New York State
Department of Environmental Conservation

Division of Lands & Forests

TRI-COUNTY UPLANDS
UNIT MANAGEMENT PLAN

FINAL

Town(s) of Harford, Richford & Caroline
County(s) of Cortland, Tioga & Tompkins

October 2009

NYS Department of Environmental Conservation
Region 7- Cortland Office
1285 Fisher Ave.
Cortland, NY 13045

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STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK 12233-1010

ALEXANDER B. GRANNIS
COMMISSIONER

NOV 24 2009

MEMORANDUM

TO: The Record

FROM: Alexander B. Grannis

SUBJECT: Final Tri-County Unit Management Plan

DATE:

The unit management plan for Tri-County has been completed. The Plan is consistent with Department policy and procedure, involved public participation and is consistent with the Environmental Conservation Law, Rules and Regulations. The plan includes management objectives for a ten year period and is hereby approved and adopted.

Alexander B. Grannis

NOV 24 2009

Date

Tri-County Uplands
Unit Management Plan

A Unit Management Plan Consisting of Three State Forests Encompassing 3,407 Acres in Northern Tioga, Southeastern Tompkins, and Southwestern Cortland Counties

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Selected Photos of the Unit

Row thinning in a young red pine plantation.

Riparian (special management) zone.

Early successional habitat.

Recently managed high canopy area.

Winter at the Tri-County Pond.
H. Dedrick

Northern red oak - an important wildlife tree.

Preface

It is the policy of the Department of Environmental Conservation (DEC) to manage public lands for multiple benefits and in a sustainable fashion to conserve natural resources and serve our customers, the People of New York State. This Unit Management Plan (UMP) has been developed to strategically guide the management activities on the **State Forests** in the Unit for the next 20 years. The 3,407 acre Tri-County Uplands Unit comprises the Andersen Hill (Tioga No. 4), Potato Hill (Tompkins No. 4), and Robinson Hollow (Tioga No. 3) State Forests which are located near the intersection of Cortland, Tioga, and Tompkins Counties.

An integral part of the Department's planning process is public participation. As such, Department staff seeks public participation throughout the UMP process to insure that all stakeholders have a chance to make their views heard. Public participation adds significant value to the planning process and thereby greatly improves the quality of the final plan. Future management of the property will be guided by this document and the ability of the land resource to produce and sustain a diverse group of **ecosystem*** and recreation services.

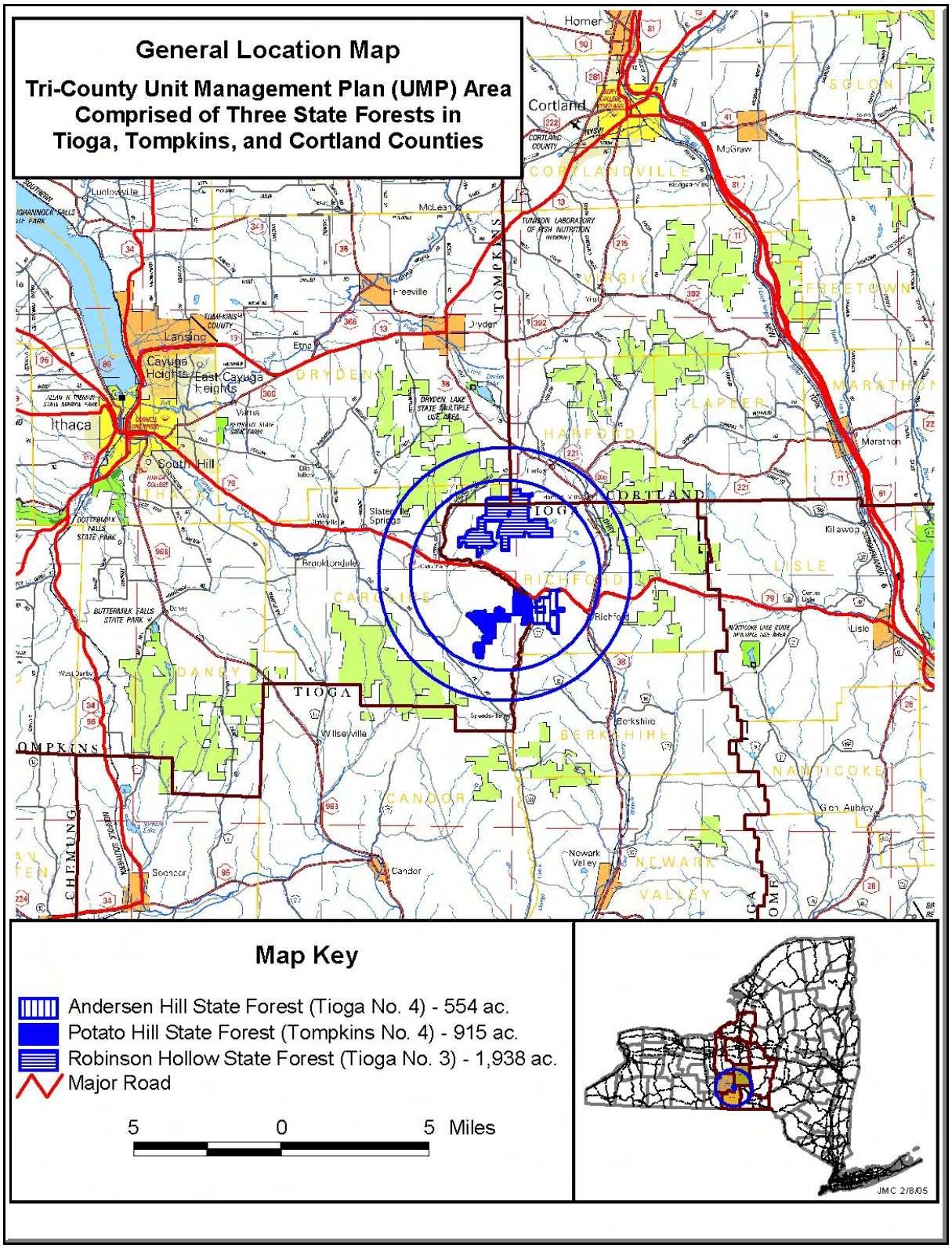
Through this plan, the Unit will continue to provide excellent recreational opportunities such as fishing, hunting, trapping, informal camping, and hiking. The Tri-County Uplands Unit will continue to provide sustainable ecosystem services such as clean water, carbon storage, and nutrient recycling, wildlife **habitat**, and renewable forest products such as **pulpwood**, firewood, and **sawtimber**. In addition, the Unit has the potential to provide oil and gas mineral resources to society. Natural resources provided by the Unit and its landscape add significant economic value by providing jobs and tourism to the region. Of great interest, the Unit and its surrounding landscape provide diverse habitats for more than two hundred birds, mammals, amphibians and reptiles.

Vision Statement

The State Forests in this Unit will be managed to promote biodiversity and ecosystem health while providing recreational opportunities, ecosystem based values and services, economic benefits and a sustainable supply of renewable natural resources for the benefit of the People of the State of New York - now and in the future.

Sustaining biodiversity through **adaptive management** strategies is one of the key goals of the plan. Included with this plan is a detailed list of proposed forest management actions by State Forest and year. The plan establishes core high canopy forest, natural, and **protection areas** for plants, animals and insects that require large blocks of minimally fragmented forest canopies. Additionally, the plan buffers and conserves water resources while creating early successional cover for wildlife species such as woodcock, grouse, song birds, and butterflies. The estimated cost to fully implement the plan's stewardship and land acquisition projects over a twenty (20) year period is $3,006,300.00. It should be noted that some of the projects may be funded through state funds, timber sales, and voluntary contributions of DEC Adopt-A-Natural Resource (AANR) partners and volunteers. However, if resources are limited some of the recommendations may not be implemented.

***** highlighted **(bold)** terms are defined in the glossary.


General Location Map
Tri-County Unit Management Plan (UMP) Area
Comprised of Three State Forests in
Tioga, Tompkins, and Cortland Counties
Homer
Cortland
McGraw
Ludlowville
McLean
Freeville
Dryden
Etna
Lansing
Cayuga Heights
East Cayuga Heights
Ithaca
South Hill
Slaterville Springs
Brooktondale
Kilawog
Marathon
Lisle
Richford
Berkshire
Wilseyville
Speedsville
Spencer
Candor
Newark Valley
Glen Aubrey
TOMPKINS
TIOGA
CORTLAND
DRYDEN
CANDOR
NEWARK VALLEY
NANTICOKE
LISLE
RICHFORD
BERKSHIRE
Map Key
Andersen Hill State Forest (Tioga No. 4) - 554 ac.
Potato Hill State Forest (Tompkins No. 4) - 915 ac.
Robinson Hollow State Forest (Tioga No. 3) - 1,938 ac.
Major Road
5 0 5 Miles
JMC 2/8/05

Green Certification of State Forests

Opportunities exist to sustain and enhance biodiversity and ecosystem health at the landscape level by promoting additional collaboration between state and local governments, private landowners and environmental organizations. Approximately 92% of the landscape surrounding the Unit's landscape is owned by private individuals. As such, the Department should continue to work with rural forestry stakeholders to help make private landowners informed decision makers.

The Tri-County Uplands State Forest Unit is administered locally by the Department of Environmental Conservation, Division of Lands and Forests Office in Cortland, New York, which manages approximately 90,000 acres of public State Forests, Multiple Use and Unique Areas in six Central New York counties. Additionally, Department forestry staff also provides forest stewardship assistance to 1.1 million acres of privately owned forest land and 146 communities in the region.

New York State DEC-Bureau of State Land Management contracted with NSF-International and Scientific Certification Systems to conduct auditing for the purpose of obtaining dual certification under Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) program standards on over 762,000 acres of State Forests in Regions 3 through 9. This independent audit of State Forests was conducted by these auditing firms from May until July 2007, with dual certification awarded in January 2008.

With the dual certification the wood harvested off State Forests from this point forward could now be labeled as "green certified" through chain-of-custody certificates. Green Certified labeling on wood products may assure consumers that the raw material was harvested from well-managed forests.

The Department has joined only an elite few states representing less than 10% of working forests certified as well-managed throughout the Northeastern Region of the United States. The Department's State Forests can be counted as well-managed to protect habitat, cultural resources, water, recreation and economic values, now, and for future generations.

#SCS-FM/COC-00104N
©1996 Forest Stewardship Council
FSC certification means that NY DEC State Forests are managed according to strict environmental, social and economic standards.

#NSF-SFIS-6l741
NY DEC use of the Sustainable Forestry Initiative® program logo mark indicates that State Forests have been certified by a qualified independent auditor to be in conformance with the SFI Standard.

The Unit Management Plan Process

What is a Unit Management Plan?
A Unit Management Plan (UMP) assesses the natural and physical resources on land managed by the Department of Environmental Conservation (DEC) and makes informed State Forest land use decisions by applying an ecosystem science-based philosophy called **ecosystem management**. This philosophy balances public needs with the ability of the land to provide ecological, economic, and recreational services. Recommended land management actions are consistent with stakeholder needs, Department policies, the Unit's natural resources, and the Department's stewardship capabilities. In essence, the UMP is a strategic plan that guides the Department's land management activities for a twenty-year period.

Who Writes the Unit Management Plan?
State Forest UMPs are written by the Division of Lands and Forests with input from the Division of Fish, Wildlife, and Marine Resources, the Division of Operations, the Division of Mineral Resources, and the Division of Forest Protection and Fire Management. A description of each Division's responsibilities is listed below as paraphrased from the Department's website.

Division of Lands and Forests
The Division of Lands and Forests is responsible for the stewardship, management, protection, and recreational use of State Forest lands, the concern of the people who use these lands, and the acquisition of additional lands to conserve unique and significant resources. The Division also provides forestry leadership by providing technical assistance to private forest landowners and the forest products industry.

Division of Fish, Wildlife, and Marine Resources
The Division of Fish, Wildlife, and Marine Resources serves the public by using their collective skills to describe, understand, manage and perpetuate a healthy and diverse assemblage of fish, wildlife, and ecosystems.

Division of Operations
The Division of Operations provides technical services, facilities' management, and maintenance of physical assets to insure effective and efficient operation of the Department and safe public use of Department lands and facilities.

Division of Mineral Resources
The Division of Mineral Resources is responsible for ensuring the environmentally sound economic development of New York's non-renewable energy and mineral resources for the benefit of current and future generations.

Division of Forest Protection and Fire Management
The Division of Forest Protection and Fire Management is responsible for the preservation, protection and enhancement of the state's forest resources, and the safety and well-being of the public using these resources.

How is a Unit Management Plan Developed?
Unit Management Plan Development Steps

The Unit Management Plan is developed in a series of eight steps:

Step 1: Conduct a natural resource inventory of the Unit.

Step 2: Solicit written and verbal input from the public through press releases, newspaper articles, local cable television, the Department's web site and direct mailing.

Step 3: Develop a draft UMP.

Step 4: Internal review and approval of the UMP.

Step 5: Release draft UMP and conduct public meeting(s), press releases, and direct mailings to gather public comments on the draft plan.

Step 6: Address additional land management opportunities and challenges as identified by the public participation process; refine the draft plan (as required) and develop a final UMP.

Step 7: Comply with State Environmental Quality Review (SEQR).

Step 8: DEC Commissioner approves final UMP and implementation begins.

Historical Background

State Forest History
The forest lands outside the Adirondack and Catskill regions owe their present character, in large part, to the impact of European pioneer settlement. After the Revolutionary War, increased pressure for land encouraged westward expansion. Up to 91% of woodlands were cleared for cultivation and pasture.

Early farming efforts met with limited success. As the less fertile soils proved unproductive, farms were abandoned and settlement was attempted elsewhere. The stage of natural **succession** was set and new forests of young saplings re-occupied the once cleared ground.

The State **Reforestation** Law of 1929 and the Hewitt Amendment of 1931 set forth the legislation that authorized the Conservation Department to acquire land, by gift or by purchase, for reforestation areas. These State Forests, consisting of not less than 500 acres of contiguous land, were to be "forever devoted to reforestation and the establishment and maintenance thereon of forests for watershed protection, the production of timber and for recreation and kindred purposes" (Article 9, Title 5, Environmental Conservation Law).

In 1930, Forest Districts were established and the tasks of land acquisition and reforestation were started. In 1933, the Civilian Conservation Corps (CCC) began. Thousands of young men were assigned to plant millions of trees on the newly acquired State Forests. In addition to tree planting, these men were engaged in road and trail building, erosion control, watershed restoration, forest protection and other projects.

During the war years of 1941-1945 very little was accomplished on the reforestation areas. Further planning, construction, facility maintenance and similar tasks were curtailed. However, through postwar funding, conservation projects once again received needed attention. The Park and Recreation Land Acquisition Act of 1960 - and the Environmental Quality Bond Acts of 1972 and 1986 contained provisions for the acquisition of State Forest lands. These lands would serve multiple purposes involving the conservation and development of natural resources, including the preservation of scenic areas, watershed protection, forestry and recreation.

Today there are more than 750,000 acres of State Forest land throughout New York State. The use of these lands for a wide variety of purposes such as forest products, hiking, skiing, fishing, trapping and hunting is of tremendous importance economically, and to the health and well-being of the people of the State.

Local History

This Unit Management Plan includes three State Forests in Tioga, Tompkins and Cortland Counties. The State Forests are located in the towns of Richford, Caroline and Harford.

Before European settlement, the region was part of the Six Nations Iroquois Confederacy. In 1779, General John Sullivan led a successful campaign against the Iroquois and British loyalists in the Tioga county area (Mix Kone). After returning home, the men of Sullivan's army told of the wonderful farmlands that the Indians farmed in the Tioga county area. Many of the soldiers returned to the region with their families and friends to work the land. European settlement in the region began in the late eighteenth century. A close look at the history of the Town of Caroline near Andersen Hill and Potato Hill State Forests will illustrate the background shared by all of the State Forests on the Unit. Foundations and remnant fruit orchards of early homesteaders can be found throughout the State Forests.

The first European settlers in the West Owego Creek area include Lyman Rawson and his wife Deborah Keith. In 1789 they were accompanied by other members of Deborah's family from their home in Uxbridge, Massachusetts, to an area just south of Potato Hill State Forest. The area where they settled came to be known as Rawson Hollow.

About 1804 Abraham Blackman, accompanied by his brother Lemuel, his sister Sarah, and his sister's husband Ezekiel Jewett, made the long trek from Berkshire County, Massachusetts. Other Blackman siblings including Martha, Lydia, Levi, Esther and Eli made the trek about 1810. Abraham Blackman came to marry Rhoda Keith, and Lemuel Blackman came to marry Eunice Keith (both Keiths were sisters of Deborah). Most of the Blackmans settled near each other. Abraham and Rhoda settled on the southern aspect of Blackman Hill near the beginning of Blackman Hill Road. Levi and Eli also settled on Blackman Hill Road (north of Abraham). Sarah and her husband settled within a mile of the rest of Blackmans. Martha and her husband settled across the Creek from the others. Lemuel and Eunice eventually moved onto Michigan. The Blackman name and legacy lives on - as the Blackman Road is a public highway two hundred years later.

When the Blackmans arrived they had very few resources and not much money. First, they cut the timber, a crop that was lost in order to make their lands tillable. Once the land was cleared, wheat, corn and potatoes were grown. The forests were filled with animals and the streams were filled with fish, so the early settlers had plenty of meat. It took a few years before the early

settlers realized the fruits of their labors, but eventually they were able to take their wheat and corn to Owego (the nearest trading post), get it ground, and barter with it. Rawson Hollow gradually grew to become a little hamlet, which made life a little easier for settlers of Blackman Hill. Rawson Hollow had a tavern, a grist mill, a cooper shop, a sash and bind factory, a sawmill, a fulling mill, a blacksmith shop and a distillery. The agricultural census of 1845 states that oats, wheat and potatoes were the chief crops produced. During that year, Tompkins County produced an estimated 528,763 bushels of oats, 375,640 bushels of wheat and 316,334 bushels of potatoes.

Settlement continued and forested valleys were cleared for farmland. Upland areas that were not farmed saw continued wood harvesting. The harsh economic times and the onset of the Great Depression in the 1930s drove many upland farm properties into bankruptcy. The State Reforestation Law and the Hewitt Amendment of 1931 provided funding to acquire abandoned farmland and create State reforestation areas. Soil erosion was a serious problem on the newly acquired lands. To solve this problem, a massive tree planting campaign began. The labor used to establish **plantations** of trees was provided by the Civilian Conservation Corps (CCC). This work program was established by the Roosevelt Administration to create jobs. As a result, CCC Camp S-125 was established in Slaterville Springs. Additional information on the history and legacy of the CCC is available at http://www.nyscccmuseum.com/index.html.

In total, about 1.8 million trees were planted on the Unit from 1935 to 1981. Tree planting peaked between 1938 and 1940. In later years trees were planted by Conservation Department staff and labor provided by Camp MacCormick. According to DEC planting records on file, Norway spruce (25%), eastern white pine (18%) and red pine (18%) were the top 3 tree species planted. **Softwoods** such as these accounted for ninety seven percent (97%) of the tree **species** planted. The remaining three percent (3%) of trees planted were **hardwoods**; black locust, northern red oak, silver maple, and white ash. A summary table of the trees planted on the Unit is in the appendix of this plan.

