chart 5 for a further breakdown of the viewshed acreage in each town and village.

Recommendations

The findings outlined above provide a lens through which to target specific landscapes and focus future conservation efforts. The Towns of Eaton, Hamilton and Madison have high concentrations of total Priority Area acreages and, as such, may serve as such strategic targets. Of these three towns, Hamilton offers the greatest possibility for scenic conservation holdings with 16,021.4 acres of Priority Areas and 624.8 acres of Critical lands. Eaton also contains a high concentration of Priority Areas (54.3 percent) as well as large amounts of Critical lands (402.4 acres). In light of these observations, the recommendations below aim to strengthen the SMHT's existing strategic plan by focusing on both short and long-term considerations regarding scenic value.

Short-Term

In the near future, and if not already considered, SMHT should review both state and federal Internal Revenue Service Scenic Enjoyment Criteria to consider potential tax benefits applicable to current projects involving conservation easements. When relevant, SMHT should advise landowners to consult a lawyer or tax specialist regarding how donated easements may qualify for a tax deduction or reduce future estate and property taxes.

Long-Term

SMHT will benefit from deciding where scenic landscape conservation efforts rank among the organization's overall categories of priority. Land acquisitions of this nature will serve the public as well as help the Trust achieve its goals by creating and maintaining partnerships with stakeholders and local planning groups. The scenic inventory analysis provided in this report is a prime tool

SMHT can use in partnership with each municipality in the service area.

It is important to note that this scenic analysis data also works to inform SMHT where potential properties can be secured to promote the long-term planning of local and county-wide greenways. To avoid "checkerboard" conservation, the differences in localized land uses that promote fragmentation of both ownership and habitat, the Trust can use this viewshed analysis with foresight to appropriately plan long-term contiguous parcel acquisition that may not be currently feasible.

Caveats

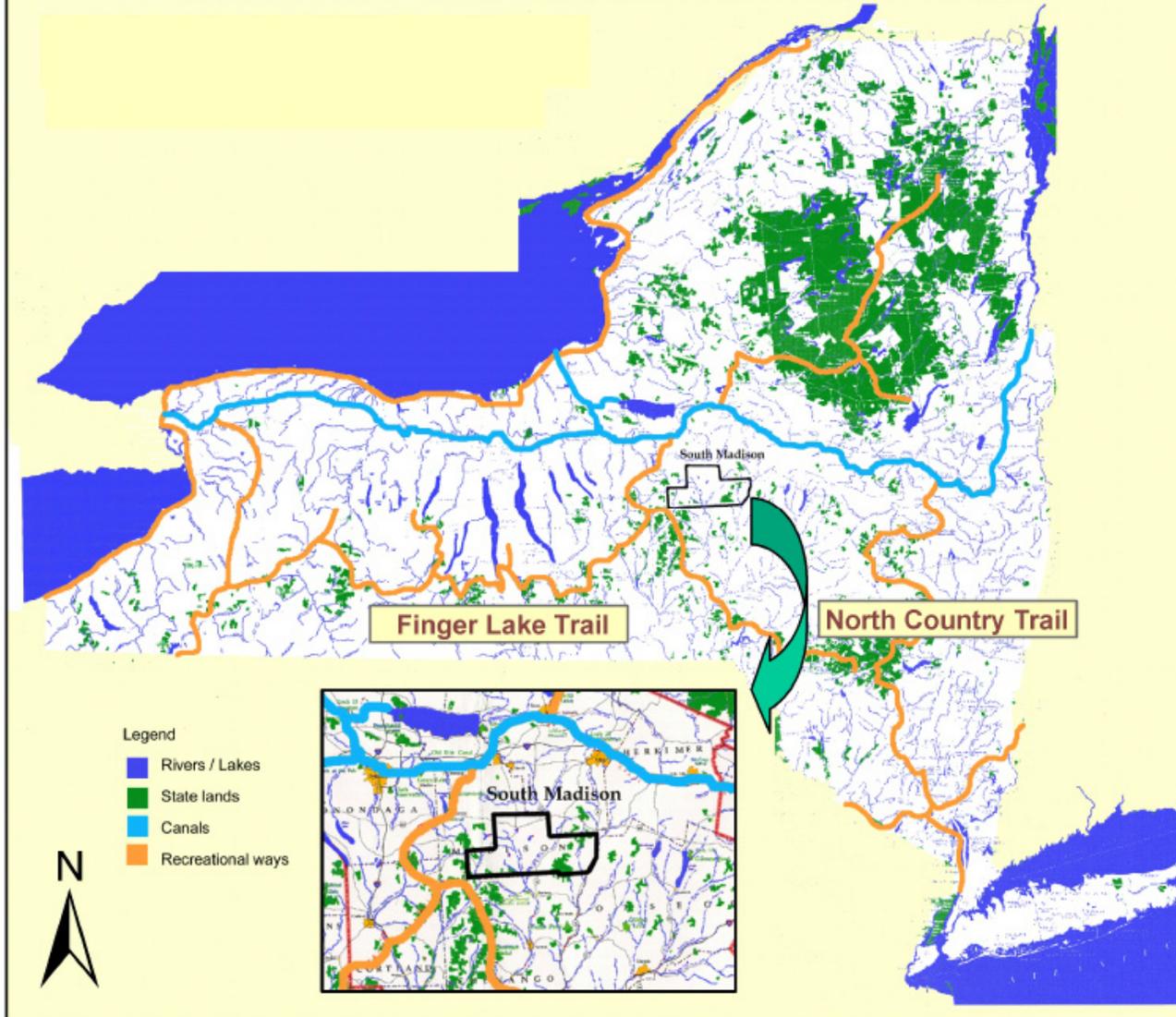
Inherent in any technical report are caveats deserving mention. To begin, the assessment of scenic value is a subjective process. The methodology employed in this document is one of several possible methodological approaches to determining "scenic" qualities. In addition, it should be noted that the methodology used in this analysis evaluated only those scenic points accessible to the public via automobile, from roadside vantage points. Also, the viewsheds generated by this analysis were determined at ground level and may differ in regard to the height of individuals viewing them. Finally, the viewshed analysis performed using GIS does not take into account natural features such as trees or seasonal leaf cover, which may affect uninhibited visibility at each individual site.

Conclusion

There is no question that the landscape of southern Madison County is beautiful. From expansive vistas looking out over rolling, forested hillsides and farmland to sleepy hamlets that populate the valleys, the scenic integrity of the land provides a sense of identity and place for its residents. Given the escalating rates of development in other rural parts of the state, the Southern Madison Heritage Trust is in an exciting position to celebrate the many scenic resources still present in the region. We hope this analysis, as an integrated part of their overall mission of land conservation, will provide a vital link for the Trust's future success in promoting a high quality of life and aesthetic appeal for generations to come.

Greenway Links

-State of New York and Southern Madison County-



**Southern
Madison
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Southern Madison County



Cornell University

Sources:
State of New York Greenway
Provided at Olin Library,
Cornell University.
November 2005.

D-1

INTRODUCTION

Greenways are interconnected systems of open space, environmental resources and built features that are designed to serve one or more functions. The Greenway Plan for Southern Madison County is comprised of three integrated components that independently provide recreational opportunity, resource protection or growth management. Collectively, they provide a vision for sustainability of Southern Madison County's breathtaking scenic views, fresh waters, rich farmland, compact village centers and other valued resources, ensuring that these natural assets may be enjoyed by future generations for years to come.

The Greenway Plan features a recreational corridor that is designed to connect high-density population centers to points of interest along a planned trail system that provides access to outdoor recreation. The recreational corridor offers opportunity for the region to expand its local economic base by stimulating new business development related to outdoor recreation.

The Greenway Plan also features a natural resources corridor that is designed to protect environmental resources including surface water, groundwater and ecologically significant areas that provide the habitat to support high species diversity. The natural resources corridor offers opportunity for the region to conserve critical environmental areas through strategically planned conservation efforts.

Finally, the Greenway Plan features a greenbelt area that is designed to preserve the sense of place and character of the Villages of Hamilton, Earlville, Morrisville and Madison through establishment of a natural buffer around each urban center. The greenbelt offers an opportunity for SMHT to collaborate with local municipalities to promote efficient growth in areas deemed suitable for new development, while at the same time protecting critical environmental areas within the region.

In developing the multi-functional Greenway Plan, consideration was given to the regional setting of the SMHT service area. Opportunities exist to connect the proposed recreational trail system into a statewide trail network that includes the NYS Canalway Trail, the Finger Lakes Trail and the North Country

Trail, which would open up hundreds of additional miles of trail to the people of Southern Madison County. Additionally, opportunities exist to incorporate the proposed natural resource corridor into larger scale planning efforts including the multi-state Chesapeake Bay Watershed planning initiative. Map D-1 illustrates SMHT service area within the context of New York State's greenway systems.

Southern Madison County Recreational Corridor

The proposed recreational corridor primarily extends in a north-south direction along the central area of Southern Madison County connecting Earlville, Hamilton and Madison Villages, and also extends west along Stone Mill Brook to Georgetown. Within this region, land elevation varies dramatically, and consequently creates a beautiful and attractive geographic landscape for outdoor activity. A map of the proposed corridor is provided as map D-2.

Benefit

The corridor presents opportunity for walking, jogging, cycling, fishing, paddling, and wildlife observation. Additionally, protected lands in close proximity to the recreational corridor may play an important role in offering such services as camping and interpretive facilities to trail users. Finally, the recreational corridor connects the population centers of Madison, Hamilton, and Earlville Villages in Southern Madison County and therefore presents an alternative transportation route for people traveling between these areas.

Components

The corridor is comprised of linear pathways that form the basis for an interconnected trail network for the region. These pathways include abandoned railways, the Chenango Canal Corridor and major waterways. The abandoned rail system and the Canal were digitized from a Madison County Map of 1941 and the New York State Canal System in Madison County, respectively. Twenty-four of fifty-three identified scenic points of interest are included in the recreational corridor, all of which are located within one mile of the pathways.

Recommendations

The recommended width of the corridor mirrors NYS Canal Corporation guidelines being implemented along the NYS Canalway Trail, to which the Southern Madison County recreational corridor may connect in the future. A

Greenway Plan

trail width of eight to ten feet, with two-foot shoulders and five-foot vegetative clearing on both sides, is recommended. Vegetative clearing will provide enough space for equipment and machinery to move around, allowing for easier trail maintenance. Additionally, clearing will reduce the potential for vegetative encroachment into the trail pathway, which can create safety hazards such as exposed roots.

Caveats

It should be noted that existing developed trails within the service area, including snowmobile trails, are not depicted on the map due to the unavailability of digital information. However, an effort should be made to integrate these existing local trails into the proposed recreational corridor. Conflict between motorized and non-motorized recreational users should be anticipated and addressed in the initial planning stages.

Additionally, points of interest including historic sites, museums and specialty farms were researched and, although not shown on the recreational corridor map, may also be integrated into the recreational corridor as appropriate. For instance linking to the Earlville Opera House will provide a destination along the trail system and may advance preservation efforts by raising public consciousness and appreciation of this treasured historic site.

Southern Madison County Natural Resources Corridor

The proposed Natural Resources Corridor identifies and strives to conserve significant environmental features within Southern Madison County. The corridor establishes linkages along major waterways to ecologically significant wetlands, lakes, forests, farmland, and other land cover with predicted high species richness. The corridor provides a natural system that supports biodiversity and wildlife migration, protects ground and surface water quality for farming and as a public drinking water source, and helps mitigate soil erosion. A map of the proposed corridor is provided as Map D-3.

Components

The major components of the corridor include waterways that originate from or flow through wetlands and lakes in the region, recognizing their potential to support biodiversity and wildlife migration across ecological transition areas. These pathways include abandoned railways, the Chenango Canal Corridor

and major waterways. The abandoned rail system and the Canal were digitized from a Madison County Map of 1941 and the New York State Canal System in Madison County, respectively¹. Twenty-four of fifty-three identified scenic points of interest are included in the recreational corridor, all of which are located within one mile of the pathways. The corridor also includes New York State Department of Environmental Conservation (DEC) designated Class 1, Class 2 and Class 3 wetlands that have high ecological value, as well as United States Fish and Wildlife Service National Wetlands Inventory (NWI) wetlands that are ten acres or more in size. Land cover with predicted high species richness (between 148 to 162 species per acre) is also integrated into the corridor; primarily these areas include significant State forestland holdings in the Towns of Brookfield and Georgetown.

