GREENE COUNTY
OPEN SPACE AND RECREATION PLAN

PHASE I
INVENTORY, DATA COLLECTION, SURVEY AND PUBLIC COMMENT

DECEMBER 2002

A Publication of the Greene County Planning Department
Funded in Part by a West of Hudson Master Planning and Zoning Incentive Award
From the New York State Department of State

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GREENE COUNTY OPEN SPACE AND RECREATION PLAN - PHASE I INVENTORY, DATA COLLECTION, SURVEY AND PUBLIC COMMENT

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I. Introduction

Greene County is a rural county, blessed with a great diversity of habitat. The county's population is growing steadily from 44,739 in 1990 to 48,195 in 2000. Concurrent with this population increase is an increase in development. Unfortunately some of this development has occurred without the guidance of land use planning. Such uncontrolled development can threaten the environment and cause water pollution and soil erosion problems. Hopefully, this plan will help foster a greater environmental awareness leading to greater consideration of the environment while accommodating growth.

Open Space and Recreational Area Conservation means different things to different people. Publicly or privately owned pastures, forests, lakes and streams come to mind. Most open space can be defined as one of the following: woodland or forest areas; ecologically sensitive or significant areas; water resources; recreational resources; publicly held land; or areas with distinct historical, cultural or natural features. Many areas have been recognized by the State of New York as worth protecting through various designations by the New York State Department of Environmental Conservation or the New York State Office of Parks, Recreation and Historic Places.

New York State continues to increase its holdings in the Catskill Park in an effort to have contiguous holdings of the Catskill High Peaks (those over 3500'). Organizations such as the New Baltimore Conservancy and the Audubon Society work to protect areas near the Hudson River, preserving habitat for migrating species and providing habitat corridors for wildlife. Private individuals donate conservation easements to protect the beauty of their land from encroaching development.

To fully understand the effect of open space and recreational opportunities on our living environment, one must first comprehend the resources that make up Greene County. The natural resources, from bedrock to water sources, forests to wildlife, create the living landscape that we inhabit. This landscape is supplemented by various uses of the land by our predecessors and ourselves. Some enhance a location and become a cultural or historical resource. Other portions are dedicated to passive or active recreational uses. From this inventory of resources and public input, a method can be developed to promote protection of open space, and development of recreational areas.

II. Natural Resources

To understand the need to protect open space and recreational areas, one must first understand the limits of our renewable and non-renewable natural resources. The following is an in-depth look at our resources.

A. Bedrock Geology

1. Geological History

Approximately 500-475 million years ago, during the Ordovician Period, the area that is now Greene County was part of a vast inland sea. About 450 million years ago, a collision of the European, African, and North American plates raised the Taconic Mountains. At that time, the rocks that comprise the Normanskill Group - the Austin Formation (graywacke or "dirty" sandstone and shale) and the Mt. Merion Formation (chert [flint] or shale) were located further to the east. The crustal movements, which formed the Taconic Mountains, pushed the rocks of the Normanskill Group to the west where they came to rest in the mud of the inland sea. Over time that mud became the rock now called Snake Hill Shale.

After the Ordovician, during the Silurian, a period of approximately 35 million years, Greene County was exposed dry land. During this period, the land surface was eroded and the material was deposited in an inland sea further west in New York. Silurian age bedrock is not normally seen at the surface in Greene County. However, this missing rock record, called an unconformity, can be seen in the road cuts on NYS Route 23, west of Catskill. It is no surprise that these road cuts have become popular spots for geological study.

In the early Devonian Period (approximately 390 million years ago), Greene County was again under an inland sea. During this period, the Helderberg and Onondaga limestones were formed. Limestones are formed from the deposition of the skeletons of microscopic marine organisms, chiefly corals and bryozoans. From the Helderberg and Onondaga limestones, it can be determined that the sea at that time was clear and warm because they contained coral. Also, because these limestones do not contain very much clay, it can be determined that they were formed before there was extensive erosion of the

Taconics.

During the middle and late Devonian Period, 365-350 million years ago, the Catskill Delta was formed from material eroded from the Taconics. The red and reddish green sandstones, shales, and conglomerates of the Hamilton Group of formations composed a delta that extended from the Taconics west into the inland sea.

At about the same time there was another collision between the North American and European plates. Evidence of this mountain forming episode, known as the Acadian Event, can be seen in Greene County at the road cut on NYS Route 23, west of Catskill. This is the westernmost point in New York State where there are folded and faulted rock layers.

During the Pennsylvania Period, approximately 200 million years ago, the weight of the huge deposits of organic material that became coal in Pennsylvania, had to be compensated for in the earth's crust. The weight "pushing down" in Pennsylvania meant something had to come up. That event caused the Uplifting of the Catskill Plateau. Originally the Catskill Mountains were a flat tableland plateau. The dissection of the Catskills (demonstrating the erosional power of water) started 50-80 million years ago and continues today.

The next major geologic event that gave Greene County much of the topography seen today was the glacial age, which began two million years ago. Greene County soils do not reflect the underlying bedrock because the glaciers stripped away what was here and deposited boulders, sand, silt, and gravel from further north.

The glaciers also dammed huge lakes. One lake extended from Tannersville to Prattsville before draining through Grand Gorge. There was a Lake Durham and Lake Cairo. Lake Albany covered the low ground of the Hudson Valley from Whitehall to Rhinebeck.

The weight of the ice compacted material into what is now called hardpan. As the ice melted, material in the ice dropped on the hardpan and formed a soil of looser consistency called till. Streams from glaciers carried gravel and sand and deposited them in deltas where the streams entered the lakes. The flats at Hunter and Jefferson Heights are deltas from the Ice Age.

The last glacier melted away 15 thousand years ago, but the topography of Greene County has been continually modified. The Kaaterskill Notch, which NYS Route 23A follows from Palenville to Haines Falls, was carved by the Kaaterskill Creek. Platte Clove in the Town of Hunter was sculpted by the Plattekill Creek. Other forces including weathering and sloughing (a slipping downward movement of an external layer of soil) have contributed to shape the landscape. Through the ages, forces such as these have given the mountains their rounded, aged appearance.

2. Overburden

The soil deposits on top of rock, also known as hardpan or overburden, range in thickness today from a mere veneer to several hundred feet. In some spots it is absent altogether and bare rock is visible at the earth's surface or projects above the soil as outcrops.

By modifying the soils, the glaciers controlled in large measure the agricultural possibilities of the region. The various types of glacial deposits each produced characteristic types of soils and subsurface drainage. One of the effects of the glaciers was to scatter stones of all shapes and sizes through the soil. Clearing away these stones so that the land could be cultivated was one of the hardest tasks of the early settlers and one that is ongoing, as the frost continually brings new crops of stones to the surface, much to the dismay of farmers and home gardeners.

The glaciers also left behind deposits of sand and gravel, these being most numerous in the deltas that were formed in the glacial lakes. The glacial sand and gravel in the Catskill region is made up of mixtures of shale and sandstone pebbles. Because of their weakness, shale pebbles in the gravel make it unsuitable for some purposes such as high-grade concrete.

Clays in great abundance are found in many parts of Greene County. They also were deposited in the many glacial lakes that were impounded in valleys blocked by the ice. They are prevailingly red in color, being derived mainly by glacial reworking in the Catskill red shales.

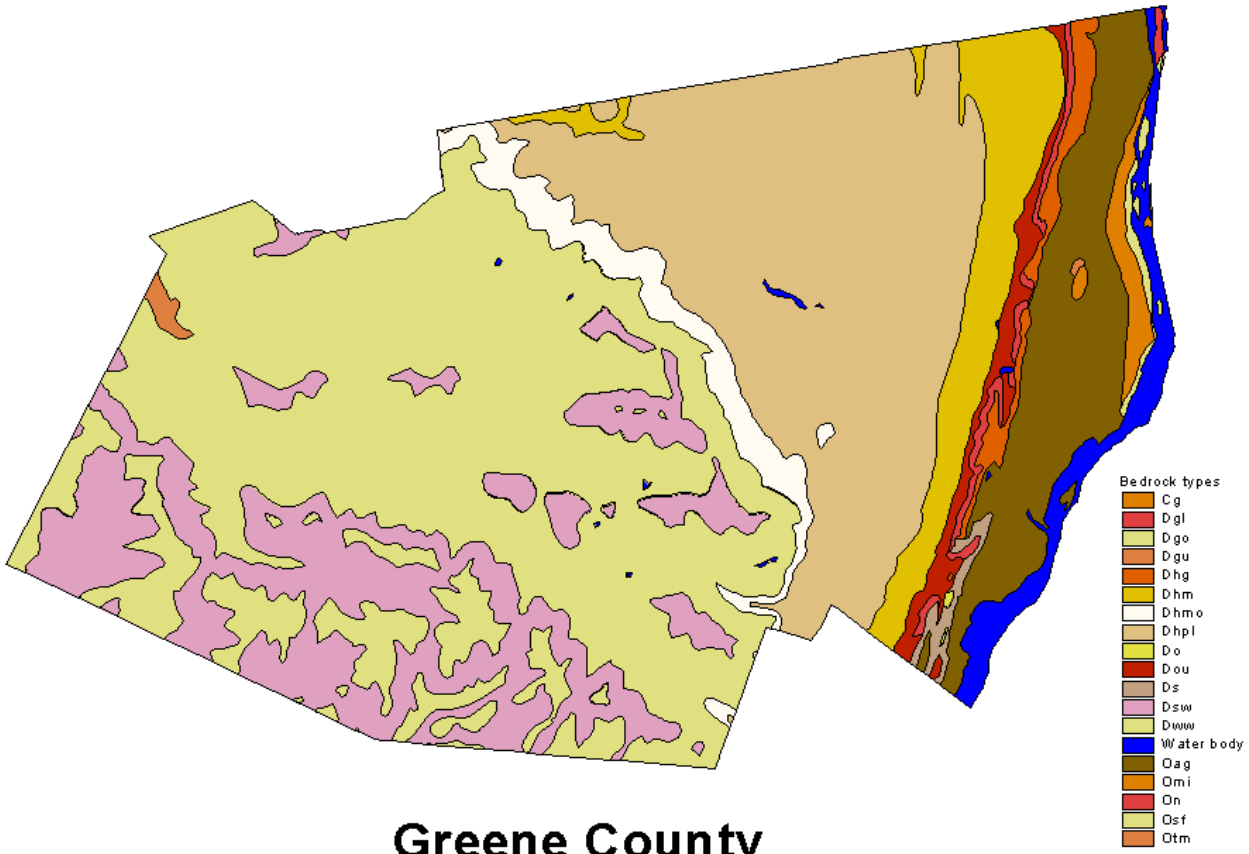
3. Major Bedrock Groups

The rocks of Greene County can be charted from east to west, with the oldest rock formations in the east and the age becoming younger to the west. All rock formations in Greene County are sedimentary (See map on page 6).

B. Soils

Soil information is valuable to many professionals including engineers, planners, developers, realtors, farmers, general contractors and homeowners. Soil information allows us to know more about the capability of the land for various purposes so that serious and costly mistakes can be avoided. The value of soils maps in guiding the management of farmland has long been recognized, but soil analysis is also essential to determine the best location and optimum density of residential communities. Soil characteristics such as texture, depth, drainage and slope have an effect on all our land use decisions. In the Catskills, soil depth has been identified as a primary determinant of vegetation types on the mountain peaks.

Soils maps show different categories of soils by assigning each category a number. The location of each category is identified on a map, based on field investigation and aerial photograph interpretation. There are two principal types of soils maps: the general soils map (sometimes called the "meso intensity" map) and the detailed soils map.



Greene County
Bedrock Geology

A general soils map presents an overall picture of the soils in a county. It is a useful tool to compare different parts of the county or to locate large tracts of land suitable for certain uses such as wildlife areas, recreational facilities, and community development. Because the map is at a scale of approximately 1 inch equals 1 mile and is only accurate to forty acres, it is not suitable for planning the management of a farm or for selecting the exact location of a road or building. If works or structures are contemplated, on-site investigation is required.

Detailed soils maps provide more specific determination of soil conditions. These are prepared at a scale of 1-inch equals 2,000 feet and are accurate down to approximately two-and-a-half acres. The US Soil Conservation Service has prepared maps for each town in Greene County and published a countywide soil survey report in 1993. For more information on detailed soils maps, contact the Greene County Soil and Water Conservation District at (518) 622-3620.

1. Soil Rating

Based on investigations, soil scientists have determined the characteristics and capabilities of each soil type. Accordingly, ratings have been developed that categorize soils in relation to specific characteristics (depth to bedrock, depth to seasonal water table, etc.) as well as in relation to the suitability of the soil for various uses (suitability for septic systems, suitability for community development, etc.). The ratings for soil characteristics place the soils into convenient numeric groups. For example, ratings for depth to bedrock are grouped as follows: less than 20 inches, 20 to 40 inches, and more than 40 inches. On the other hand, the ratings for the soil suitability maps are expressed as slight, moderate or severe limitations.