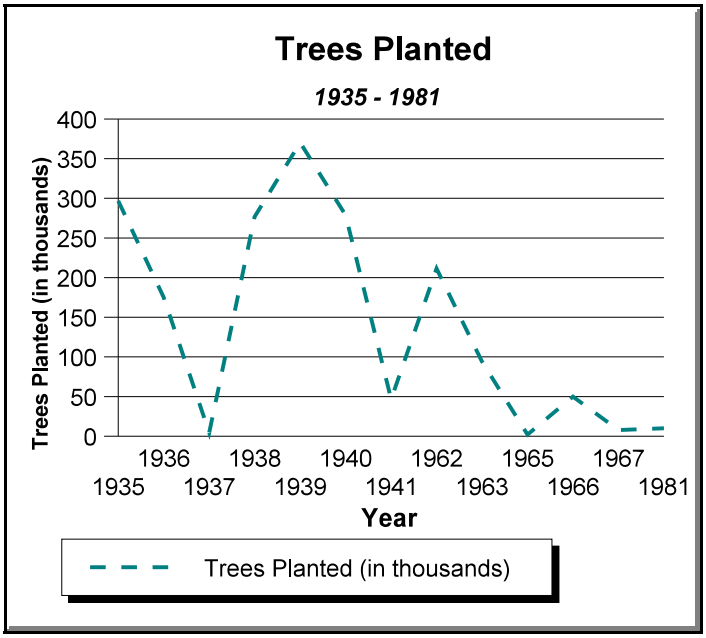


Figure 1 - Trees Planted on the Tri-County Unit

Potato Hill State Forest

The majority of Potato Hill State Forest (Tompkins No. 4) was acquired in 1938 and 1940. There were two additional purchases in 1975 and 1980. The name of the forest attests to the large scale planting of potatoes in the Tompkins County by early Irish Immigrants which reached its peak in 1845, as 316,334 bushels were produced. By 1865, county production had

dropped to 166,300 bushels. Potatoes continued to be raised on a decreasing scale until the 1960s. Previous landowners include the Kendall, Hotaling, Royce, Cortright, Delola and Michaud families, as well as the Federal Land Bank and Tompkins County.

Slaterville Springs CCC Camp S-125 hand planted more than 602,000 tree **seedlings** on Potato Hill State Forest from 1939 to 1941. In 1965, the Caroline Center Youth Camp (now called Camp MacCormick) hand planted 2,000 more tree seedlings. Almost all the seedlings planted were softwood species. Norway spruce, red pine and white pine were the most frequently planted species. These species represent more than sixty percent (60%) of the seedlings planted.

Andersen Hill State Forest

The majority of Andersen Hill State Forest (Tioga No. 4) was purchased from 1938 to 1942. There were two additional purchases - one in 1962 and the other in 1975. The previous owners include the Cunningham, Cortright, Parmele, Barden and Nace families.

According to Department records, the Slaterville Springs CCC Camp S-125 hand planted more than 61,000 tree seedlings from 1939 and 1940. Conservation Department employees planted more than 58,000 tree seedlings in 1954 and more than 53,000 tree seedlings in 1963 using a tractor and spade. Approximately 85% of the seedlings planted were softwood species. Norway spruce, red pine and white spruce were the most frequently planted species - representing over 80 % of the seedlings planted. In addition, pitch pine and loblolly pine were planted on an experimental (and limited) basis.

Robinson Hollow State Forest

The majority of Robinson Hollow State Forest (Tioga No. 3) was purchased from 1934 to 1941. Five (5) additional properties were purchased in the 1960s and 2 more properties were purchased in the 1980s. The previous owners include the Oliver, Fitzcharles, Wattles, Beam, Dickenson, Wright, Allen, Hoaglin, Loring, Welch, Royce, Morton, Gardiner, Brown, Beebe, Wuensch, Cortright and Donato families.

Slaterville Springs CCC Camp S-125 hand planted more than 793,000 tree seedlings from 1935 to 1939. Additionally, Conservation Department employees planted more than 211,000 tree seedlings in 1962 and more than 40,000 tree seedlings in 1963 using a tractor and spade. The MacCormick Youth Camp hand planted tree seedlings in 1966 and 1967. They planted more than 57,000 seedlings. In 1981, 10,000 more tree seedlings were hand planted on Robinson Hollow State Forest; almost all the seedlings planted were softwood species such as Norway spruce, red pine and white pine. Interestingly, experimental plantings of Chihuahua pine (also called yellow pine), Dunkled larch and Ponderosa pine were established. None of these experimental plantings are known to have survived.

INFORMATION ON THE UNIT

A. Geographic Information

Location

The Tri-County Uplands Management Unit is located in the Town of Richford in Tioga County, the Town of Caroline in Tompkins County, and the Town of Harford in Cortland County. The Unit is located approximately 3 miles northwest of the hamlet of Richford, 8 miles south-southwest from the Village of Dryden, 13 miles southeast of the City of Ithaca, 16 miles south-southwest of the City of Cortland, and 25 miles northwest of the City of Binghamton. New York State Route 79 bisects the Unit and provides excellent access to local roads that serve the State Forests in the Unit.

The Unit includes three State Forests encompassing 3,407 acres and is located in the Appalachian Plateau-Central Appalachian ecozone and the Owego Creek watershed. The Unit's watershed is part of the Upper Susquehanna watershed of the greater Susquehanna River Basin. Elevation ranges from 1,200 to 1,900 feet above mean sea level. The lowest elevations are found along the West Branch of Owego Creek - the highest elevations are found on the northern portion of Robinson Hollow State Forest in the towns of Caroline and Harford. Table 1 provides additional information on the State Forests in the Unit.

The landscape immediately surrounding the Unit is a mosaic of forests, farms and residential dwellings. The nearest community centers are the hamlets of Harford, Slaterville Springs and Richford. All of these communities are anchored by a post office and are within 5 miles of the center of the Unit. Each hamlet has a mixture of historic and modern architecture and its own unique rural character. The Unit is within the confines of the Dryden, Ithaca and Newark Valley school districts.

Table 1 - State Forests in the Tri-County Uplands Unit Management Plan

Administrative Name	Common Name	Municipalities	Acres
Tioga No. 3	Robinson Hollow	Tioga, Tompkins, and Cortland Counties, Towns of Richford, Caroline, and Harford, respectively.	1,938
Tioga No. 4	Andersen Hill	Tioga County, Town of Richford.	554
Tompkins No. 4	Potato Hill	Tompkins County, Town of Caroline	915
		Total Unit Acreage	3,407

Demographics
During the past 150 years the landscape of the region and the Unit has been significantly altered by human settlement. Data from the New York State Department of Economic Development illustrate that from 1820 to 2000, the counties of Cortland, Tioga and Tompkins grew by 194%, 205%, and 367%, respectively. Recently, however, population growth has slowed.

Figure 2 shows nearly level population growth trend lines for Cortland and Tioga counties from 1980 to 2000. The Tompkins County population growth trend line illustrates continued growth, but at a pace that slowed during the period (New York State Department of Economic Development, 2000).

In the year 2000, the combined population of the 3 counties that encompass the Tri-County Uplands Unit was estimated to be 196,884. The Cortland and Tioga County populations decreased by an estimated one percent (1%) from 1990 to 2000. Conversely, Tompkins County posted an estimated 2.6% growth in population during the same period. The nearest urban centers are the cities of Cortland and Ithaca, with estimated populations of 18,870 and 29,287, respectively. Both the cities of Cortland and Ithaca posted population losses (an estimated 5.6 and 0.9% respectively) from 1990 to 2000 (U.S Census Bureau, 2000).

Local census tract data was also analyzed for the Unit. The Unit is within three U.S. Census tracts that cover 319 square miles with an estimated population of 15,944 people. The average family size is 3 people, with a median age of 37. Approximately 50 people per square mile (13 acres per person) live in an estimated 6,632 housing units on the land surrounding the Unit. Approximately 73% of housing units are owner occupied.

Parcelization Trends
Although the human population in the Unit's municipalities has decreased slightly or remained stable for the past decade, records obtained from the New York State Office of Real Property Services (ORPS) show that between 1998 and 2004 the average number of real property land parcels in the 3 county Unit area have increased by 3.3%. On a related front, the average real property parcel size decreased by an estimated 3.2% during the same period. This data illustrates that the rural landscape surrounding the Unit is gradually being divided into smaller ownerships.

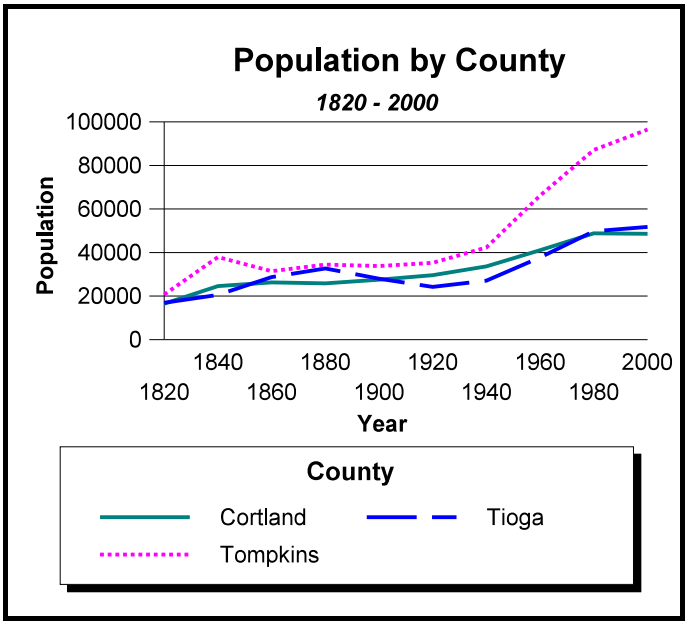


Figure 2 - Historic Population by County

Table 2 - Land Parcelization Trend Data, Tri-County Uplands Area								
County	Estimated Acres	No. of Parcels 1998	No. of Parcels 2004	Change in Parcel No.	Percent Change (Parcels)	Average Parcel Size (1998)	Average Parcel Size (2004)	Percent Change (Size)
Cortland	320,708	21,417	21,998	581	2.7	15.0	14.6	-2.6
Tioga	334,373	24,250	25,604	1,354	5.6	13.8	13.1	-5.3
Tompkins	314,414	33,000	33,524	524	1.6	9.5	9.4	-1.6

Based on these trends, it is reasonable to expect that land parcel size will continue to decrease in the three county region. As a result, the rural landscape of the future will be managed by a greater number of private landowners. It is important to note that private landowners currently own an estimated 92% of the landscape in Cortland, Tompkins and Tioga Counties. Therefore, continued parcelization will likely increase the demand for forestry and agriculture related technical assistance and education outreach services. Similarly, demand for forest based recreation and products/services is likely to increase, thereby placing additional pressure on the Unit's forest ecosystems. Land parcelization associated with development will also place additional demands on roads, schools, public safety agencies and sanitary sewer systems.

Local Climate

The local climate is humid continental, as the summers are warm and the winters are as long as they are cold, with many storm events. The average annual rainfall ranges from 35 to 38 inches, and the average annual snowfall is approximately 70 inches. Lake effect snow from Lake Erie and Lake Ontario is not uncommon, particularly during the early winter months when the lake temperatures are warm relative to the surrounding air. January, February and March are the driest months, as the area receives an average of 1.82, 2.00, and 2.27 inches of precipitation each month respectively. Precipitation is well distributed the remaining months of the year, averaging 2.95 inches each month. The average annual temperature is approximately 46 degrees Fahrenheit. The month of July is on average the warmest month with an average temperature of 68.5 degrees Fahrenheit. Not surprisingly, January is (on average) the coldest month with an average temperature of 21.5 degree Fahrenheit (Northeast Regional Climate Center, 1995). The annual growing season is approximately 155 days (Soil Survey of Tioga County, New York 1953).

B. Geological Information

Surface Geology

Most surface geology in the Finger Lakes region and Allegheny Plateau of the Southern Tier of New York was influenced by the processes of glaciation that occurred during the Pleistocene Epoch. Ice sheets from the last glaciation episode (Wisconsinan glaciation episode) retreated from the area approximately ten thousand (10,000) years ago. Glacial activity left behind numerous sedimentary deposits and surficial features; these include elongate scour features. The subsequent weathering and erosion by streams and rivers has continued to sculpt the surface geology of the Allegheny Plateau to present day, resulting in the hills and valleys prevalent throughout the region. Some features filled with water, creating numerous lakes, small and large. A number of these lakes to the northwest of this area are now called the Finger Lakes. Most soils and sediments in the region are related to past glacial activity, and subsequent weathering and erosion processes over the last 20,000 years. The underlying

parent rocks (rocks that were subjected to the processes of glaciation, weathering and erosion) of this region are sedimentary rocks; specifically shale, sandstone and minor limestone that were deposited in shallow seas that existed in this region during the Devonian Period of the Paleozoic Era, approximately 370 million years ago. Any post Devonian rocks have been eroded from the region. The presence of rounded igneous and metamorphic clasts are indicative of past glacial activity transporting material into the region from the Canadian Shield to the north.

All lands included in this unit management plan contain surface geology consisting of glacial till as the dominant surface sediment in the area. Bedrock outcrops and subcrops of Devonian shales, siltstones, and minor limestones are located intermittently on the sides and crests of ridges and hills in these areas. These rock outcrops and subcrops are most likely due to the erosion of overlying glacial till, causing the exposure of the bedrock.

Table 3: Surface Geologic Material

State Forest	Surface Material
Tioga No. 3 (Robinson Hollow)	Glacial till: - Deposition beneath glacial ice (predominant material). Bedrock: - intermittent outcrops of shales, and siltstones of the Devonian Sonyea Group & overlying West Falls Group.
Tioga No. 4 (Andersen Hill)	Glacial till: - Deposition beneath glacial ice (predominant material). Pre glacial & recent fluvial sands and gravels associated with sediment deposition in Owego Creek. Bedrock: - Intermittent outcrops of shales and siltstones of the Devonian Sonyea Group & overlying West Falls Group.
Tompkins No. 4 (Potato Hill)	Glacial till: - Deposition beneath glacial ice (predominant material). Bedrock: - Intermittent outcrops of shales and siltstones of the Devonian Sonyea Group & overlying West Falls Group.

Additional information on the surface geology in the region is available in the Surficial Geologic Map of New York, New York State Museum, Geologic Survey, Map and Chart Series #40 (1986).

Bedrock Geology

Bedrock underlying the Finger Lakes region and Allegheny Plateau of the Southern Tier of New York is inclusive of sedimentary rock units deposited from ancient seas during the Cambrian (550-500 million years ago (mya)), Ordovician (500-440 mya), Silurian (440-400 mya) and Devonian (400-350 mya) Periods of the Paleozoic Era.

Rock units (bedrock) outcropping or subcropping at the surface in the areas of this unit management plan are shales and siltstones of the Upper Devonian Sonyea Group and overlying West Falls Group. These Groups were deposited during the Upper Devonian Period (approximately 350 - 400 million years ago).

Younger bedrock units deposited during the post-Devonian Periods (such as Mississippian and Pennsylvanian Periods) have been subsequently eroded away by erosional and glacial processes. Underlying the Paleozoic rocks are pre-Paleozoic Era rocks or pre-Cambrian rocks generally considered to be composed of igneous and metamorphic rocks. These rocks are generally referred to as “basement” rocks. Further information on the bedrock geology of the region is provided by the: Geologic Map of New York, Finger Lake Sheet, New York State

Museum and Science Service, Map and Chart #15, 1970.

Geologic Structure
Subsurface rock formations (become deeper) to the south-southwest at an average dip angle of approximately one (1) degree or deepens approximately 100 feet per each mile traveled to the south (also called a **homocline**). The Geologic map of New York - Finger Lakes Sheet #15, 1970, depicts progressively older rock units outcropping farther to the north, confirming the southerly dip of strata in the region. Geologic structural features in the region generally trend in a northeast to southwest direction. North-south trending faults have also been identified in the region. These structures are thought to be due to compressional stress and strain associated with plate tectonics during the Paleozoic Era, and the opening of the Atlantic Ocean Basin that began at the end of the Paleozoic Era. Structural reference is available at the Preliminary Brittle Structures Map of New York, New York State Museum-Map and Chart Series No.31E, 1974.

Soils of the Tri-County Uplands Unit
The USDA Natural Resources Conservation Service (NRCS) soil type map identifies nine (9) major soil types on the Unit. The nine (9) soils on the Unit are: Bath channery silt loam, Chenango gravelly silt loam, the Ellery, Chippewa and Alden soil combination, Lordstown channery silt loam, Mardin channery silt loam, the Marden and Langford soil combination, the Middletown and Tioga soil combination, Volusia channery silt loam, and the Volusia and Erie soil combination.

These soils are common throughout the Tri-County Uplands area and tend to be moderately deep, gently to moderately sloping, are medium textured, and are clay-based. Soils in the Unit typically formed in very low lime glacial till that was derived from local shale and sandstone rocks. The local shale and sandstone tends to be acid; as a result the soil is correspondingly moderately to strongly acid. Many of the soils have a **fragipan** that restricts plant root growth, water movement, and overall site productivity.

Overall, most of these soils have major limitations for intensive crop production including a seasonally high water table, low fertility, moderate to high acidity, and erodibility on steep slopes. However, many of the soils in the Unit and the surrounding landscape are well suited to growing cool season grasses, shrubs and trees. Additional information on soils in the region is available in the United States Soil Conservation Service (NRCS) soil surveys of Tioga and Tompkins counties (1953 and 1965, respectively).

C. Landscape Analysis

Landscape Ecology Assessment
Ongoing research by universities and public environmental agencies suggests that ecosystem health is strongly related to **biological diversity**. As such, promoting and sustaining biodiversity has become the cornerstone of public land management. Biodiversity is the term used by conservation biologists to describe the entire diversity of life - encompassing all the species, genes, and ecosystems on earth (Perlman and Midler, 2005). Having a wide range of plant and animal species, land types, and ecosystems in a landscape increases biodiversity and ecosystem resiliency. Sustainable landscapes are connected to different land types by natural habitat features at many different scales and have core blocks of minimally fragmented habitat.

To assess the landscape surrounding the Unit, Department foresters utilized the United States Geological Survey (USGS) Land Use and Land Cover data set from the DEC Master Habitat

Database (MHDB). The data was spatially analyzed using the Environmental Systems Research Institute's (ESRI's) ArcView version 3.3 **geographic information system** (GIS) software.

The landscape within a 20 mile radius of the Tri-County Uplands Unit is chiefly comprised of rural forests (56%) and agriculture (36%). Forests are clearly the most connected and most extensive landscape type in the planning unit, and, as such, play a dominant role in the function of the landscape (Forman and Godron, 1986). This **landscape matrix** is connected to other landscape types by natural features such as stream **corridors**, hedgerows and **wetlands**.

Historically, much of the land that is currently forest was once cleared for pasture and cropland. Early farmers quickly learned that the thin, fine textured upland soils within the Unit would not support intensive agriculture. As such, many of uplands in the Unit have reverted back into forest through the process of natural succession over the past 100 years.

Today, land use **conversion**, parcelization and landscape **fragmentation** is greatest within and in close proximity to the cities of Ithaca and Cortland. However, gradual residential and commercial development of agricultural and forested lands will continue to fragment the landscape and likely negatively impact the health, function and biodiversity of existing rural ecosystems. Conversion of agricultural land to commercial or residential use typically reduces and/or fragments critical habitat components such as forests, hedgerows, wetlands and stream corridors. In addition, conversion of natural landscapes to residential and commercial land use typically impacts watershed (hydrologic) function by reducing water quality and increasing streamflows. **Table 4** lists the land use **cover types** by area and relative percentage within a 20 mile radius of the Unit's center.

Table 4: Land Cover Types of the Unit - 20 Mile Radius		
Land Use Cover Type	**Acres**	**Percentage**
Transitional Areas	43	0.01
Industrial	74	0.01
Orchards, Vineyards and Nursery	134	0.01
Forested Wetland	452	0.06
Streams and Canals	476	0.06
Other Agricultural Land	575	0.07
Nonforested Wetland	632	0.08
Mines, Quarries, Gravel Pits	1,185	0.15
Reservoirs	1,486	0.18
Other Urban/Built-up Land	2,874	0.36
Transportation and Utilities	3,282	0.41
Mixed Urban/Built-up Land	3,414	0.42
Lakes	5,946	0.74
Commercial and Services	9,389	1.17
Shrub & Brush Rangeland (Includes Seedling/Sapling Type)	13,190	1.64
Residential	19,367	2.41
Evergreen Forest Land	23,556	2.93
Cropland and Pasture	290,977	36.17
Mixed Forest Land	427,427	53.13
Summary - All Land Cover Types	**804,479**	**100.0**
Forested Cover (Only)		
Forested Wetland	452	0.06
Evergreen Forest Land	23,556	2.93
Mixed Forest Land	427,427	53.13
Summary - All Forest Cover Types	**451,435**	**56.1**

Table 4 illustrates that less than 2% of the landscape is in the seedling/sapling, shrub and brush stage of growth. Additionally, no **old growth** forests are known to exist in the landscape. Approximately 56% of the landscape is forested (53% is natural mixed forest land, 3% is evergreen forest land, and less than 1% of the landscape is classified as forested wetland). Thus, forests are the dominant landscape matrix.