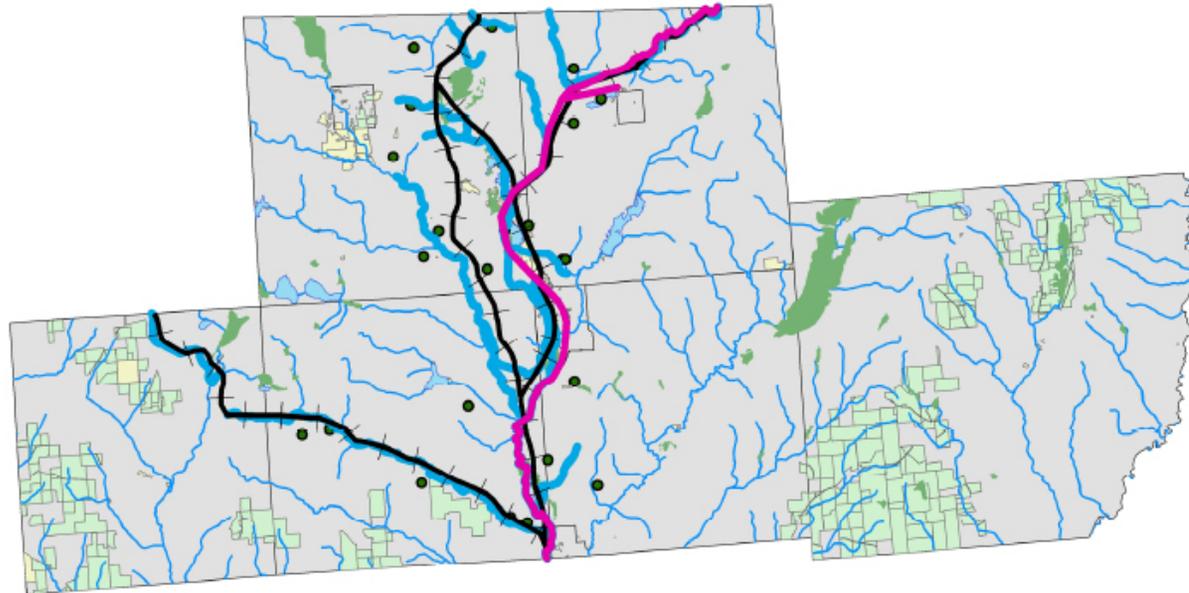
Finally, the corridor integrates privately owned lands along selected waterways and forestland that are receiving special assessment through New York State's forestry and agricultural tax abatement programs. Program participants receive tax breaks in exchange for non-binding commitments to not develop their land for varying periods of time, depending on the program. Should program beneficiaries develop their land within the established time period, they are subject to fines and repayment of a portion of their accrued tax break. Generally, tax abatement program participants are considered committed to maintaining their land as undeveloped open space and therefore may play an important role in establishing the Natural Resources Corridor, since these lands often provide ecological transition areas that support wildlife.

Recommendations

Opportunities exist to develop linkages between the Sangerfield River, Nine Mile Swamp, Otselic River, and State forestland holdings within the region to support biodiversity and wildlife migration. Additionally, development of appropriately designed buffers along significant environmental features including waterways, lakes and wetlands will provide multiple benefits.

A river corridor should be wide enough to effectively perform the functions of 1) controlling water and nutrient flows from upland areas to the surface water, and 2) facilitating the movement of upland forest interior animals and plants along the waterway². It is recommended that identified waterways within the Natural Resources Corridor include vegetative buffers along both banks to

Recreational Corridor



0 1.5 3 6 Miles



Legend

- | | |
|-----------------------|-------------------------|
| Canal | Lakes |
| Abandon Railways | Major Streams |
| Rivers for Recreation | Protected land (State) |
| Scenic Points | Protected land (Others) |
| DEC Wetlands | Municipalities |



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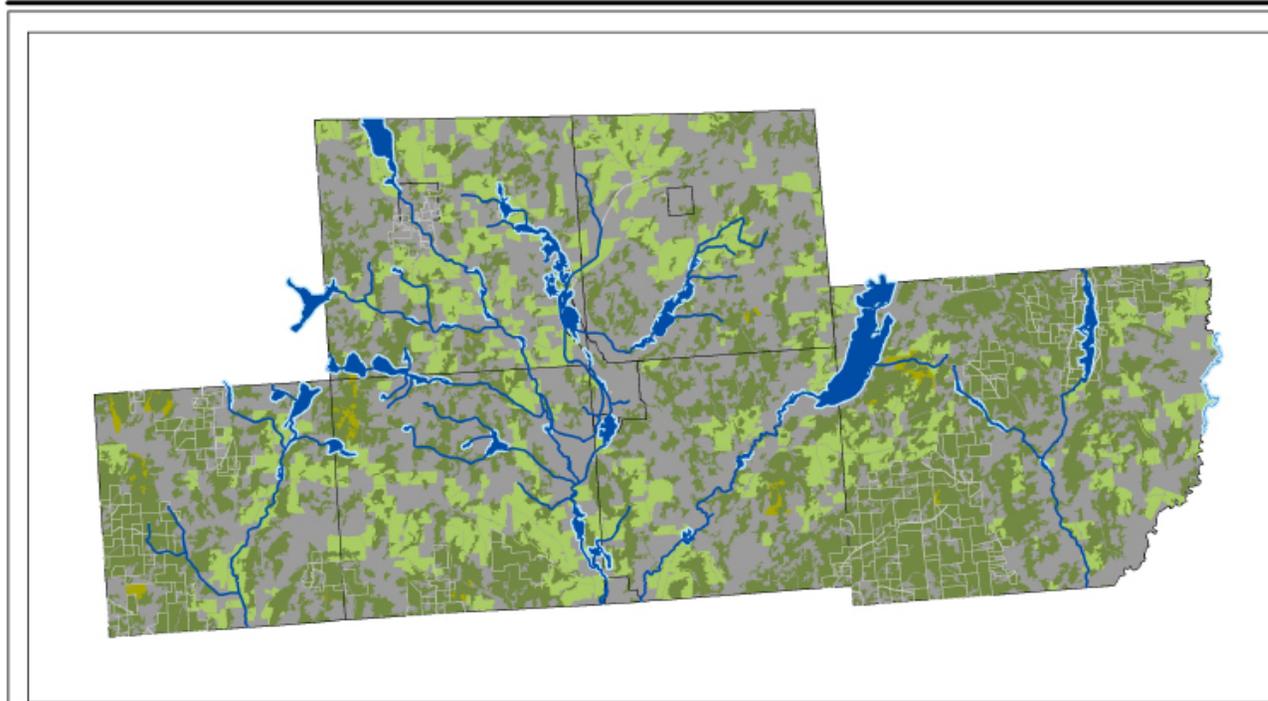


Cornell University

Sources: Watershed, Major Streams, Lakes, Land Ownership Data and Municipalities date are provided by Madison County, NY. NY county boundaries is provided by GEDDeS Lab server, Cornell University. November 20, 2005.

D-2

Natural Resources Corridor



Legend

- | | |
|--------------------------|---|
| Lakes, wetlands, streams | State owned lands |
| Buffer | Municipal boundary |
| Species Richness | Tax abatement program participants (Farmland) |
| 148-162 | Tax abatement program participants (Forestry) |



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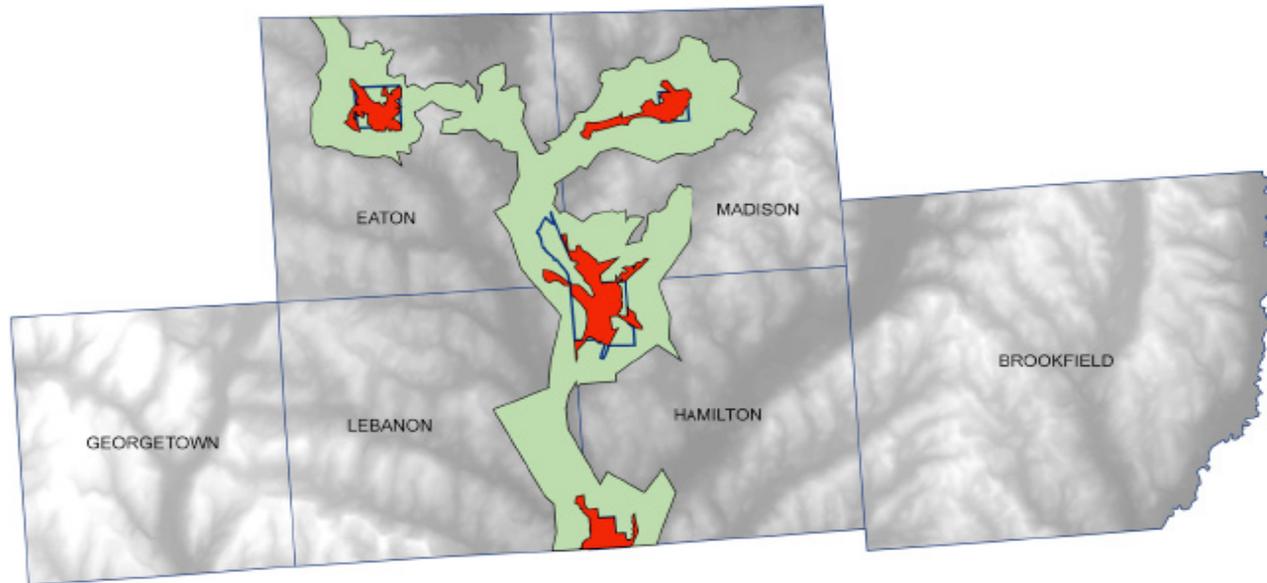


Cornell University

Sources: Waterbodies, waterways, land ownership data are provided by Madison County, NY. Species Data are Provide by GAP. NY county boundaries is provided by GEDDeS Lab server, Cornell University. Nov. 20, 2005.

D-3

The Y-Plan: Growth Areas and Greenbelt



Legend

- Greenbelt
- Growth Areas
- Village Boundaries

Elevation



Sources: Municipalities data is provided by Madison County, NY. NY county boundaries is provided by GEDDeS Lab server, Cornell University. November 20, 2005.

D-4

Greenway Plan

prevent encroachment of development or agricultural land use into the riparian zone.

Locating development away from riparian zones may prevent soil erosion along stream banks and will allow floodplains to function as a water storage area while safeguarding against property loss and risk to public safety. Planting of grassland or forest in the riparian zone may effectively remove up to 50% of sediments, fertilizers, pesticides, pathogens, and other potential contaminants from runoff, and will provide habitats and migration routes for wildlife. The NRCS National Conservation Practice Standards recommends establishing a vegetative buffer width of 30 to 150 feet along waterways to protect water quality and provide minimum ecological benefit.

Wetlands frequently have higher ecological value than waterways and waterbodies, and support higher levels of biodiversity. The recommended buffer width along wetlands varies considerably depending on the species of interest and wetland classification. Recommendations range from a minimum width of 30 feet for small mammals to over 1000 feet for larger mammals³. U.S. Fish and Wildlife Service suggests the minimum buffer width of 300 feet to enhance riparian wildlife⁴.

Given this range of difference among recommendations, the proposed Natural Resources Corridor recommends establishing buffer zones of minimum 100 ft wide within riparian and littoral zones, and 300 feet wide along significant wetlands to protect their ecological value.

Caveats

It should be noted that width, flow and other characteristics of the region's waterways and wetlands were not considered in developing recommendations for buffer widths. Further analysis and investigation should be done to design buffer zones that respond to varying environmental conditions. Further research is needed to identify specific needs for wildlife corridor widths for indicator species in the region. Finally, the most developed areas of Southern Madison County are located along the Sangerfield and Chenango Rivers. This fact presents a challenge for SMHT and local municipalities to develop cooperative relationships with private landowners to implement recommendations contained

herein, to achieve maximum functionality of the Natural Resources Corridor.

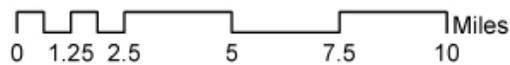
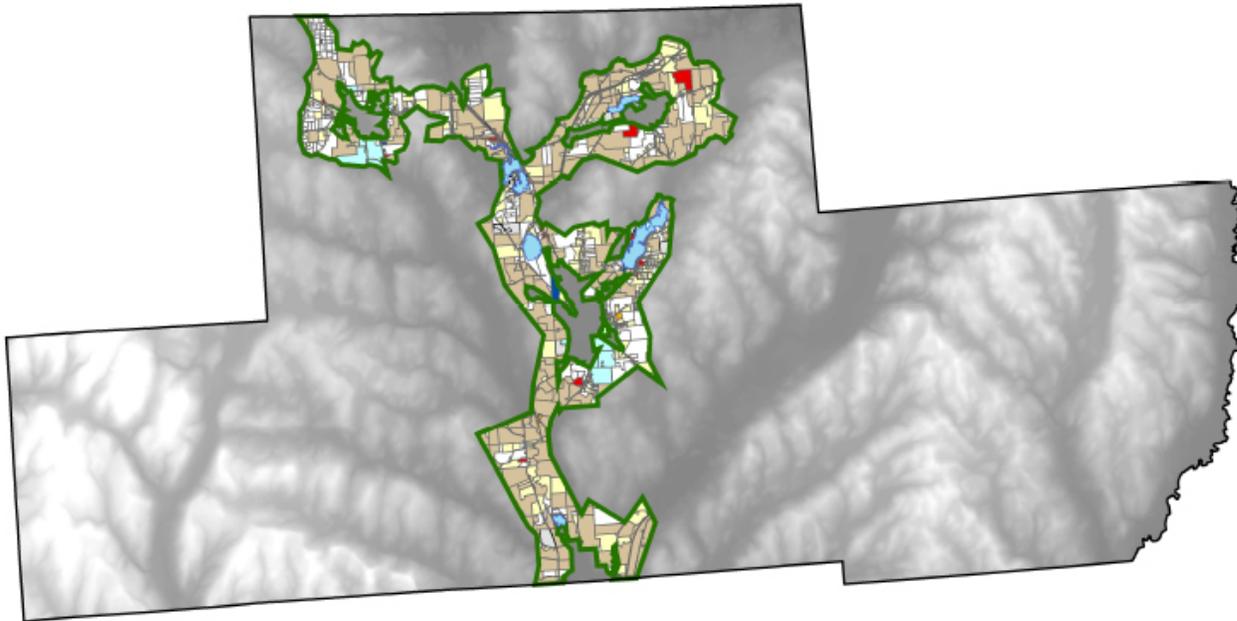
The Greenbelt Y-Plan: A Regional Growth Plan for Southern Madison County
The Y-Plan is a regional growth plan designed to reinforce traditional settlement patterns in and around the Villages of Earlville, Hamilton, Madison and Morrisville. The Y-Plan strives to conserve critical environmental areas, scenic resources, and prime farm soils in the region by directing growth to areas appropriate for development. There are two components to the Y-Plan: growth areas and the greenbelt. Map D-4 illustrates the Greenbelt Y-Plan vision in its most basic form.