2. Depth to Bedrock

The measurement of the thickness of the overburden, or depth to bedrock, is important in land use planning. Areas of thick overburden hold valuable resources such as sand, gravel, and clay. These areas also have the capacity to hold large amounts of water between the soil particles and are called aquifers.

Because they absorb water quickly, such aquifers are also easily polluted and should be protected. Thick drift, soil formed under the glacier and compacted, makes good agricultural land, second only to alluvium along larger streams.

Where the bedrock is near the surface, the weight of large structures such as industrial buildings can be supported. This advantage is then weighed against the expense of drilling into the rock, the search for water, and problems of sewage disposal.

3. Suitability for Septic Systems

In the Greene County Comprehensive Sewerage Study prepared for the county by engineering consultants in 1979, it was estimated that 95% of the land in Greene County is potentially not suited for subsurface sewage disposal based on ratings of soil suitability for septic systems according to the general soils map. This soil information provides only a general guide because it depicts average conditions within a general soil classification. Pockets of soils that are acceptable for subsurface sewage disposal systems may be included within larger areas that are considered unsuitable for septic systems. In specific areas under consideration for home septic tank systems, soils sampling and onsite investigations should be undertaken to ascertain the subsurface sewage disposal capabilities of each parcel. Limiting factors include high groundwater, closeness of bedrock to the surface, poorly drained soils or flooding.

Most municipalities in Greene County have sewerage ordinances designed to insure proper installation of septic systems. Their objective is to prevent pollution of surface and ground waters, and to maximize the life of the system by mandating sufficient leach field size according to percolation rates, and by requiring that the system be located a certain distance from wells, streams, and property lines.

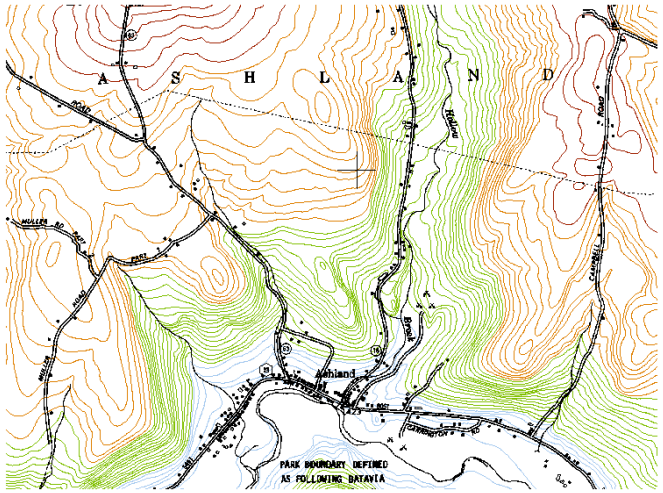
4. Limitations to Community Development

Limitations to community development is a very general category, as different types of development (buildings, roads, etc.) have differing soils requirements. A detailed soils map can show soil limitations for the construction of dwellings with basements and factors in a variety of soils characteristics including depth to bedrock, depth to seasonal high water table, flood hazard, slope, potential frost

action, shrink-swell potential, and surface rockiness and stoniness. By avoiding areas poorly suited for dwellings, builders can avoid costly modifications, such as the need to bring in large amounts of fill in areas of seasonal high water.

C. Topography

Topographical maps describe both natural and man-made features of the land's surface. While natural features change very slowly if at all, man's activities on the land may alter the topography at such a rate that maps depicting topography shortly become outdated.



Greene County
Topographical Map
Ashland Quadrant

United States Geological Survey (USGS) Topographic maps delineate the contours of the land. They also show natural features, buildings, roads, transmission lines, railroads and industry. Examination of a topographic map can reveal a great deal of basic information about a place and the human activity that occurs there.

Topographic maps of the entire county have a scale of 1:24,000 and are available from the Greene County Soil and Water Conservation District. USGS topographic maps of New York State are divided into sections called quadrangles. In order to study all of Greene County, twenty-one quadrangles must be examined. Along the margins of each quadrangle are numbers referring to three locational systems: (1) longitude and latitude; (2) the State Plane Coordinate System; and (3) the Universal Transverse Mercator System.

Topographic maps are useful when planning locations of structures, roads, communication lines and industrial parks. Combined with slope maps and soils maps, they are also useful tools in drafting land use plans. Each topographic feature has a corresponding best land use. For instance, steep slopes are best left for wildlife preservation and passive recreation. Large flat areas near transportation routes adapt well to industrial uses, provided the soils are suitable.

D. Slope

The determination of an area's suitability for development is dependent to a large degree on the slope of the land. Slope is a measurement of the steepness or grade of the land. A 15% slope means that for each horizontal distance of 100 feet, the land increases in elevation by 15 feet. The greater the slope, the greater the difficulties in developing that land. Where steep slopes exist, special design and construction techniques are required to avoid problems such as soil erosion and water runoff.

Undisturbed slopes can stand up against erosion from water or wind because the vegetation's roots hold the topsoil in place. If vegetation is removed or destroyed, the topsoil erodes, preventing new vegetation from gaining a foothold; and erosion increases. Even slight slopes may be inappropriate for construction if their soil has a tendency toward slippage or is fine grained and prone to erosion.

Slopes are categorized as 0-15%, 15-30%, and 30% and over. The 0-15% category generally contains the lands most favorable for development. Encouraging development in these flatter areas will minimize the cost of providing services. The 15-30% category is located on the lower slope of the major mountains, particularly the ridges that define the Schoharie Valley. Individual houses properly sited, agricultural uses and forests are the only uses envisioned for this category. The 30% or more category, consists of the lands that are largely unsuited for development purposes. In Greene County, this category consists of the upper elevations of the ranges, which surround the mountaintop.

E. Erosion and Sedimentation

Soil erosion is the movement of soil particles by wind, ice, water, gravity, or combinations of these. Most soil erosion in New York is caused by water falling as rain or flowing over land surfaces that are disturbed. Removal of vegetation for development and increasing impermeable surfaces (such as pavement or buildings) result in a higher rate of surface water runoff since there is less land area and vegetation to absorb the moisture. A more intense "scrubbing" of the land results, causing turbidity in streams and higher flood levels. Increased siltation can prevent the exchange of water between surface and subsurface supplies, lowering the base water level during dry periods. Runoff from upland development can also pollute water supplies with salts, nutrients, and chemicals, while causing the loss of valuable topsoil.

Proper soil conservation practices during and after alteration of the land can minimize the erosion rate. The Greene County Soil and Water Conservation District, with offices in Cairo, NY, telephone (518) 622-3620, canl help people design appropriate soil conservation measures.

Sedimentation is the depositing of water borne particles of stone and soil into streams and bodies of water. It is the result of the erosion process: the water erodes the soil, picking up small particles and carrying them into streams. Sediment can build up to an extent where it interferes with the stream flow, causing flooding and interfering with the normal function of the stream. Expensive dredging operations may then be required, which could further harm the stream and its inhabitants.

Removal of sediment from rivers or streams by dredging presents problems, such as locating environmentally suitable sites for disposal of the dredged material. Ocean disposal and upland disposal are both utilized, depending on the location of the dredging. Dredging activities also increase turbidity and redistribute pollutants on the bottom. Unless carefully scheduled, dredging can also adversely impact fish populations. The amount of dredging required varies according to the degree of sedimentation or pollution.

The US Army Corps of Engineers estimates that it will remove 200,000 cubic yards of dredged materials from the Hudson River between Castleton and the Port of Albany every ten years. This operation is very expensive. In the past, it has been necessary to remove sediment from the tidal portion of Catskill Creek, as well.

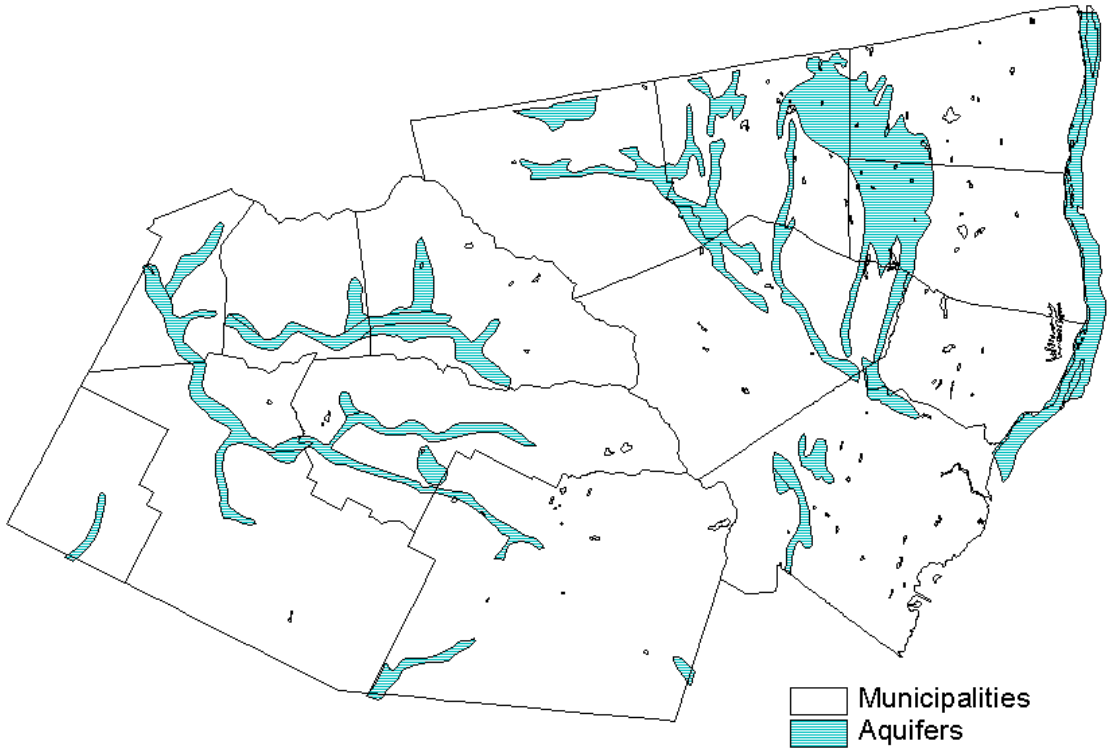
F. Aquifers

An aquifer is an underground formation of rock or gravel, which contains and can yield or transmit water in usable quantities through springs or wells. The portion of the aquifer in which the crevices and pores between the rocks are completely full of water is called the zone of saturation. Above this is the zone of aeration, containing a mixture of air and water between the soil and rock particles. The line where these two zones meet is called the water table. The water table rises and falls depending on the rates of recharge and withdrawal of the aquifer.

Roughly half of Greene County's population depends on ground water for their potable water source (see map on page 13). The remaining water needs are met through municipal water supply systems consisting primarily of reservoirs. Ground water is important not only as a drinking water source, but also as a "feeder" system to many of our streams and lakes. During periods of drought, discharges from the underground aquifers into streambeds may be the only source of stream flow. Conversely, in times of high surface flow, some surface waters feed back into the aquifers.

The average yield of the wells in the Catskill Formation of bedrock is reported to be 17 gallons per minute. In those areas of the county not underlain by the Catskill Formation, the amount of available ground water is variable. Ground water supplies from soils generally follow streambeds and are more numerous in the mountains of Greene County than in the valley areas.

The recharge of all ground water in Greene County occurs when rain and snow melt percolate through the soil to the aquifer. Aquifer recharge areas generally occur along the major stream valleys and along areas of rock outcrop. Once aquifer recharge areas are delineated, steps can be taken to protect them through enactment of land use controls similar to watershed protection methods implemented through the Memorandum of Agreement with New York City and its Watershed Regulations.



Greene County
Aquifers yielding greater than
10 gallons/minute

G. Stream Classifications and Drainage

Article 17 of the New York State Environmental Conservation Law, dealing with water pollution control, establishes a permit system for all commercial wastewater discharges to either surface or groundwater within New York State. This permit system is known as the State Pollutant Discharge Elimination System (SPDES), an outgrowth of the Clean Air and Water Act. Such permits are required for municipal treatment plants, industrial plants, large subdivisions, resorts, apartment complexes of four or more units, and all other commercial and industrial discharges. In Greene County there are currently over 120 SPDES permit recipients. Various conditions accompany such permits, including maximum allowable daily discharge and varying levels of intensity of effluent treatment before discharge. The intensity of effluent treatment required depends on the state classification of the receiving stream. In New York State, the Department of Environmental Conservation has classified all major streams according to their "best usage". The system assigns a letter code and a set of water quality standards corresponding to each classification. Those waters with higher dissolved oxygen content are classified trout waters, acknowledging that trout can successfully spawn there. The standard examples of "best usage" according to the Department of Environmental Conservation classification is as follows:

A. Water Supply
B. Bathing
C. Fishing
D. Agricultural or Industrial Uses

The majority of the classified streams in Greene County are classified as C. Such classification means that the bacteriological (Coliform) pollution count is so high that swimming is not advised, but that due to the stream velocity and physical attributes of most streams (rapids, waterfalls, etc.), the dissolved oxygen is still high enough to support fish and fish spawning.