Critical Landscape Components

Young seedling/sapling and brush areas are often called early successional forests, or mixed shrubland. This vegetation type is gradually disappearing from the landscape as farms naturally revert back into forest, and fields are developed into building lots. Early successional forests with thick shrubby areas are important habitat for wildlife. Field nesting species such as pheasant use these areas for winter cover. Similarly, the golden-winged warbler, yellow warbler,

field sparrow and small mammals use these sites for nesting and cover. Low swampy thickets or abandoned farmland harbor species such as the American woodcock or common snipe. Swampy thickets also provide cover for wintering mammals. The 2001 GAP analysis of New York found that shrublands comprise only 2% of the State, with "successional shrub fields accounting for most of the cover." Most of the upland shrubland is privately owned state wide. However, 16% of the shrub swamp and salt shrub/maritime types are managed by state agencies.

Eastern old growth forests are conceptually described as being relatively old and relatively undisturbed by humans (Hunter, 1989). Some definitions describe old growth as a forest with trees older than 150 years with little or no human-caused **disturbance** in the forest **understory** during the past 80 to 100 years (Frelich, 1986). The Minnesota Department of Natural Resources defines old growth as forests defined by age, structural characteristics, and relative lack of human disturbance. These forests are essentially free from catastrophic disturbances, contain old trees (generally over 120 years old), large **snags**, and downed trees (1994). Experts estimate that approximately 251,000 acres (1.4% of the landscape) of old growth forest exists in New York State. These old growth forests are chiefly located in remote areas of the Adirondacks, Catskills, and western New York (Leopold, 1996).

The DEC recognizes that *Old-Growth Forest* involves a convergence of many different, yet interrelated criteria. Each of these criteria can occur individually in an area that is not old growth, however, it is the presence of many factors that when combined, differentiate *Old-Growth Forest* from other forested ecosystems. These factors include: an abundance of **late successional** tree species, at least 180-200 years of age, in a contiguous forested landscape that has evolved and reproduced itself naturally (with the capacity for self perpetuation) which is arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor. Other features include: (1) canopy **gaps** formed by natural disturbances creating an uneven canopy, and (2) a conspicuous absence of multiple stemmed trees originating from stumps, rocks, or branches.

Old growth forest sites typically (1) are characterized by an irregular forest floor containing an abundance of coarse woody material, which are often covered by mosses and lichens; (2) show limited signs of human disturbance since European settlement; and (3) have distinct soil horizons that include definite organic, mineral, illuvial accumulation, and unconsolidated layers. The forest understory displays well developed and diverse surface herbaceous layers

Biological legacy trees are defined as trees that are of significant size and age, strategically left after harvesting, or that survive natural disturbances such as wind or ice events. Biological legacies grow to full maturity and die naturally, thereby providing coarse woody material, seed, cavities for wildlife, and aesthetic value. Leaving biological legacy trees adds to the natural structural diversity of the forest ecosystem (http://www.tnc-ecomanagement.org/images/FBChap4.pdf, 7/23/04). Biological legacy trees are lacking at the landscape level because forest ecosystems were significantly altered during European settlement of the region. Additionally, many privately owned forests are purposely managed to grow trees to an economic value or economic (not biologic) maturity which maximizes economic return to the landowner to help offset ownership costs such as Real Property taxes.

Most of the private forested areas surrounding the State Forests in this Unit are harvested on a periodic basis, and most of the landscape was cleared by early European settlers for agriculture. Therefore, the landscape lacks forest cover types that demonstrate old growth characteristics such as biological legacies.

Geographic analysis of the landscape paints a clear picture; the Unit's landscape clearly lacks early successional (seedling/sapling) and old growth **forest types**. However, the public owns only a fraction of the Unit's landscape. Public efforts to enhance biodiversity on public land can be significantly leveraged by informing, educating, and assisting private landowners. Private and public land stakeholder organizations such as the USDA Natural Resource Conservation Service (NRCS), the New York Forest Owner's Association (NYFOA) , the Nature Conservancy (TNC), the Finger Lakes Land Trust, and Cornell Cooperative Extension provide valuable information and education to rural forest landowners. Additionally, the DEC Division of Lands and Forests has a long history of providing technical assistance to forest landowners through its cooperative forest management (CFM) program.

Landscape Challenges

There are three significant long term challenges to maintaining biodiversity and the existing landscape matrix at the landscape level. First, residential and commercial development, if not properly planned, will continue to parcelize and fragment land cover on the landscape. Fragmentation and conversion of rural forests and fields to other land uses will reduce available wildlife habitat and likely disrupt existing wildlife travel corridors. Second, non-native forest insects and diseases such as gypsy moth and chestnut blight, respectively, have historically damaged forest ecosystems. Introduction of new non-native insects and diseases through global trade is a significant threat to the region's forest ecosystem health. Third, many credible researchers believe that rapid global climate change related to increased global greenhouse gas emissions (largely carbon dioxide and methane) created by the burning of fossil fuels by humans will likely impact forest ecosystem health and productivity this century.

State Forest Assessment

To provide updated data for informed decision making at the State Forest level, all State Forests in the Unit were reinventoried during the winter of 2004. State Forest inventory data was collected on tree species, tree diameter, tree height, density, visible defect, forest type, topography and soil drainage. In May of 2005, the New York Natural Hertitage Program completed a Biodiversity Inventory of all State Forests in the region. Data from the project was used during the development of this plan.

The DEC Region 7 Cortland Forestry Office also developed and implemented a supplemental inventory datasheet to capture natural resource features not typically collected during a forest inventory. Supplemental inventory attribution guidelines were also developed and implemented to insure that the data was organized in a consistent manner. **Table 5** illustrates the supplemental attributes collected during the State Forest inventory.

Table 5: Supplemental Inventory Data Attributes	
Natural Resource Attribute/Feature	**Description**
Hydrology	Identifies various hydrologic resources at the forest **stand** level such as wetlands, ponds, streams, spring seeps, waterfalls, erosion issues, and beaver dams.
Herbaceous Plants	Identifies herbaceous plants observed in a forest stand related to site potential such as sensitive ferns, horsetails, blue cohosh, maiden-hair fern, trout lily, and orchids. Also notes the presence of rare and endangered plants.
Forest Health	Identifies general forest health observed in a stand; specifically stand decline, **blowdown**, **crown** damage, or insect/disease issues.
Recreation	Identifies recreational activity in a forest stand. Specifically, informal camping, formal camp sites, mountain bike trails, trails for individuals with **CP-3** permits, x-country ski trails, hiking trails, multiple use trails, and informal trail use.
Forest Treatment Recommendations	Specifies recommended treatment based on field observations at the stand level.
Safety	Identifies a public safety hazard at the stand level such as open water wells.
Forest Treatment Interval	Specifies a treatment interval in years for a given forest stand.
Forest Treatment Priority	Prioritizes stand level treatment needs.
Stand Age Structure (Present and Future)	Specifies observed **stand structure** at the time of inventory; **even-aged**, **uneven-aged**, or two-aged. Also provides a field for future (desired) age structure**.**
Wildlife Observations	Describes wildlife observed in the stand during the inventory/field inspection.
Evidence of Past Management	Identifies any past management activity in the stand as indicated by old stumps, tops, **skid trails**, or tree marking paint.
Protection Zones	Identifies areas that should be considered as a special ecosystem protection zone that has the potential to develop into old growth forest or provide critical habitat for wildlife and herbaceous plant species.
Early Successional Habitats	Identifies areas that could be managed for species requiring early successional habitat.
Oil and Gas Conflicts	Describes potential oil and gas exploration conflicts; specifically hydrologic/wetland, recreation, unique **natural areas**, archeological, steep slopes, or highly erodible soils.
Archeological Resources	Identifies archeological resources at the forest stand level; specifically features such as old foundations, stone walls, or artifacts that appear over 75 years old.

It should be noted that not all the attributes listed in **table 5** were measured or observed when the inventory was completed. Deep snow covered much of the landscape during the winter of 2004. However, the supplemental inventory database will be updated during each 10-year forest inventory cycle, or when a forest stand is actively managed. Furthermore, DEC forestry staff collect updated stand data and develop stand level prescriptions prior to marking an area for harvest.

Spatial Analysis

Spatial analysis may be defined as a process to analyze various sets of geographic based data - typically using a computer based Geographic Information System (GIS). Spatial analysis can be highly technical and mathematical or very simple and intuitive (Goodchild, 2001). The information provided by the GIS helps DEC staff make informed land management decisions.

Many sources of data (information) were used to develop this plan. Specifically, data from the state forest inventory database, the supplemental natural resource data presented in **table 5**, the New York GAP Analysis Project, and DEC's Master Habitat Database were used.

Spatial analysis using ArcView version 3.3 GIS software was conducted to assess land cover types on the 3,407 acre Unit. **Table 6** illustrates that approximately 3% (113 acres) of the State Forest is in the early successional seedling-sapling brush stage. Less than ½ of a percent (11 acres) of the Unit's landscape is comprised of forest stands dominated with trees averaging eighteen (18) inches or greater in **diameter at breast height** (dbh). Thus, the Unit's landscape is chiefly comprised of young to middle aged forest stands that are between 6 to 17 inches in dbh.

This makes sense as many acres of the Unit were once cultivated to grow potatoes, oats and wheat. For the past five to six decades the old fields have been converted back to forests through deliberate tree planting by the Civilian Conservation Corps. and the process of natural succession. However, as with the surrounding landscape, the State Forests in the Unit clearly lack two important cover types for wildlife: 1) early successional forest (with very young and small trees typically less than 40 years of age) and, 2) late successional forest with old growth characteristics (with trees 180 to 200 years of age).

Table 6: Present Land Uses and Cover Types by Forest Stand Diameters						
		Medial Stand Diameters				
		1-5"	6-11"	12-17"	18" +	
Land Classification* (No. of Features)	**Total Acres**	**Acres**	**Acres**	**Acres**	**Acres**	**Percent of Total**
Pond (2)	8.9					0.26
Roads (7)	26.2					0.77
Shale Pits (2)	0.8					0.02
Wetlands (6)	29.6					0.87
Early Successional (10) (Seedling/Sapling)	113.2	113.2	0.0	0.0	0.0	3.32
Natural **Conifer** (6)	69.0	0.0	0.0	64.0	5.0	2.03
Conifer Plantations (44)	910.8	0.0	426.1	484.7	0.0	26.73
Conifer Plantations Mixed with Natural Hardwood (44)	554.5	4.5	359.0	191.0	0.0	16.28
Natural Hardwood/ Conifer Mixed (33)	476.0	0.0	377.8	98.2	0.0	13.97
Natural Hardwood (103)	1,218	0.0	681.0	530.9	6.1	35.75
Percent of Total	100.0	3.5	54.1	40.2	0.3	100.00
TOTAL ACRES	**3,407.0**	**117.7**	**1,843.9**	**1,368.8**	**11.1**	

*Notes on Land Classifications

❒ Roads include town roads, seasonal town roads and **public forest access roads**.

❒ Early Successional represents early successional communities commonly containing shrubs.

❒ Wetlands are areas that have few trees and may be open wet meadows or lightly wooded swamps.
❒ Natural Conifer are stands that have been established without direct human intervention.

❒ Conifer Plantations contain trees that have been established by direct human action and are composed of species such as red pine, white pine, Scotch pine, Norway spruce, white spruce, white cedar, and larch (Japanese and European).

❒ Conifer Plantations w/ Hardwood are conifer plantations with a hardwood component of greater than 10%.

❒ Hardwood/Natural Conifer Mixed are stands that have been established without direct human intervention

❒ Natural hardwood stands have also been established without direct human intervention, but consist almost entirely of hardwood species such as sugar maple, red maple, red oak, beech, white ash, and black cherry.

Detailed information about plant communities can be found in the publication entitled Ecological Communities of New York State (Edinger 2002).

Forest Stand Structure

The updated forest inventory data was spatially analyzed to establish the existing age structure of each stand on the forest, and to predict future stand structure. Each stand was classified as even-aged, uneven-aged or other.

Table 7 - Present Stand Structure

	Present Stand Structure			
	No. of Stands	Structure	Acres	Percentage
	202	Even-aged	2,817	82.7
	46	Uneven-aged	563	16.5
	11	Other	27	0.8
TOTAL	**259**		**3,407**	**100.0**

Table 7 illustrates that presently:

- ❒ 82.7% of the Unit's land cover is even-aged forest;
- ❒ 16.5% of the Unit's land cover is uneven-aged forest;
- ❒ 0.8 % of the Unit's land cover is water and roads.

D. WETLAND AND WATER RESOURCES

Watershed Characteristics

The Robinson Hollow, Potato Hill, and Andersen Hill State Forests lie within the Upper Susquehanna Watershed which is a part of the greater Susquehanna River Basin. Of great interest, the the Susquehanna River Basin drains some 4,500 square miles within New York State and contains about 5,500 miles of rivers and streams. It is the second largest river basin east of the Mississippi River and the largest on the Atlantic seaboard (DEC Division of Water, 2001).

Due to the primarily rural-agricultural character of the Susquehanna River Drainage Basin, most water quality issues in the basin tend to be the result of agricultural activities and other nonpoint sources that are becoming a growing concern all across the state and throughout the country. Within the basin, streambank erosion and various agricultural activities result in **riparian buffer** loss and excessive nutrient and sediment loading to tributary watersheds. The 1999 Susquehanna River Basin Waterbody Inventory and Priority Waterbodies List, published in August of 2001 by DEC's Division of Water, provides additional detail on individual watersheds in the basin.

Streams

Surface water flowing from the Unit enters the West or East Branch of Owego Creek, a DEC regulated trout stream, and eventually flows into the Susquehanna River and the Chesapeake Bay. Approximately 11.0 linear miles of streams flow through the State Forest Unit; of this total, 1.9 linear miles of the West Branch of Owego Creek is classified as "C(t)" or regulated trout stream. Waters classifed as C(t) support trout populations. The remaining 9.1 linear miles is classified as "C" fresh surface waters. The best usage of class "C" waters is fishing. Class "C"

waters may be suitable for recreation, as well as fish propagation and survival. The Department's Bureau of Fisheries and County Federated Sportsman stock approximately 5,000 brown trout in the West Branch of Owego Creek that flows through the Tioga county town of Richford.

With the exception of rapid snowmelt or heavy rain events, the majority of precipitation that falls on the Unit does not reach the stream channels by flowing over the land (overland flow). Rather, precipitation from storm events is absorbed into the soil profile as subsurface water and flows into the areas immediately surrounding the small streams on the property. The thick layer of organic material on the forest floor acts as a giant sponge absorbing, filtering and storing tremendous amounts of water.

Ponds

The Unit also has 2 ponds that encompass approximately 8.9 acres. One of the ponds, called "Tri-County Pond", is located on the Robinson Hollow (Tioga No. 3) State Forest near the intersection of Cortland, Tompkins and Tioga Counties. The 3.7 acre Tri-County pond was constructed by the Department and is stocked with rainbow trout by the Department's Bureau of Fisheries. The second pond is a natural landscape feature that has been enhanced by beavers, and is approximately 5.2 acres in size. It is located on the northern portion of Potato Hill (Tompkins No. 4) State Forest. Both ponds provide valuable habitat for waterfowl, various mammals, snakes, salamanders, frogs and aquatic invertebrate insects such as dragonflies.

Freshwater Wetlands

No DEC Article 24 regulated wetlands are on the Unit. However, approximately 30 acres of small wetlands are present. The average wetland size is approximately 2 acres. Approximately 26 acres of these wetlands are classified as Palustrine Wetlands in the National Wetlands Inventory. Palustrine wetlands are low places that collect water to a depth of only a few inches or feet. They are often dry during a portion of the year. Most of these wetlands exist along the floodplain of the West Branch of Owego Creek and along small stream channels.

Spring Seeps

Many spring seeps and some vernal pools can be found on the property. These spring seeps and vernal pools enhance the biodiversity of the entire parcel as they enhance wildlife habitat. Spring seeps are broad shallow flows that occur where groundwater emerges on sloping terrain usually on the lower slopes of hillsides and mountains.

Spring seeps are valuable to wildlife, particularly wild turkey in severe winters because the emerging groundwater provides snow-free feeding sites in winter and are among the first sites to provide green plants in spring. Spring seeps are used by amphibians such as the Jefferson salamander, spotted salamander and by **neotropical migratory birds** such as the veery and wood thrush.

Vernal Pools and Ponds

Vernal pools and ponds are small areas that are wet in the spring of the year. Vernal pools and ponds derive their name from *vernalis*, the Latin word for spring, because they result from various combinations of snowmelt, precipitation, and high water tables associated with the spring season. The ponds tend to occur in small depressions and while many dry up in late summer, a few have water year round. By definition, vernal pools and ponds are free of fish and can support a rich **community** of amphibians and invertebrates that would be difficult to sustain if fish were present. (http://www.na.fs.fed.us/spfo/pubs/n_resource/wetlands,7/26/04).

Tri-County Pond Fishery Summary
Tri-County Pond is a two acre impoundment which, contrary to it's name, straddles the county line of Cortland and Tompkins Counties only. The pond's dam is located approximately 350 feet north of the Tioga County line. For several decades the pond's fishery has been managed under a put-grow-and-take trout basis which has been supported by an annual **stocking** of 200 rainbow trout. Ice fishing was prohibited throughout this period.

In response to several angler's requests to allow ice fishing for non-trout fish species in the pond a fishery survey was conducted in June 2001 to ascertain the current fish community composition. A single gill-net and trap-net were each fished for one (1) night and water chemistry data was collected. Oxygen and temperature levels at depths between 5 and 8 feet were suitable to support trout. Six yearling rainbow trout were captured in the gill net and all were in good condition. Of significant interest, a total of 400 black crappie were captured in the trap net along with several bullhead and golden shiners. These species were not stocked by DEC personnel and were presumably introduced by local fisherman. All crappie captured measured between 5 and 6.5 inches in length and the sample of fish which were aged were all 4 years old. The length-at-age data and high catch rate in the trap net reflect a black crappie population which is slow growing and overabundant.

As a result of the survey work the following management actions were instituted at Tri-County Pond. 1). Trout management was changed from a put-grow-and-take philosophy to a put-and-take philosophy - any attempts to eradicate the non-trout species in the pond would likely have prompted the reintroduction of unwanted species by anglers; 2). beginning October 2002, ice fishing was permitted; 3). twenty-four largemouth bass, ranging in length from 4.5 to 10.2 inches in length were stocked. Bass were stocked to provide predatory pressure on the overabundant, slow growing crappie population and to diversify the fishery.

E. WILDLIFE RESOURCES

The Robinson Hollow, Potato Hill and Andersen Hill State Forests and the surrounding landscape are home to a wide range of wildlife. As previously mentioned, the State Forest inventory procedure was enhanced to include collection of data related to wildlife resources. We have also relied on several peer reviewed resources and surveys to predict which species can be potentially found on and near the Unit.

The New York GAP Analysis Project (a project led by United States Geological Survey) , New York Herp Atlas, and Breeding Bird Atlas studies were combined with state forest inventory and field observations to help obtain a "snap-shot" of the wildlife that potentially frequent the State Forests and surrounding landscape. The United States Geological Survey (USGS) states that "Gap Analysis is a scientific means for assessing to what extent **native animal and plant species** are being protected. It can be done at a state, local, regional, or national level." Gap analysis is a **coarse filter approach** to biodiversity protection. "The land cover types mapped in GAP serve directly as a coarse filter, the goal being to assure adequate representation of all native vegetation community types in biodiversity management areas" (Smith et. al, 2001).

The goal of gap analysis is to maintain the highest level of biodiversity possible by protecting habitats that support rare and endangered species and hot spots of species richness in a network of conservation areas. In addition, gap analysis strives to "keep common species common" by identifying those species and plant communities that are not adequately represented in existing conservation lands. Common species are those not currently threatened

with extinction. By identifying their habitats, gap analysis gives land managers, planners, scientists, and policy makers the information they need to make better-informed decisions when identifying priority areas for conservation.