Why Plan? Dispersed Development in Southern Madison County

SMHT's service area is experiencing both residential and commercial sprawl development. Over the past decade, population has decreased in the Villages but has grown substantially in the outlying Towns. An absence of public sewer or water in the Towns (with the exception of Georgetown, which has a small water district) suggests that new growth is primarily low density, large-lot residential development that consumes substantial rural acreage. This pattern of residential development is frequently associated with the following impacts:

- Loss of scenic rural landscape
- Loss of prime farm soils
- Fragmentation of working farmland
- Increased farm-neighbor conflict
- Increased cost to service new development
- Encroachment into sensitive environmental areas
- Increased reliance on energy for transportation to access goods and services
- Diminished water quality caused by increased runoff from impervious surfaces

Land Use in the Greenbelt

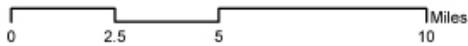
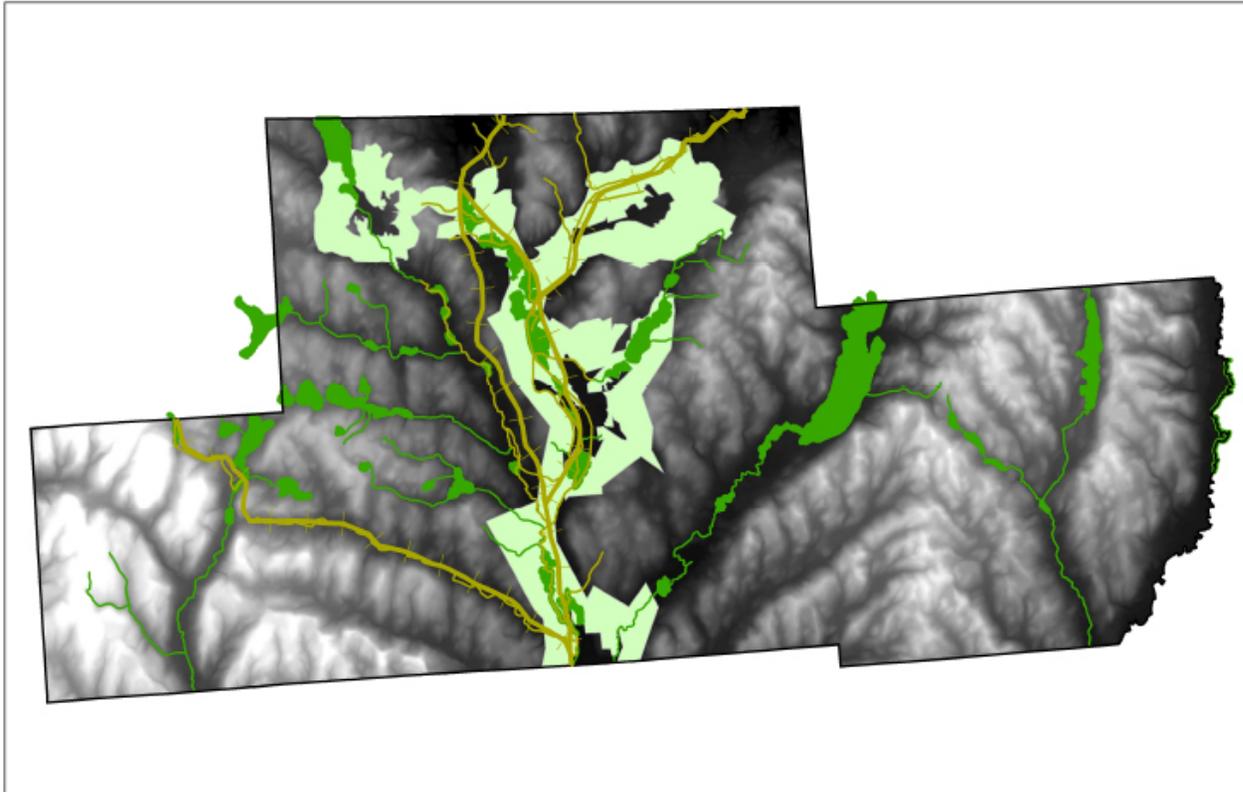


Cornell University

Sources: Watershed, Municipalities data (provided by Madison County, NY. Greenbelt is digitized by the Greenway Team. NY county boundaries is provided by GEDDeS Lab server, Cornell University. November 20 2005.

D-5

Southern Madison County Greenway Plan



Legend

-  Greenbelt
-  Natural Resources Corridor
-  Recreation Corridor

Elevation



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Sources: Watershed, Major Streams, Lakes, and Municipalities data are provided by Madison County, NY. Abandoned railways, Canals, Greenbelts digitized by Greenway Team. NY county boundaries is provided by GEDDeS Lab server, Cornell University. November 20 2005.

D-6

Additionally, commercial development has proliferated along some of the highway corridors outside the Village centers (e.g. NYS Route 12B north of Hamilton). This pattern of commercial development is frequently associated with the following impacts:

- Loss of character and sense of place of Village centers (due to unsightly gateways caused by strip development)
- Disconnection between population centers in the Villages and the jobs, goods and services that are locating in outlying areas (the need to travel greater distances to access these commercial enterprises may create financial burden for low-income populations in the region)
- Threatened viability of the Village central business districts

The Y-Plan offers an alternative approach to sprawling development patterns that have emerged within the region. The Y-Plan vision is to grow efficiently by encouraging new development near the urban centers where infrastructure and services already exist. SMHT may play a lead role in achieving the Y-Plan vision by purchasing some of the greenbelt land in fee or easement; and by fostering local buy-in and intermunicipal cooperation to develop policies and programs that direct new development toward designated growth areas.

Y-Plan Growth Areas

Growth areas (areas deemed suitable for new development) are recommended for each of the four Villages. The growth areas were delineated by overlaying a series of features in GIS to compare and contrast existing development patterns to significant environmental features. To gain an understanding of the region's development patterns, we examined population density distribution, public water and sewer service areas, and existing commercial and industrial development patterns. The growth areas were initially delineated to conform to areas of higher population density and development in and around the Village centers.

However the final delineation of the four growth areas occurred only after reviewing the presence or absence of significant environmental features at the fringe of each boundary. In some instances, development appears to be encroaching on significant environmental features including steep slopes (15% or more) in the Village of Hamilton, and surface waters including Craine

Lake in the Town of Lebanon near the Village of Earlville. In these instances, the growth boundaries were reconfigured to exclude these environmental features, recognizing that further development may degrade the quality of these resources.

Conversely, undeveloped areas near existing development, in which there appeared to be an absence of significant environmental features, were added to the growth boundaries. It should be noted that municipal borders were not considered in the delineation of the growth boundaries. Boundary decisions were based solely on the suitability of an area to accommodate new growth in relationship to existing development.

Y-Plan Greenbelt

Once the growth areas were delineated, greenbelt conservation areas were developed to form a natural buffer around each village. The boundaries of each greenbelt were designed to encompass significant environmental features including steep slopes (15% or more); NYS DEC designated wetlands; federally designated wetlands; surface waters; prime farm soils; areas of high speciesrichness (140-162 species, predicted); and critical viewshed areas.

The total acreage contained within the greenbelt is 22,288.80 acres, or approximately 12% of all acreage in the SMHT service area. Nearly half of all land is classified as agricultural; nearly one-quarter of the remaining is classified as vacant land. Both of these land uses are highly susceptible to development. Additionally, another 18% of total acreage is classified as residential; much of this however is rural residential containing ten or more acres of land, which is similarly susceptible to subdivision and future development. Map D-5 provides an illustration of land usage within the greenbelt area. Figure D-1 illustrates the distribution of land usage within the greenbelt.

Greenway Plan

Table D-1 illustrates the acreage of prime farm soil, critical scenic viewshed, and high species diversity within the greenbelt in relationship to the total acreage within the SMHT service area. The resource value of lands within the greenbelt is significant. Although the greenbelt comprises only 12% of the service area, over one-quarter of the regions prime farm soils are located within the greenbelt. Additionally, nearly one-fifth of the region’s most critical scenic viewshed areas are located within the greenbelt. Particularly with farmland preservation, there are opportunities for SMHT to partner with the County and Towns to develop a Farmland Protection Program to purchase development rights on farms within the greenbelt.

Table D-1: Resource Value of Greenbelt Area Compared to Service Area

	Service Area Acreage	Greenbelt Acreage (% of Total)
Total Area	186,074.50	22,288.80 (12.00%)
Prime farm soils	28,425.00	7,543.68 (26.54%)
High species diversity	37,773.12	4,942.15 (13.08%)
Scenic areas	23,003.30	4,154.73 (18.06%)

Table D-2 shows the breakdown of proposed land conservation in the greenbelt. Total acreage within the greenbelt is 22,288 acres. However, this area includes land that is already protected, land that cannot be developed (surface water), and land that is already developed (roads, housing, etc). After removing acreage within these categories, the adjusted greenbelt acreage targeted for conservation totals to a 16,947 acres. Table D-2 below provides a snapshot of the tools recommended for conservation of these 16,947 Greenbelt acres, which are discussed in greater detail within the Cost Estimation and Implementation section of this Plan.

Table D-2 Area Breakdown of Greenbelt

Type of Areas	Acres
Greenbelt	22,288
Greenbelt in need to conserve*	16,947
Hamilton and Madison**	9,800
Land in tax reduction program	3,567
Land for outright purchase	3,580

* Area without road, protected land, and water bodies

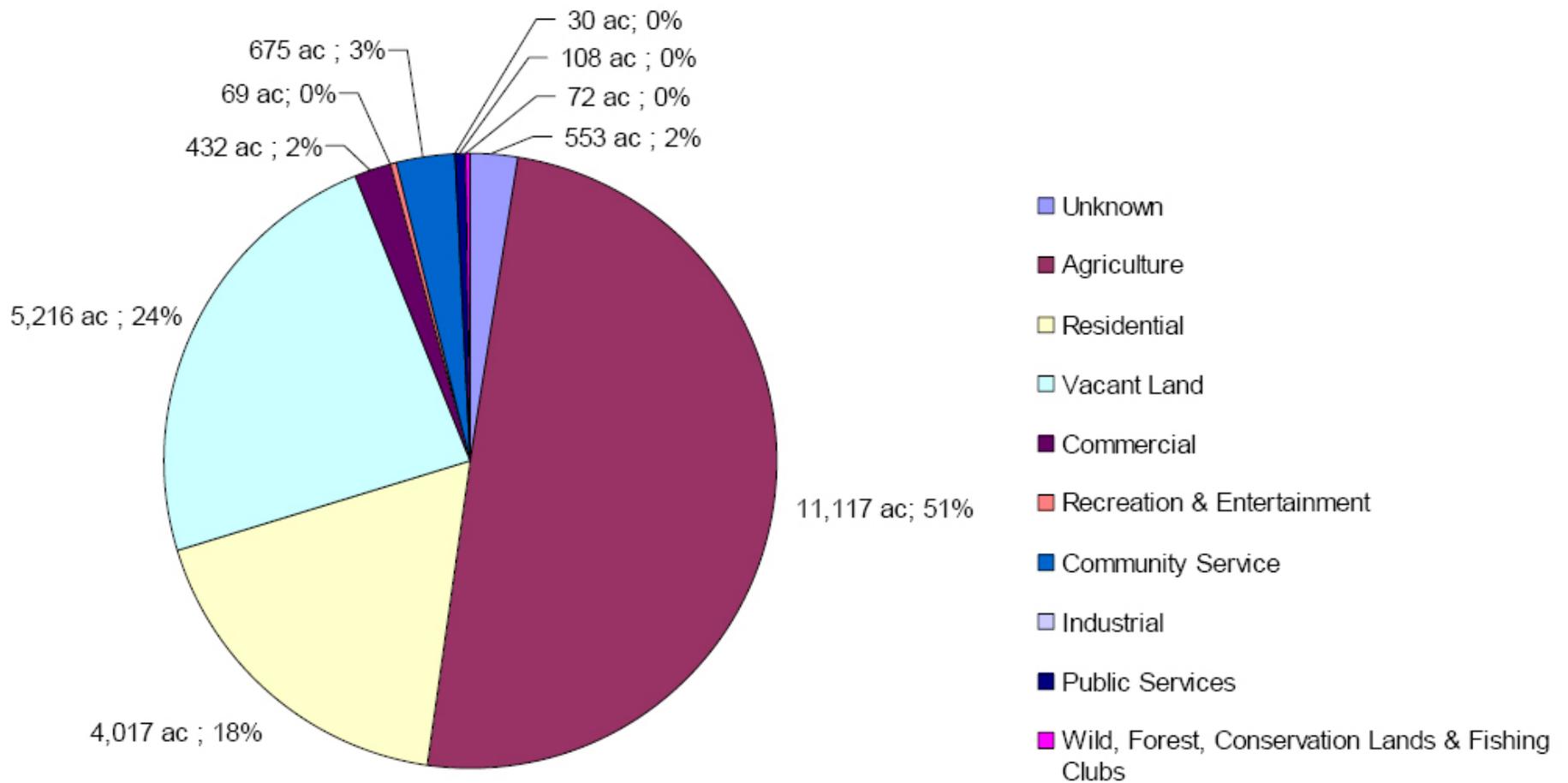
** Area conserved via regulation

Southern Madison County Greenway Plan Conclusion

The Greenway Plan provides a conceptual framework for a regional conservation and growth management plan that strives to provide recreational and economic opportunity, conserve significant ecological resources, and preserve the character and sense of place of the four Villages within the service area. The three components of the Greenway Plan combine to form a sustainable vision for Southern Madison County. Map D-6 provides an illustration of the integrated components of the Greenway Plan.