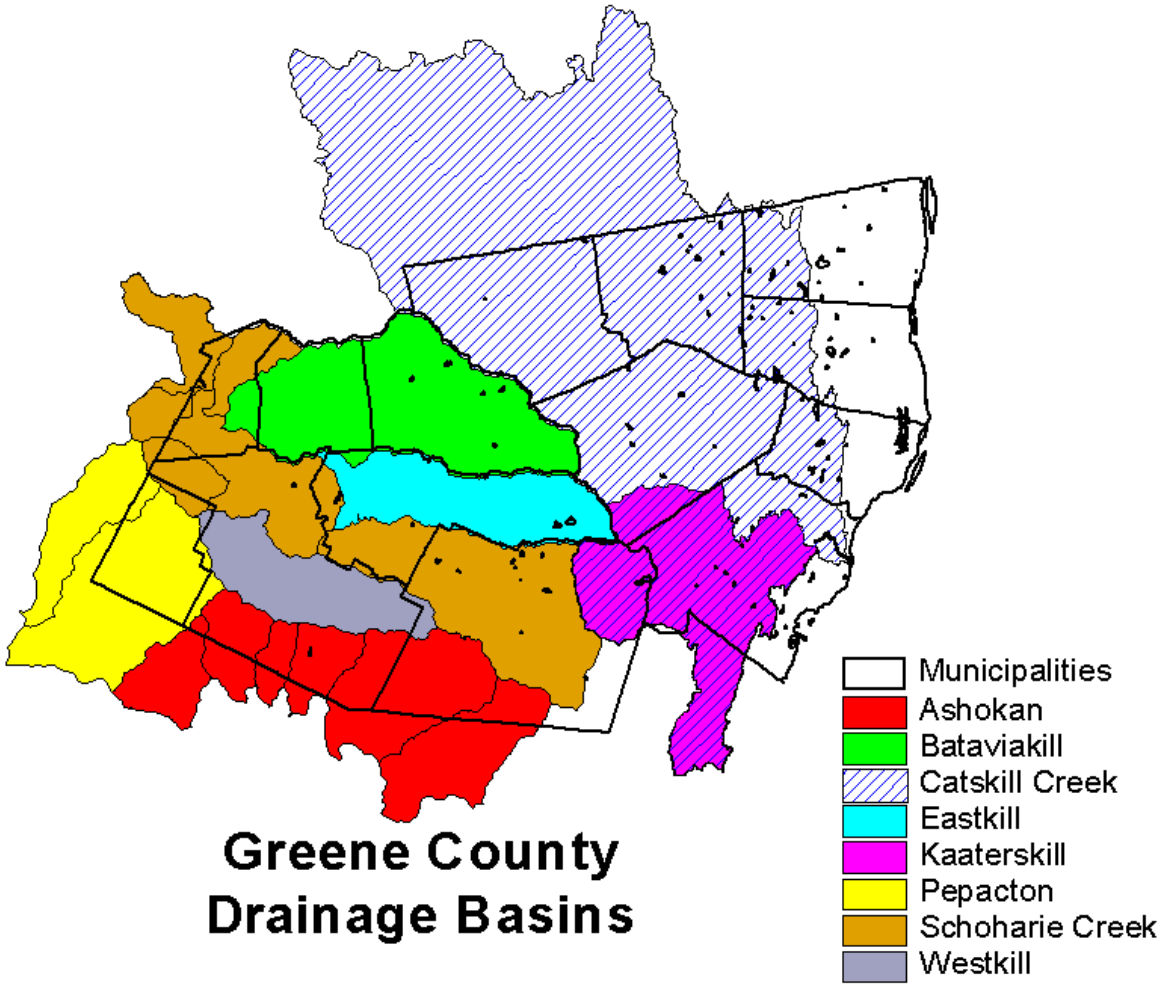
This classification method also means that SPDES permit recipients need to treat wastewater effluent only to maintain C classification water quality standards. If the receiving stream were classified B, effluent quality would have to be higher. Thus, in some cases these classifications could be viewed as being self-fulfilling. Smaller headwater tributaries, which usually consist of the purest water and form the last stronghold of the

native Brook Trout (which cannot tolerate minor pollution as the Brown or Rainbow Trout can), are unclassified. Unclassified streams suffer additionally since they are not covered by the Stream Classification Act, which requires a permit for any activity within the streambed. The whole state stream classification system is being constantly revised with the aim of higher standards and decreased pollutant discharges.

The coliform bacteria mentioned earlier, while not in themselves considered pathogenic, can indicate fecal contamination from both human and animal feces. Sources of such pollution include not only SPDES permitees but also failing and improperly installed septic systems and agricultural runoff carrying animal excretory wastes. The latter two sources, which enter surface waters over a wide area, are called "non-point" pollutant sources, as opposed to "point" sources, which enter the water at easily discernible spots, such as an outfall pipe from a wastewater treatment plant. Such pollution causes an increase in water temperature, increase in algae and other aquatic vegetation with a concomitant increase in the Biological Oxygen Demand (B.O.D.), thus reducing the level of dissolved oxygen fish and other aquatic life need for survival.

Drainage basins or watersheds are defined as all the land area draining into a given lake or stream. Except for the extreme southwest corner of the county, all surface water eventually makes its way to the Hudson River. The Drainage Basin of the Hudson is made up of many smaller drainage basins. Boundaries between basins usually follow ridgelines, such as the Catskill Mountain escarpment. The map on page 16 shows drainage basins of Greene County.

The New York City Department of Environmental Protection (NYCDEP) has taken the lead in monitoring pollution levels in streams and creeks of the county within the New York City Watershed. Since a Memorandum of Agreement was signed in 1997 with the Coalition of Watershed Towns, as well as state and federal agencies, NYCDEP has worked toward the long term protection of water quality in the Ashokan, Bataviakill, Eastkill, Pepacton, Schoharie Creek and Westkill watersheds comprising nearly half of Greene County through land acquisition programs, watershed rules and regulations, and partnership programs.


Greene County
Drainage Basins
Municipalities
Ashokan
Bataviakill
Catskill Creek
Eastkill
Kaaterskill
Pepacton
Schoharie Creek
Westkill

H. Wetlands

Long considered nuisance landscape, wetlands are now recognized as important for flood control, ground water recharge and wildlife habitat. Definitions for the term "wetland" can vary greatly. Among the most widely accepted definitions is that of Cowardin et al. (1979), which was adopted by the U.S. Fish and Wildlife Service.

> *Land where an excess of water is the dominant factor determining the nature of soil development and the types of animals and plant communities living at the soil surface. It spans a continuum of environments where terrestrial and aquatic systems intergrade.*

Wetlands act as sponges, absorbing excess water during periods of high precipitation. During dry periods, the water is slowly released, replenishing ground water supplies and maintaining stream flows. The water held in a wetland is also cleaned and filtered because sediments have a chance to settle. As development continues and the demand for potable water grows, the cleansing and recharging functions of wetlands also becomes more important. Wetlands provide opportunities for recreational and open space preservation. They are an important source of food, cover and water for wildlife, and thereby are prime places for hunting, fishing, hiking, and the observation of wildlife.

The NYS Freshwater Wetlands Act of 1975 regulates all wetlands greater than 12.4 acres and smaller ones of unusual local importance, protecting them from uncontrolled dredging, filling, and the discharge of pollutants (see map on page 18). The wetlands smaller that 12.4 acres are regulated by the US Army Corps of Engineers.

12.4 Acres and Larger Only

Following extensive review of preliminary maps depicting the approximate boundary of regulated wetlands, final freshwater wetlands maps depicting approximately 10,600 acres of Greene County were filed on February 4, 1987. Anyone proposing construction in or alteration of a wetland should first consult the Department of Environmental Conservation office in Schenectady for advice.

A number of "cover types" are considered to be regulated wetlands, as the law is based on a preponderance of wetland plant species, not the presence of standing water. Such cover types include shrub swamps, swamps with large trees, marshes (including the tidal marshes along the Hudson River), seasonally wet meadows, bogs (rare in Greene County) and others. Red maple swamps are the predominant cover type in Greene County, and as one would expect, there are fewer large wetlands in the Mountaintop area of Greene County than in the Valley. Common wetland classes for New York State are shallow wet marshes, deep wet marshes, shrub swamps, wooded swamps, bogs, wet meadows, seasonally flooded flats, and open water.

Often a natural progression from marshes to swamps, called succession, occurs as water levels and vegetation types change. Both marshes and swamps are found where there is little water movement and vegetation can gain a foothold. As decaying material accumulates, deep marshes are filled in and become shallow marshes. If shrubs begin to grow, the marsh becomes a shrub swamp. If trees then take root, a wooden swamp is developed.

Bogs are found in poorly drained depressions with acid conditions that encourage the growth of sphagnum moss. As the moss dies, it accumulates as peat, rather than decaying, and forms a resilient surface covering part or all of the water. Wet meadows are areas where ground water is close to the surface, keeping the soil saturated throughout the growing season. Seasonally flooded flats are floodplains along streams or rivers where flooding waters can reach a depth of 12 inches or more. The soil remains saturated with surface water visible in spots. Open water from 3 to 10 feet deep can be associated with any of the wetland categories.

I. Flooding

Every community in Greene County has land areas that are subject to flooding. These areas are located adjacent to streams, ponds, lakes and wetlands and are shown in a series of maps prepared for each community by the US Federal Emergency Management Agency. These maps show Flood Prone Areas - those lands likely to be inundated during periods of high water.

Throughout Greene County, a great deal of development has occurred in the floodplains. This is because the land in these areas is usually level and water resources here are abundant. While we now recognize that the floodplain is better suited to such uses as pasture, recreation, and wildlife management, it is important to protect the homes and businesses currently located in the floodplain. The National Flood Insurance Program helps protect existing development while assuring that future development is compatible with the flooding that we can anticipate.

National Flood Insurance Program

Inaugurated in 1968 and broadened in 1969 and 1973, the National Flood Insurance Program is a comprehensive approach to flood damage protection. It enables individual property owners in flood prone areas to acquire flood insurance coverage at affordable rates. At the same time, it requires that communities with designated flood prone areas adopt floodplain management measures to protect against the devastation of future flooding. To be eligible for this federally subsidized insurance protection, the community in which an individual resides must apply to the federal government and meet minimum requirements to participate in the program.

Such requirements include limiting development in the flood plain and requiring all new construction to be built above the scientifically determined 100-year flood level. The regulations are designed not only to protect those in danger of being flooded, but also to prevent an increase in damages by limiting future construction.

As soon as a community completes the requirements for entry in the program, residents can buy policies at 90% subsidized premium costs. The Federal Insurance Agency, meanwhile, conducts a detailed flood risk study of the areas to determine actuarial rates and produce a Flood Insurance Rate Map (FIRM). When the FIRM is complete, the residents may purchase additional coverage at actuarial rates.

Protection under the program extends to damage caused by flooding from the overflow of rivers, streams, lakes, and oceans, from overland runoff, and from mud flows and erosion caused by sudden and violent flooding conditions.

J. Public Lands

Greene County residents are fortunate in having an abundance of public land available for recreation. Developed park facilities, however, are not available at all towns.

State owned lands total over 85,000 acres. Most of this acreage is within the Catskill Park and classified "forever wild" or "forest preserve", meaning very few man-made structures are allowed. Some exceptions include the two state-run campgrounds: North Lake and Devil's Tombstone. Throughout Catskill Park, the State Department of Environmental Conservation maintains a network of hiking trails, covering almost all of the higher peaks (there are 18 mountains over 3,500 ft. elevation in Greene County).

The Hudson River has become a desirable recreation area since water quality has improved, especially considering the limited presence of large water bodies in the Catskill Region. Local officials are recognizing that to utilize the potential of the Hudson River, land holdings must be obtained now, or private interests will exclusively control access to this resource.

The State maintains two public boat-launching areas on the Hudson River in Greene County; one in Athens and one in Coxsackie. The NYS Office of Parks, Recreation and Historic Places (NYS OPRHP) has jurisdiction over several Hudson River islands in Greene County, including the Middle Ground Flats (between Athens and Hudson). In 1979, NYS OPRHP began taking action to remove squatter's huts and to develop the islands as primitive parks. Roger's Island located under the Rip Van Winkle Bridge is under the jurisdiction of the NYS Department of Environmental Conservation. Finally, the NYS Department of Environmental Conservation has acquired many miles of public fishing easements along larger creeks.