Gap Analysis came out of the realization that an ecosystem based land management strategy at the landscape level is an effective way to address loss of biodiversity. Many researchers believe that a species-by-species approach to conservation is not effective because it does not address the continual loss and fragmentation of natural landscapes. “Only by protecting regions already rich in habitat, can we adequately protect the animal species that inhabit them” (http://www.gap.uidaho.edu/about/what_is_gap_analysis.htm, 7/9/2004).

The New York Gap Analysis Project (NY GAP), which was developed as part of a nation wide initiative by the University of Idaho, uses predictive modeling to map species that breed or use habitats in a given landscape. To predict their distributions, species are associated with mapped habitat characteristics using computerized GIS tools. The resulting maps are checked for accuracy against verified checklists and public reports of species occurrences and peer reviewed by experts species by species (uidaho.edu/about/gap_fs2004.pdf, 7/9/2004). The ability to successfully map natural communities and species in terrestrial as well as aquatic environments is the result of recent advances in science, technology, and effective partnering of federal, state and private conservation agencies.

To help assess biodiversity, the NY GAP Project uses the U.S. EPA’s Environmental Monitoring and Assessment Program (EMAP) hexagon mapping unit. EMAP is a national research program that is developing the tools necessary to monitor and assess the status and trends of national ecological resources. EMAP's goal is to develop the scientific understanding for translating environmental monitoring data from multiple spatial and temporal scales into assessments of current ecological condition and forecasts of future risks to our natural resources.

EMAP aims to advance the science of ecological monitoring and ecological risk assessment, guide national monitoring with improved scientific understanding of ecosystem integrity and dynamics, and demonstrate multi-agency monitoring through large regional projects. EMAP develops indicators to monitor the condition of ecological resources. EMAP also investigates designs that address the acquisition, aggregation, and analysis of multiscale and multilayer data (http://www.epa.gov/emap/, 7/23/04).

Approximately 99% (3,377 acres) of the Unit lies within EPA EMAP hexagon 420. The remaining 1% (30 acres) lies within EPA EMAP hexagon 450. The EMAP hexagon is based on the EPA’s global hexagonal grid system. Each hexagon is approximately 160,200 acres in size, or about 250 square miles. A map depicting the EMAP hexagons that comprise the area in and around the Unit is in the map section of this plan. The number and type of species is very consistent in both hexagons. This makes sense as both hexagons have similar land cover, land uses and habitats.

Reptiles and Amphibians

The New York Gap Analysis Project confirmed or predicted 42 species of reptiles and amphibians within EMAP hexagons 420 and 450. Confirmed species are known to exist within the EMAP hexagon; occurrence of predicted species is forecasted by the NY GAP model.

Predicated species have not been confirmed on the ground within the hexagon. Appendix A-1 lists amphibians and reptiles predicted or confirmed by the New York GAP Project in EMAP hexagons 420 and 450. The table in A-1 has been modified to list 36 species, based on information from the New York State Herp Atlas Project and in consultation with DEC Biologists.

Amphibians and reptiles (herps from the branch of science called herpetology) are vertebrates like birds and mammals, but they are fundamentally different in one important way. Herps are cold blooded, whereas birds and mammals are warm blooded. Warm blooded animals must eat regularly to fuel the biochemical mechanisms producing body heat. As such, most warm blooded animals are active year round (Partners in Amphibians and Reptile Conservation, 2003). In contrast, cold blooded animals such as salamanders and turtles are only active during the late spring, summer and early fall during warmer temperatures.

Amphibians do not have scales, feathers or fur to insulate their bodies, so they are especially sensitive to changes in temperature and humidity. Most amphibians require moist habitats such as a shaded forest floor. Reptiles, however, are covered in scales and are therefore less vulnerable to changes in temperature and humidity.

While encounters with some herps, such as frogs or toads can heighten some people's trips afield, the herps as a group include many species, which often go unnoticed other than to those specifically looking for them. Despite this, herps are an important group, as their presence, absence and relative abundance are an indicator of the ecological health of a site. Naturalists, scientists and land managers agree that local habitat destruction is the primary cause of reptile and amphibian declines in the northeast. Activities such as poorly planned agriculture and forest harvesting, urbanization, wetland destruction and stream channelization are the primary causes of habitat destruction and loss.

Principal Reptile and Amphibian Habitats Provided by the Tri-County Uplands Unit

Late Successional Forest Habitat - The Unit provides extensive forest cover with late successional characteristics such as coarse woody material, moderate to heavy shade, and moist forest floor conditions. Amphibians such as the red backed, northern dusky, spotted, and marble salamander salamanders require this type of habitat. The red back salamander can reach very high densities in northeastern hardwood forests. The biomass (combined weight of all individuals) can be more than all the mammals combined and equal to all the birds combined (Partners in Amphibian and Reptile Conservation, 2003). Salamanders are of vital importance to the ecosystem as a whole because they consume invertebrates and serve as prey for other vertebrates (Crawford and Semlitsch, 2007). Appendix A-1 summarizes the specific species confirmed or predicted to occur within and near the Unit.

Ponds, Vernal Pools/Ponds, Wetlands, Seepages, Spring and Stream Habitats - The lands of the Unit also provide stream corridors, two ponds, small wetlands, many seepages, and scattered vernal pools/ponds that provide valuable habitat for several species of salamanders, frogs, snakes, and turtles. Appendix A-1 summarizes the specific species confirmed or predicted to occur within and near the Unit.

Mammals

The NY Gap Project predicts or confirms 53 species of mammals on the Unit's landscape. Adaptive forest management that provides young, middle, and old-aged forests will help diversify the landscape and contribute toward maintaining a diverse population of mammals. State Forests are the home to the majority of Norway spruce plantations of Upstate New York's

rural landscape, which provide unique habitats for mammals such as the red squirrel. Large blocks (500 acres or more) of high canopy forest provide unique habitats for mammals such as silver-haired bat, eastern red bat, and hoary bat, northern flying squirrel and black bear. The Tri-County Uplands Unit and the private lands that surround it provide a matrix of different landscape and cover types for a wide range of mammals. Appendix A-2 lists the mammals predicted or confirmed by the New York GAP Program in EMAP hexagons 420 and 450.

Principal Mammal Habitats Provided by the Tri-County Uplands Unit

Late Successional Forest Habitat - The State Forests in the Unit provide a substantial block of high canopy forest managed to provide late successional forest characteristics. The vast majority of the natural and protection areas also provide these characteristics. Late successional forests provide important open space and habitat for mammals that require connected blocks of high canopy forest cover (with 65% or greater average canopy closure) such as the black bear, bobcat, fisher, smokey shrew, pygmy shrew and northern flying squirrel. This type of forest cover also provides hollow trees and snags that act as homes for animals such as the gray squirrel, red squirrel, northern flying squirrel, Keen's myotis (bat), Indiana myotis (bat), little brown myotis (bat), silver-haired bat, red bat, hoary bat and raccoon.

Long-Lived Conifer Forest Habitat - The State Forests in the Unit provide significant long term critical open space habitat for mammals that require conifer cover in the form of Norway spruce, white spruce, red pine, larch, and white pine plantations. The Unit also has areas of natural eastern white pine and eastern hemlock. Conifer forests moderate temperature extremes and thereby provide winter thermal cover. Mammals that require or benefit from conifer cover include the red squirrel, snowshoe hare, white tailed deer and bobcat.

Early Successional Forest Habitat - The State Forests in the Unit provide critical early successional forest (seedling/sapling and brush growth) that provides habitat for mammals that require brushy habitats. Many mammals benefit from a variety of habitats and **edges** with adjacent cover types. Species that use brushy areas include the red fox, gray fox, white tailed deer, eastern cottontail, woodland vole, eastern chipmunk, woodchuck, southern bog lemming and meadow jumping mouse. Early successional forests are disappearing from the surrounding landscape as forests grow and mature in the landscape.

Pond Habitat - The 5.2 acre and 3.7 acre ponds in the Unit provide a valuable source of shallow freshwater for mammals that live, visit and reproduce on the State Forests.

Birds

One of the best available inventories of bird populations is the Breeding Bird Atlas. The Breeding Bird Atlas (BBA) is a comprehensive, statewide survey that reveals the current distribution of breeding birds in New York.The New York State Ornithological Association and the Department of Environmental Conservation sponsor the project in cooperation with the New York Cooperative Fish and Wildlife Research Unit at Cornell University, Cornell University Department of Natural Resources, Cornell Laboratory of Ornithology, and Audubon New York. The backbone of the atlas is a dedicated group of volunteers who do the actual on the ground survey. Originally conducted from 1980 to 1985, the year 2000 BBA shows a change in bird occurrence in parts of the state.

The breeding bird survey areas are organized into ten regions based upon the "Kingbird" reporting regions for the New York State Ornithological Association. One or two Regional Coordinators are responsible for seeing that all of the blocks in their region are surveyed. Each

block measures 5 x 5 km (3 x 3 mi); there are 5,335 blocks in the entire state. Atlasers visit various habitats within their assigned block(s) and record evidence of breeding for the birds they see, using defined Breeding Codes. The State Forests in the Unit fall within breeding bird atlas blocks 3868B, 3969D, and 3968A, 3969A, and 3969C. In total, 185 instances of breeding birds were observed in the blocks that fall within the State Forest Planning Unit. Additionally, 148 birds were observed as possible or probable breeding. A complete list of these birds and their respective levels of state and federal protection is provided in the appendix of this plan.

Why are birds important? The opportunity to hear and see birds enhances the field experiences of many people. Moreover, diversity and size of bird populations are related to overall ecosystem health - on a local, regional and global scale. Region wide, there are several species of birds identified on the Unit which are known to be suffering declines and are of conservation concern. Many of the birds that are of conservation concern such as the Henslow's sparrow, black-billed cuckoo and prairie warbler require early successional (brush and young trees) or grassland habitat to breed and nest. Some species of conservation concern such as the Cerulean warbler require larger tracts (greater than 500 continuous acres) of **mature forest cover** with late successional characteristics to successfully nest and reproduce. Other species, such as the woodthrush and northern saw-whet owl, use a variety of habitats. Many of the birds that visit or breed in our region are **neo-tropical migrants**; they nest and breed in the north and fly south (migrate) to warmer climates in the winter.

It is suspected that habitat change is responsible for decline the bird species mentioned above. In the Central Appalachian region, millions of acres of former agricultural land has reverted to back to forest over the past 100 years. This changing habitat creates opportunities for some bird species and represents a potential threat to species that require early successional vegetation habitats (brush and young trees) and grasslands. Researchers suspect that changes in land use in Central and South American winter habitat may be impacting neo-tropical migrant bird populations as well. The U.S. Fish and Wildlife Service uses the North American Bird Conservation Initiative (NABCI) Bird Conservation Regions (BCRs) to track bird populations across the North American landscape. The purpose of NABCI is to ensure the long-term health of North America's native bird populations through cooperation between public and private North American conservation organizations. BCRs are ecologically defined units that provide a spatial framework for bird conservation across the North American landscape (U.S. Fish and Wildlife Service, 2002).

BCRs are being used to help assign "conservation priority" scores for bird species. Each BCR, regardless of internal political boundaries, has its own priority species list. Species contained on a given BCR list are ranked by conservation importance according to a standardized set of criteria determined by partners from Mexico, the United States and Canada. Derived BCR lists of priority species will help guide conservation activities throughout the continent (http://www.bsc-eoc.org/international/bcrmain.html).

The Tri County Unit falls within the Appalachian BCR (region 28). In the report entitled *The Birds of Conservation Concern 2002*, the U.S. Fish and Wildlife Service (USFWS) identifies several birds of concern that are known to exist within or near the Unit. **Table 8** summarizes the birds species of conservation concern that have been observed within Unit's landscape, and describes the basic habitat requirements for each bird, respectively.

Table 8 - U.S. Fish and Wildlife Service - Birds of Conservation Concern in the Tri-County Uplands Unit's Landscape
Please note: Birds that are shaded were observed in both 1985 and 2000 in BBA blocks 3868B, 3869D, 3968A, 3969A, 3969C.

Common Name	Habitat Requirements
Acadian Flycatcher	Key habitat requirements are tall closed forest canopies and relatively open understories. The major threat is loss of suitable habitat as natural forests become fragmented, favorable conditions become less common, and cowbird parasitism increases (The Nature Conservancy, 1997).
Black-billed Cuckoo	Brushy pastures, shrubby hedgerows, edges of fields, and open woodlands (DeGraaf and Rudis, 1986).
Cerulean Warbler	Typically found in mature forested areas with large and tall trees of broad-leaved, **deciduous** species and an open understory, but may also inhabit wet bottomlands, some second-growth forests, and **mesic** upland slopes (Audubon, 2005).
Golden-winged Warbler	The Golden-winged Warbler prefers early successional habitats for nesting. Recently abandoned farms and **regeneration** harvests are ideal. These habitats, however, do not last long, and the warbler often quickly disappears from an area. The warbler benefited from the extensive deforestation of the last several centuries, especially as farms were abandoned in the 20th century. Return of forest cover is reducing available breeding habitat (Cornell Lab of Ornithology Website, 2005).
Henslow's Sparrow	The Henslow's Sparrow breeds in weedy grasslands of the east-central United States. Its population numbers have declined steadily over the past few decades, largely because of habitat loss (Cornell Lab of Ornithology Website, 2005).
Louisiana Waterthrush	Moist forest, woodland, and ravines along streams; mature deciduous and mixed floodplain and swamp forests. Prefers areas with moderate to sparse undergrowth (Prosser and Brooks 1998) near rapid-flowing water of hill and mountain streams (Brown et al. 1999).
Northern Saw-whet Owl	Uses a variety of habitats, but prefers mature mixed forests with scattered dead trees. Birds roost in conifers at edge or interior of extensive woodlands. Typically nests in a **cavity tree** with a minimum d.b.h. of 12 inches (DeGraaf and Rudis, 1986).
Prairie Warbler	Optimal breeding habitats are usually associated with poor soils and include brushy dune/lakeshore communities, fallow fields with scattered trees, young jack pine stands, pine plantations (especially Christmas tree plantings), oak clearcuts, and powerline right-of-ways (Evers 1994). Large openings surrounding or containing clumps of shrubs are typical components of breeding habitat (USFWS, 2005).
Red-headed Woodpecker	Prefers open areas with snags and lush herbaceous ground cover. Breeds in lowland and upland habitats, river bottoms, wooded swamps, groves of dead and dying trees, and beaver swamps (DeGraaf and Rudis, 1986).
Swainson's Warbler	Habitat management for the Swainson's Warbler has been attempted at a number of national forests, national wildlife refuges, state lands, and private refuges but success has been limited. This may be because of a lack of a complete understanding of the habitat requirements of the species. To alleviate this problem a number of research projects are underway with funding provided by federal and state agencies (Audubon, 2005).

Table 8 - U.S. Fish and Wildlife Service - Birds of Conservation Concern in the Tri-County Uplands Unit's Landscape *Please note*: Birds that are shaded were observed in both 1985 and 2000 in BBA blocks 3868B, 3869D, 3968A, 3969A, 3969C.	
Common Name	**Habitat Requirements**
Upland Sandpiper	Require large open grasslands and show a preference for nesting, feeding, and courtship in vegetation less than 2 feet in height (Ailes 1976, Kirsch and Higgins 1976), most commonly in areas interspersed with taller grasses which provide concealment (Johnsgard 1981, White 1988, Carter 1992). The birds require open areas 125 acres or greater in size.
Wood Thrush	Requires moderate to dense understory and shrub density with a lot of shade, moist soil, and decaying leaf litter. Shows much variation in habitat use, from mature deciduous forests to shrubby second-growth forests and suburban parks in the Northeast to riparian habitats in the Great Plains (Cornell Lab of Ornithology Website, 2005).
Worm-eating Warbler	Well-drained upland deciduous forests with understory patches of mountain laurel or other shrubs, drier portions of stream swamps with an understory of mountain laurel, deciduous woods near streams; almost always associated with hillsides.
Yellow-bellied Sapsucker	Mixed hardwood-conifer forests, especially near water and small clearings and woodlots. Requires trees with a d.b.h. of 10 inches for nesting (DeGraaf and Rudis, 1986).

Principal Bird Habitats Provided by the Tri-County Uplands Unit

The Tri-County Uplands State Forest Unit and its surrounding landscape provides significant habitats for many species of breeding birds. It is apparent to the casual observer that the landscape provides many valuable habitats as demonstrated by the richness of breeding bird species within and surrounding the Unit. As such, the Tri-County Uplands Unit's State Forests provide four important and critical bird habitats.

Late Successional Forest Habitat - The Unit has high canopy forest, natural and protection areas that provide significant blocks of continuous forest canopy with late successional forest characteristics (with 65% or greater average canopy closure). This type of cover provides habitat for neotropical migrant birds that are moderate to high in conservation priority in the region such as the wood thrush, scarlet tanager, Canada warbler, Louisiana waterthrush and black-throated blue warbler. Other birds that prefer mature deciduous and mixed coniferous-deciduous forests include the red-eyed vireo, veery, American redstart, ovenbird, blue headed-vireo, black throated green warbler and yellow-bellied sapsucker.

Additionally, habitats with late successional characteristics - when compared to other forest cover - will tend to have higher densities of live or dead hollow trees greater than 10 inches in diameter at breast height that provide homes and/or forage areas for cavity nesting birds such as the northern flicker, yellow-bellied sapsucker, black-capped chickadee, downy woodpecker, hairy woodpecker, red-bellied woodpecker, eastern screech owl, great crested flycatcher, wood duck and pileated woodpecker. The high canopy forest also provides nesting habitat for raptors (birds of prey) that require extensive forested areas such as the northern goshawk.

Long-lived Conifer Habitat - The long-lived conifers on the Tri-County Uplands Unit provides important habitat for a **suite** of bird species requiring conifers such as the Magnolia warbler, Blackburnian warbler, pine warbler, yellow-rumped warbler, red-breasted nuthatch and black throated green warbler. Mature tall conifers also provide important nesting habitat for raptors such as the northern goshawk and sharp shinned hawk.

Early Successional Forest Habitat- Early successional seedling/sapling sized forest provides critical habitat for a suite of birds that require young dense vegetation for breeding, nesting, and foraging. Bird species that require such habitat include the ruffed grouse, American woodcock, white-throated sparrow, American goldfinch, rufous-sided towhee, chestnut sided warbler, yellow warbler, blue winged warbler, white-eyed vireo, alder flycatcher, willow flycatcher, least flycatcher, hermit thrush, brown thrasher, Indigo bunting and gray catbird.

Pond Habitat - The two ponds encompassing 8.7 acres provide habitat for birds that require water in close proximity for breeding, nesting, or foraging. Specifically, the pond provides habitat for birds such as the tree swallow, wood duck, hooded merganser, mallard, American black duck, blue wing teal, green heron and Canada goose.

Major Game Species

Several game or furbearer species exist on the Unit. A few species of high importance with regards to use demands, habitat management needs, or impact to forest ecosystems are discussed below.

White-tailed Deer

White-tailed deer are an important component of the Unit's fauna, both for their recreational value and their capacity to impact other resources and human activities and interests. Deer numbers on the upland forests surrounding the Unit are relatively low due to the fact that the pole and sawtimber dominated **site** provides limited food and cover resources for deer.

Deer populations in the state are managed in Wildlife Management Units (WMUs). The entire Tri-County Uplands Unit is part of Wildlife Management Unit 7R. DEC utilizes Citizen Task Forces (CTF) to set a WMU's deer population objective. The CTF process convenes representatives from various community interests, i.e. farming, forestry, hunting, highway safety, ecology, and small businesses. The task force provides a way for these potentially affected interest groups to share interests and concerns, and ultimately make a recommendation on the desired deer population for a Wildlife Management Unit--more, less, or the same. This process seeks to obtain a community view on appropriate deer numbers and requires comprise by many participants, since all interests can not be fully satisfied.