SMHT can play an important role in promoting the Greenway Plan to local organizations, institutions, communities, elected officials and residents. A variety of tools will be needed to achieve the Greenway vision, including acquisition in fee or easement by SMHT, local land use planning, commitment not to extend water or sewer infrastructure into the Greenbelt, and property owner education on best management practices to protect sensitive environmental areas. It is therefore essential that SMHT begin to nurture local buy-in and commitment to the Greenway Plan, to identify and assist partners with defining their role in plan implementation, and to begin discussions of intermunicipal cooperation which will be essential to achieving the vision of the Greenway Plan.

Figure D-1: Percent Distribution of Land Usage in Greenbelt



Suitability Analysis

Suitability Analysis

INTRODUCTION

Developing a set of criteria on which to evaluate the relative conservation values of multiple land parcels is a smart move for any land trust, but a critical one for volunteer-run organizations such as SMHT (for whom the challenges of effective and comprehensive land conservation are especially acute). Establishing clear guidelines for selecting projects increases transparency to the public and provides a strategic focus to conservation efforts that helps organizations like the SMHT get a “bigger bang for their buck” by identifying parcels that best fit their mission and that build, rather than burden, their organizational capacity.

Once established, criteria can be used to perform a “suitability analysis” in Geographic Information Systems (GIS) to best target conservation efforts across a wide range of site conditions and land uses. Suitability analysis is a technique for determining the “fitness” of a specific activity or land use on a particular site, given the concurrent presence of multiple landscape or other conditions. It was first developed by the landscape architect Ian McHarg (author of the pioneering book “Design with Nature”) in the late 1960s by laying colored transparencies representing flood planes, slopes and other environmental factors over maps of regions to determine the most environmentally suitable (and unsuitable) areas for human development. With time, and the introduction of GIS software, suitability analysis has become a more precise and widely used technique. Today, suitability analysis is a quantitative method in which multiple conservation factors are ranked, weighted and spatially overlaid (i.e. mathematically combined) to reveal a numerical range allowing for the identification of those areas or parcels with the highest conservation value.

Methodology Employed

The Cornell team strove to develop a suitability methodology tailored to the specific mission and goals of the SMHT. The team identified six overarching criteria factors – water resources protection, natural resources protection, soil quality, parcel size, land banking, and scenic quality – composed of eleven dataset elements (see Table E-1). Data within each of these elements were ranked on a scale of 0 to 3, where 3 connotes “most suitable” and 0 connotes “unsuitable”. In the soil quality dataset, for example, soils with a suitability class of I or II were given a ranking of 3 while soils with a suitability class of VI or VII were given a rank of 0 because it is more desirable for the SMHT to preserve areas

with “prime” soils (classes I and II) than those with marginal soils (classes VI and VII). Similarly, in the scenic value dataset Critical Areas were ranked 3 while Non-Priority Areas were ranked 0. Classifying all the datasets on the same ranking scale creates a standardized value platform for assessing the relative contributions of each element to the overall suitability analysis. A complete list of ranking designations, with explanatory reasoning, can be found in Table E-1.

Once the ranking process is complete, criteria factors must be weighted. The higher the weight assigned to a given factor the more that factor is valued in the final suitability analysis. For example, if natural resource protection and soil quality protection were desirable but the primary mission of the SMHT was to protect scenic integrity, one would ascribe a very high weight to the scenic value factor relative to natural resources and soil quality. Varying the weighting scheme applied to factor criteria may yield major changes in the results of a suitability analysis, depending on the number of factors included and the ranking designation employed as well. To demonstrate this, the Cornell team created two weighting schemes as part of their suitability analysis. The first, called SMHT Weighting, was developed to reflect the spirit of the SMHT’s mission statement and strategic plan. For this reason it gave the greatest weight to the protection of prime natural resources, water resources, and soils and lesser weights to other factors such as parcel size and scenic value. The results of the SMHT Weighting scheme can be seen in Map E-1. The second weighting scheme, titled Greenbelt Weighting, was created to show the most suitable lands for conservation in Southern Madison County if the vision of creating a greenbelt is amenable to SMHT’s constituents. In this scheme the heaviest weight was given to the land banking criteria (and the greenbelt element in particular) and all other factors received lower, and equal, weights. The results of the Greenbelt Weighting scheme are illustrated in Map E-2. A complete list of weights for each weighting scheme is included in Table E-2.

Suitability Analysis

Table E-1. Ranking Scheme and Reasoning for Suitability Analysis Criteria

Suitability Analysis Criteria	Reasoning for each Ranking Scheme
A. Land Banking	
A-1. Proximity to Protected Lands	
<i>Rank Description</i> 3 Area is within ¼ Mile of protected lands 2 Area is between ¼ and ½ Mile of protected lands 1 Area is between ½ and 1 Mile of protected lands 0 Area is greater than 1 Mile away from protected lands	<p>This ranking reflects the assumption that preserving contiguous parcels of land is preferable to preserving land in a more fragmented manner. In line with this, the ranking reflects the notion that areas adjacent to already protected lands have the most value for future protection efforts, and areas further away are of lesser value in this process. The ranking break distances were based on the fairly small size of the SMHT service area. Already protected lands were derived from 2004 tax parcel data for Madison County.</p>
A-2. Proximity to Proposed Greenbelt	
<i>Rank Description</i> 3 Area is within Greenbelt 2 Area is 1/2 Mile beyond the Greenbelt 1 Area is between ½ and 1 Mile beyond the Greenbelt 0 Area in current population center and greater than 1 Mile beyond the Greenbelt	<p>This ranking reflects the assumption that protecting lands within the proposed greenbelt is preferable to protecting lands outside the greenbelt or in already developed municipalities. The ranking break distances beyond the proposed Greenbelt were based upon the fairly small size of the SMHT service area.</p>
A-3. Tax Abatement Parcels	
<i>Rank Description</i> 2 Tax Abatement Parcel 0 Non-Abatement Program Parcels	<p>This ranking is based on the assumption that tax parcels already enrolled in a Tax Abatement Program are preferred targets for conservation efforts because the owners of these parcels may be more ready/willing to further protect their lands than owners who have not yet taken such measures. Parcels in a Tax Abatement Program were given a ranking of less than 3 because there is still the potential for owners to decide to drastically change their land (such as opening it up to subdivision) after the abatement period is over. Parcels participating in a tax abatement program were identified with data from the Madison County Tax Assessor.</p>
B. Scenic Value	
<i>Rank Description</i> 3 Critical Areas of Scenic Inventory 2 High Priority Areas of Scenic Inventory 1 Priority Areas of Scenic Inventory 0 Non-Priority Areas of Scenic Inventory	<p>This ranking is based on the assumption that protecting areas that can be seen from multiple scenic viewpoints is preferable to protecting areas that can not be seen from a scenic viewpoint. Reflective of this, the ranking breaks were assigned in relation with the four scenic designations generated by the Cornell team's viewshed analysis.</p>
C. Soil Quality	
<i>Rank Description</i> 3 Class I, II: Prime Agriculture 2 Class III: Very Productive 1 Class IV, V: Steep Slopes Suited for Orchards and Wetlands 0 Class VI, VII: Suitable for Livestock Grazing Only	<p>This ranking is based on the assumption that protecting areas where "prime" soils can be found is preferred to protecting areas where marginal soils are present in order to preserve land capable of agricultural production. The ranking breaks were an attempt to reflect the SMHT's classification preferences as outlined in the Land Acquisition Criteria section of their Strategic plan. Suitability classes were found in the Madison County Soil Survey.</p>
D. Size of Parcel	
<i>Rank Description</i> 3 Greater than 211 acres (Average Farm Size in New York State, 2004) 2 25 to 211 acres 1 5 to 24 acres 0 Less than 5 acres	<p>This ranking is based on the assumption that protecting larger parcels is preferable to protecting smaller parcels. The ranking breaks take several issues into consideration. The average farm size in the state of New York was 211 acres in 2004. Since the SMHT's Land Acquisition Criteria express a strong desire to acquire parcels that can support farming, we felt this should be the minimum size for the highest ranked parcels. The other ranking breaks correspond to the size of SMHT's current protected holdings, the largest of which is 25 acres and the smallest of which is 5 acres. Parcel size was determined through analysing 2004 Tax Parcel data for Madison County.</p> <p><small>(Source: http://usda.mannlib.cornell.edu/reports/nassr/other/zfl-bb/filo0105.pdf)</small></p>

Suitability Analysis

Table E-2. Weighting Scheme for Suitability Analysis Criteria

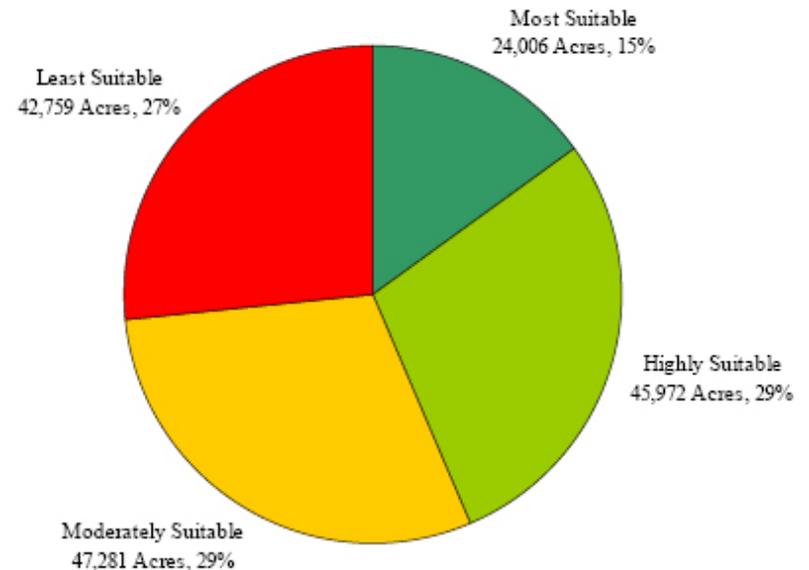
Suitability Criteria	SMHT Weighting	Greenbelt Weighting
A. Land Banking	15	25
A-1. Proximity to Protected Lands	(5)	(5)
A-2. Proximity to Proposed Greenbelt	(5)	(15)
A-3. Tax Abatement Parcels	(5)	(5)
B. Scenic Value	15	15
C. Soil Quality	20	15
D. Size of Parcel	15	15
E. Natural Resources Protection	20	15
E-1. Forest	(10)	(7.5)
E-2. Conserves Significant Wildlife Habitat	(10)	(7.5)
F. Water Resources Protection	20	15
F-1. Wetlands	(10)	(7.5)
F-2-a. Lakes	(5)	(3.75)
F-2-b. Rivers and Streams	(5)	(3.75)
Total Weighting	100	100

Using the raster calculator, numeric values reflecting the suitability of all lands in the SMHT service area for conservation purposes were calculated in 10m by 10m units of land area. The resultant “suitability score” of a given place is found by taking the sum of rank and weight values contributed when all factor criteria are overlaid on that area of land. The suitability scores generated by this analysis ranged between 0 and 83.75 (though the highest potential suitability score given the weighting schemes employed was 100). Resulting values were divided into four suitability classifications. Least Suitable lands received scores between 0 and 30, Moderately Suitable lands received scores between 31 and 40, Highly Suitable lands received scores between 41 and 50, and Most Suitable lands received a score of 51 or more. The divisions chosen reflect Natural Breaks, a classification method in GIS whereby “natural breaks” in data groupings are identified and data is sorted into classes accordingly.