Greene County owns some land with great potential for recreational use. The old County Farm Property in Cairo consists of 130 acres adjacent to a wild trout stream. Portions of this property have been developed as a Town Park for Cairo and other portions are used for county office space. In the Maplecrest area in the

Town of Windham, the 127-acre Batavia Kill Watershed project has been developed as a recreational area centered on a 26-acre lake.

Recommendations have been made in the past to preserve the many unique scenic areas throughout the county. Local municipalities usually have several holdings for public buildings and park sites, in various stages of development. Interested parties should contact the local Town Clerk for further information.

Some private environmental organizations also have preserves in Greene County that are open to the public. For example, the National Audubon Society owns the Livingston Marsh, a 260-acre wetlands area adjacent to the Hudson River in the Town of Catskill. The Catskill Center for Conservation and Development owns and manages the 208-acre Platte Clove Preserve in the Town of Hunter. The Catskill Center maintains hiking trails to the 60-foot Plattekill Falls and connections to state owned land and the Long Path. There is also a cabin where the Catskill Center hosts an Artist-in-Residence program.

Unfortunately, many areas open to the public suffer from littering, illegal camping and overuse. Private lands are not exempt from this abuse either, which has led too more private lands being posted.

K. Wildlife Habitat

Wildlife Habitat in Greene County

Contributed by Karen Strong, Hudson River Estuary Program, NYS DEC and Cornell University

All pictures courtesy New York Natural Heritage Program

Greene County has abundant biological resources that contribute to its rural character. Catskill forests, eastern cliffs, and the Hudson River coastline harbor plants, animals, and habitats are unique in New York State due to their rarity and quality. The natural features of Greene County are most remarkable due to the many high quality, intact forest, wetlands, and fields. Pristine headwater streams and large contiguous forests contribute to recreational opportunities for tourists and residents as well as scenic and aesthetic value. Low density of development has allowed these systems that contribute regionally to recreation and as habitat.

Healthy forests, wetlands, and fields provide many benefits to human communities, and are a result of species interacting with the non-living environment. The production of oxygen, control of erosion, protection of groundwater resources, filtration of water supply, and formation of soil are a few examples. These are things people value, yet nature provides for free. Development sited without consideration of the natural systems that provide these valuable services may interfere with the continuation of these natural processes. In addition, individual plants and animals are significant due to their rarity or recreational and economic value.

To protect nature with open space, you need to protect the land that is needed for the species and ecological communities to thrive. This entails knowing where the key habitat is (mapping) and what is needed to allow the habitat to persist (ecology).

1. Open Space Planning and Conservation of Wildlife Habitat

Open space plan implementation is an important part of county and municipal wildlife conservation, since it protects intact habitats. Each habitat is home to hundreds of species and habitat protection is essential to protecting the species that live there and the services the habitat may provide, such as clean air and water.

Poorly planned development fragments habitat. When already small parcels of land are further separated by development, they become too small to support the complex interactions of organisms required to maintain it. Retaining larger pieces of undeveloped lands is important for reducing fragmentation and maintaining habitat connections. For this reason, protecting important habitat in open space networks is a key step in protecting wildlife.

Protecting nature/wildlife with open space is often consistent with other open space planning goals. However, certain species and habitats are very sensitive to disturbance and some recreation goals may be incompatible in those areas. Once the natural resources in protected areas are identified and prioritized by the community, the most sensitive areas can be protected from disturbance.

Open space is only one element of protecting biodiversity in communities, though it may be the most important. Other considerations that should be part of a biodiversity conservation plan are

comprehensive or master planning that considers natural resources, compatible zoning and subdivision regulations, best management practices for storm water and wastewater, natural landscaping, and managing land for natural habitats. Resources to help communities develop a comprehensive biodiversity conservation plan include the *Biodiversity Assessment Manual for the Hudson River Estuary Corridor* (Kiviat and Stevens 2001) and *Protecting Nature in Your Community* (Navota and Dreher 2000).

2. The Plants, Animals and Habitats of Greene County

Greene County is 92% forested, the primary types are either sugar maple-beech and evergreen – northern hardwood. Only 2% of the county is human influenced habitat, including suburban and urban development, golf course, lawn and roads. Of the rest, herb-dominated abandoned fields, non-forested wetlands, croplands and pastures make up 3% and shrub-swamps are 1%. Species diversity is relatively high in Greene County. A study by the US Geological Survey and Cornell University predicted 25 amphibian species, 23 reptile species, 56 mammal species, and 158 bird species. Greene is expected to have the most mammal species of any county in the Hudson River Valley and is among the most diverse for birds.

3. Animals

Aside from the aesthetic values they provide, many game species of wildlife also provide economic benefits in the form of meat for the table, and through moneys brought in by hunters, both in the form of license fees and through the purchase of local goods and services at a slack time of the county's tourist industry. The Whitetail Deer is, of course, the number one species when considering economic impact, both positive and negative. Since they are so common, deer often are a nuisance to farmers and annually cause many thousands of dollars of damage due to automobile collisions.

The New York State Department of Environmental Conservation (DEC) keeps close tabs on the deer take, which in 2001 included 1,340 bucks and a total of 2,343 deer for Greene County. This figure does not include the many deer killed by cars, dogs, and illegal kills.

The Black Bear is another species that arouses considerable interest. Harvest of bears has fluctuated over the last several years as the DEC has been trying to manage the bear population with the objective of a stabilized population at higher levels. It is estimated that the current northern Catskill Bear population (Ulster and Greene Counties) consists of approximately 300 individuals. The primary bear range is in the western, mountainous half of Greene County. Unlike bears often seen at garbage dumps and parks in other areas, Catskill Bears are extremely wary and keep to the more remote sections. During the 2001 hunting season, 40 bears were taken in Greene County.

Several other mammalian species are of special interest. The Muskrat, Beaver, Raccoon, Mink, Fox, Bobcat, and other furbearers are a source of income for many county residents who trap. The Coyote, a rarity only a few years ago, is becoming increasingly common. A trap and transfer program has recently successfully reintroduced the Fisher to the mountain areas.

It would be hard to pick out only a few bird species found in the county to discuss. However, the game species again have economic benefits. The major game bird species found in Greene County include the Ruffed Grouse, Ring-necked Pheasant, Ducks and Geese, Woodcock, and Wild Turkey. The Wild Turkey has shown a tremendous comeback in our area in recent years, progressing easterly from earlier establishment on the mountaintop.

Several rare and endangered species utilize some of Greene County's habitat. The Bald Eagle has been sighted almost every month of the year feeding along the Schoharie Reservoir, along with the rare Osprey or Fish Hawk. Both species are sometimes seen migrating along the Hudson River, and the Osprey along some of the large creeks. The Bicknell Thrush is known to breed in certain areas of the Catskill Mountains.

Trout fishing is the primary stream fishery resource in Greene County, with a large percentage of the trout being "stream-bred," as opposed to stocked trout that are artificially propagated in state-owned hatcheries. The only native trout, the Brook Trout, has been displaced in dominance by the non-native Brown and Rainbow Trout, which can tolerate warmer and less clean waters. The native Bookie is now found only in headwater streams which remain unpolluted, unless they are artificially stocked elsewhere.

In addition to trout, limited fishing opportunities exist for bass, panfish and other species in lakes, ponds, and the lower reaches of the larger creeks. There is also a unique high quality Walleye Fishery in the Schoharie Reservoir. The Hudson River formerly supported fisheries of a magnitude that would make all of the above seem inconsequential, consisting primarily of Striped Bass, Shad, Atlantic and Shortnose Sturgeon, Carp and other. Industrial and domestic sewage pollution caused a decline in fisheries.

4. Habitats

The New York Natural Heritage Program (NYNHP) is a joint program of the New York State Department of Environmental Conservation and The Nature Conservancy. NYNHP maps rare plant and animal species statewide, as well as ecological communities that are either rare or of exceptional quality when compared to other examples around the state. Information from the New York Natural Heritage Program shows that Greene County has three main areas of biological concentration: Catskill forests, Hudson River coastal habitats, and the Cliff and Talus communities of the Potic Mountain Ridge and along the Hans Vosen Kill and Austin Glen. The map shows only ecological communities and wildlife concentration areas and not species, due to the sensitive nature of some rare species locations. Recent efforts of the Greene County IDA, GC Soil and Water Conservation District and others have shown that areas in eastern Greene are significant for Grassland bird habitats.

The Catskills: Southwest and Central Greene

Greene County's portion of the Catskills is home to some of the highest quality forest community and forest interior species in the state. Eight different types of forest are found here depending on elevation, moisture, and the direction the slope is facing. Throughout the Catskills, the primary forest is Beech - Maple and Hemlock-Northern Hardwood. Beech maple occurs on valleys and slopes and Hemlock-Northern Hardwood can be found on cool ravines and steep slopes. Smaller patches of other forest types can be found throughout. On the high peaks, one can find mountain fir forest and mountain spruce fir forest, the habitat for the rare Bicknell's Thrush. Much of this area is protected as state forest preserve.

Cliff Communities

The significant cliff communities are part of larger complex of Hudson Valley Limestone and Shale Ridges that extends south into Ulster and north into Albany County as the Helderberg Escarpment. The cliffs are very long, narrow features that consist of cliff communities, floodplain forest, and rocky woodlands. Because most of the bedrock in this area is limestone, many rare species, especially plants, are found here. The significant cliff communities in Greene County are found on Potic Mountain, and along the Hans Vosen Kill and Austin Glen on Catskill Creek.

Greene County Grasslands

Grassland habitats in eastern Greene County are significant as habitat for the NYS threatened Northern Harrier as well as other at-risk bird species. The area of focus is the new Greene County IDA site for which a management plan has been developed. This management plan can be used as a guidance document for protecting open space in that area for long-term protection of grassland bird habitat in Greene County.

Hudson River Coastal Habitats

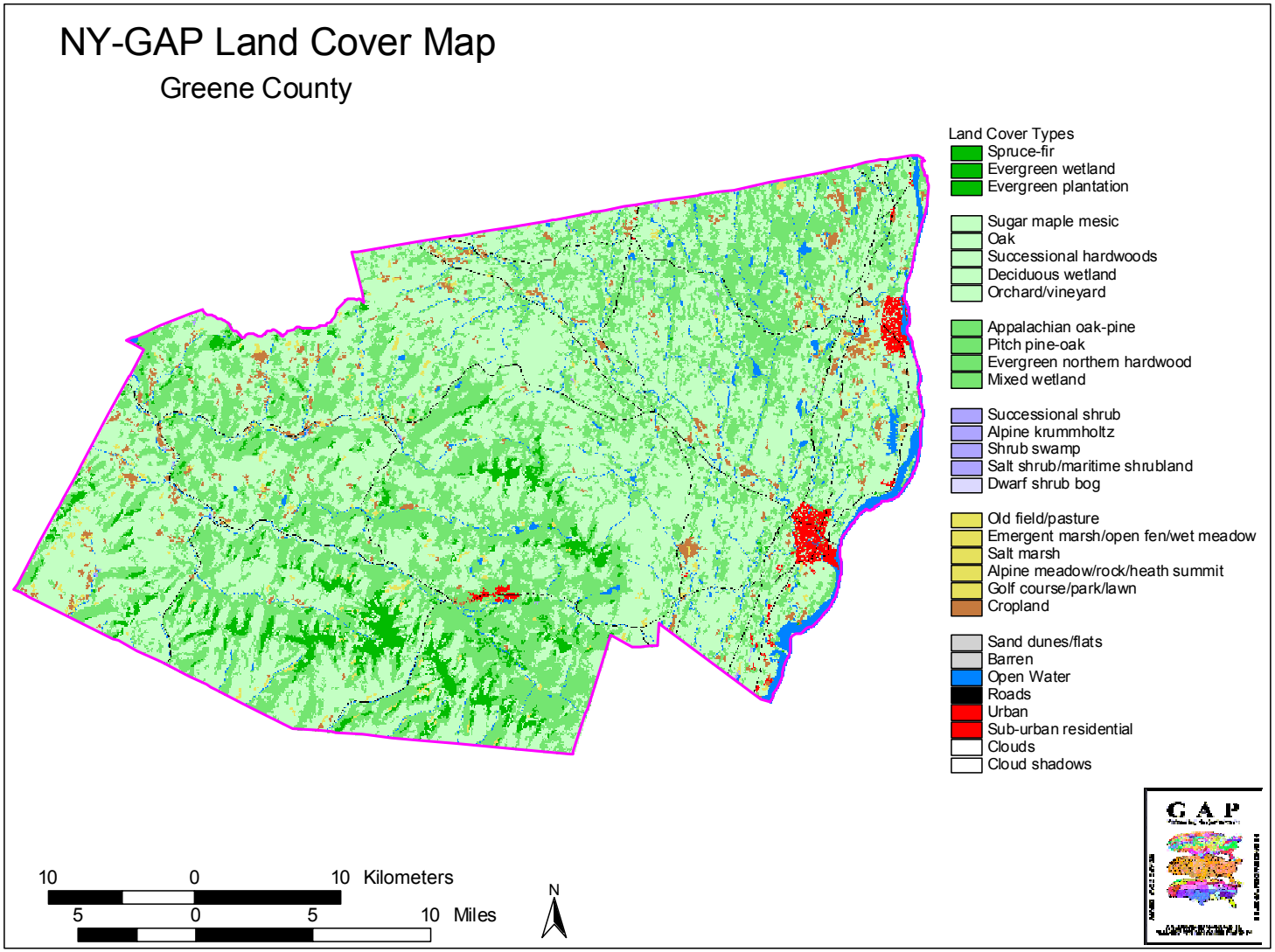
Eastern Greene County, bordered by the tidal Hudson River has a number of significant species and habitats. There are freshwater tidal marshes that harbor the Hudson River water nymph, the only place it occurs in the world. Marshes also are home to Least Bitterns, a threatened species in New York State. Andromadous fish, which are those that are born in rivers, mature in the ocean, and return to the river to spawn, congregate in the Hudson along Greene County's shore.