Deer management permits are issued by the Department's Division of Fish and Wildlife, Bureau of Wildlife, to control the number of female deer taken by hunters in each Unit. Citizen Task Forces are formed in each WMU to represent the various community interests in deer management. Task forces consider hunting and agricultural interests, the number of deer/auto collisions, damage to residential landscaping, and any other impacts deer have on society. They then make a recommendation as to how many deer they want to see in any given Wildlife Management Unit - more, less, or the same. The Department's Bureau of Wildlife then sets the quota of deer management permits that will be issued to move the deer population in the direction recommended by the task force.

The most recent Citizen Task Force (CTF) to update deer population objectives was completed during the winter of 2003-2004. In Wildlife Management Unit (WMU) 7R, the CTF recommended the population be reduced 35%. The Unit's new Buck Take Objective (BTO) is 2.7 bucks per square mile (DEC Bureau of Wildlife). The BTO is the average number of bucks per square mile expected to be taken when the deer population is at the level recommended by the task force. The Department's Bureau of Wildlife monitors the deer population and annually adjusts the quota of deer management permits available to hunters striving to maintain a Unit's deer population at the level recommended by a task force. The deer herd is somewhat uniformly distributed throughout the Tri-County Uplands Unit although more deer are probably found at the lower elevations in valley bottomlands where agricultural activities are concentrated. Below, figure 3A shows the deer take in the three towns that comprise the Tri-County Uplands Unit from 2001 to 2006. Figure 3B compares the actual buck take to the buck take objective in WMU 7R for the same period.

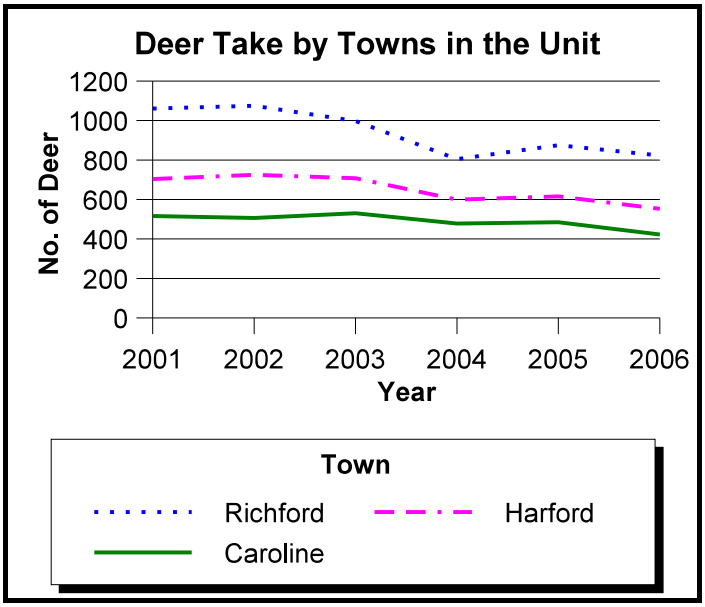


Figure 3A - Deer Take by Town in the Unit

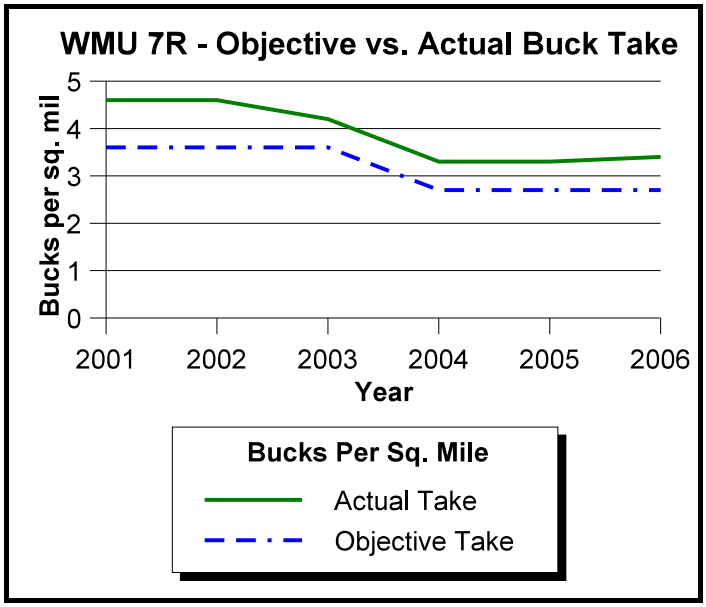


Figure 3B - Objective vs. Actual Take, WMU 7R

The Department's Wildlife Biologists monitor and manage wildlife populations in the State. Until recently, deer population levels were generally on the increase. Over the past decade, this increase was attributed to: 1) a number of winters with favorable conditions for deer survival, 2) an overall decline in the number of hunters, 3) large private parcels being subdivided and sold resulting in fragmentation of habitat, and 4) more private landowners posting their property against hunting.

Research on the Allegheny National Forest has shown that high deer populations over an extended period of time can negatively impact **species richness** and the overall productivity and health of forest ecosystems. In portions of the Allegheny National Forest in northwestern Pennsylvania with excessive deer populations, researchers have noted changes in the forest understory associated with excessive deer **browse**. In some areas, specific trees, shrubs, and herbaceous plants, which are preferred browse sources for deer (including birch, ash, witch hobble, sumac, wild raisin, blueberry, wintergreen) have become scarce in the forest understory. Lack of a herbaceous/shrub layer leads to higher nest predation of ground-nesting and shrub-nesting birds. It also directly alters the habitat and food sources for small mammals.

Today, and for the near term, deer populations within the Tri-County Unit's immediate landscape are being managed within reasonable limits and appear to be trending slightly downward. However, in the long term, deer populations may trend upward as the land is gradually developed and habitat changes.

Wild Turkey

Wild turkey can be found throughout the Unit as the forests and fields found in the landscape provide excellent food and cover. In the spring and summer of year, adult wild turkeys feed on wild leeks, roots, fruits, grasshoppers, dragonflies and snails. During the winter the animals feed on acorns, seeds and left over fruits. In agricultural areas, they also feed on manure, silage and any residual grains. The bird has made a remarkable recovery after disappearing from the State around the mid-1840s as the landscape was cleared for farmland.

As farming declined on the infertile hilltops, the land gradually reverted back into brush and forest. By the late 1940's, much of New York's southern tier was again capable of supporting turkeys. Around 1948, wild turkeys from a small remnant population in northern Pennsylvania crossed the border into western New York. These were the first birds in the State after an absence of 100 years. In 1959, these natural populations were supplemented by a trap and release program begun by the then New York State Conservation Department (DEC Bureau of Wildlife, NYS Chapter of the National Wild Turkey Federation, 2004).

Humans have been an important predator of wild turkeys for many thousands of years and are part of the region's natural heritage. This wonderful bird is now legally protected as a game species by spring and fall turkey hunting seasons, which are closely monitored by State biologists. This management has helped increase the number of turkeys throughout most of the State.

Ruffed Grouse and Woodcock

Early in the 20th century, as farms were abandoned in the northeastern U.S. and the landscape recovered from unregulated logging and large forests fires, the new generation of early successional forest that followed became good ruffed grouse habitat. In the past 100 years, the forests have matured and forest fires have been controlled. Additionally, regeneration cutting is seldom used as a management tool on smaller land ownerships. These changes, driven by changes in public policy, population, land use, economics, and social factors - have resulted in a significant reduction in ruffed grouse habitat. As such, continued loss of early successional forest habitats are likely on private forest lands as ownership parcelization increases and average parcel size decreases. Ruffed grouse and American woodcock depend on shrub-dominated and young forest habitats (Dessecker, McAuley). The high tree and shrub densities characteristic of these habitats protect them from predators and enable local

populations to attain levels substantially greater than on landscapes dominated by mature forest (Sepik and Dwyer, 1982). In many regions, both ruffed grouse and woodcock numbers have declined as forests have become more extensive and older.

Ruffed grouse and woodcock are both listed as species of “greatest conservation need” in the State’s Comprehensive Wildlife Conservation Strategy (NYSDEC, 2006). They are two of the many species which would benefit from the creation and maintenance of early successional habitats. Their numbers can often be readily enhanced or restored by creating habitat through heavy forest regeneration cutting on a regular basis or through the use of prescribed fire to allow open habitats for young growing grouse to feed on insects, a high protein source. Forest stands with low to moderately low potential productivity, that have aspen as an existing component, are good candidates for grouse and woodcock habitat management. The overall goal is to provide a diversity of **age classes** of aspen to meet the food and cover requirements in a manner consistent with their limited mobility (The Ruffed Grouse Society, 2005).

Eastern Cottontail Rabbit

New York’s cottontail rabbit population was relatively small prior to European settlement when forests covered much of the State. By the early 20th century, most of New York’s forests had been cleared. Formerly cleared areas grew back to brush and young forests, providing excellent habitat for rabbits for several decades. Today, young early successional cover has declined as the forests have matured. Management techniques such as periodic mowing, brushing, or regeneration cutting help provide brushy cover. Additionally, maintenance of existing old field grass, goldenrod, and aster habitats by annual mowing to prevent succession is recommended.

Black Bear

The Tri-County Uplands Unit is within black bear range and bear are becoming more common. More sightings have been reported in recent years and the number of nuisance complaints have risen as well. Black bear require large blocks of remote mature forest cover with a thick forest understory. They also require abundant sources of hard and soft **mast** from plants such as northern red oak, chestnut oak, white oak, wild blueberry, elderberries and blackberries. These large mammals have returned with the natural reestablishment of large blocks of upland transitional oak and **northern hardwood forest** in the region.

Beaver

Beaver populations in New York are abundant and their populations are secure. The Department regulates trapping seasons to ensure the continued security of New York's furbearer populations (DEC Division of Fish and Wildlife, 2005). Beaver require small to large slowly flowing brooks, streams or rivers that are usually, but not necessarily, bordered by woodland (DeGraff and Rudis, 1986). The west branch of Owego Creek and its associated floodplain provides good beaver habitat. Trapping provides important benefits to New Yorkers including: the control of nuisance damage, economic benefits to trappers and people involved in the fur industry, and recreation to trappers. The colonization of a site by beavers often results in the flooding of an area and changes in wildlife habitat. Most of the changes associated with beaver related flooding are beneficial in that additional habitat for amphibians and wildlife is created. However, flooding can impact trout habitat, individual tree health, and highways.

F. ENDANGERED, THREATENED, AND SPECIAL CONCERN SPECIES

As previously illustrated, the Tri-County Uplands Unit is located in a diverse landscape that is dominated by forest cover and open farmland, with some residential development. Analysis of the Breeding Bird Atlas and the New York GAP model data illustrate that the landscape potentially supports a minimum of 217 species of birds, mammals, fish, reptiles, and amphibians. Additionally, the landscape is the home to many species of invertebrate animals such as dragonflies, skippers and butterflies.

Important Species at the Landscape Level

The Environmental Conservation Law of New York, Section 11-0535 and 6 NYCRR (New York Code of Rules and Regulations) part 182 authorizes the Department to list and protect endangered, threatened and special concern wildlife species. No endangered, threatened, or special concern wildlife or plant species are known to exist within the State Forests that comprise the Tri-County Uplands Unit at this time. However, at the larger landscape level, several threatened or special concern wildlife species have been recorded by the 1985 and 2000 breeding bird atlas census and confirmed or predicted by the New York GAP Analysis Model. **Table 9** lists these species and their required habitats.

Table 9 - Endangered, Threatened, and Special Concern Species - Landscape Level Scale

Common Name	Habitat Requirements	Record Source	Status
Indiana Myotis (bat)	Females congregate in nursery colonies under the loose bark of dead trees located along the banks of streams or lakes in forested habitat. Only a handful of colonies have ever been discovered. In New York State, these bats are known to winter in only seven caves or mines, with nearly one-half of the world's population being found in only two caves. Even though other populations have been discovered in recent years, the additions have not offset the losses recorded over the full extent of the species range (DEC **Endangered Species** Unit, 1999).	NY GAP MODEL (PRED)	E
Cooper's Hawk	Breeds and winters in extensive deciduous or mixed woodlands that are dense or in open, scattered woodlots interspersed with open fields (DeGraff and Rudis, 1986).	BBA 1985 2000	PSC
Northern Goshawk	Breeds and winters in interiors of remote and heavily forested areas of coniferous and mixed forests (DeGraff and Rudis, 1986).	BBA 1985 2000	PSC
Red-Shouldered Hawk	Breeds and winters in moist hardwood or mixed woodlands, wooded swamps, bottomlands, and wooded margins often close to cultivated fields (DeGraff and Rudis, 1986).	BBA 1985 2000	PSC
Sharp-shinned Hawk	Breeds and winters in open mixed or coniferous woodlands, clearings, and edges. A bird of cold-temperate conifer forest and temperate deciduous woodlands (DeGraff and Rudis, 1986).	BBA 1985 2000	PSC

Table 9 - Endangered, Threatened, and Special Concern Species - Landscape Level Scale			
Common Name	**Habitat Requirements**	**Record Source**	**Status**
Vesper Sparrow	Found in various open habitats with grass, including prairie, sagebrush steppe, meadows, pastures, and roadsides. Winters in the southern United States from South Carolina to southern California, southward to southern Mexico (Cornell Lab of Ornithology, 2005).	BBA 1985 2000	PSC
Yellow-breasted Chat	Breeds in dense thickets around wood edges, riparian areas, and in overgrown clearings. In the eastern and southern portions of the range, abandoned agricultural fields left unmanaged for 10 years and the removal of trees and encouragement of a shrub layer in powerline rights-of-way will create suitable chat habitat. Wherever marginal cropland is abandoned, the species should benefit before canopy closure (Nature Conservancy, 1998).	BBA 1985 2000	PSC
Pied-billed Grebe	Breeds on seasonal or permanent ponds with dense stands of emergent vegetation, bays and sloughs. Uses most types of wetlands in winter. Winters in central and southern United States southward to Central America, wherever open water can be found. Also in Caribbean and South America (Cornell Lab of Ornithology, 2005).	BBA 2000	TH
Cerulean Warbler	Breeds in forests with tall deciduous trees and open understory, such as wet bottomlands and dry slopes. Winters in broad-leaved, evergreen forests in mountains of northern South America (Cornell Lab of Ornithology, 2005) .	BBA 1985 (town)	PSC
Barn Owl	Breeds and winters almost anywhere in open country but prefers vicinity of farms and villages. Avoids woodlands and higher elevations (DeGraff and Rudis, 1986).	BBA 1985 (town)	PSC
Common Nighthawk	Breeding in open areas such as plowed fields, gravel beaches, barren areas with rocky soil, railroad right of ways, large woodland clearings, and cities. Winters in South America (DeGraff and Rudis, 1986).	BBA 1985 (town)	PSC
Henslow's Sparrow	Henslow's sparrows historically bred in native tallgrass prairie habitat; in the East grasslands maintained by natural disturbances or fires set by Native Americans provided habitat (Burhans, 2002).	BBA 1985 (town)	E
Upland Sandpiper	Breeds in wide open pastures or grassy fields, often hayfields with alfalfa or clover; occasionally in forest openings. Winters in South America (DeGraff and Rudis, 1986).	BBA 1985 (town)	E
Eastern Box Turtle	Woodlands, old fields, powerline clearings, field edges, thickets, marshes, bottomlands and streambanks (DeGraff and Rudis, 1986).	NY GAP MODEL (PRED)	PSC

Table 9 - Endangered, Threatened, and Special Concern Species - Landscape Level Scale			
Common Name	**Habitat Requirements**	**Record Source**	**Status**
Jefferson Salamander	Found in undisturbed damp, shady deciduous or mixed woods, bottomlands, swamps, moist pastures, or lakeshores. Requires temporary ponds with a pH greater than 5 (DeGraff and Rudis, 1986).	NY GAP MODEL (CONF)	PSC
Spotted Turtle	Requires unpolluted, small, shallow bodies of water such as woodland streams, wet meadows, bog holes, small ponds, marshes, swamps, and roadside ditches (DeGraff and Rudis, 1986).	NY GAP MODEL (PRED)	PSC
Wood Turtle	Frequents slow-moving, meandering streams with sandy bottoms and overhanging alders. Disperses from water sources during summer months to fields, woods and roadsides (DeGraff and Rudis, 1986).	NY GAP MODEL (PRED)	PSC

Key to Codes

BBA - Breeding Bird Atlas
E - Endangered Species (New York)
PSC - Protected, Special Concern Species (New York)
TH - **Threatened Species** (New York)
(PRED) - Predicted Species
(CONF) - Confirmed Species

Natural Heritage Program Listings

Interestingly, the New York Natural Heritage Database lists two additional records of interest. In June 2004, New York Natural Heritage staff observed the Arrowhead Spiketail dragonfly (*Cordulegaster obliqua*) in the southeastern portion of the Robinson Hollow State Forest (Tioga No. 3). As a group, dragonflies are excellent biological indicators as they reproduce and feed in shallow seepage areas that feed into streams. The seepage areas often have dense growth of ferns and other herbaceous plants (Novak, 2005). Biological **indicator species** are unique environmental indicators as they offer a signal of the biological condition in a watershed. Groups of bioindicators species can be used to detect pollution or changes in ecosystem health within a watershed (U.S. EPA, 2005). Because of their specific habitat requirements, conspicuous nature, and their position as top invertebrate predators, these insects help enhance public awareness of the links between land use, water supplies, and biodiveristy (SaintOurs, 2002). The Arrowhead Spiketail is not protected by Environmental Conservation Law.

In 1970, the Southern Grizzled Skipper (*Pyrgus wyandot*) was observed within ½ mile of the Robinson Hollow State Forest. This small butterfly is listed as an endangered species in New York State, and its populations are imperiled (rank G2) globally. Its historical range included much of the Appalachian Highlands and included an isolated population in Northern Michigan. Many researchers believe that there is a strong link between the introduction of aerial pesticide spraying to control non-native forest gypsy moth caterpillars and the decline of the Southern Grizzled Skipper. As is the case with many inconspicuous invertebrate animals, the specific habitat requirements of the Southern Grizzled Skipper are not completely known. Many researchers have found that the skipper requires a landscape dominated by forest cover that has openings of exposed shale bedrock. The skipper larvae reportedly feed on Canada

cinquefoil, cloudberry and wild strawberry. Other likely habitat includes pipelines, clear-cuts, open barrens and dry south facing ridges (Parshall, D., 2002).

Keystone Species

Keystone species are species that play roles affecting many other organisms in an ecosystem (Miller, 2004). Keystone species are organisms whose health is often linked to the health of an entire ecosystem. A keystone species creates habitat that is required by other species. Therefore, the presence, absence, increase or decrease of a keystone species across a landscape is an indicator of ecosystem health. Examples of Central Appalachian ecozone keystone species found on the Unit include the American chestnut, Eastern white pine, Eastern hemlock, pileated woodpecker and beaver. Beginning in 1904, chestnut blight, a non-native disease, effectively eliminated American chestnut from the ecozone's landscape. By 1950 (except for the shrubby root sprouts the species continually produces and which also quickly become infected) this keystone species disappeared from nine million acres of eastern forests (http://www.acf.org/Chestnut history.htm, 4/21/06).

Organizations such as the American Chestnut Foundation (ACF) and the State University of New York College of Environmental Science and Forestry (SUNY ESF) hope to leverage advances in genetic science to restore the magnificent American chesnut to the Appalachian landscape. Today, global trade continually introduces non-native **invasive species** such as hemlock woolly adelgid, Asian longhorn beetle, emerald ash borer and Sirex woodwasp. These species have the potential to devastate our forest ecosystems in the region. Keystone species such Eastern hemlock and Eastern white pine may be significantly impacted on the Unit and across the Appalachian ecozone.

G. MINERAL RESOURCES

Oil and Gas

Article 23, Title 11, Section 23-1101 of the Environmental Conservation Law and State Finance Law authorizes the Department of Environmental Conservation to make leases on behalf of the State for exploration, production and development of oil and gas on State lands.

In all areas covered by this unit management plan, New York State manages the surface estate through the NYS DEC Division of Lands and Forests, and the mineral estate is managed through the NYS DEC Division of Mineral Resources.

An initial title review indicates New York State owns the mineral estate under all areas covered by this plan, with the qualification that mineral reservations may exist and no expressed or implied warranty of title is being offered in this document.