Suitability Analysis Findings

Two suitability analyses were run for the SMHT’s consideration. Results demonstrate the fact that outcomes in a suitability analysis differ in relation to the specific weighting scheme employed. Suitability results were first calculated from the SMHT Weighting scheme, as it most directly reflects the SMHT’s current work plan. The resulting distribution of suitability types for the 160,000 acres included in the team’s analysis are shown in Figure E-1 below¹. Fifteen percent of the area analyzed was considered Most Suitable for conservation efforts in this scenario. Highly and Moderately Suitable lands represented 29 percent of the study area each, and areas considered Least Suitable for the SMHT’s conservation efforts comprised 27 percent of the study area.

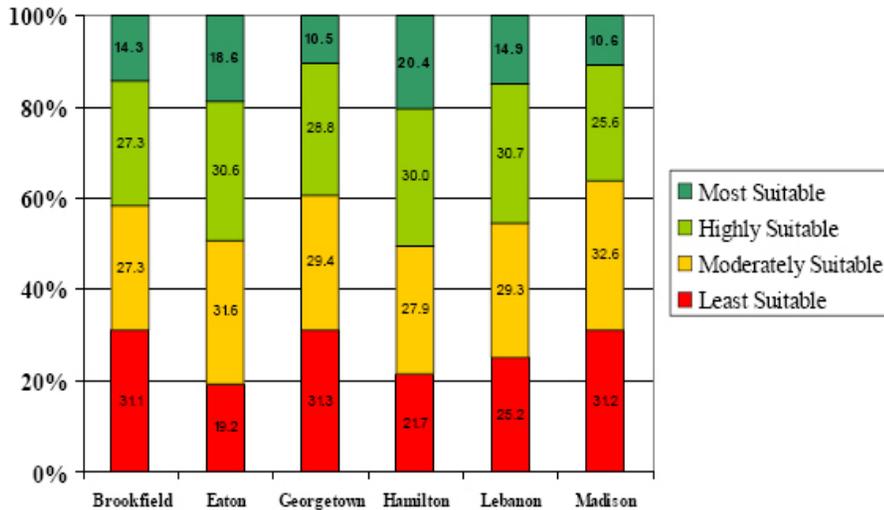
Figure E-1. Land Conservation Suitability Distribution Southern Madison County, NY, 2005 - SMHT Weighting



Suitability Analysis

There was moderate variation in the distribution of conservation land suitability across the six Towns in Southern Madison County under the SMHT Weighting scheme (see Figure E-2 below). The Town of Hamilton has the highest proportion of Most Suitable land for conservation (20.4 percent), while the Town of Madison had the highest proportion of Least Suitable land for conservation purposes (31.2 percent). On average, towns had nearly twice the proportion of Least Suitable as opposed to Most Suitable land for conservation purposes, and about the same proportion of Moderately and Highly Suitable conservation land.

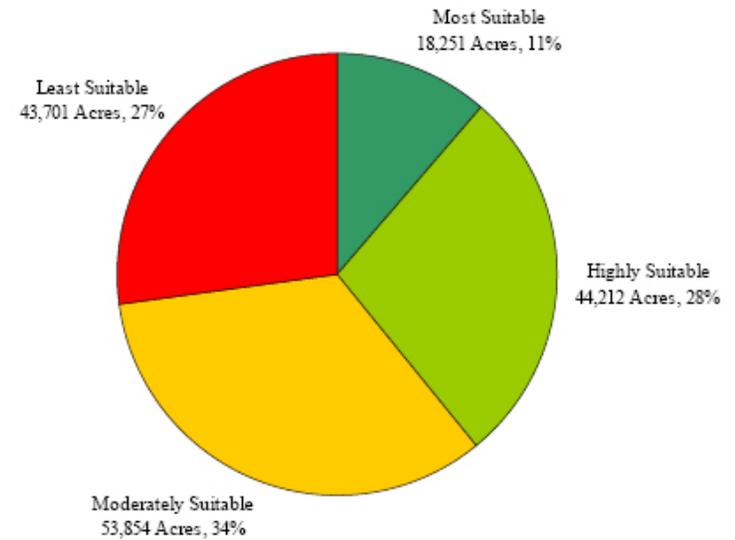
**Figure E-2. Land Conservation Suitability by Town
Southern Madison County, NY, 2005 - SMHT Weighting**



A second analysis tallied suitability scores under the Greenbelt Weighting scheme to reveal areas for focused conservation efforts if the SMHT decides to promote the formation of a greenbelt in Southern Madison County. The distribution of suitability types under this weighting scheme differs slightly from that in the SMHT Weighting scheme (see Figure E-3 below). Under the Greenbelt Weighting scheme, a smaller proportion of land in the service area falls into the Most Suitable conservation class than it did in the SMHT Weighting scheme (11 percent versus 15 percent) and the largest share of land falls into the Moderately

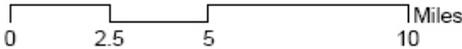
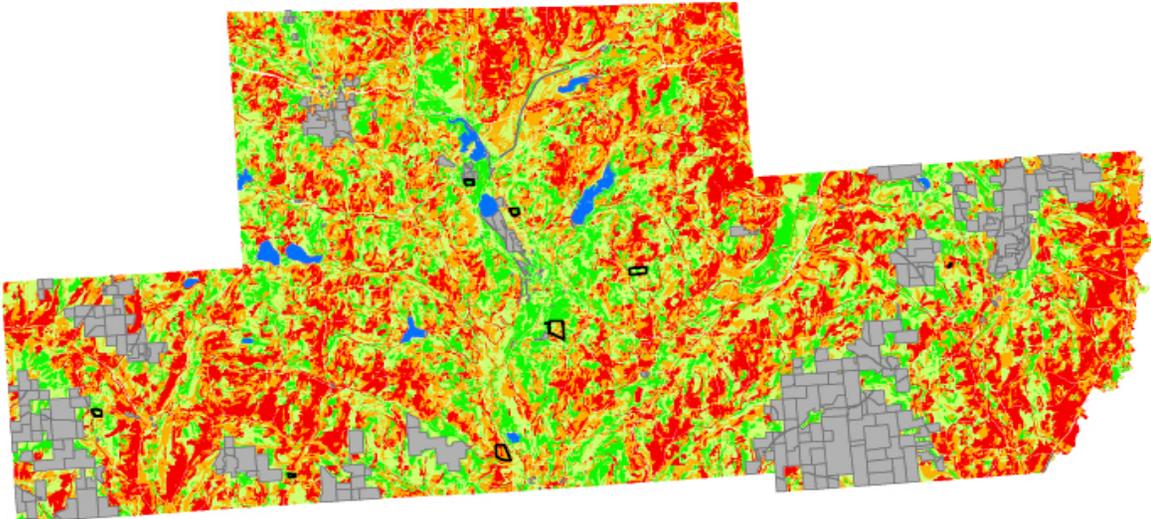
Suitable classification (34 percent). Highly Suitable lands comprise 28 percent of the study area while land considered Least Suitable for the SMHT to pursue covers 27 percent of the study area.

**Figure E-3. Land Conservation Suitability Distribution
Southern Madison County, NY, 2005 - Greenbelt Weighting**



There is greater variation in the distribution of suitable conservation lands under the Greenbelt Weighting scheme than there was as a result of the SMHT Weighting (see Figure E-4 below), as several towns in the service area fall outside the proposed greenbelt. The Town of Eaton, which is inside the proposed greenbelt, has the greatest proportion of Most Suitable conservation lands (21 percent), followed by the Towns of Hamilton (17 percent), Madison (15 percent), and Lebanon (12 percent). The Towns of Brookfield and Georgetown have no land area in the proposed greenbelt and therefore each contain very small proportions of Most Suitable conservation land under this weighting scheme (3 percent or less).

Suitability Analysis - SMHT Weighting



Legend

Suitability Overlay

Protection Value

-  Least Suitable (0 - 30)
-  Moderately Suitable (31 - 40)
-  Highly Suitable (41 - 50)
-  Most Suitable (51 - 83)
-  Protected Lands
-  SMHT Test Parcels
-  Waterbodies

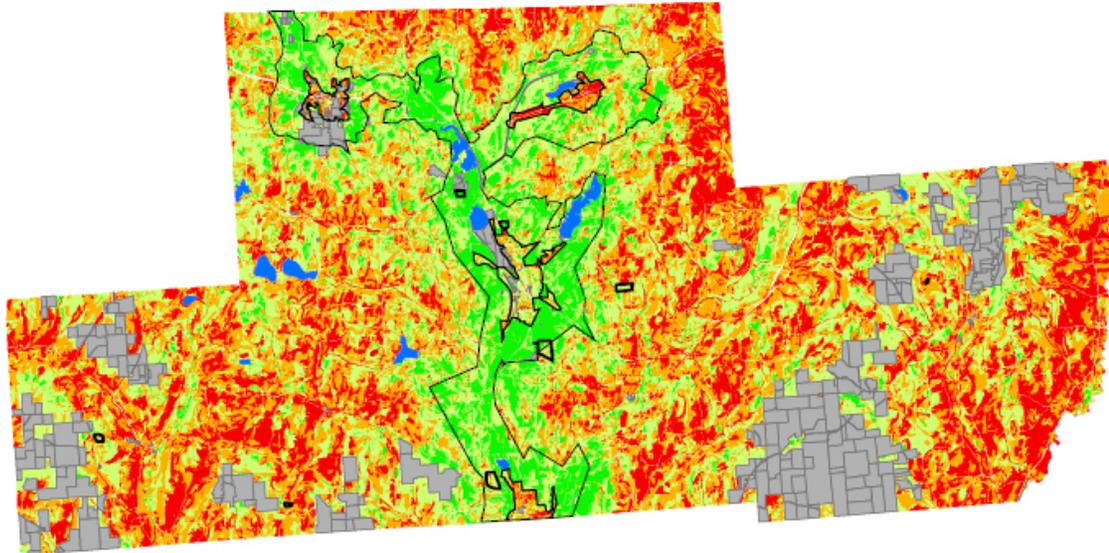


Sources: Southern Madison County boundaries and Waterbodies layers provided by Southern Madison Heritage Trust. Protected Lands and Test Parcels layers created by the CRP 558 Natural Resources Team. Suitability Analysis Overlay created by the CRP 558 Suitability Analysis Team, Cornell University, November 2005.

E-1

Suitability Analysis

Suitability Analysis - Greenbelt Weighting



0 2.5 5 10 Miles



Legend

Suitability Overlay

Protection Value

	Least Suitable (0 - 30)		Greenbelt
	Moderately Suitable (31 - 40)		Protected Lands
	Highly Suitable (41 - 50)		SMHT Test Parcels
	Most Suitable (51 - 83.75)		Waterbodies



Southern Madison County

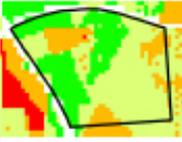
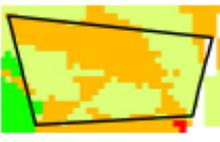
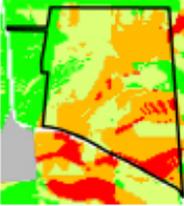
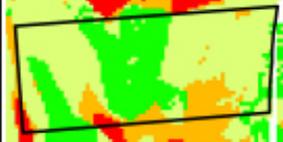
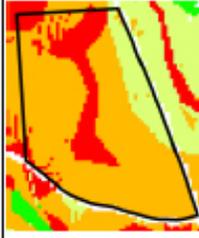
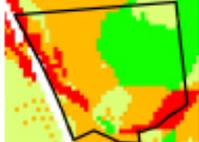
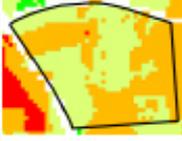
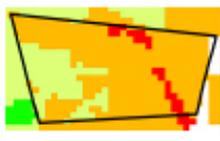
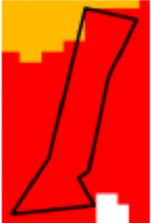
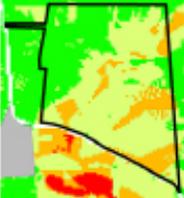
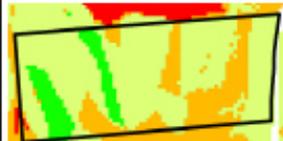
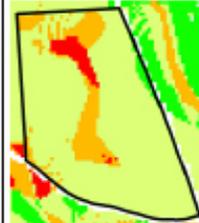
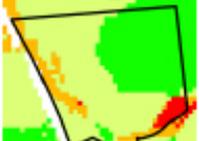


Cornell University

Sources: Southern Madison County boundaries and Waterbodies layers provided by Southern Madison Heritage Trust. Protected Lands and Test Parcels layers created by the CRP 558 Natural Resources Team. Suitability Analysis Overlay created by the CRP 558 Suitability Analysis Team, Cornell University, November 2005.