Hudson River Habitat

Also found along the shoreline in the water are large beds on submerged aquatic vegetation, or SAV. SAV is critical for the support of the aquatic ecosystem and grows in the shallow areas of lakes, oceans and estuaries and provides habitat and food for larval and adult fish, waterfowl, and the invertebrate species that feed them. Protecting open spaces and marshes along the estuaries and limiting disturbance of SAV beds when boating will help support the aquatic ecosystem.

Table 1. Land Cover in Greene County, 1993.

LAND COVER TYPE	AREA IN ACRES	PERCENT OF GREENE
Spruce-fir	2241.97	3.29
Evergreen wetland	69.70	0.10
Evergreen plantation	242.75	0.36
Sugar maple-mesic	25466.62	37.38
Oak	10294.09	15.11
Successional hardwoods	3.49	0.01
Deciduous wetland	842.83	1.24
Appalachian oak-pine	3159.07	4.64
Evergreen-northern hardwood	20354.44	29.88
Successional shrub	0.50	0.00
Shrub swamp	58.32	0.09
Old field/pasture	438.55	0.64
Emergent marsh/open fen/wet meadow	162.65	0.24
Cropland	1451.95	2.13
Open water	2126.84	3.12
Roads	555.08	0.81
Urban	539.24	0.79
Suburban/residential	81.90	0.12
Golf course/park/lawn	0.04	0.05


NY-GAP Land Cover Map
Greene County
Land Cover Types
Spruce-fir
Evergreen wetland
Evergreen plantation
Sugar maple mesic
Oak
Successional hardwoods
Deciduous wetland
Orchard/vineyard
Appalachian oak-pine
Pitch pine-oak
Evergreen northern hardwood
Mixed wetland
Successional shrub
Alpine krummholtz
Shrub swamp
Salt shrub/maritime shrubland
Dwarf shrub bog
Old field/pasture
Emergent marsh/open fen/wet meadow
Salt marsh
Alpine meadow/rock/heath summit
Golf course/park/lawn
Cropland
Sand dunes/flats
Barren
Open Water
Roads
Urban
Sub-urban residential
Clouds
Cloud shadows
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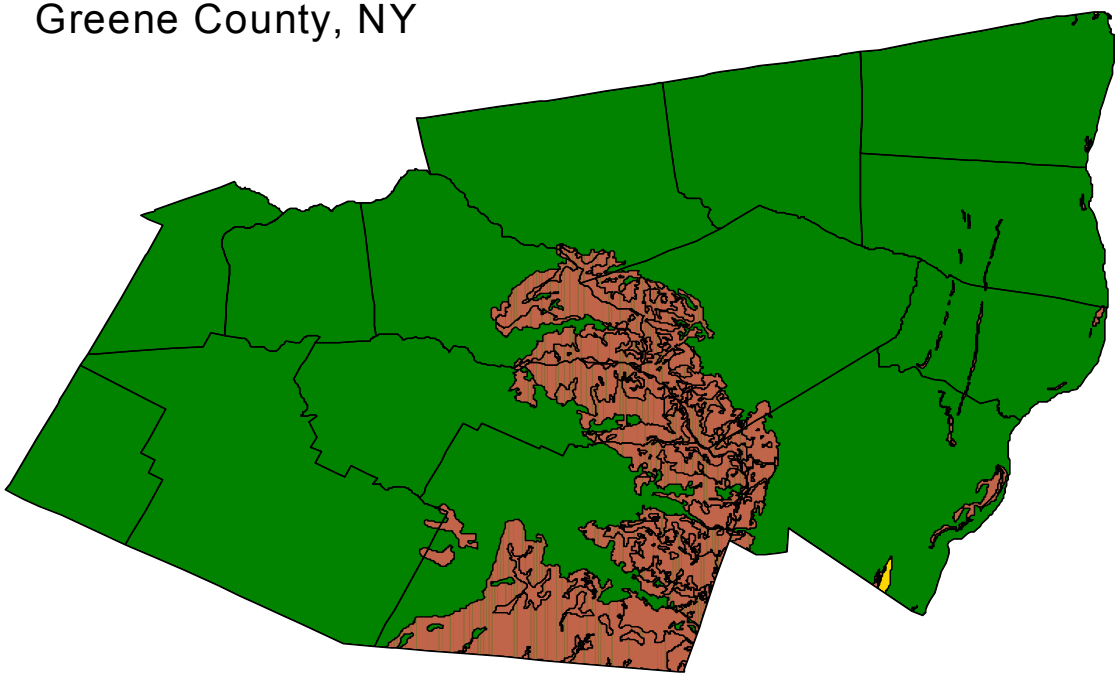
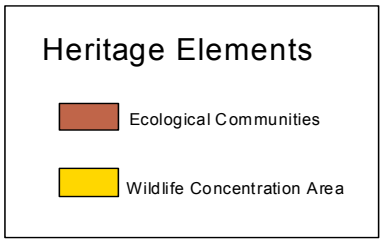
GAP

New York Natural Heritage Program

Ecological Communities
Wildlife Concentraition Areas
Greene County, NY





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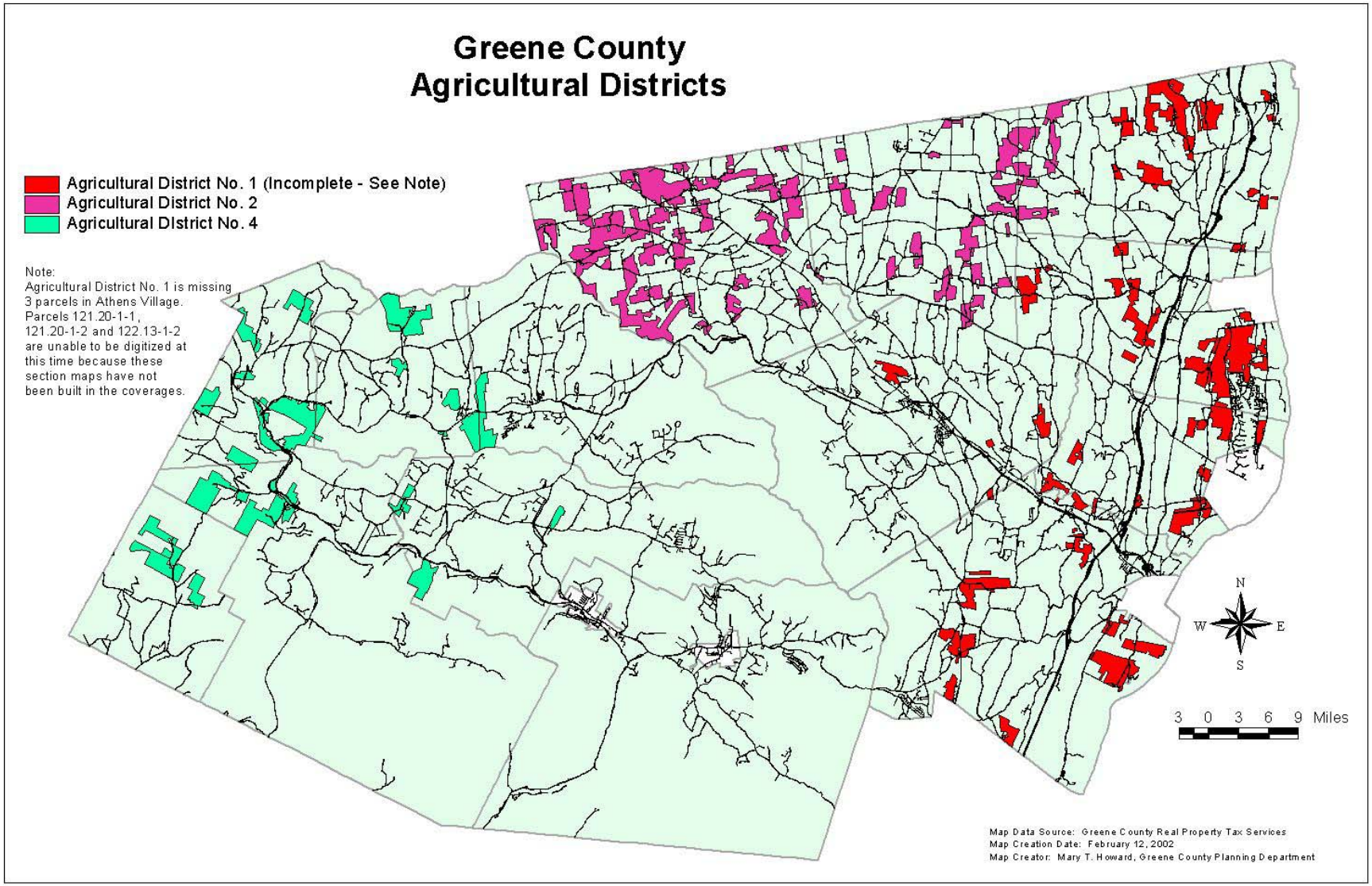
L. Agriculture

Agriculture plays a significant role in Greene County. The economic impact generated from its total of 242 full and part-time farms and 48,770 acres of farmland is more than $8.7million per year. Since 1992 the number of full-time farms has increased 9% to 114 with over 48,000 acres total, an increase of 6%. Greene County has managed to resist the statewide and national trend of reducing full-time farming. By continuing standard dairy, poultry, horticultural, vegetable and beef cattle production, the county's farmers are maintaining many family farms. Much of the recent growth in the industry can be attributed to the increase of niche markets, which are expected to expand further in the next decade. The Northern Catskills have become an internationally renowned area for ginseng production. Elks, emus, llamas, and alpacas are now being produced locally. Grass based agriculture and woodland production are also on the rise.

The rapid rate of population growth that Greene County has experienced over these past three decades has placed tremendous pressure on its agricultural industry. Developing a plan of action to sustain this important industry and land use is vital to its future viability. The Greene County Agricultural and Farmland Protection Board developed the Agricultural and Farmland Protection Plan as a result of much discussion and careful consideration. The end result is an action-oriented plan of work that meets the specific needs of Greene County through outreach, education, and important agricultural development and farmland protection components.

The Agricultural Districts Law, enacted in 1971, provides a procedure for the creation of "agricultural districts" which serve to identify specific land as a viable segment of the State's economy and as an environmental resource of major importance. The law is aimed at preserving and enhancing our agricultural industry by both limiting governmental interference in such areas and by providing special tax benefits for agricultural land.

There are currently three Agricultural Districts in Greene County, totaling 30,073 acres or roughly three-fourths of the farmland in the County. Once agricultural land is lost to secondary growth or development, it is difficult and costly to later reclaim for farmland activity. The loss of farmlands also means the loss of open space, and associated agribusinesses, which depend on farming for their existence.



Map from the Greene County Agricultural Development and Farmland Protection Plan, 2002.