It is NYS DEC policy to recommend excluding operations in surface areas with sensitive habitats (stream banks, wetlands, steep slopes, rare communities etc.) or intensive recreational use. Sites to be excluded from drilling, production and/or other surface occupancy for mining, are illustrated by maps included at the end of this plan. Any proposal for mineral development other than oil and gas would require SEQR review.

Recent Activity

Exploration, Drilling and Production

There has not been any recent natural gas drilling that resulted in production activity, proximal to the Tri-County Unit. Natural gas exploration and drilling activity has recently (2002 to 2003) taken place in Cortland County to the north, and Tioga County to the south of the Unit. This drilling activity has targeted the Trenton Limestone and Black River Limestone/Dolomite rock layers.

Drilling has taken place in the Township of Virgil, Cortland County, at a location approximately seven (7) miles to the north of the Tri-County Unit. The Lower Ordovician Trenton/Black River Formations were tested by the drilling of the Phillips Production Company - Sega #1 well. This well was drilled in 2003 to a depth of 7,821 feet. The well was plugged and abandoned as a dry hole.

Drilling has also taken place in the Township of Tioga, Tioga County, at a location approximately ten (10) miles to the south of the Tri-County Unit. The Lower Ordovician Trenton/Black River Formations were tested by the drilling of the Columbia Natural Resources, Inc.- Manwaring #24470 well. This well was drilled in 2002 to a depth of 11,659 feet. The well was plugged and abandoned as a dry hole.

Approximately seven (7) miles northeast of the , Phillips Production Company was issued a drilling permit by the New York State Department of environmental Conservation, Division of Mineral Resources to drill The Phillips Production Company - Pitman #1 well to a depth of 8,500 feet. This well was never drilled. The drilling permit expired on June 10, 2003.

Leasing Activity

Due to recent exploration, drilling and production activity in western New York, the State received requests to nominate all lands contained within the Tri-County Unit and leased the oil and gas mineral rights in the 2006 lease sale. The leases have a five year primary term and can be extended through production as defined in the terms of the lease. It should be noted that if the mineral estate is under a lease agreement, only the lessee, or entities authorized by the Lessee, will be issued a TRP for exploration, development, seismic acquisition and other associated activities.

In subsequent years these forests could again be nominated for further exploration. As with the 2006 leases there would again be solicitation of public comment through notice in the Environmental Notice Bulletin (ENB), and in local newspapers. A public meeting would be held to provide information about natural gas development specific to the Unit and to receive comments. A 30-day public comment period follows. The Department will consider all comments prior to making a decision regarding oil and gas leasing.

For further information including the 2006 lease sale, lease procedures, well drilling permitting procedures, historical and statistical information go to the Department's website at **http://www.dec.ny/gov/energy/205.html** or contact the NYS DEC Mineral Resource staff at (585) 226-5376 or by mail at Region 8, 6274 East Avon-Lima Road, Avon, New York 14414-9591. Additional contacts include; **New York State Department of Environmental Conservation-Division of Mineral Resources- Bureau of Oil and Gas Regulation, 3rd Floor, 625 Broadway, Albany, New York 12233 (518) 402-8056.**

Gravel and Hard Rock Mining
Gravel and hard rock resources in the areas surrounding and including the Tri-County Uplands Unit Management Plan are limited. Currently there are two small shale pits on the Unit which combined are less than 1 acre is size. Shale from both pits was used to build the Andersen Hill Public Forest Access Road and the Potato Hill Haul Road. Both shale pits are currently inactive. There are no current mining contracts, permits, or operations on any areas in this unit management plan. Under Article 7 of the New York Consolidated Laws / Public Lands, any citizen of the United States may apply for permission to explore and/or extract any mineral on State lands. However, current department policy is to decline any commercial mining application(s) pertaining to any lands covered by this plan. The Department may occasionally mine small quantities of shale rock or gravel for use on state facilities such as access roads, parking lots or recreational trails. Should those actions be anticipated there will be an evaluation regarding the need for a permit. Further information may be found at the Department's website or with the Division of Mineral Resources.

H. CULTURAL RESOURCES

Types of Cultural Resources
The term **cultural resources** encompasses a number of categories of human created resources including structures, archaeological sites and related resources. The Department is required by the New York State Historic Preservation Act (SHPA) (PRHPL Article 14) and SEQRA (ECL Article 8) to include such resources in the range of environmental values that are managed on public lands.

On lands managed by the Department's Region 7 Division of Lands and Forests Office, the number of standing structures is minimal. State wide, those structures that remain are related to the Department's land management activities such as fire towers, "ranger" cabins, maintenance facilities, and related resources. Fire towers as a class of resources, have been the subject of considerable public interest over the last decade. The majority of surviving fire towers have been found eligible for inclusion in the State and National Registers of Historic Places and a number of towers were formally listed in the Registers in 2001. For state agencies, Register listing or eligibility are effectively the same; obligating the Department to treat these resources appropriately and requiring that special procedures be followed should it be necessary to remove or otherwise effect these resources. There are no fire towers, ranger cabins, maintenance facilities, or related assets on the Rapid Waters Unit.

As a part of the inventory effort associated with the development of this plan, Department staff reviewed the archaeological site inventories maintained by the New York State Museum and the Office of Parks, Recreation and Historic Preservation to identify known archaeological resources that might be located within or near the Unit. The two inventories overlap to an extent, but do not entirely duplicate one another. The purpose of this effort was to identify any known sites that might be affected by actions proposed within the Unit and to assist in understanding and characterizing past human use and occupation of the Unit. According to these records, approximately 380 acres of the lands comprising the Andersen Hill and Potato Hill State Forests are archeologically sensitive.

The quality of the site inventory information varies a great deal in all respects. Very little systematic archaeological survey has been undertaken in New York State. Therefore, all current inventories must be considered incomplete. Even fewer sites have been investigated to any degree that would permit their significance to be evaluated. Many reported site locations result from 19th century antiquarian information artifact collector reports that have not been field

verified. Often very little is known about the age, function or size of these sites. This means that reported site locations can be unreliable and encompass a large area. Should systematic archaeological inventory be undertaken at some point in the future, it is very likely that additional archeological resources will be identified.

Archeological Site Protection

The archaeological sites located within this Unit and any unrecorded sites that may exist on the property are protected by the provisions of the New York State Historic Preservation Act (SHPA - Article 14 PRHPL), Article 9 of Environmental Conservation Law and Section 233 of Education Law. No actions that would impact these resources are proposed in this unit management plan. Should any such actions be proposed in the future they will be reviewed in accordance with SHPA. Unauthorized excavation and removal of materials from any of these sites is prohibited by Article 9 of Environmental Conservation Law and Section 233 of Education Law. Archaeological sites are locations where materials (artifacts and ecofacts) or modifications to the landscape reveal evidence of past human activity. This includes resources that range from Native American camps and villages to farm homesteads established by European immigrants during the nineteenth and early twentieth centuries. Such sites can be entirely subsurface or can contain above ground remains such as foundation walls or earthwork features. Old homestead foundations, water wells, stone walls and barbed wire attest to the agricultural history of the Unit and its landscape. Archeological sites within the State date back as far as 12,000 years and are located in a wide variety of settings, from forests and **flood plains** to waterways and mountain tops (NYS Office of Parks, Recreation, and Historic Preservation, 2005).

Archaeological Research

The archaeological sites located on this land Unit, as well as additional unrecorded sites that may exist on the property will be made available for appropriate research. All future archaeological research to be conducted on the property will be accomplished under the auspices of all appropriate permits. Research permits will be issued only after consultation with the New York State Museum and the Office of Parks, Recreation and Historic Preservation (OPRHP). Extensive excavations are not contemplated as part of any research program in order to assure that the sites are available to future researchers who are likely to have more advanced tools and techniques as well as different research questions.

I. ROADS

The Public Forest Access Road System (PFAR) provides both public and administrative access to the Unit. The roads are constructed by the Department to standards that will provide reasonably safe travel and keep maintenance costs at a minimum. These roads are not normally plowed or sanded. There are three types of roads: public forest access roads, (formerly called truck trails), **haul roads** and **access trails**. They provide different levels of access depending on the level of standards to which they were constructed.

Public forest access roads (PFARS) are permanent, unpaved roads. These roads are open for the public use unless the road is gated and/or signed to prohibit use. PFARS may be designed for all weather use depending on their respective location and surfacing. These roads provide primary access to the Unit. The standards for these roads are those of the Class A and Class B access roads as described in the Department's Forest Road Handbook (Swartz, et al. 2004). The speed limit of the PFARS is 25 miles per hour. There are no PFARS on the Robinson Hollow State Forest (Tioga No. 3).

Haul roads are permanent, unpaved roads, but are not designed for all weather use. They are constructed primarily for the removal of forest products and provide only limited access to the Unit. As such, most of these roads are not open for motor vehicle use by the public and are blocked by berms, rocks, or gates to prevent unauthorized motor vehicle use. The standards for these roads are those of a Class C road as described in the Department's Forest Road Handbook. There is a one-half mile haul road on the Robinson Hollow State Forest (Tioga No. 3). The haul road is blocked from regular motor vehicle use.

Access trails may be permanent, are unpaved, and do not provide all weather access on the Unit. These trails are originally designed for removal of forest products and may be used to meet other management objectives such as recreational trails. These trails are constructed according to **best management practices** and are designed for temporary use. Approximately 19 miles of access trails are located throughout the Unit. The vast majority of these access trails are blocked by berms or gates to prevent unauthorized motor vehicle use. **Table 10** lists the roads that are open to public use in the Unit.

Table 10 - Public Roads Open to Public Use in the Unit

State Forest	Road Name	Road Jurisdiction - Type	Mileage
Andersen Hill (Tioga No. 4)	Big Pine Rd. Andersen Hill Rd. West Creek Rd. State Highway 79	DEC - PFAR (Seasonal) Town - Public Road (Plowed) County - Public Road (Plowed) State - Public Road (Plowed)	1.6 .4 .4 .3
Potato Hill (Tompkins No. 4)	Level Green Rd. Blackman Hill Rd. Lake Frank Rd. State Highway 79	Town - Public Road (Plowed) Town - Public Road (Plowed) DEC - Haul Road State - Public Road (Plowed)	1.3 0.5 0.4 0.2
Robinson Hollow (Tioga No. 3)	Lacey Rd. Robinson Hollow Rd. Welch Rd. No name Elishaburg Rd. (former)*	Town - Public Road (Seasonal) Town - Public Road (Plowed & Seasonal) Town (Former) - (Seasonal) DEC - Haul Road Qualified abandoned (2006)*	1.8 1.7 .4 . 5 .5*

Public Highways and town roads also serve as access to, from, and through the State Forests on the Unit. These roads are critical in that they provide vehicular access to the Unit, and are maintained by Town, County or State Highway/Transportation Departments.

There are no designated off-road motor vehicle trails on this Unit. Off-road vehicle travel is prohibited except where otherwise posted for people with CP-3 (DEC Commissioner Policy No. 3) permits. Goal 2, objective 2.1 of this plan provides additional detail on CP-3 permits. Therefore, the use of all terrain vehicles (ATVs) by the general public on all State Forests in the Unit, including all PFARs, is prohibited.

Please note*: On November 13, 2006 by order and judgement of the State of New York Supreme Court, County of Tioga, the Elishaburg Road was deemed a qualified abandoned road. Section 205-b of the New York State Consolidated Highway Law states that the road is open for public access. However, sections of the road are currently in poor condition and impassible by car or trucks. Designated public parking is not

available, and insufficient space exists to create a suitable public parking lot where the road ceases to be maintained by the town. As such, the DEC may occasionally repair sections of the qualified abandoned portions of the Elishaburg Rd. to provide access for scheduled forest ecosystem management activities. However, the DEC has no plans to make permanent repairs or upgrade to the road.

J. RECREATIONAL ASSETS

Historically, State Forests have provided open space for outdoor recreational activities that require minimal facilities. Such activities include hunting, fishing, trapping, hiking, nature observation, picnicking, mountain biking, snowshoeing, snowmobiling and cross country skiing. In the past, the intensity of recreational use was low. This resulted in low environmental impacts and few user conflicts. However, during the 1990s, demand for recreational trails increased substantially (DEC Region 7 Draft Recreation Plan, 2001).

To help meet the increasing demand for recreation, the Department increasingly depends on partnerships with recreation groups to help maintain, enhance, and construct recreational assets. Partnerships between recreation groups and the Department are formalized through the Department's Adopt a Natural Resource (AANR) Program. The program is authorized by Section 9-0113 of the Environmental Conservation Law. The statute authorizes the Department to use a stewardship agreement for activities it approves for the preservation, maintenance, or enhancement of state-owned natural resources.

Volunteerism is the cornerstone of the AANR program. It is a means for completing work that helps preserve, maintain and enhance natural resources at minimum cost to the State. Individuals and groups interested in providing volunteer services are afforded a formal opportunity to propose activities that meet management needs of state-owned natural resources. Such activities may involve remediating vandalism, establishing or maintaining access or nature trails, building camping sites, providing interpretive services for school groups and other citizens, managing fish and wildlife habitats, and otherwise providing positive benefits to the natural resource.

The AANR program has been very successful in Region 7. Since the inception of the program, volunteers have built several **lean-tos**, cleared miles of trails from ice storm damage, built miles of new trail, groomed snowmobile trails, and have removed refuse. These volunteer construction and maintenance activities add significant value to the State Forest system and the people it serves.

The Department's AANR partners are strongly committed to enhancing and protecting natural resources on the Unit. Not surprisingly, these Adopt a Natural Resource (AANR) partners have developed a strong sense of ownership and are very interested (and often involved) in the planning and natural resource management activities that take place on the State Forests in the Unit.

It should be noted that the Hammond Hill State Forest is contiguous to the Robinson Hollow State Forest. The Hammond Hill State Forest has a very strong AANR partnership called the *Friends of Hammond Hill*. Members of this organization spend countless hours maintaining recreation trails and assist Department law enforcement (Forest Rangers and Conservation Officers) by providing timely reports on illegal all terrain vehicle (ATV) use. The Hammond Hill State Forest receives some of the heaviest recreational use in the region. The 16 mile multiple use Hammond Hill trail system provides family-based recreation for hiking, mountain biking, horseback riding and cross country skiing. The trail system is a cooperative effort between the

Department, the Cayuga Nordic Ski Club, the Cayuga Nature Center, the Friends of Hammond Hill, the Dryden-Caroline Drifters Snowmobile Club, and the Town of Dryden. Additionally, the Finger Lakes Trail Conference (FLTC) hiking trail and Dryden-Caroline Drifters snowmobile trail connect the Robinson Hollow with Hammond Hill.

High use recreation areas and trail system assets were identified as part of the forest inventory and GIS spatial analysis process. Presently, there are 4.0 miles of the Finger Lakes Trail (FLT)-North Country National Scenic Trail and 5.9 miles of snowmobile trails (comprising part of corridor 5B). Additionally, the FLTC maintains the Kimee lean-to on the Robinson Hollow State Forest. Both the Finger Lakes Trail Conference and Dryden-Caroline Drifters Snowmobile Club have an AANR agreement with the Department. In addition, approximately 1.5 miles of the West Branch of Owego Creek bisects a portion of the Unit. A cooperative fishing access site developed by the Department and the Tioga County Soil and Water Conservation District (SWCD) provides excellent public fishing access from West Creek Road.

Corridor snowmobile trail development and maintenance activities across the State are promoted and funded via a local grant program administered by the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP). Approximately $1.1 million per year is distributed to counties, towns and villages. Much of this money is passed on to the clubs that do the actual work. There are approximately 8,500 miles of funded trails in New York State. The Dryden Caroline-Drifters corridor trail is funded in part by the program.

The Finger Lakes Trail System is the main hiking trail from the Pennsylvania-New York border in Allegany State Park to the Long Path in the Catskill Forest Preserve. The main FLT is 562.9 miles long. There also are 5 branch trails and fifteen loop trails that extend from the main FLT. These branch and loop trails currently total 236.0 miles. The Trail System has been and is being built and maintained by 20 organizational and 38 individual and family trail sponsors. All of these groups and individuals are volunteers, except for personnel of the U.S. Forest Service who maintain the 12-mile-long Interloken Trail, one of the FLT System's branch trails. The Finger Lakes Trail Conference, Inc., (FLTC) was organized in 1962 to promote and coordinate the building, maintenance, and protection of the FLT System. The trail system is located almost equally on private and public land. There are currently over 450 private landowners who allow the trail to be on their land.

Several sections of the main FLT have been certified by the National Park Service as official components of the North Country National Scenic Trail. When completed, the North Country Trail will extend 4,600 miles across seven states between eastern New York to central North Dakota (http://www.fingerlakestrail.org/,7/23/04).

The State Forests of the Tri-County Uplands Unit also provide opportunities for organized group events. Any group organizing a competitive or group event must apply for a **temporary revocable permit** (TRP) from the Department. The permit process offers the Department an opportunity to address health, safety, and resource protection issues related to the event. There is a $25 administrative fee for this permit.

A group event is defined as any gathering that has been advertised to the public by the sponsoring organization in flyers, newsletters, newspapers, websites, or through other media. To hold any event, the sponsoring organization must request permission in writing at least 30

days in advance of the date of the proposed activity. The TRP applicant or sponsoring organization must provide proof of liability insurance. Historically, TRPs have been issued for construction of the Kimee lean-to, forest insect research, town road repair and telephone line repair.

Illegal ATV use is an issue that faces many private and public landowners in the region. Use of the machines to reach remote outdoor destinations is increasing at a rapid pace. To prevent chronic adverse environmental impacts associated with frequent use, ATV trails open for use for the general public must be properly designed and maintained, be situated on relatively well drained ground, and be placed in blocks of open space 5,000 acres or more in size. Many of the soils in the Tri-County Uplands Unit are wet with seasonally high water tables. Potential damage from chronic illegal use includes rutting, soil erosion, and sedimentation of streams. Often, unregulated ATV use conflicts with other sanctioned recreational activities such as hunting, horseback riding, hiking, mountain biking, running, wildlife observation and cross-country skiing. To prevent trail damage and user conflicts, ATV use is prohibited on the New York State Snowmobile Corridor Trails and Finger Lakes Hiking Trail on DEC State Forests in Region 7 (Region 7 Draft Recreation Master Plan for State Forests, 2001).

In summary, the Unit's recreational assets significantly add to the quality of life and to the overall value of the Unit's land to the People of the State of New York. Long term, as parcelization, fragmentation, and posting of the privately owned landscape continues, it is expected that the Tri-County Uplands Unit will continue to provide significant opportunities for a wide range of recreational stakeholders. Increased recreational use on the State Forests in the Unit will likely benefit local economies as well.

K. OTHER FACILITIES THAT REQUIRE MAINTENANCE

Boundary Lines

State Forest	Miles
Tioga No.3 (Robinson Hollow)	12.2
Tioga No. 4 (Andersen Hill)	6.0
Tompkins No. 4 (Potato Hill)	11.0
TOTAL	**29.2**

Signs and Registers

State Forest	Type	Number
Tioga No. 3(Robinson Hollow)	Identification Sign	1
Tioga No. 4 (Andersen Hill)	Identification Sign	1
Tompkins No. 4 (Potato Hill)	Identification Sign	1
Tompkins No. 4 (Potato Hill)	FLT Trail Register	1

Impoundments (Dams)

State Forest	Number
Tioga No. 3(Robinson Hollow)	1

Shale Pits

State Forest	Number	Size
Tioga No. 4 (Andersen Hill)	1	0.7 acre
Tompkins No. 4 (Potato Hill)	1	0.1 acre

Parking Areas

State Forest	Location	Size (approximate)
Tioga No. 3 (Robinson Hollow)	Fisherman Access Tri-County Pond	Small (3-5 cars)
Tioga No. 4 (Andersen Hill)	Fisherman Access West Creek Rd.	Small (3-5 cars)

Utilities Lines

State Forest	Type	Number	Size
Tioga No. 4 (Andersen Hill)	Electric	1	1.0 acre

Miscellaneous

State Forest	Type	Number
Tioga No. 3 (Robinson Hollow)	Lean-to	1
Tioga No. 3 (Robinson Hollow)	Gate	1

L. PROPERTY USE AGREEMENTS

In March 2005, DEC Real Property Staff researched Region 7 Real Property records. Their research yielded the following list of properties (proposals) identified that were pursued for acquisition by the Department. The notes following each proposal indicate whether it was acquired, as well as any rights to the property that are or were held by other parties. The enclosures and proposal maps referenced in the text are on file at both the Syracuse and Cortland DEC Division of Land and Forests offices. This research also checked Department records with regards to former town roads on the respective State lands.