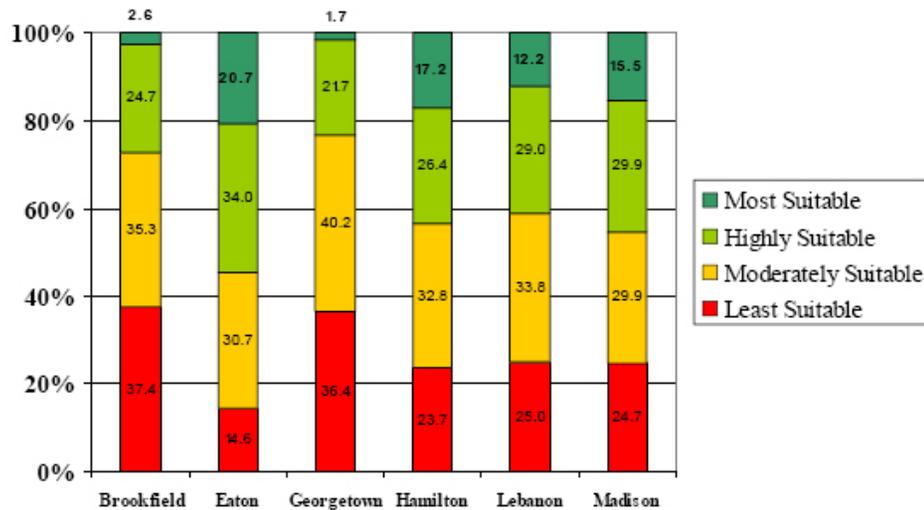
E-2

Figure E-5. Test Parcel Comparison Between SMHT and Greenbelt Weighting Schemes

Parcel #	1	2	3	4	5	6	7	8
SMHT Value	Low	Low	Low	Medium	Medium	High	High	High
SMHT								
GREENBELT								

Suitability Analysis

**Figure E-4. Land Conservation Suitability by Town
Southern Madison County, NY, 2005 - Greenbelt Weighting**



Test Parcels

The SMHT sent the Cornell team a list of eight tax parcels in Southern Madison County, along with their “gut” feeling about whether they should be priority parcels for conservation efforts. Parcels 1-3 were ranked by the SMHT as low priority, parcels 4-5 as medium priority, and parcels 6-8 as high priority for conservation. Once the suitability analyses were complete, the Cornell team compared their results to the SMHT’s initial ranking of these parcels. Figure E-5 presents the suitability results of both the SMHT Weighting and the Greenbelt Weighting for the 8 test parcels received from the SMHT. As one can see, parcels 3 and 7 best fit the SMHT’s sense of these individual parcels’ conservation value, and none of the results are grossly out of sync with the SMHT’s forecast. In general, the suitability results from the Greenbelt Weighting scheme appear to better fit the SMHT’s gut ranking of parcels’ conservation value. See Figure E-5 for test parcel results.

Broader Context of Suitability Analysis

Though the suitability analysis provides a key step in identifying strategic sites for the SMHT’s land conservation process, suitability scores should not be used as a stand alone determination of a given site’s conservation value. Due to the

fragmentation or unavailability of certain types of data in GIS form, there may be issues of critical consideration for the SMHT’s acquisition process that cannot be captured by a suitability model. Internal administrative considerations or the desire for parcels to contribute to “the community’s understanding of its past and strengthening of ‘sense of place’” are examples of such data limitations. To help place the suitability analysis in the context of broader considerations, the Cornell team developed a Land Conservation Flow Chart with Companion Questions to help guide the SMHT’s land acquisition process (see Figure E-6 and Figure E-6a below). The Land Conservation Flow Chart and Companion Questions provide the SMHT board members with a flexible, but justifiable, written guide for evaluating parcel quality (not only in relation to its suitability score, but in line with a broader set of concerns the suitability analysis may not be able to capture). By tailoring the Filter Questions and Feasibility Criteria to fit the organization’s mission, the SMHT board can add value to the suitability analysis results and more strategically pursue its goal of land conservation within the parameters of its fiscal and human resources constraints.

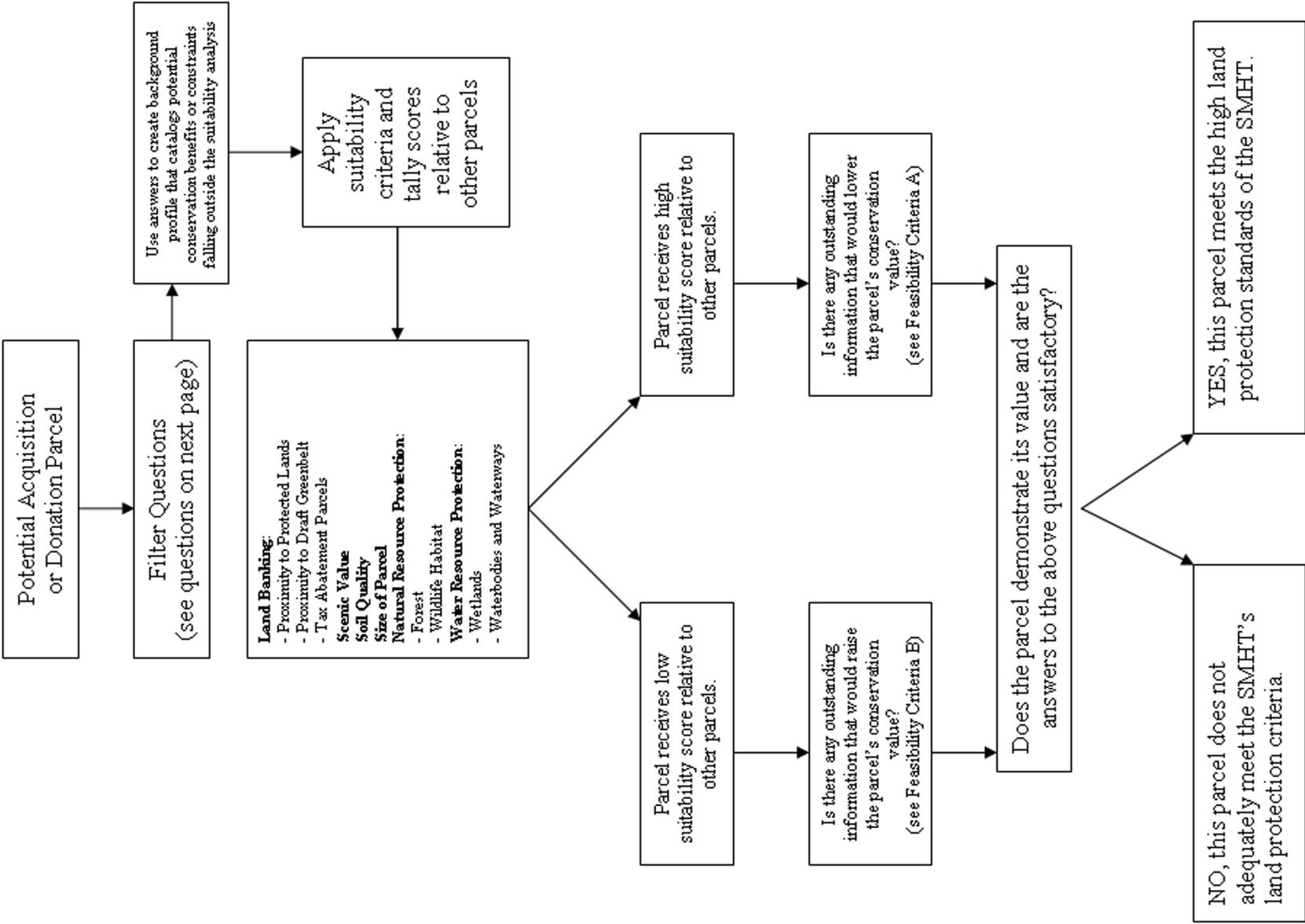
Caveats

The results of a suitability analysis are only as valuable as the data and assumptions used to generate it. Decisions about how to rank and weight the components of the analysis are subject to interpretation and although the schemes employed in this analysis were a “best-fit” attempt to capture the strategic goals of the SHMT (derived from the Criteria for Land Acquisition outlined in its strategic plan), the Trust may want to reorient current designations to better serve its continually evolving work in the community. Furthermore, a number of factors listed as desirable acquisition criteria in the SMHT’s strategic plan (such as the existence of agricultural infrastructure, historic landmarks or ‘sense of place’) had no available data sources and were unable to be included in the analysis. It is important to keep these caveats in mind when considering the outcomes of the suitability component of the analysis.

Recommendations

The SMHT board could perform a thorough review of the suitability analysis performed by the Cornell team to evaluate the methodology employed and explore alternative ranking and weighting schemes that ensure consistency with the Trust’s organizational direction at the present moment as well as into the future.

Figure E-6. Land Conservation Flow Chart



Suitability Analysis

The Trust's board members could undertake further research to supplement the suitability analysis and identify potential acquisition parcels county-wide. Under both weighting schemes, approximately 40 percent of lands in Southern Madison County qualify as Most or Highly Suitable for conservation, thus providing the Trust with a significant area across which to steer its efforts. The Towns of Hamilton and Eaton represent a tremendous opportunity to identify landowners, develop a positive rapport and discuss donation or acquisition potential with constituents, as approximately 20 percent of the lands in each fall into Most Suitable for conservation designation. Under the Greenbelt Weighting scheme, the Town of Madison is also home to a significant proportion of Most Suitable conservation lands and may be another strategic target for community level conservation efforts. Extending efforts to towns outside of Hamilton, where the SMHT is based, will increase broader public awareness of the SMHT's work and augment its existing reputation in the community of Hamilton.

One strategy the board of the SMHT might consider for proactively identifying properties to pursue conservation deals with would be to lay the 2004 Madison County tax parcel data over the results of the suitability analysis in GIS to identify where high conservation value parcels exist. This approach could increase the degree of detail for prospective land acquisitions via the ability to search both the property class codes and landowner information necessary when evaluating land on a parcel by parcel basis. In addition, this approach could simultaneously identify those landowners who are currently enrolled in the state-wide Tax Abatement Program. These lands are preferred targets for conservation efforts because the owners of these parcels may be more ready/willing to further protect their lands than owners who have not yet taken such measures. This strategy could prove useful for evaluating the relative merits of moving forward when property owners approach the SMHT to discuss a conservation deal as well.

The results of the Greenbelt Weighting scheme address current and emerging settlement patterns in Southern Madison County. The forces of development and conservation are constantly at play, sometimes working in concert but often in opposition of conscientious land use planning. The Greenbelt Weighting analysis works to inform and guide the SMHT board's pursuit of valuable conservation land by channeling efforts within the 16,947 acres of designated greenbelt in hopes of steering the future path of development in a more comprehensive and less fragmented manner.

Suitability Analysis



Photo courtesy of John Hubbard

Cost Estimation & Implementation

Cost Estimation & Implementation

INTRODUCTION

The Strategic Land Protection Plan for Southern Madison Heritage Trust (SMHT) presents a vision for conservation and protection of the region's most significant natural resources. Implementation of the Plan will require collaboration with multiple interest groups and application of a variety of land conservation methods. SMHT should work with local government, institutions, residents and other stakeholders to implement the Plan. Success will require public education focused on the benefits of land protection. This section presents cost estimates for conserving the region's most suitable resource lands, cost estimates for establishing the Y-Plan Greenbelt and recommendations for implementation strategies.

Methods of Conservation

The primary methods of conservation include: purchase of land, conservation easements or purchase of development rights, and regulation. A conservation easement is a legal document in which a landowner agrees to maintain their land in its current undeveloped, open space use. Conservation easements are appealing because a non-profit organization or government agency can help customize the easement to meet the landowner's objectives. Moreover, the landowner is able to remain on their land. If the landowner donates the conservation easement they may be eligible for a federal and state tax deductions¹. Alternatively, a government agency or non-profit organization can purchase an easement (the development rights). The value of the development rights is the difference between the property's fair-market value and the property's value for current use, such as agricultural use. Although easements exist in perpetuity and follow transfer of ownership, they can be terminated by court intervention in rare cases.^{2,3}

Regulation is also used to conserve land. The most common regulatory measure is agricultural zoning. Farmland can be zoned for agricultural use – just like land can be zoned for residential or commercial use – to ensure that farming and similar activities take place on that parcel. Regulatory measures should be based on a comprehensive plan in order to be defensible against legal challenges⁴.

Methodology of Cost Estimation

To gain a sense of the cost to implement the Strategic Land Protection Plan, average cost per acre estimates have been calculated for each recommended land conservation tool including fee simple acquisition, easement/PDR, and land use regulation. These methods and costs have been applied to conservation lands targeted through the suitability analysis, as well as land within the Y-Plan Greenbelt.