III. Scenic Resources, Scenic Areas of Statewide Significance and Scenic Byways and Roads

A. Scenic Resources

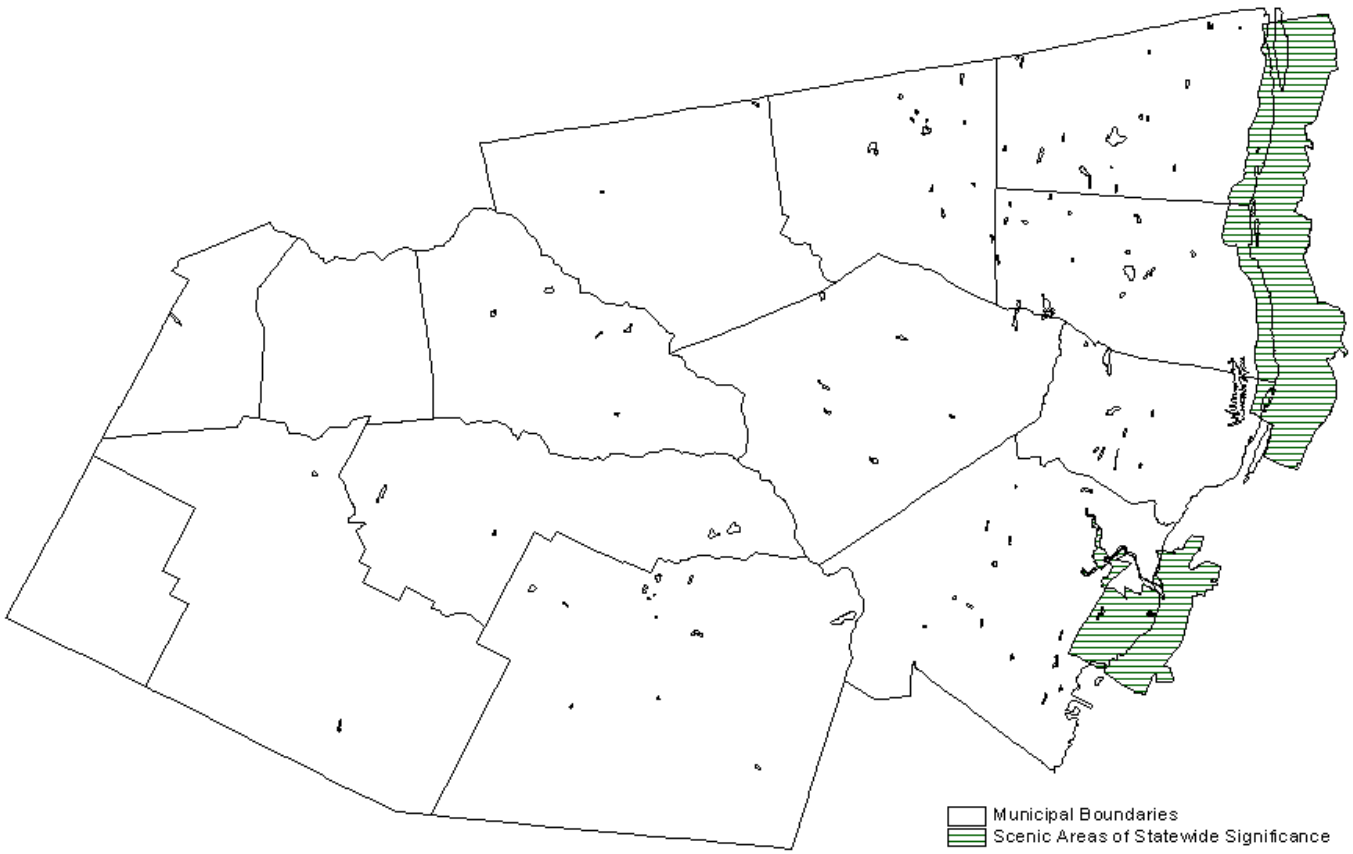
Since Henry Hudson's crew stepped ashore at Athens, the landscape of Greene County has undergone many changes. Timber has been cut, fields plowed and later covered with second growth forest. Settlements have been built and commerce and industry established.

Yet there remain many instances where the character of the landscape has changed little, and other areas where evidence of people's use of the land fits into the scene nicely. The scenic resources includes all the elements that make up the environment, the buildings, trees, hills, water. Woven together, they comprise the fabric of the visual environment. Their variety adds to the interest and quality of daily life. Careful consideration must be undertaken by each community to insure the preservation of these unique and treasured views that they may continue to provide beauty, peace and inspiration to future generations.

B. Scenic Areas of Statewide Significance

Scenic Areas of Statewide Significance (SASS) in Greene County include Columbia-Greene and Catskill-Olana (see map on page 35). These areas are designated by New York State based upon their quality, uniqueness, public accessibility and public recognition as part of the coastal resources of New York State. Any projects initiated by the state or federal government must follow guidelines such as:

- Sitting structures and other development such as highways, power lines, and signs, back from shorelines or in other inconspicuous locations to maintain the attractive quality of the shoreline and to retain views to and from the shore; and
- Clustering or orienting structures to retain views, save open space and provide visual organization to a development.



Greene County
Scenic Areas of Statewide Significance

Additionally, any local projects that require review through the State Environmental Quality Review Act (SEQRA), must consider if a significant negative impact may threaten the SASS by implementing the projects.

C. Scenic Roads and Byways

Greene County contains almost 50 miles of state designated Scenic Roads. These were automatically designated Scenic Byways when the state Department of Transportation became responsible for the development of the Scenic Byways program. Scenic Byways are representative of the region's cultural, scenic or historical resources.

On Greene County's Scenic Byways, one can see the views of the Hudson River to the east and the Catskill Mountains to the west along NYS 385 from the Village of Catskill north to the Town of Coxsackie, the green hills of Durham reminiscent of Ireland, the rugged mountain lanes that follow the hollows in Hunter.

IV. Existing State Recreational Opportunities

State facilities in Greene County include: (1) 78,845 acres of Forest Preserve; (2) 21 miles of Fishing Rights along sections of the West Kill, Schoharie Creek, East Kill, Batavia Kill, Catskill Creek and Ten Mile Creek; (3) 115 miles of Hiking Trails, with lean-to's at various locations on the hiking trails; (4) 11 miles of Horse Trails; (5) 18 miles of Snowmobile Trails; (6) 16 miles of cross country ski trails; (7) 2 Boat Launching Sites at Athens and Coxsackie; and (8) 2 Public Campgrounds at North Lake and Devil's Tombstone in the Town of Hunter; (9) Roadside parking areas with picnic tables at several locations on Route 23A in the western part of the County.

A. Catskill Park and Catskill Forest Preserve

The Catskill Park is a 700,000-acre geographic region encompassing the most mountainous tracts of both public and private land in Ulster, Greene, Delaware, and Sullivan Counties. Created in 1885, it was one of the earliest attempts at land preservation in the United States.

The Catskill Forest Preserve is the public land within the Catskill Park. The 1885 legislation directed that the Forest Preserve "be forever kept as wild forest lands". In 1894, an amendment to the New York State Constitution gave further direction that the Forest Preserve lands, "shall not be leased, sold or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed." This mandate, under Article XIV of the State Constitution, assures lasting protection for Forest Preserve lands; it also limits the degree to which these areas can be used and developed, since all development here must fit within the framework of these constitutional protections.

Since 1885, the Catskill Forest Preserve has grown from 34,000 acres to over 280,000 acres. It serves as watershed, wild land recreation area and ecological and scenic reserve. Forest Preserve lands have been classified according to their characteristics and capacity to withstand use as follows:

1. Wilderness

Wilderness is defined as an area of state land or water having a primeval character without significant improvements or permanent human habitation. Wilderness has been affected primarily by the forces of nature and is generally free of the imprint of man. Management of wilderness area seeks to preserve, enhance and restore, where necessary, its natural conditions.

Wilderness areas provide opportunities for solitude and a primitive and unconfined type of recreation. Four such wilderness areas have been designated in the Catskill Preserve encompassing 118,000 acres. Two of these wilderness areas, encompassing more than 37,000 acres, are located in Greene County.

2. Wild Forest

A Wild Forest is an area where the resources permit a somewhat higher degree of public use than in wilderness, while retaining an essential wild character. A Wild Forest may lack the sense of remoteness common to Wilderness Areas while offering a wider variety of recreational opportunities. The Department of Environmental Conservation has designated 18 Wild Forest Management Units in the Catskill Forest Preserve totaling nearly 158,000 acres. Six of these Wild Forest areas, totaling 33,990 acres, are located in Greene County.

3. Intensive Use Areas

These are areas where the State provides facilities for intensive forms of outdoor recreation. Less than 2% of the Catskill Forest Preserve has been designated as intensive use. Two intensive use areas are located in Greene County: Devil's Tombstone and North-South Lake.

Devil's Tombstone consists of 160 acres, and includes 24 campsites, capacity for 276 picnickers and hiking trails; North-South Lake consists of 600 acres, and includes 219 campsites, capacity for 1,596 campers and picnickers, swimming with bath house and life guards, boat and canoe rental and launching facilities, and hiking trails.

Hiking, camping, hunting and fishing are among the more popular of the many outdoor recreational activities on Catskill Forest Preserve lands within the Catskill Park. The park is also appropriate for eco-tourism, environmental education, and interpretation. Guidelines for the protection and use of the Catskill Forest Preserve are contained in the Catskill Park State Land Master Plan. In addition, Unit Management Plans direct management activities within the Catskill Forest Preserve.

B. Other State Lands and Facilities in Greene County (Outside the Catskill Park)

The State maintains public boat launches in Athens and Coxsackie and has forest preserve lands in the Towns of New Baltimore and Coxsackie and unattached areas of wild forest scattered outside of the Catskill Park. Other lands maintained by the State include wildlife management units in Athens and Catskill and reforestation areas in the Towns of Athens and Windham.

In addition, New York State maintains a scenic parking area (Five State Lookout) on State Route 23, in East Windham. The parking area provides views of the Hudson River Valley and five states. And in the Village of Catskill, the NYS Bridge Authority owns and maintains the Rip Van Winkle Bridge Park. The bluff-top park is well kept, with terraces high above the Hudson and a sweeping view of the river and opposite shore.

V. Existing County Recreational Opportunities

Several Greene County agencies provide recreational sites as listed below:

<u>Town of Athens</u>	
Cohotate Preserve	County-owned facility. 52-acre site located along Hudson River, off NYS Route 385 includes the Columbia-Greene Community College Hudson River Environmental Field Station. Managed by the Greene County Soil and Water Conservation District there are trails, scenic views, and interpretive signs. Some scheduled events in season.
Green Lake	County-owned facility. Includes boat launch and docking facilities
<u>Village of Catskill</u>	
Catskill Point Park	County-owned facility includes promenade along Hudson River and Catskill Creek. Historic Freightmaster's building serves as interpretive center. Warehouse is used for events and as a farmers' market in the summer.
RamsHorn-Livingston Sanctuary	Sanctuary that encompasses 480 acres of the Hudson River's largest tidal swamp forest and is an important feeding area for heron, waterfowl and migratory birds. It is a breeding ground and nursery for American shad and bass. More than three and a half miles of trails. Twenty-eight-foot wildlife observation tower. Canoe launch to the river Canoe/kayak access to the sanctuary is by way of the RamsHorn Creek that connects to the Hudson River. Co-owned by Scenic Hudson Land Trust and the National Audubon Society.
<u>Town of Coxsackie</u>	
Four Mile Point Preserve	7.5 acre nature preserve and public park located along Hudson River on Four Mile Point Road. Is open to the public from dawn to dusk and includes a parking area, a small beach, an upland pond and wetland, trails, scenic overlooks and a picnic area. Canoe launch. Owned by Scenic Hudson and managed by the Town of Coxsackie.

VI. Existing Municipal Recreational Opportunities

Village of Athens	
Athens Riverfront Park	1-acre park on the Hudson River at the foot of Second Street featuring the newly restored village of Athens dock. Includes picnic tables, benches, and docking facilities for boats. The park provides views south to the Rip Van Winkle Bridge, north to the end of Middle Ground Flats, and east to the Flats, parts of Hudson, Mount Merino and the Hudson-Athens Lighthouse. Band concerts and the Athens Street Festival are held here in the summer. Restoration of adjacent ferry slip has been proposed.
Village Greene Park	1.6 acres. Includes 1 basketball court and 1 little league field.
Isabelle Rainey Park	14.6-acre park. North of NYS boat launch, featuring a ball field, nature trail, observation deck, and picnic tables. A skating rink is maintained at the park in the winter. Between the ball field and the river lie state-protected wetlands. Site of former landfill.
Union Street Park	8.9-acre park along Union Street with pond and nature trail. Includes pavilion and picnic tables. Adjacent to Sleepy Hollow development.
South Franklin Street Park	A small triangular shaped park located at the end of South Franklin Street has a bench and provides a view of the Hudson-Athens Lighthouse, Mount Merino and the Rip Van Winkle Bridge. The park is a memorial to veterans of the World Wars.
Fourth Street Informal Boat Launch	Located at the foot of Fourth Street, this is an unimproved area owned by the Village of Athens. The Village was awarded funds in 2002 to improve the launch site as part of the Water Trails program by the Hudson River Greenway. No parking available as of this printing.
Athens Elementary School	2 lighted tennis courts, 2 softball fields, playground, and small gym. Application and approval is required to use facilities. Payment of custodian's fee may be required in certain cases.
Athens Ferry Slip	Historic ferry slip adjacent to riverfront park. The Athens-Hudson ferry, which operated until 1947, used the ferry slip. Restoration of the ferry slip has been proposed.