Tioga No. 3 - Robinson Hollow State Forest

Parcels which adjoin Beam Road (aka Welch Road, known as Lacey Road in Cortland County), Robinson Hill Road (formerly known as Richford Hill Road) and Welch Road are subject to the rights of the traveling public to use the current right of way or easement for highway purposes along those existing road corridors.

Proposal A: former oil and gas lease considered null and void both per time duration and lack of continued activity.

Proposal A-1: Subject to the rights of others in and to the former road bed. Oil and gas lease expired.

Proposal B: Per abstract item A - R.O.W. across premises in favor of Newton G. Cook, his heirs and assigns, to and from the south road (L 84 P 686 Dated 5-11-1870 and L 64 P 143 Dated 3-29-1862). Abstract item B - R.O.W. reserved across southwest corner of described premises (107.55 acres in Lot 578) to and from the public road (L 86 P 502 Dated 5-02-1870). Right of Way reference above could be to access the former road on the west side of Lot 578 or it might have meant the south road through Lot 543 & Lot 539 (as shown on the 1936 aerial photo) which connects to what now is Welch Road. Deed research does not confirm the latter. Former road along the westerly boundary line subject to the rights of others.

Proposal C: Not Acquired. Shown on DEC Map 4146 (Also T.G. Miller, P.C. survey map).

Proposal D: Subject to the rights of others along former road adjoining the westerly boundary.

Proposal E: Not Acquired.

Proposal F: Oil and gas lease rights expired.

Proposal G: Oil and gas lease rights expired. Subject to the rights of others in and to the former road bed which passed through the center of this proposal.

Proposal H: Subject to the rights of others in and to the bed of the former north/south road.

Proposal I: Subject to the rights of others in and to the bed of the former road.

Proposal J: Subject to the rights of others in and to the bed of the former road.

Proposal K: Subject to the rights of others in and to the bed of the former highway known as Elishaburg (Lishaburg) Road.

Proposal L: No further reservations.

Proposal M: No further reservations.

Proposal N: Not Acquired.

Proposal O: Not Acquired.

Proposal P: Oil and gas lease rights expired. Subject to the rights of others in and to the bed of former highway known as Elishaburg Road.

Proposal Q: Subject to the rights of others in and to the bed of the former road.

Proposal R: No further reservations.

Proposal S: Subject to the rights of others in and to the bed of the former road running east/west.

Proposal T: No further reservations.

Proposal U: Subject to the rights of others in and to the former road along the westerly boundary line. This Proposal was never field surveyed. A survey would include marking and monumenting 3800± feet of property line.

Proposal V: Subject to the rights of others in and to the bed of the former road.

Proposal W: Not Acquired.

Proposal X: Not Acquired.

Proposal Y:

a) Subject to the rights of others in and to the bed of the former road.

b) Access Right of Way reserved over proposal for the benefit of the adjoining owner (L 376 P 706 see DEC Map No. 10608 for location.

c) Subject to utility easements: 1.) L224 P17 - Transmission and Distribution of Electricity; and 2.) Telephone service line along Robinson Hollow Road as per DEC Map No. 10608.

Status of former Town Roads

a) Various atlas maps and aerial photo's dated 1936-37 show former location of five (5) roads that passed through this reforestation area and may be subject to the rights of others.

b) It is suggested that a formal letter be prepared to the Town of Richford requesting access to old Town records relative to these roads, Town Board minutes and/or Highway Superintendents records dating back to the early or mid 1850s that may speak to these issues.

c) The best approach would be to research all applicable former roads that cross or adjoin State Reforestation Areas within a town.

d) Elishaburg Road was researched. Record deeds refer to it as a highway. Deeds imply at a minimum an access easement benefitting the land owners adjoining same. The DEC verbally requested access to the old Town Board meeting minutes and/or highway records from the Town Clerk and Highway Superintendent. They knew of no old records, but both stated that they were aware that a resolution of qualified abandonment of this road had recently been passed. This of course does not prove the fact as to whether it ever was a Town Road per the towns historic records (Resolution and Highway Law on file).

Tioga No. 4 - Andersen Hill State Forest

Parcels which adjoin West Creek Road (Co. Rte. 31), Andersen Hill Road and NYS Rte. 79 (S.H. No. 8330, Susquehanna and Bath Turnpike aka Catskill Turnpike) are subject to the rights of the traveling public to use the current right of way or easement for highway purposes along those existing road corridors.

Proposal A: The portion of NYS Route 79 (S.H. No. 8330) crossing the northerly portion of Pro. A was reconstructed. The 1991 mapping delineates an area of concurrent use and occupancy by DEC and DOT. The southerly extent of this area was to be monumented.

Proposal B: Not Acquired.

Proposals A and C: (See DEC Map No. 10585 and hilited aerial photo)

a) West Creek Road was rebuilt approximately 100 feet west of its original position. This appears to have been done by a revocable permit issued by the Department in 1954.

b)The property line between Pro. C and the Twentyfour Poor Shots Rod and Gun Club parcel is the centerline of the old West Creek Road alignment and the club property rights include the right to travel the old roadway but otherwise do not extend west of the

old centerline. The tax map incorrectly shows the property line along the new centerline and the tax mapping office has been notified and sent supporting documentation.

c) Prior DEC surveying work shows utilities along the road frontage on these proposals. The utilities also leave the current road corridor, crossing Pro. C, to service the rod and gun club. No easements or reservations were found for these utility lines.

C: A survey done for the southerly adjoiner, "Callinan", shows an overlap onto the DEC lands. The lines in question fall between West Creek Road and Andersen Hill Road. A survey to resolve this would include the marking and monumenting of 1700± feet of property line.

Proposal D: No further reservations.

Proposal E: Not Acquired.

Proposal F: (See aerial photo, portion of Richford quad. And DEC Map No. 6296)

a) Tioga County tax maps show a 120 by 110 foot private parcel at the northwest corner of the truck trail and Andersen Hill Road. No documentation was found to support that location of the parcel and the tax mapping office has been notified and sent supporting documentation to correct its position.

b) Acquisition records for this parcel indicate an electric and telephone line along the town road (Andersen Hill Road). DEC's ownership extends to the centerline of the road. No easements or reservations are listed in the deed or abstract for this parcel.

c) This proposal was acquired "subject to the rights of others in the highway adjoining the premises on the south".

d) In 1991 the owners of an 18 acre parcel, bordering Pro.s A, G, C, and F, were notified they had no legal right to access their parcel by crossing DEC lands without a TRP. The owners at that time were Phillip and Harold Barden.

e) Some time between the mid 1990s and 2002 a straight swath was cleared, through a reforested area, diagonally across the southerly portion of this proposal. The west end is near the 1 acre reserve shown on DEC Map No. 6296 and runs southeasterly towards and across the truck trail near its intersection with Andersen Hill Road. No records were found to explain this.

f) This proposal was acquired without the benefit of a survey. The acquisition created a one acre reserve fronting on Andersen Hill Road. A survey would entail 6300± feet of property line to be marked and monumented, including the reservation, and 2400 ± feet of road frontage.

Tompkins No.4 - Potato Hill State Forest

Parcels which adjoin Level Green Road, Blackman Hill Road and NYS Rte. 79 (S.H. 8330, Susquehanna and Bath Turnpike aka Catskill Turnpike) are subject to the rights of the traveling public to use the current right of way or easement for highway purposes along the existing road corridors.

Proposal A:

a) Deed into the State is “subject to the rights of Erwin Dean, if any”? We don’t have an abstract of title for this proposal and at this time don’t know what rights may have been referred to in the deed. County Clerk’s Office research would be necessary to clear up this issue.

b) Trespass issue regarding access over truck trail/haul road by the adjoining owner to and from his house. Owner has valid access rights over the former road bed of Blackman Hill Road. An exchange was proposed by the adjoining owner, Mr. Frank Baldwin, but was not finalized by the owner. Access over truck trail should cease and the culvert and fill should be removed.

c) DEC truck trail encroaches upon lands of an adjoiner, this access issue needs to be addressed.

d) Proposal is subject to the rights of others in and to the former bed of Blackman Hill Road.

e) Blackman Hill Road was relocated through Proposal A, west of its original position, some time after acquisition. Real Property has no record of this transaction.

Proposal B: Reserved from the conveyance to the State were rights to two springs, located about 165 feet northeast of Level Green Road directly opposite the buildings of the party of the first part. Together with the right to install and maintain underground water pipes from springs to and across Level Green Road.

Proposal C: No deed reservations or subject to clauses. Subject to the rights of others in and to the bed of the former road lying to the west of Level Green Road.

Proposal D: No deed reservations or subject to clauses.

Proposal E: No deed reservations or subject to clauses. Subject to the rights of others in and to the bed of the former road lying along the east boundary of said proposal.

Proposal F: No deed reservations or subject to clauses. Subject to the rights of others in and to the bed of the former road.

Proposal G: No deed reservations . Subject to easements and restrictions of record. Also conveys all rights, title and interest of the County of Tompkins in and to the bed of roads or waterways together with any and all right of ingress and egress to and from said premises. Subject to the rights of others in and to the bed of the former road.

Proposal H: Not Acquired.

Proposal I: Deed excludes and is subject to any and all public utility easements, telephone or transmission lines affecting said premises. Also, subject to a permanent right of concurrent use and occupancy, along NYS Rte. 79, by the Department of Transportation for highway purposes in and to three (3) parcel areas as shown on DOT Map No. 59T, Parcels 70,71 and 72 (NYSDEC Map No. 10973).

Proposal J: Not Acquired.

Proposal K: Not Acquired.

Proposal L: Not Acquired. (Proposed Baldwin exchange parcel).

This Real Property report was provided to the Cortland Office Division of Lands and Forests, Bureau of State Land Management in March 2005 with the following enclosures:

- *Region 7 State Forests and Wildlife Management Areas* composite map
- portion of Dryden/Harford, Richford, Speedsville quadrangle maps
- qualified abandonment proceeding for Elishaberg Road.
- Highway Law, Article VIII
- portion of aerial photos of Tioga 4 Pro. A & C (West Creek Road) and Pro. F (Andersen Hill Road)
- portion of 1937 aerial photo showing Northeast portion of Tompkins SRA No. 4
- sketch showing Tompkins SRA No. 4, Pro. A issues
- DEC Map No.s 6296, 10585 and 10608

M. RESOURCE DEMANDS

The demand for traditional and non-traditional forest products and ecosystem based services on the State Forests of the Unit have historically varied over time. Additionally, written and verbal comments concerning the development of this plan and resources of the Unit were requested and gathered from the public through: 1) press releases, 2) newpaper articles in the Ithaca Journal, 3) interviews with Ithaca College students, 4) a direct mailing to 1,250 residents within about a mile of the Unit, and, 5) comments specific to the proposed oil and natural gas lease sale received during and after public meetings in Cortland on June 27-28, 2005 and in Elmira on June 28-29, 2005.

Forest Product Demands

The following is a list of forest products and associated demand trends that State foresters and the public have formally and informally observed in the Tri-County Unit.

Product	Trend
Firewood	Increased
Softwood Sawtimber	Increased
Hardwood Sawtimber	Increased
Hardwood Pulpwood	Increased
Softwood Pulpwood	Variable
Mushrooms	Stable
Maple Syrup	Stable
Medicinal Plants	Increased
Ginseng	Increased
Honey	Decreased
Fence Posts	Decreased

Demands for Ecosystem Based Products, Services and Values

Diverse ecosystems and ecosystem based products, services, and values are very important to the public. Stakeholders have provided the following comments and suggestions concerning the

ecosystem based products, values, and services of the Unit.

- ❒ Maintain and enhance biological diversity.
- ❒ Adopt a invasive plant management program to eradicate non-native plant species.
- ❒ Encourage all-age management.
- ❒ Manage the forest to develop late successional old-growth character.
- ❒ Avoid fragmenting the forest.
- ❒ Leave buffer zones along streams and steep slopes.
- ❒ Consider seasonal limitations on recreational use to prevent soil erosion.
- ❒ Limit clearcutting.
- ❒ Manage for wildlife diversity.
- ❒ Conduct improved natural resource inventories.
- ❒ Better enforce hunting seasons.
- ❒ Protect the natural resources and values of the White Rock Gorge Natural Area.
- ❒ Plow seasonal roads to improve winter access.
- ❒ Increase habitat for early successional stage species.
- ❒ Lease the lands for natural gas exploration.
- ❒ Acquire additional lands as part of the Emerald Necklace Open Space Project.
- ❒ Maintain and expand the existing trail system, especially for hiking and cross-country skiing.
- ❒ Restore the state forests to a more pristine state.
- ❒ More effectively manage the deer herd to protect forest ecosystems and reduce Lyme disease.
- ❒ Omit logging on State lands.
- ❒ Expand the amount of timber sold from the Tri-County Uplands unit.
- ❒ Make sure there are no “no-cut” mandates.
- ❒ Leave some natural areas without trails and without logging.
- ❒ Maintain “no-cut” areas adjacent to trails.Prevent commercial logging and building.
- ❒ Develop more small game habitat with more low cover.
- ❒ Conduct more homeowner firewood sales and longer contract periods for cutting.
- ❒ Use grass seed to stabilize soil and prevent erosion after logging.
- ❒ Require loggers to restore site to original condition.
- ❒ Continue managing State Forests in the same manner as before.
- ❒ Lease state lands for the potential development of natural gas reserves.
- ❒ Ban oil and mineral extraction from State lands.
- ❒ No prescribed burns.
- ❒ Keep state forest lands as wild as humanly possible.
- ❒ Snowmobiles should be kept on trails to protect wildlife.
- ❒ Forest management provides wood products, jobs, and diverse wildife habitat; keep doing it.
- ❒ Take the land out of public ownership and return it to private ownership.
- ❒ Overall, from what I have seen, you folks are doing a very good job of managing our state lands.
- ❒ Manage the land to supply wood products and to cover management costs - but not through clear-cutting.
- ❒ Andersen Hill and Potato Hill support a great range of wild mushrooms; habitat management is critical.

N. PUBLIC USE AND FACILITY DEMANDS ON THE UNIT

Recreational Uses

The following lists a variety of recreational pursuits and their estimated trends based on observations by Department foresters during the past 10 years:

USE	TREND
Hunting	Decreased
Trapping	Decreased
Fishing	Stable
Horseback Riding	Increased

Hiking	Increased
Camping	Increased
Snowmobiling	Increased
Cross-Country Skiing	Increased
Mountain Biking	Increased
Geocaching	Increased
Illegal ATV Use	Increased
Nature Observation	Increased

Recreational Facility Demands
Demands for the following facilities have been expressed through emails, letters, and phone calls.

- ❒ Provide all-terrain vehicle (ATV)/off-road vehicle (ORV) trails.
- ❒ Maintain and enhance cross-country ski trails.
- ❒ Provide formal mountain biking trails.
- ❒ Maintain and enhance snowmobile trails
- ❒ Maintain and enhance hiking trails
- ❒ Consider building a horse trail system and formal camping area.
- ❒ Please don't build any additional trails.

O. MANAGEMENT CHALLENGES ON THE UNIT

Physical Challenges
The following factors pose physical management challenges of the Unit's lands and waters: steep slopes; soil characteristics; recreational trails; potential insect and disease infestations; climate change; human population increases; fluctuations in wood markets; global economic change; limited access; presence of rare or endangered species; presence of cultural resources; proximity of the Unit's forests; presence of county, town, and state roads; electrical transmission lines, telephone lines, and pipelines; easements; and **exotic** (non-native) conifer species planted on incompatible soils.

Administrative Challenges
The following factors are administrative limitations on the management of the Unit: limited budgets, limited staffing, increased recreational demand, and reduced availability of inmate work crews.

Societal Challenges
Changing public opinion and values about public forest land impact how forest ecosystem management is practiced on the Unit. The State Forests have traditionally produced sustainable supply of forest products - and have also been used for trapping, hunting, and hiking. As large open space gradually becomes developed, the forests of the Unit are increasingly valued for the recreational services they provide. Activities such as mountain-biking, snowshoeing, snowmobiling, geo-caching, bird watching and cross country skiing are becoming increasingly popular.

Moreover, many people value the forest as a place for reflection and relaxation. Ecosystem management activities such as patch cutting to create early successional wildlife habitat - and natural disturbances caused by ice or wind events can impact **aesthetics**. However, aesthetic impacts caused by such disturbances don't last very long, as our temperate forest typically reestablishes itself within 10 to 15 years of disturbance events. Thus, as the Unit receives a

greater number of visitors, Department forest land managers must continuously adapt and balance ecosystem management goals, objectives and practices with the changing demands on the Unit.

Departmental Rules, Regulations, Laws, and Policies

Please refer the appendix of this plan for a list Department Rules, Regulations, Environmental Conservation Laws, and Policies governing the management activities on the Unit.

LANDSCAPE MANAGEMENT STRATEGIES - STATE FOREST GOALS, OBJECTIVES, ACTIONS

GOAL 1: *Provide Healthy, Sustainable, and Biologically Diverse Forest Ecosystems*

The Department's principal goal is to provide healthy, sustainable and biologically diverse forest ecosystems using the principles of ecosystem management. Ecosystem management is a process that considers the total environment - including all living and non-living components. It requires the skillful use of ecological, economic, social, political, and managerial and leadership principles to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values and services over the long term. Ecosystem management recognizes that people and their social and economic needs are an integral part of ecological systems (Bureau of Land Management, 1994).

One of the simplest definitions of ecosystem management points out the complexity of understanding and managing an ecosystem. That definition is in the form of a slogan on a United States Forest Service poster promoting ecosystem management. The slogan simply defines ecosystem management as "Considering All Things." This approach asks that management decisions consider all living things from soil micro-organisms to large mammals, including their complex interrelationships and habitat requirements; all non-living components of the ecosystem, including physical, natural, and geological components; and all social, cultural, and economic factors as well. As ecosystem management is conceptually applied through the actions recommended in this plan, the Department will strive to strike a balance between human needs and ecosystem health. To achieve this goal, this plan recommends actions that promote biodiversity at the landscape level, and healthy, productive, sustainable forest ecosystems.

The cornerstone of ecosystem management is promotion of a biologically diverse landscape. As previously mentioned, the landscape includes the Unit's State Forests and the surrounding geographical area. Biodiversity refers to the variety and abundance of living things, their habitats, and their interdependence in a given area or "landscape." Ecosystem integrity cannot be sustained or enhanced without considering land uses and cover types beyond the State Forests of the Unit. For example, important landscape features such as grasslands and forests need to be present in relatively large blocks and be connected to one another by hedgerows, **riparian zones**, or wetlands to be completely functional.

Biodiversity, by definition, is greater when there are many species of plants and animals present in the landscape. It is further enhanced if each respective population has a wide range of genetic variability and ages. Having many different habitats also contributes to greater biodiversity. Peer reviewed scientific studies strongly suggest that diverse ecosystems are more resilient to environmental stresses, human impacts, and attacks by insects and disease.

Diversity within the Unit can be broadly measured and interpreted by assessing the variety of species and the range of land cover types and **forest development** stages present. Maintaining and enhancing such diversity will require a number of specific objectives and actions.

The biodiversity objective can be achieved through both passive and active management strategies. Foresters employ passive management strategies through designation of natural and protection areas - and use of riparian buffers.

When actively managing forest ecosystems to produce forest products, foresters employ two silvicultural systems which mimic natural disturbance patterns and help promote biodiversity. The two systems are referred to as even-aged and uneven-aged management. Trees in an even-aged stand originated at approximately the same time, either naturally or by planting. They grow, are cared for, and may undergo various **intermediate improvement thinning** during their development. Ultimately, trees are removed in one or more major harvest cuts after which a new stand is released or established. Such a stand, consequentially, has a beginning and an ending point in time.