Fee Simple Acquisition

The cost to conserve land through fee simple acquisition is estimated by applying an average cost per acre to total acreage targeted for purchase, and then adding a 15 percent contingency. Average cost per acre was determined by examining sale prices for 13 parcels located in Southern Madison County that sold between January 1, 2002 and December 31, 2004. Each property examined is enrolled in either the state forestry or agricultural tax abatement programs. The following equation was applied:

Equation 1:

Costs of Purchasing Land =

(Average Sales Value per Acre + 15% Contingency Factor) * (Recommended Total Acreage)

Table F-1. Average Cost per Acre for Fee Simple Purchase

No. of Parcels Examined	13
Total Acreage	1,353.93
Total Sales Value	\$977,080.00
Avg. Sales Value Per Acre	\$721.66
Contingency Factor (15%)	\$108.25
Estimated Cost of Purchasing Land per acre	\$829.91

Purchase of Development Rights

The cost to conserve land through purchase of development rights is estimated by applying an average cost per acre to total acreage targeted for conservation easement, and then adding a 15 percent contingency. Average cost per acre was

Cost Estimation & Implementation

determined by calculating the difference between full assessed value and reduced assessed value for 484 parcels located in southern Madison County, each of which are enrolled in the State’s farm or forestry tax abatement programs. The differences for all 484 parcels were averaged to calculate the average cost per acre for purchasing development rights in the area. The following equation was applied:

Equation 2:

$$\begin{aligned} & \text{Costs of Purchasing Development Rights} = \\ & ((\text{Average Full Assessed Value per Acre} - \text{Average Reduced Assessed Value per} \\ & \text{Acre}) + \\ & 15\% \text{ Contingency Factor}) * \text{Recommended Total Acreage}^5 \end{aligned}$$

Table F-2. Average Cost per Acre for Purchase of Development Rights

No. of Parcels Examined	484
Total Acreage	45,503.26
Total Assessed Value	\$23,080,900.00
Total Reduced Assessed Value	\$13,261,822.00
Avg. Assessed Value per acre	\$507.24
Avg. Reduced Assessed Value per acre	\$291.45
Avg. Cost of Development Rights per acre	\$215.79
Contingency Factor (15% of \$215.79)	\$32.37
Estimated Cost of Development Rights per acre	\$248.16

The average cost per acre for purchasing development rights is estimated to be \$248.16.

Land Most Suitable for Conservation

The cost to conserve the 24,006 acres identified through the suitability analysis will vary depending on the extent to which each conservation method is applied. Table F-3 presents four different land protection strategies and their associated costs. Each scenario assumes that all easements and/or acquisitions will be purchased, although land donations may be an important part of SMHT’s land conservation strategy. Each also assumes that all suitable acreage located in Hamilton and Madison (7,875 of the 24,006 acres) may be protected through regulatory measures outlined above, since these municipalities have comprehensive plans that support land conservation to some degree. The differences among the

four scenarios may be found in protection tools applied to the remaining 16,131 acres.

Table F-3. Comparative Cost Analysis of Four Land Protection Scenarios

Method of Conservation	Estimated Cost Per Acre	Scenario 1 Total Acreage	Scenario 2 Total Acreage	Scenario 3 Total Acreage	Scenario 4 Total Acreage
Purchase Outright	\$829.91	10,577	8,065.5	0	16,131
PDR	\$248.16	5,554	8,065.5	16,131	0
Regulation	\$0	7,875	7,875	7,875	7,875
Total Cost		\$10,156,150	\$8,695,174	\$4,003,069	\$13,387,440

Scenario one targets 10,577 acres of land in Brookfield, Eaton, Georgetown, and Lebanon for fee simple acquisition, 5,554 acres within these Townships for PDR (those properties currently enrolled in tax abatement programs), and 7,875 acres in Hamilton and Madison for regulatory protection. The estimated total cost of land protection under scenario one is \$10,156,150.

Scenario two suggests a balance between acquisition and PDR, targeting 8,065.5 acres for each, and 7,875 acres for regulatory protection. The estimated total cost of land protection under this scenario is \$8,695,174, less than scenario one since more land is being protected via easement rather than fee simple purchase.

Scenario three targets 16,131 acres for PDR, and the remaining 7,875 acres for regulatory protection. The estimated total cost of land protection under this scenario is \$4,003,069. Finally, scenario four targets 16,131 acres for fee simple purchase, and the remaining 7,875 acres for regulatory protection. This is the most costly conservation scenario, totaling an estimated \$13,387,440.

Of the four land protection strategies presented, scenario one may be the most feasible in that it applies land protection tools based on knowledge of current land use in the region. Only those properties participating in tax abatement programs are targeted for PDR. It is assumed that property owners may wish to retain ownership of this land, and continue to manage their property as farm or forestland. However these owners may be amenable to selling the development rights on

their land. Table F-4 illustrates scenario one's land protection methodology by township.

Table F-4. Land Protection Scenario One: Conservation Methodology by Township

	Suitable Conservation Acreage Participating in State Tax Abatement Program	Suitable Conservation Acreage Not Participating in State Tax Abatement Program	Total Suitable Conservation Acreage
Brookfield	1,338.20	3,909.55	5,247.75
Eaton	1,760.27	3,173.74	4,934.00
Georgetown	855.31	1,267.43	2,122.73
Hamilton	1,297.43	3,888.30	5,185.73
Lebanon	1,600.51	2,226.16	3,826.67
Madison	559.63	2,129.69	2,689.32
Total	7,411.35	16,594.87	24,006.21

Conserved via Easement or PDR
 Conserved via Purchase
 Conserved via Regulation

Greenbelt Conservation

In addition to protection of land identified through the suitability analysis, the Strategic Land Protection Plan targets land conservation within the Y-Plan Greenbelt. Total acreage within the greenbelt is 22,288 acres. However, this area includes land that is already protected, land that cannot be developed (surface water), and land that is already developed (roads, housing, etc). After removing acreage within these categories, the adjusted greenbelt acreage targeted for conservation is 16,947 acres.

Of the 16,947 acres targeted for conservation, 9,800 acres are located in the towns of Hamilton and Madison. Land use regulations including zoning overlay districts may be adopted to protect this acreage. Development within overlay zones may trigger higher level of review by local planning or zoning boards, and may require compliance with additional regulations such as those to protect scenic viewsheds. An intermunicipal overlay zone may be appropriate for land protection in the greenbelt because it may apply consistent regulations to all land uses within the greenbelt.⁶

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Table F-5 presents proposed methods of land protection within the Greenbelt Y-Plan. Of the 16,947 acres of targeted conservation land, 9,800 may be protected by regulation. The remaining 7,147 acres located in the Townships of Earlville and Morrisville may be protected through fee simple purchase and purchase of development rights.

Table F-5. Proposed Land Protection Strategies in the Y-Plan Greenbelt

	Acreage to be Conserved in Greenbelt	Greenbelt Acreage in Tax Abatement Program	Greenbelt Acreage Not in Tax Abatement Program
Morrisville	3,735.1	1,791.8	1,943.3
Earlville	3,411.4	1,775.5	1,635.9
Hamilton	5,716.3	927.5	4,788.8
Madison	4,084.0	1,593.2	2,490.8
Total	16,946.7	6,087.9	10,858.8

Conserved via Easement or PDR
 Conserved via Purchase
 Conserved via Regulation

Of the remaining 7,147 acres, 3,567 are enrolled in the State's farm or forestry tax abatement programs. This acreage, which is owned by only 29 landowners, is most likely to be conserved via conservation easement or purchase of development rights. Conservation of the remaining 3,579 acres is recommended through fee simple acquisition.

Given these recommendations, the total cost of land protection within the Greenbelt is estimated at \$3,855,660.38. Table F-6 presents costs associated with the various land protection strategies.

Table F-6. Cost Estimation of Y-Plan Greenbelt Land Protection

Greenbelt Acreage in Tax Abatement Program	3,567.3
Estimated Cost of PDR per Acre	\$248.16
Total Cost of Conservation by Easement	\$885,240.43
Greenbelt Acreage Not in Tax Abatement Program	3,579.2
Estimated Cost of Fee Simple Purchase per Acre	\$829.91
Total Cost of Conservation by Purchase	\$2,970,419.95
TOTAL COST OF LAND PROTECTION IN GREENBELT	\$3,855,660.38

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Potential Funding Sources

Reliable funding is essential for SMHT to implement their conservation plans, as it will allow the land trust to plan ahead, and operate with more freedom and flexibility. In order to create a sustainable financial base it is critical that the SMHT focus its efforts on generating local support (in the form of donations or other initiatives) and winning grants, as well as learning to think “outside the box” to use unconventional methods of revenue and resource generation.

Focusing on local sources of money will help the land trust gain credibility in the community as well as build a base of support for external funding sources. Individual donations (from institutional partners such as Colgate University or local businesses or from people who play a leadership role in the community) could be one of the most important sources of funding.⁷ Creating and giving presentations tailored to the conservation interests of different local stakeholder organizations (from congregations and chambers of commerce to snowmobile clubs, hunting associations or local businesses that benefit from eco-tourism) is a strategy the SMHT might pursue to generate interest and support in this arena.

Bond measures authorized by voter referendum are a lucrative (though at times politically untenable) source of conservation revenue, as they provide significant and consistent flows of funding from local budgets to protect and preserve natural resources over the long term. In 2004, New York State voters approved eight bonds totaling \$273.3 million for conservation initiatives. The Southern Madison Heritage Trust may consider working with the Trust for Public Land (TPL) to assist local governments in generating interest in a local conservation bond measure.

Federal and state funds are limited and in high demand. Nevertheless, foundations have become increasingly active in the conservation and growth management arena, typically helping to fund national, regional, and local land trusts.⁸ The United States Department of Agriculture Farmland Protection Program, the New York State Conservation Partnership Program, and the Norcross Wildlife Foundation are a few potential funding sources.

Land trusts usually have difficulty obtaining loans from conventional sources such as banks and savings-and-loans institutions because these institutions are reluctant

to finance unprofitable ventures. Consequently, unconventional financing may be more feasible. For example, other land trusts have raised thousands of dollars by selling donations of equipment and land that does not have conservation value. The Ottauquechee Regional Land Trust – now known as the Vermont Land Trust – borrowed \$565,000 from a local bank by having a number of local residents co-sign the loan. Though SMHT may not be able to borrow this amount of money, this example shows that funding opportunities can arise if there is broad local support for land conservation.

Working With Government

The SMHT may work with Madison County to establish and operate a Purchase of Development Rights (PDR) Program. Under this partnership, the County may seek state and federal grant funds, or generate funds locally to purchase development rights on targeted parcels. SMHT’s role would function as program administrator including holding and monitoring the easements in perpetuity. Interested landowners would submit applications to the SMHT and the trust would make recommendations to a County PDR oversight committee.⁹

The potential to raise funds through this program exists through minor property tax increases. According to Matt Zieper, Research Director of the Trust for Public Land’s Conservation Finance Program, most citizens are willing to spend \$20 to \$30 dollars per year for conservation. If there is a similar level of support for conservation in Southern Madison County, a modest tax increase may be feasible. In Madison County, a one-percent property tax increase would raise \$283,137 for conservation. If these funds were distributed on a per capita basis, the towns of southern Madison County would receive \$70,784 annually - enough to purchase development rights on nearly 300 acres.¹⁰

Another major funding source to support local PDR Programs may be available in the future, should NYS legislators pass the Community Preservation Act (CPA). The CPA would allow local municipalities to tax real property transfers over a pre-determined purchase threshold, putting that tax into a reserve for local conservation efforts.

Educating the Public

Successful protection of suitable lands and achievement of the Y-Plan Greenbelt will depend, in large part, on SMHT’s ability to educate local elected officials

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and residents about the public benefits of land conservation. An educated public may be more readily willing to donate money or land easements to SMHT for conservation purposes. Additionally, an educated public may be more supportive of SMHT's activities in general that may result in taking property off the tax roles, and may support stricter land use regulations to protect natural resources and scenic views in Hamilton and Madison.

Economic Benefits of Ecosystem Services

In educating the public about the value of conservation, SMHT may wish to discuss the cost benefits of ecosystem services provided by natural resources in the service area. Renowned ecologist Robert Costanza has performed substantial work in this domain, documenting and quantifying the various "ecosystem services" that provide direct and indirect economic benefits for human welfare. Table F-7 presents 12 ecosystem services that are most relevant to the land coverages of Southern Madison County, and describes the impact associated with loss or degradation of those services.

Ecosystem services will vary by land cover, and quantifiable public benefit will vary by ecosystem service. The ecosystem services that convey the largest dollar value according to Costanza's analyses are disturbance regulation (ability of lakes, swamps and wetlands to mitigate flooding) and water supply and regulation. This translates into high economic value for lakes/streams, freshwater wetlands and swamps/floodplains.

Indeed, protection of drinking water supplies and maintenance of access to lakes, rivers and streams are two of the most common reasons cited for land conservation. Protecting water quality is essential not only for safe drinking water but also to support agriculture and other industrial or commercial development. Table F-8 presents land cover type, related ecosystem services, number of ecosystem services per cover type, and estimated total value of those ecosystem services per year per acre.

According to Costanza's analysis, one acre of forest provides an estimated \$526 in public economic benefit annually.¹¹ If applied to parcel one from the suitability analysis, a 23.55-acre deciduous forest located in Georgetown, this parcel potentially provides more than \$12,387 of public benefit annually. Stated another way, each year parcel one remains undeveloped, its owner is unknowingly

contributing \$12,387 to the welfare of the community. In total, Southern Madison County's 90,126 acres of forest provide an estimated \$47,406,276 in public benefit annually.