Town of Cairo	
Angelo Canna Town Park	32.9-acre park includes recreational facilities and a scenic walking trail. Activities here include annual Corvette show, Cairo Appreciation Day, apple festival, little league, soccer, Pop Warner Football, Greene County Youth Fair, and summer recreation program.
Village of Catskill	
Dutchman's Landing Park	18.6-acre riverfront park. Large picnic area, bathroom facilities, tables benches. Village boat ramp and docks located here. Waterfront hiking trail extends to Beattie Powers House and Harrison Street.
Elliott Park	Lighted ball diamond used by little league and men's softball league; additional field area used for ball playing, ice skating area; apparatus area; pavilion; toilets and washrooms
Village of Coxsackie	
Coxsackie Riverfront Park	Riverfront Park includes grills and picnic tables, a State Boat Launch, and a Village dock and gazebo. The Park is the site of summer concerts and arts festivals. Adjacent to Riverfront Park is a half-acre of Village owned and managed parkland. This area includes children's play equipment and a basketball court. Additional village owned property is owned upstream; potential beach area.
Veteran's Memorial Park	Small park with benches at corner of Ely and Washington Streets.
McQuade Park	13.5 acres park along Mansion Street; small pavilion, lighted skating rink; basketball court; picnic tables; tennis court, ball field, soccer field, summer program for children. Community Playground.
Firemen's Park	A small park in West Coxsackie along Mansion Street.
Town of Durham	
Brandow Memorial Park	Pavilion, picnic tables, tennis court, basketball court, baseball field, children's play area.

Town of Greenville	
Norton Hill Park	Park on Rt. 81 and New Ridge Road. Includes basketball court and swing and slide set along side of pond.
Veteran's Memorial Park	At the intersection of SR 81 ands SR 32. Includes pond, gazebo, park benches and table.
G.V. Vanderbilt Park	156.6-acre park on SR 32. Includes ball field, soccer field hiking trails (1.5 miles), preserved wood lot, playground, and picnic tables.
Town of Hunter	
Clum Hill Road Trail	Three-mile multi-use path from Clum Hill Road near Cortina Valley Ski Center to Bloomer Road near Tannersville Supply. Follows old rail bed. May eventually extend to North Lake.
Village of Hunter	
Dolan's Lake Park	Swimming area with 75' beach, concession stand, parking lot, rest rooms. Also includes open-air pavilion with kitchen, rest rooms, picnic tables and chairs. Basketball court is located nearby on CR 83.
Village of Tannersville	
Rip Van Winkle Lake Park	18 acre lake, 60 foot beach, 5 acres land adjacent; skating, fishing, non-motorized boating. Day camp in summer.

Town of New Baltimore	
Joseph Wynche Park	Located on NYS Route 144 in the New Baltimore Hamlet area. The park has a pavilion, playground, and softball fields.
Cecil B. Halock Park	Located on County Rt. 54 in Hannacroix. Large open field with pavilion to one side and playground in back. Includes two slides, swings and basketball hoop (with no court). Ice skating under pavilion in winter.
Silver Lake Park	Located on Old Kings Road in Medway. Secluded, tree lined park. It has two levels; top with pavilion, utility buildings and porta-john; lower with baseball fields, swings, slides, "jungle gym" and outbuildings.
Cornell Park	Small park with gazebo adjacent to sewage treatment plan offering visual and physical access to the Hudson River.
Hannacroix Park Preserve Hudson River Interpretive Trail	Wetland preserve at northeast corner of New Baltimore near the mouth of Hannacroix Creek. The Town of New Baltimore owns 20 acres. NYS owns another portion of wetland extending to Shady Harbor Marina.
Paper Mill Trail	The Beaverkill Conservancy has recently expanded its holdings in this vicinity to extend public open space along the Hannacroix Creek. There is a trail to falls (Hannacroix Creek) on a former town road.
Town of Prattsville	
Pratt Rock	White painted relief carving, 150 years old. Short climb. Picnic tables and parking. Open year round. State and National Register of Historic Places.
Town of Windham	
Clarence D. Lane Park	Swimming, baseball, children's gym equipment, pavilion, water (canoe and rowboat), restrooms. Picnic tables.

VII. Existing Private Recreational Opportunities

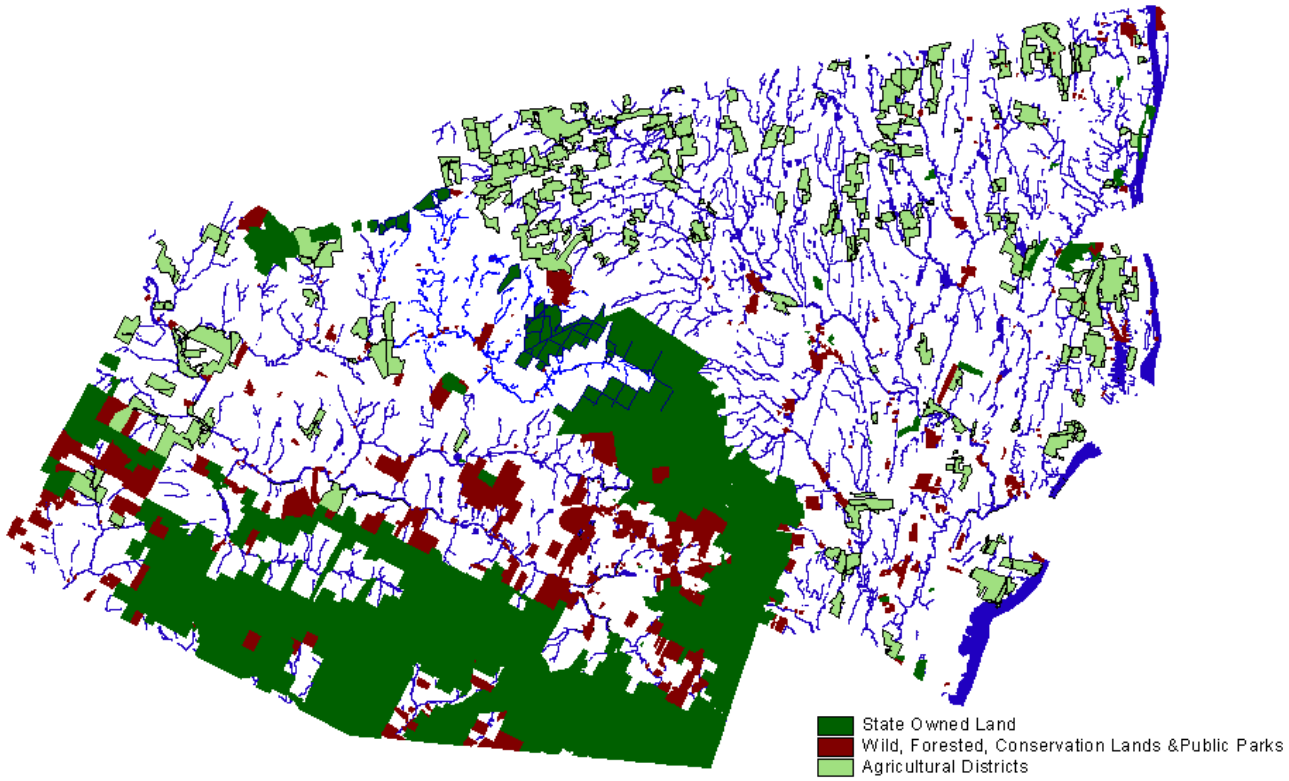
Greene County has a wide range of activities provided by private enterprises. Horseback riding, nordic skiing, cross-country skiing, bicycling and other outdoor sports equipment rentals and guides are available. These and other recreational opportunities in Greene County are listed at the Greene County Promotion website http://www.greene-ny.com with links to many local sites. A list of marinas, with available slips and facilities along the Hudson River is available via a link through NYS DEC's website http://www.cce.cornell.edu/seagrant/marinas/hrmarinas.html.

VIII. Historic & Cultural Resources

RESERVED FOR FUTURE DEVELOPMENT

IX. Existing Open Space Opportunities

Through a combination of state, local, not-for-profit and private agencies a significant portion of Greene County has been set aside as permanent open space. The map on page 45 denotes state or municipally owned properties and privately held wilderness and forest areas. The agricultural districts are not permanently protected but serve as an indicator of available open space. Please note that there are other parcels not shown here that are conserved through conservation easements and not all municipal and state parcels are necessarily protected open space.



Greene County
Overview of Open Space as
Agricultural Districts, Conservation Areas
and Protected Forests

X. Land Conservation Efforts

A. Inventory of Conservation Methods

A variety of methods are available to temporarily or permanently preserve and protect open space. Listed below are some of the most prevalent:

- **Fee Simple Acquisition** –New York State, municipalities or conservation groups can purchase land to be held as open space or recreational lands.

- **Agricultural District Law** – this Law protects lands and farming operations in designated districts through "right to farm" provisions, agricultural assessments, an agricultural notice process, and reparation penalties for conversion of agriculturally assessed land thus protecting a valuable source of open space

- **Donation of Conservation Easements** – Property owners may donate a conservation easement outright to a land trust. Incentives for this include income tax reductions and property tax reductions.

- **Purchase of Development Rights (PDR)** – PDR programs allow landowners to sell the rights to develop their land. This is typically accomplished by recording conservation easements in favor of a county or land trust. The easement is priced on the difference between the value of the land for development and as farmland or vacant land. Funding sources include state and federal purchase of development rights programs, land trusts, the Watershed Agricultural Council and landowner donations with income tax reductions as an incentive. There are many variations of such programs.

- **Lease of Development Rights (LDR)** - This method of open space protection is similar to PDR but involves easement of limited duration. It is a less expensive and less permanent method of protection that is often more economically and politically palatable than PDR. Generally a LDR agreement is paid for in yearly installments or tax reductions for up to 25 years, rather than a lump sum. Also, the total amounts paid are usually much less per acre than those given for the PDRs, sometimes as low as 10% of the PDR value.

- **Transfer of Development Rights (TDR)** – This method involves transfer or trade of development rights from farmland or open land to developable land. It has been used successfully in fast developing regions (e.g. Montgomery County, Maryland) to encourage higher population densities in developed areas and lessen pressure in nearby farmland and open space. However, it is very complex and requires very active real estate markets.

- **Forestry Management Tax Reduction Program (480-a)** – This program is intended to maintain healthy, sustainable forests. Most farms in Greene County have a woodlot segment that, if enrolled and managed properly, could produce better harvests while taxes are lowered though the program. There is a fifty-acre minimum lot size. It can be complex and the penalties are somewhat stringent.

- **New York State Environmental Quality Review (SEQR)** – This is a planning, review and decision-making process set up as part of the Environmental Conservation Law. It is intended to help determine, at the earliest stages through the use of an Environmental Assessment Form (EAP), if a project will have adverse effects on the environment. Impacts on open space, conservation areas and agricultural lands must be considered in the review process and, therefore, SEQR may be considered another from of agricultural protection.

- **Comprehensive Planning and Zoning** Through active planning, a municipality can protect vital open space. Comprehensive plans identify areas that should be protected due to the presence of specific natural resources, scenic attributes, special wildlife habitation or other specific resources. Land is a resource that can be utilized wisely or unwisely.

B. State Agencies

1. New York State Department of Environmental Conservation

The New York State Department of Environmental Conservation has several bureaus, which deal with open space conservation and recreational opportunities. These bureaus include the Division of Land and Forest, Hudson River Estuary Program and the Bureau of Habitat.

The New York State Department of Environmental Conservation's Open Space Conservation Plan (available at http://www.dec.state.ny.us/website/dlf/osp/toc2002.html) contains a comprehensive description of programs and policies that affect the conservation of the State's open space resources, a compilation of major conservation successes accomplished under the plan and a list of priority projects.

In Greene County priorities include: conservation efforts on and around Bearpen, Vly and Roundtop Mountains; protection of the Catskill Escarpment, Hunter Mountain Wild Forest Area; improved access and preservation of the Westkill Wilderness Area and Windham High Peak; protection of the stream banks of the Coxsackie Creek, protection of Hudson River Estuary habitat at Vosburgh Swamp/Four Mile Point; increasing public ownership in Greene County along the Long Path which extends from the Tappan Zee Bridge to John Boyd Thatcher State Park; and protection of NYC Watershed lands.