Measuring Economic Benefits: Three Approaches

The three most common methods used to quantify the economic value of ecosystem services are cost avoidance, replacement cost and net factor income. Cost avoidance is defined as the economic cost that society would sustain in the absence of a particular ecosystem service. For example, floodplains are critical in preventing or reducing the effects of floods, which can result in billions of dollars of damage if left unmitigated.

Replacement cost refers to the cost required to replace an ecosystem service with human-made technology. For example, studies have shown that freshwater wetlands help cleanse the water supply. According to Costanza, local governments pay \$5,696 per year in wastewater treatment for every acre of wetland that is destroyed.

Healthy ecosystems also contribute directly to the income of some residents, such as through increased tourism revenue. This is termed the net factor income.¹² According to the U.S. Fish and Wildlife Service, in 1996 NYS had 18,058 jobs associated with fishing, hunting and wildlife recreation, with a combined annual income of \$494.9 million.¹³ In 2001, fishing, hunting, and wildlife recreation expenditures in New York State totaled \$1.39 billion.¹⁴ Conserving land will be essential to the continued success of the tourism and resource-based economy of Southern Madison County.

Caveats

Costanza's analysis provides a snapshot of the quantifiable benefits of land conservation to human welfare. Data for this study were collected at the national level and do not refer specifically to Madison County or New York State. The exact economic value of an ecosystem varies depending on the economy of the region and the specific qualities of that ecosystem. For example, some regions of the nation are more dependent on singular water supply sources than others and may therefore be willing to pay more to protect those sources. Similarly, people living in urban areas may be willing to pay more for clean air since air quality often is poorer in urban areas. Thus, the ecosystem benefits described in this

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Table F-7. Function and Value of Ecosystem Services

Ecosystem Service	Example	Cost of Degraded or Depleted Ecosystem
Climate and Atmospheric Gas Regulation	Maintenance of a climate supportive of human habitation	Detrimental impact of global warming; loss of farmland
Water Regulation and Supply	Provides water for drinking and irrigation	Cost of building additional pipelines, irrigation systems and resevoirs
Nutrient Regulation	Maintenance of quality soils for farming and healthy plant life	Cost of fertilizer and destructive impact of runoff
Soil Retention and Creation	Preservation of arable land and prevention of erosion	Diminished productivity of agriculture and loss of farms
Refugia/Habitat	Habitat for migratory or regional species	Loss of species and damage to food chain
Pollination	Pollinators such as birds and insects	Lessened biodiversity and harmful impact to
Recreation	Tourism, out door sports and enjoyment of scenery	Reduction in tourism, lower real estate values and fewer out door sports opportunities
Disturbance Regulation	Storm and Flood Prevention	Greater flood and other disaster damage
Waste Treatment	Cleans and filters water	Increased burden on waste treatment plant
Food Production	Cropland, hunting, fisheries	Loss of hunting and agricultural productivity
Raw Materials	Lumber, fuel	Depletion of natural resources
Cultural	Opportunities for non-commercial uses	Loss of aesthetic, educational and scientific benefits

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Table F-8. Annual Cost Benefit of Ecosystem Services by Land Cover

Land Cover	Ecosystem Services Measured	Number of services	Value Per Acre (\$/Yr)
Freshwater Wetlands	Climate and Atmospheric Gas Regulation, Waste Treatment, Food Production, Water Supply and Regulation, Habitat, Recreation, Disturbance Regulation, Raw Materials, Cultural	9	\$8,159
Swamps/ Floodplains	Climate and Atmospheric Gas Regulation, Waste Treatment, Food Production, Water Supply and Regulation, Habitat, Recreation, Disturbance Regulation, Raw Materials, Cultural	9	\$10,805
Forest	Climate and Atmospheric Gas Regulation, Waste Treatment, Food Production, Nutrient Regulation, Soil Retention and Creation, Water Supply and Regulation, Disturbance Regulation, Raw Materials, Cultural	9	\$526
Grass/Rangelands	Climate and Atmospheric Gas Regulation, Waste Treatment, Food Production, Nutrient Regulation, Soil Retention and Creation, Water Supply and Regulation	6	\$121
Lakes/Rivers	Water Supply and Regulation, Waste Treatment, Food Production, Recreation	4	\$4,358

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report should be understood as generalizations that may serve as talking points, but that are not specific to Southern Madison County.

Despite these caveats, other factors suggest the numbers developed by Robert Costanza may actually *undervalue* the full contributions of ecosystem services to society because they reflect the current value of ecosystem services. These services will only become more valuable in the future, as environmental features and natural resources are further depleted, degraded or otherwise put at risk. Moreover, this analysis ignores the “complex interdependencies between [ecosystem] services” and, thus, may not capture the value of their synergistic interconnections.¹⁵

SMHT may educate the public of the financial benefits of ecosystem services through various methods, from developing brochures or flyers for display in libraries or public gathering spots to conducting educational programs or field trips on conserved land. Whatever the means of education, focusing on the monetary benefits (especially if *locally relevant* numbers can be generated) of land conservation may be one of the more effective ways to captivate the public around issues of land conservation.

Conclusion

The Strategic Land Protection Plan presents a long-range vision that may take years to achieve. The conservation of over 24,000 acres of land and the establishment of a permanent greenbelt around the Villages of Southern Madison County are bold initiatives. Broad public support for conservation and substantial financial resources are needed to accomplish these goals. SMHT may partner with local municipalities to secure State and Federal grants, apply for foundation funds, and work to raise funds *locally*, which will help establish credibility and foster local commitment to land protection. Public education about the benefits of conservation will be critical in order to build public support and secure financial resources to implement the Strategic Land Protection Plan. Over time, with collaboration, commitment and leadership fostered by SMHT, the significant natural resources of Southern Madison County may be protected.

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Photo courtesy of John Hubbard

Endnotes

History and Demographics

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²Jennifer G.F. Solms and Paula A. Schoonmaker, eds, *Country Roads* (Wampsville, NY: Madison County Planning Board, 1976) 12, 14.

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⁴Solms and Schoonmaker 13.

⁵Barbara J. Giambastiani, *Country Roads Revisited* (Oneida, NY: Madison County Historical Society, 1984) 5.

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⁷Madison County, New York, Farmland Protection Board, *Madison County Agriculture and Farmland Protection Plan* (Madison County, NY: 2002) 10.

⁸Solms and Schoonmaker 96.

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¹² Giambastiani 5-7.

¹³ Solms and Schoonmaker 96.

¹⁴Giambastiani 8-9.

¹⁵John E. Smith, ed., *Our Country And Its People: A Descriptive and Biographical Record of Madison County, New York* (Boston: Boston History Company, 1899) 559. James H. Smith 491-92.

¹⁶Madison County, New York, Farmland Protection Board, *Madison County*

Agriculture and Farmland Protection Plan (Madison County, NY: 2002) 19.

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²⁰Town of Georgetown, New York, *Development Ordinance: Town of Georgetown* (Town of Georgetown, New York: 1998) 1.

²¹Town of Brookfield, New York, *Town of Brookfield Building Ordinance* (Town of Brookfield, New York: 2004).

²²Town of Madison, New York, *Comprehensive General Plan Town of Madison* (Madison County, NY: 1989) 1.

²³Giambastiani 81.

²⁴Giambastiani 53.

²⁵Farmland Protection Board 58.

²⁶"Brief History of the New York State Forest Program," New York State Department of Environmental Conservation, 11 Oct. 2005 <<http://www.dec.state.ny.us/website/dlf/publands/stateforests/history.html>>.

²⁷United States, Department of Agriculture, *2002 Census of Agriculture County Profile: Madison, New York*, 26 Sept. 2005 <<http://www.nass.usda.gov/census/census02/profiles/ny/cp36053.PDF>>.

Natural Resources

¹Conversation with Greg Owens, NYS DEC Forester, 09/10/2005

²Smith et al., *The New York GAP Analysis Project Final Report*, New York Cooperative Fish and Wildlife Research Unit: 2001.

Scenic Inventory

¹See *Visual Assessment of South-East Queens Land*, 1993

²See *Massachusetts Landscape Inventory*, 1982.

³Results from the 1982 Massachusetts Landscape Inventory determined that 91 percent of Massachusetts landscapes were Common, 5 percent were Noteworthy, and 4 percent were Distinctive.

⁴Actual mileage driven totaled 380 miles.

⁵Based on interview with SHMT board members from September 10, 2005.

⁶This number was generated by clipping raster viewsheds to municipal boundaries in GIS. As such, the number reached through this analysis differs slightly from the number calculated by the Natural Resource Inventory section in this report.

Greenways

¹Abandoned railway system and the Canalway were digitized from a Madison County Map of 1941 and the New York State Canal System in Madison County. Canalway map was prepared by the Madison County Planning Department in May 1993.

²Richard T.T. Forman and Michel Godron. 1986. *Landscape Ecology*. New York

³Zhu Qiang, Yu Kong-Jian & Li Di-Hua. 2005. The Research on the width of Ecological Corridor in Landscape Planning. *Acta Ecologica Sinica*. Vol. 25 No. 9. Peking University.

⁴Minimum buffer width of 300 feet to enhance riparian wildlife is suggested by U.S. Fish and Wildlife Service online at <http://www.fws.gov/panamacity/programs/pdf/bufferfact.PDF>

Suitability Analysis

¹The suitability model was applied to only 160,000 acres of the total 185,583 acres in SMHT's service area in order to exclude all roads, waterbodies, and currently protected lands from the analysis.

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¹Chris Demers & Douglas R. Carter, *Conservation Easements: Options for Preserving Current Land Uses*, <<http://edis.ifas.ufl.edu/FR149>>.

²Federico Cheever & Nancy A. Mc Laughlin, "Why environmental lawyers should know (and Care) about land trusts and their private land conservation transactions?" *Environmental Lawyer Reporter*, 3-2004, 34, 10223-10233.

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⁴"Agricultural Zoning," *Pace Law School Land Use Center*, 30 Nov. 2005 <<http://www.law.pace.edu/landuse/bagzon.html>>.

⁵George Franz & Thomas Daniel, *Tompkins County Agricultural Lands & Natural Areas Preservation Feasibility Study*, January 2002, 31-33.

⁶State of Arizona, Arizona Department of Commerce, *Overlay Zoning*, May 1997, 30 Nov. 2005 <<http://www.commerce.state.az.us/pdf/commasst/cqiss18.pdf>>.

⁷Interview with Matt Zieper, Research Director, Trust for Public Land, 11/21/2005.

⁸The Trust for Public Land, *Conservation Finance Handbook* (San Francisco: The Trust for Public Land, 2004) 7.

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¹⁰Madison County 2006 Preliminary Budget

¹¹Robert Costanza, "The value of the world's ecosystem services and natural capital," *Nature*, Vol 387, 15 May 1997, 254-255.

¹²Robert Costanza, "The value of the world's ecosystem services and natural capital," *Nature*, Vol 387, 15 May 1997, 256-257.

¹³James Caudill & Andrew Laughland, "1996 National and State Economic Impacts of Wildlife Watching," U.S. Department of the Interior, U.S. Fish & Wildlife Service, Arlington, Virginia, 1998, 10.

¹⁴"2001 National Survey of Fishing Hunting and Wildlife-Recreation: State Overview," U.S. Department of the Interior, U.S. Fish & Wildlife Service, Arlington, Virginia, June 2002, 30.

¹⁵Robert Costanza, "The value of the world's ecosystem services and natural capital," *Nature*, Vol 387, 15 May 1997, 258.

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Madison County 2006 Preliminary Budget

Madison County, New York, Farmland Protection Board, Madison County Agriculture

Prime Farm Lands

United States Department of Agriculture's National Resource Conservation Service (NRCS) maintains an inventory of prime farm soils nationwide. Prime farmland is defined as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods (<http://soils.usda.gov/technical/handbook/contents/part622.html>)." Southern Madison County contains additional significant farmland that, while not classified as USDA Prime Farmland, nonetheless retains a position of regional and/or statewide significance. Although data was not readily available to map these additional resource lands at the time this Plan was produced, SMHT may take advantage of local and institutional knowledge to identify these areas.

Department of Environmental Conservation (DEC) Classification Systems for Wetlands

Different wetlands provide different functions and benefits to different degrees. The Freshwater Wetlands Act requires DEC to rank wetlands in one of four classes ranging from Class 1, which provide the most benefits, to Class IV, which provide the fewest benefits. It is more difficult to get a permit to alter a Class I wetland than to alter a Class IV wetland. Because of this, wetland classifications are important and are subject to public comment during the map hearing process.

Gap Analysis Program (GAP)

Gap analysis is a scientific method for identifying the degree to which native animal species and natural communities are represented in our present-day mix of conservation lands. Those species and communities not adequately represented in the existing network of conservation lands constitute conservation "gaps." The purpose of the Gap Analysis Program (GAP) is to provide broad geographic information on the status of ordinary species (those not threatened with extinction or naturally rare) and their habitats in order to provide land managers, planners, scientists, and policy makers with the information they need to make better-informed decisions.



"Aim High In Hope And Work"

- Daniel H. Burnham