2. New York State Department of State

The New York State Department of State Division of Coastal Resources has numerous policies in place to protect, enhance and even restore the scenic quality of coastal areas. The entire Hudson River shoreline is included in this program, which seeks to meet the needs of coastal residents and visitors, while striving to advance economic development opportunities and protect our natural coastal resources. For further information including funding resources for planning purposes, contact George Stafford, Director of Coastal Resources, 41 State Street, Albany, NY 12231-0001, E-mail: coastal@dos.state.ny.us, Phone: (518) 474-6000.

C. Conservation Groups

A variety of private, non-profit conservation groups exist in and around Greene County. Below is a short inventory of local, national and international organizations that work to preserve not only open space but working landscapes and areas of historical significance as well.

1. Hudson River Valley Greenway

The state-funded Hudson River Valley Greenway consists of two parts. The Greenway Communities Council works with local communities to improve land use planning efforts. The Greenway

Conservancy for the Hudson River Valley provides funding options and technical assistance to bolster local and regional planning efforts. The Conservancy has served an important role in the expansion of the land and water trails of the Hudson Valley and assisted in the preservation of agricultural lands to protect existing open space. Funding for specific conservation projects typically comes from Clean Water/Clean Air Bond Act grants. More information about the Conservancy's work can be found at www.hudsongreenway.state.ny.us

2. Hudson River Valley National Heritage Area

In 1996 the Hudson River Valley National Heritage Area was established by Congress to recognize, preserve, protect, and interpret the nationally significant historic, cultural and natural resources of the valley for the benefit of the nation. Managed by the Hudson River Valley Greenway, the Heritage Area program promotes stewardship of the historic and natural wonders of the Hudson River Valley.

3. Scenic Hudson

Since its inception in 1966, Scenic Hudson through its affiliate Scenic Hudson Land Trust has preserved over 15,000 acres in the Hudson Valley from development. Scenic Hudson has both preserves and conservation easements along the Hudson River in Greene County. Owners of working agricultural lands or areas of important ecological value can contact the Trust (www.scenichudson.org) to arrange voluntary conservation easements to preserve and protect these important open spaces.

4. Catskill Center for Conservation and Development

The Catskill Center for Conservation and Development (www.catskillcenter.org) also has a Land Conservation program serving the entire Catskill region. In Greene County, the Catskill Center helped protect several properties in the Kaaterskill Clove, including Fawn's Leap; has a conservation easement along the Kaaterskill Creek in Palenville; and has a wilderness preserve and conservation easement in the Platte Clove. In February 2002, the Catskill Center, in partnership with the Durham Valley Land Trust, accepted easements on over 950 acres in Durham along Ginseng Ridge. This easement will protect a scenic farm and forestland as well as a portion of the Long Path, a trail that extends from the George Washington Bridge (New York City) to John Boyd Thatcher Park (Albany County).

5. Other Conservation Groups

There are a number of other groups that will hold conservation easements or take ownership of sensitive or threatened land. The locally based Durham Valley Land Trust and New Baltimore Nature Conservancy are instrumental in protecting unique habitats. The American Farmland Trust works to protect agricultural lands from development and the Land Conservancy is dedicated to protecting land and water resources and enhancing our natural and scenic heritage. Both are national organizations working to promote open space conservation. The Nature Conservancy is an international organization working to save many of the world's most endangered natural sites. Other groups are the Open Space Institute and the Trust for Public Land.

XI. Threats to Conservation

A. Funding

Funding for open space conservation is limited. Organizations are torn between spending funds on small tracts in developed areas or on large tracts that are not yet threatened by development. Efforts are made to conserve areas that are contiguous with other open space parcels to provide corridors for wildlife movement and provide belts of open space. Many non-profit land trusts do not have the funds for acquiring property or conservation easements. They must rely upon donations of property or easements by willing landowners.

B. Low Density Development

From 1992 to 1997, according to the USDA Natural Resource Inventory, more than 11 million acres of rural land was converted to developed use. The US Department of Housing and Urban Development indicated in its *State of the Cities 2000* report that land is being developed at twice the rate that population is increasing. Inadequate planning for development has led to an increase in low density (one dwelling unit per every 1-5 acres) development. Patterns for development may be changed to place quality development in appropriate areas.

Almost 70% of the Greene County Open Space survey respondents were in favor of focusing development and redevelopment towards core downtown areas and to retain the outlying areas of the communities as rural open space. Land use regulations can direct development to certain areas and protect open lands. Regulation alone cannot cure the problems associated with current land use patterns. New development and strong comprehensive plans that are effectively implemented with citizen support can change those patterns.

XII. Recommendations

The recommendations listed below are based upon the results of the Greene County Open Space survey conducted in October 2001 and currently available techniques for open space conservation and recreational area development.

A. Priority Areas for Conservation

Watercourses- From comments received in an Open Space survey in 2001 by the Greene County Planning Department, many Greene County residents would like areas along watercourses maintained as open space. Specific mention was made of protecting the Hudson River shoreline, Catskill Creek and the Kaaterskill as well as Black and Green Lakes. More than 80% of the survey respondents indicated that is was very important to protect or enhance drinking water quality. One respondent combined watercourse protection with bike/pedestrian concerns by suggesting a bike path or trail from Catskill to New Baltimore along the Hudson River. This last proposal is also promoted by the Greenway Conservancy for the Hudson Valley in its trails program.

- Action - Individual property owners can protect watercourses using vegetative borders or buffers around streams, creeks, ponds and lakes. By using these greenbelts, they can protect and improve the natural and scenic resources of these areas, retain ownership of the land and improve water quality. The surrounding vegetation will absorb storm water runoff. Trees will shade the waterways, reducing the water temperature and promoting a healthier environment for fish and sub-aquatic vegetation.

- Action – Individuals can grant recreational easements to various conservation groups or organizations like the Greenway Conservancy to allow trail construction along the Hudson River. Access to the riverfront for hand launching canoes and kayaks can expand the Hudson River Water Trail.

- Action – Municipalities can adopt land use regulations that discourage the placement of buildings and impervious surfaces within several hundred feet of water bodies. Utilizing site plan review and setback requirements, municipalities can protect water resources and the lives and property of their citizens from flood damage.

- Action – Municipalities can adopt land use regulations to protect aquifer recharge areas.

- Action – Municipalities can incorporate consideration of the impact of new construction as related to Scenic Areas of Statewide Significance and Scenic Byways in site plan reviews.

Mountaintops - Protecting mountain top areas such as Big Hollow in Maplecrest and Round Top were suggested as priority areas. These summits have steep slopes, contain sources of numerous creeks, and provide habitat for countless species.

The New York State Department of Environmental Conservation (NYS DEC) has acquired all 18 mountain peaks in Greene County over 3500'. NYS DEC, the New York-New Jersey Trail Conference and other conservation groups are working to provide access to large portions of the Catskill Park.

- Action- Individuals can sell or donate conservation easements to various conservation groups or donate land to NYS DEC.

- Action- Municipalities can adopt land use regulations that discourage the placement of buildings and impervious surfaces on steep slopes and ridges. This will protect peaks, steep slopes and ledges and reduce erosion, sedimentation and loss of habitat.

Historic Sites - The Open Space Survey included many site specific suggestions: the Thomas Cole House, now a National Historic Site; the Bronck House, headquarters of the Greene County Historical Society; St Paul's Lutheran Church; the Catskill Main Street Historical District; Athens Brick Row; the Woodstock Dam in

Cairo; Willow Farms on Route 385 and Flats Island. Several of these areas are already under federal, state or conservation group protection. Other sites listed are privately owned and may be vulnerable to development. Further investigation is needed to determine which sites are most sensitive so conservation groups or municipalities can take action on the sites' behalf. Privately owned sites can be preserved through a variety of methods including the following actions:

- Action - Property owners of historically significant sites can apply for a listing on the County, State and National Registers of Historic Places.

- Action – Property owners can substantially rehabilitate historic homes and receive a tax credit for doing so. A certified historic structure can be eligible for a credit for up to 20% under the Federal Historic Preservation Tax Incentive. For further information, go to http://www.cr.nps.gov/hps/tps/tax/brochure1.htm.

B. Community Planning

Communities can use comprehensive planning and appropriate land use regulations to protect and preserve open spaces. An analysis of natural resources, compatible zoning and subdivision regulations, best management practices for storm water and wastewater, natural landscaping, and managing land for natural habitats can make it easier for a community to identify the unique and valued areas.

The majority of respondents to the Greene County Open Space Survey indicated that the rural atmosphere influenced their decision to move here and continues to influence them to stay here. Affordable housing costs and recreational opportunities also influenced them. Comprehensive planning helps a community determine where development will take place and at what density In environmentally sensitive areas, large lot requirements (15+ acres) combined with clustering of housing, can allow development with minimal impact thus maintaining open fields and woodlands for open space. In an effort to provide affordable housing, more compact development can be encouraged in areas that have water and sewer service, or with well drained soils outside of hazardous or sensitive areas.

- Action - Municipalities can review and revise their comprehensive plans on a regular basis, usually every three to five years. Areas relating to open space can be added or revised to reflect the

community's interest in protecting particular portions of open space and provide guidelines for planning and zoning officials. Greenbelts along watercourses can be designated to include low intensity water-related uses.

- Action - Municipalities can adopt land use regulations that encourage compact development with mixed uses.

C. Land Acquisition Program

Responses to the Greene County Open Space Survey conducted in 2001 indicated strong support for local governments to:

- Require developers to dedicate land for recreational use to the community when their subdivisions are approved.
- Acquire conservation easements by donation.
- Establish a local land acquisition program.

There was an equally strong response indicating that many respondents were unwilling to sell or donate their own land, however, they felt it important to have this opportunity for others. In 2002 alone, residents of eleven municipalities in New York State voted to either approve a bond for land acquisition, purchase of development rights or enact a 2% mortgage tax for land acquisition.

- Action – Municipalities can adopt subdivision regulations that require dedicated open space for public recreational use. This can include areas for active or passive recreation.

- Action – Promote the fact that property owners can sell or donate conservation easements and/or open space parcels to a land trust. This can be publicly, privately or jointly funded. In order to leverage funding from state and federal governmental agencies as well as private philanthropic organizations, a public-private land acquisition program is advised. Targeted areas include riverfront properties, those adjacent to designated Scenic Roads and Byways, floodplains and significant habitats as determined on the Natural Heritage map or other sources.

- Action - Greene County can establish a local land acquisition program for recreational and open space funded by bonds to acquire parcels, a minimal mortgage tax or a combination of both. The funds from a mortgage tax would take some time to build but the land acquired with these funds would be somewhat proportional to any new development in the county.

D. Recreational Areas

Respondents to the Open Space Survey indicated that they were only somewhat satisfied with the opportunities currently available to children to play and recreate. Small children have access to playgrounds in some town, village and hamlet centers or at elementary schools.

- Action - Municipalities can acquire small parcels in areas of denser development and construct playgrounds and parks for the local residents. The initial land acquisition and construction can be funded by the municipality, corporate donations or local fundraising efforts.

- Action – Municipalities can acquire larger parcels for large-scale active recreation (soccer, football, baseball, swimming pool, etc.) and passive recreation in areas targeted for future development.

E. Quality Communities Recommendations

In order to maintain New York's leadership in Open Space Conservation, the New York State Quality Communities Interagency Task Force compiled a number of recommendations to protect environmentally sensitive lands, unique habitats and preserve scenic areas for recreational uses.

The Quality Communities Interagency Task Force's recommendations to state and local governments included:

- *Continue funding of open space protection and stewardship of locally significant open space, significant State open space and farmland protection.* Local governments can work with state agencies and not-for-profit groups to leverage funding for conservation easements and acquisitions.

- *Provide a Conservation Donor Credit to further the conservation goals of the State and its local governments by providing a tax credit to encourage landowners to donate real property or other interests in real property, such as conservation easements to nonprofit organizations or to governmental entities for conservation purposes*. The New York State Legislature would adopt this measure. Provisions must be made for the implementation of this one time tax credit to ensure that the acquisition furthers the conservation goals.

- *Provide an important new open space conservation tool for local governments by authorizing the creation of open space districts*. Voluntary participation by landowners within the district would protect open space areas from development while granting some tax relief to them.

- *Continue and enhance the dedicated funding source for the purchase of development rights (PDRs) on undeveloped lands, including farmland, and study alternative methods of protecting open space, particularly in areas not yet experiencing strong development pressure*. While PDRs are an important method of protecting open space, a survey recently conducted in Greene County showed little support for this method. Less than half of the respondents were interested in PDRs, even if they received the fair market value of the real estate. A related survey for Agricultural and Farmland Protection showed that farmers were more interested in leasing development rights as suggested in the preceding recommendation.

XIII. Appendix

See attached survey results**.**