The even-aged management system is an important land management tool because it creates early forest developmental stages necessary for the survival of many plant and animal species. It favors the establishment of **shade intolerant** tree species such as aspen, black cherry, pin cherry, red oak, white oak, chestnut oak, shagbark hickory, tulip poplar and white ash. These species have significant environmental, biological and financial values. Additionally, even-aged management favors the establishment of many tree species that produce mast, such as black cherry, white oak, chestnut oak and northern red oak. These mast producing species provide valuable food for wildlife. Over the years, the availability of hard mast producing trees has declined in the landscape as a result of diseases which have severely impacted beech and butternut trees and caused the virtual extinction of the American chestnut.

The uneven-aged management system differs from the even-aged system in several important ways. Instead of maintaining one dominant age condition in the stand, this system establishes and maintains at least three or more age groups (**cohorts**) ranging from seedlings and saplings to very large, mature trees. Uneven-aged management uses two different methods: single tree selection and **group selection**. Single tree selection is used to maintain a relatively closed forest canopy as desired in the uneven-aged **high canopy forest areas**. Group selection is used to create openings for the regeneration of shade-intolerant species such as white ash, red oak, white oak, and black cherry and enhances species diversity within the stand.

The uneven-aged single tree system tends to favor shade tolerant tree species such as Eastern hemlock, American beech and sugar maple. Many of these species are long-lived. Through this system a vertical layering of the forest canopy is created with multiple crown classes. Each layer of vegetation provides distinct habitat niches. Uneven-aged management promotes a relatively continuous tree crown canopy and provides late successional habitat characteristics such as large diameter trees and a moist forest floor.

More than 83% of the Tri-County Uplands Unit is comprised of even-aged forest stands as a result of European settlement and historical agricultural land management practices. To promote biodiversity and create additional blocks of continuous high canopy forest conditions, some even-aged stands will be converted to uneven-aged stands through single tree and group selection **silviculture**. This strategy will help minimize the size of openings in the canopy, and thereby help establish and retain a relatively continuous closed tall (high) forest canopy.

Continuous high canopy forests 500 acres or greater in size are environmentally significant as they provide habitat for wildlife species such as the Northern goshawk, black bear, wood thrush, scarlet tanager, Canada warbler, Louisiana waterthrush and black-throated blue warbler. Additionally, high canopy forests provide effective wildlife travel corridors between adjacent habitats on public and private lands. High canopy forest areas typically have many late successional forest characteristics such as larger diameter trees, greater amounts of coarse woody material on the forest floor, and greater numbers of living, or dead hollow trees. In many ways, uneven-aged silviculture mimics the natural process by which older trees grow to maturity, die, and are gradually replaced by young seedlings and saplings.

The process to convert an even-aged forest to an uneven-aged forest structure typically takes more than 100 years. In this plan, recommendations to convert even-aged stands to uneven-aged stands are made where forest conditions are suitable and other objectives are not compromised. Stands that are good candidates for long term uneven-aged management are typically located on productive ground that is capable of growing shade tolerant **long lived** tree species - chiefly sugar maple, American beech, and Eastern hemlock. It should be noted that some stands outside the core high canopy forests areas will continue to be managed on an even-aged basis in an effort to diversify wildlife habitat, contribute hard mast, and provide early successional forest types.

This plan provides a framework to strategically apply adaptive even-aged and uneven-aged forest ecosystem management techniques that help create or maintain diverse ecosystems and forest stand structures. Forest management activities may vary due to DEC staff capabilities, unplanned natural disturbances such as ice storms, insect and disease outbreaks, and changing market demands - particularly for low grade forest products.

Objective 1.1: Apply a Landscape and Ecosystem Health Perspective to Decision Making. The management actions recommended by this plan identify and focus on opportunities to sustain or increase the biodiversity of the Tri-County Upland Unit's landscape. These actions will be balanced with other economic, social, recreational and ecosystem management goals. The long term public ownership of State Forests provides exciting opportunities to contribute unique landscape components that are more difficult to provide from private lands with shorter term ownership patterns. Specifically, the State Forests of the Tri-County Uplands Unit will strive to provide early successional, old growth, and minimally fragmented high canopy forest types.

Ecosystems are very complex systems where almost all life forms are interrelated in some manner. Managing an ecosystem on a species-by-species basis is a difficult task. Typically, enhancements made to the ecosystem to benefit one species will invariably affect numerous other species as well, in both a positive and negative fashion. It is impossible to determine and rank the value of all the common species present on the forest in order to choose which populations should be helped at the expense of others. For these reasons, this plan strategically promotes biodiversity and sustains ecosystem health through diversification of horizontal and vertical forest structure, conservation of gene pools, establishment of natural areas and protection of water resources.

Adaptive forest management will be applied to sustain and enhance ecosystems (and the services provided by them) for a suite of wildlife indicator species, particularly neo-tropical migrant songbirds, reptiles, amphibians, salamanders and frogs. As previously mentioned, Department land managers will employ land planning and management strategies that will create, maintain, or enhance high canopy forest areas with appropriate **special management zones** that **buffer** streams, wetlands and vernal pools. Natural and protection areas will be strategically linked with high canopy forest, uneven-aged forest, and riparian zone protection areas.

Action 1.1.1: Apply ecosystem management using GIS technology.
Geographic Information Systems (GIS) and GAP analysis tools are increasingly used by conservation organizations to develop appropriate landscape level management strategies, goals, objectives, and actions. As previously mentioned, GIS technologies use computer-based mapping and databases to assist with decision-making and spatial analysis. GIS technologies will be continually employed to make informed ecosystem based decisions at the landscape level. Use of improving GIS technologies will help Department foresters continue to create and maintain a variety of ecosystems and associated wildlife habitats. Additionally, Department staff will seek additional opportunities to collaborate and share this plan and its associated GIS data sets with municipal land use planners and land conservation organizations.

Objective 1.2: Protect Soil and Water Resources.
Sustainability of a forest ecosystem largely depends on the protection of soil and water resources. Providing clean water is considered the most vital of ecosystem services provided by our forest and wetlands (USFS, 2009). The aquatic, riparian, and wetland ecosystems on the Unit and its landscape provide food, breeding areas, and cover for numerous plant and animal species. These water resources are an integral part of the larger hydrologic cycle (the route water takes from rainfall to evaporation through condensation to rainfall again) providing sediment filters, regulating runoff and recharging aquifers. Reducing and preventing soil erosion and sedimentation caused by water flowing over bare mineral soil throughout the Unit and its landscape is of critical importance.

Action 1.2.1: Apply Best Management Practices (BMP's).
Apply best management practices (BMP's) on all State Forest land management operations including timber harvesting, the development of recreational facilities, and oil or gas exploration and/or development. Continue to encourage the voluntary use of BMP's on private lands through the Department's Division of Lands and Forests, Bureau of Private Land Services, Cooperative Forest Management (CFM) program.

Harvesting and construction activities are not a major cause of water quality problems when properly managed. When minimally disturbed, forest soils retain their capacity to absorb tremendous amount of water. However, construction of skid trails, roads, log landings, well pads, parking lots, and any large scale earth moving project has the potential to become a source of erosion, sedimentation and siltation. Such water quality issues are primarily caused by water flowing over the surface of disturbed mineral soil during heavy rain or snowmelt events.

Sedimentation and turbidity (cloudiness) is caused when eroded soil gets into a stream, wetland, pond, or lake. This condition can damage fish habitat, spawning areas, and make the water unsuitable for other uses downstream. Severe erosion moves large quantity of soil and can negatively impact ecosystems.

The key to protecting water quality is proper planning and the appropriate use of best management practices (BMPs). These simple, often low-cost practices and techniques are incorporated into timber harvests and construction projects. BMPs keep water clean, maintain the productivity of the forest, improve public confidence in logging, and maintain public support for activities which are essential for sustainable forest management.

Forestry BMPs will be followed for all construction, maintenance, logging, log landings and mineral extraction projects. All main skid trails will be located by Department Foresters prior to harvesting. BMP recommendations for road placement, grading, water diversion devices and culverts will be followed. Whenever possible, log landings will be located at least 250 feet away from water bodies. If any log landings are located closer than 250 feet, additional sediment control methods will be employed (including straw bales and silt fences) to prevent sedimentation and minimize erosion. Cutting and filling on roads and trails will be limited. Goal No. 3, Objective 3.2 of this plan details specific buffer guidelines for extraction of minerals on the Tri-County Uplands Unit.

Upon completion of a logging job, the log landing must be back-bladed and seeded with an appropriate mix of native, warm-season grass seed to reduce erosion and provide food and cover for wildlife. The grass species may include big bluestem (Andropogon gerardi) var. 'Niagara', little bluestem (Schizachyrium scoparium), switchgrass (Panicum virgatum), eastern gamma grass (Tripsacum dactyloides) and/or Tioga deer tongue (Panicum clandestinum). Depending on the species used, seedling rates may range from 10 pounds to 25 pounds per acre. The grass seed mix may include up to 20% (by weight) of annual ryegrass as a cover crop.

New York's BMPs are consistent with the United States Environmental Protection Agency approved Non-Point Source Pollution Management Plan. The State's plan outlines our approach to implementing timber harvesting BMPs. Proper use of BMPs can eliminate these problems before they occur (New York Forestry BMP Field Guide 2000).

Action 1.2.2: Establish Special Management Zones (SMZ's).
Establish SMZ's along streambanks, wetlands, spring seeps and vernal pools in accordance with the DEC Division of Lands and Forests Management Rules for the Establishment of SMZ's.

To help protect stream habitat and overall surface water quality, natural and protection areas have also been established adjacent to water resources. Additional buffering from land management activities will be provided by SMZ's. An estimated 600 acres of land (17% of the Unit) along 11 miles of streams will be buffered by SMZ's as shown by the Management Direction Maps at the end of this plan.

Along perennial and intermittent streams, a 100 foot SMZ will be established along both sides of the stream banks. Along perennial streams, the first 50 feet next to the stream will be a protection buffer; the next 50 feet will maintain at least 75% of pre-harvest basal area. Along

intermittent streams, a 100 foot SMZ will be established on each side of the stream, and a 75% buffer of pre-harvest basal area will be maintained. Spring seeps and wetlands will also be buffered by a 100 foot SMZ. Ponds will have a 50 foot protection buffer and an additional 100 foot SMZ that retains at least 75% of the pre-harvest basal area. Vernal pools will be buffered by a SMZ at least 100 feet wide in which 75% of tree crown cover will be retained.

New skid trails will be kept at least 100 feet from wetlands and water bodies and at least 150 feet away from water resources when adjoining slopes are greater than 10 percent. No skidding will take place through the origins of spring seeps. When roads and trails must cross outside the origin of spring seeps, they will be located as far from the seep origin as possible and cross the seep at right angles.

New haul roads or log landings will not be constructed with within 250 feet of wetlands, streams or ponds. Any newly constructed roads associated with oil and gas development and exploration will be buffered as described by Objective 3.2 of this plan.

Action 1.2.3: Monitor and control invasive exotic species.
Protect aquatic and terrestrial ecosystems by monitoring and controlling invasive exotic species. **Herbicides** and pesticides may be used to control invasive exotic (non-native) plants and insects, but only as a last resort. Instead, the Department will employ Integrated Pest Management (IPM). IPM is a comprehensive approach to controlling insects, weeds, and plant pathogens with environmentally and economically sound practices that minimize risks to people and the environment. Promoting species diversity, structural diversity, a variety of size classes, and enhancing forest health are cornerstones of IPM on State Forests. Healthy forests are better able to resist insect and disease outbreaks.

When invasive exotic (non-native) species are not able to be controlled by the methods described above, all other available methods of eradication and control will be considered, including the use of herbicides and/or pesticides if necessary. If it is determined that herbicides and/or pesticides are necessary, SEQR (State Environmental Quality Review) will be followed.

Objective 1.3: Protect, Endangered, Threatened and Special-Concern Species.
Protection of endangered, threatened, and special-concern species is a priority. However, no rare, endangered, threatened, or special-concern species of plants or animals are known to exist on the State Forest lands of the Unit at this time. At the larger landscape level outside the Unit, several threatened and special-concern animal species are known or predicted to occur by DEC's Master Habitat Database and the New York Gap Analysis Model. Most of these species are raptors (birds of prey) such as the sharp-shinned hawk and Northern goshawk, or birds such as Henslow's sparrow and the golden-winged warbler that require **early successional habitat**. Some of the animals are amphibians and birds that require blocks of forest and mid to late successional habitat - such as the Jefferson salmander and Cerulean warbler, respectively. In its' entirety, this plan seeks to provide a diverse suite of early, mid, and late successional habitats for many species.

It should also be noted that the Natural Heritage Program did observe the Arrowhead Spiketail dragonfly (*Cordulegaster obliqua*) on the Robinson Hollow State Forest during a biological survey in 2004/2005. The New York Natural Heritage Program has recorded this species in approximately 16 locations in 11 separate counties across a broad extent of the Southern Tier,

Finger Lakes, and Hudson Valley, and a number of these locations have been found in the past 5-10 years. The Natural Heritage Program reports that the habitat is not uncommon within the broad range occupied by the species and many additional populations will undoubtedly be discovered as a result of more extensive survey efforts. However, there are a number of potentially significant threats to the habitat required by these dragonflies and populations at individual sites are not expected to be large (http://www.acris.nynhp.org/guide). Habitat may be lost as wet grassy sites revert back into forest or are developed.

Action 1.3.1: Identify the locations of endangered, threatened, and special-concern species.
Continue to collaborate with the New York Natural Heritage Program to identify any endangered, threatened, or special-concern species on the Unit. If such species are found, adaptive ecosystem management strategies will be employed to conserve, enhance, or protect habitat based on the best scientific information available. This document provides management actions and guidelines that diversify, conserve and protect wildlife habitats across the entire Unit and connecting landscape.

Action 1.3.2: Promote biodiversity.
Manage for a variety of habitats to promote biodiversity as proposed by this plan. This approach will help relatively common species remain common and provide opportunities for animals such as the arrowhead spiketail dragonfly. Create early successional habitat in wet areas when possible. The New York Natural Heritage Program reports that "these dragonflies spend most of their time at small spring fed streams and seeps with soft bottoms and sometimes rocks. Such streams are usually in forested areas although the seepage areas themselves may be in small areas of more open habitat types such as meadows dominated by ferns and other moisture dependent herbaceous plants. Adults may feed in forest clearings in the vicinity of the principal breeding habitat arrowhead spiketail requires."

Objective 1.4: Conduct Periodic Forest Inventories.
Natural resource research influences and updates management decisions and strategies. Periodic data collection of vegetation and wildlife will help monitor ecosystem conditions and future changes. A forest inventory was conducted on each State Forest in the Unit during the winter of 2004. Periodic inventories and re-inventory after each silvicultural treatment will continue to be conducted.

Action 1.4.1: Update Forest Inventory.
The State Forest Information Database (SFID) has been updated and continues to collect and manage natural resource information at the stand level (stands average about 15 acres in size). The updated software provides improved data storage and sharing capabilities. As such, it supports ecosystem based planning initiatives.

Action 1.42: Inventory the forest on a regular schedule.
Forest inventory will be conducted according to the following schedule:

Table 11 - State Forest Inventory Schedule

State Forest	State Forest Name	Acres	Last Inventory	Inventory Update	Next Inventory
Tioga No. 4	Andersen Hill State Forest	554.4	1985	2004	2014
Tompkins No. 4	Potato Hill State Forest	914.9	1985	2004	2014
Tioga No. 3	Robinson Hollow State Forest	1938.0	1981	2004	2014

Objective 1.5: Address the "Gaps" Identified in the Landscape Surrounding the Unit.

Issue 1: The demand for high value timber species such as black cherry, sugar (hard) maple, and red oak has resulted in these species being harvested from private lands at a rate that reduces their dominance in the forest. As a result, species like red maple, which is not as valuable, has become more dominant and plentiful in the forest. Since many life forms from fungi, to insects, to birds, depend on specific tree species, their populations could also be altered.

Issue 2: The acreage of oak types is declining in the region. Changes in the prevalence of oak types illustrate this issue. According to the United States Forest Service surveys between 1980 and 1993, the oak types in the South Central Highlands Inventory Unit have declined 35 percent (Alerich 1995). The Tri-County Uplands Unit is within the U.S. Forest Service South Central Highlands Forest Inventory Unit. Therefore, from the standpoint of biological diversity, it is important to continue to take advantages of opportunities to perpetuate oak types within the Tri-County Uplands Unit. Insects and diseases have negatively impacted other mast-producing species such as American beech, white ash and butternut. The decline of these hardwood species has the potential to negatively impact ecosystem connections and wildlife populations.

Issue 3: Gap analysis indicates that the landscape surrounding the Unit lacks early and late successional forests. Ideally, the Cortland Forestry office would like to maintain 15 to 25% of the entire State Forest landscape managed for early successional cover, and 15% to 25% of the Unit with late successional characteristics (both managed and minimally managed). If this plan is fully implemented, the Unit will eventually provide an estimated 618 acres (about 18%) of early successional wildlife habitat.

Issue 4: Gap analysis indicates that these State Forests positively contribute to the plantation and natural conifer component at the landscape level. Ideally, the Cortland Forestry office would like to maintain 20% of the entire State Forest landscape in long term conifer cover.

Issue 5: Native and exotic pests/diseases, severe weather events, and global climate change are threats to forest ecosystem health and sustainability.

Issue 6: Long term, suburban sprawl and associated land development pressures will continue to drive parcelization and fragmentation of forest cover habitats on surrounding private land. This loss of habitat connectivity could impact the Unit's wildlife populations.

The following management actions will help address these issues.

Action 1.5.1: Maintain an oak component on the State Forests in the Unit.

❒ Manage 11 stands of oak and transition hardwoods (Northern Hardwoods-Oak) comprising 85 acres using an even-aged management strategy on a 20 to 40 year **cutting interval**.

❒ Manage 9 stands of oak mixed with northern hardwoods, eastern hemlock and eastern white pine comprising 144 acres using an uneven-aged management strategy on 15 to 30 year cutting intervals.

❒ Designate 2 stands of oak mixed with northern hardwoods and eastern hemlock comprising 13 acres as natural areas. These natural areas will not be managed for the production of forest products. Some of the individual dominant oak trees will likely grow to biological maturity and have the opportunity to become biological legacies and snag trees for wildlife. Through these actions, the oak component of these sites will be maintained and in some instances enhanced. Red, chestnut, and white oaks are a highly valued food source for wildlife. Additionally, oaks are long lived and capable of growing to 36 inches in diameter at breast height on good growing sites. Large, long lived trees provide a wide range of environmental and aesthetic values.

The oak types in the region are often called transition oak types, since the percentage of oak declines as shade tolerant species occupy the site. Heavy **overstory** removal actions, either natural or human-implemented, favor the perpetuation of oak species provided that interfering species have not become heavily established. Partial cutting tends to favor shade tolerant non-oak species such as sugar maple, American beech, eastern hemlock and red maple.

Action 1.5.2: Promote forest health.
Promote forest health by leaving selected co-dominant and dominant high quality trees with favorable and diverse genetics for seed source whenever possible.

Action 1.5.3: Manage for early successional wildlife habitat.
Increase the acreage of the early successional forests by converting 21 stands into natural hardwood forest through harvesting. Approximately 471 acres of plantation conifers, many of which are on marginal growing sites, will be converted into natural hardwood as forest product markets and site conditions permit. **Table 12** lists the basic characteristics of the stands scheduled for hardwood conversion.

Table 12 - Conifer Stands Scheduled for Conversion to Natural Hardwood Forest Ecosystems										
Stand No.	**Species No. 1**	**Species No. 2**	**Species No. 3**	**Species No. 4**	**Species No. 5**	**Acres**	**DEC Forest Type (Calc.)**	**Size Class**	**TPA**	**Basal Area**
Robinson Hollow State Forest (Tioga No. 3)										
A-18	R. Pine	N. Spruce	R. Maple	W. Ash	W. Pine	29.3	61	PT	517	249
A-24	R. Pine	W. Ash	N. Spruce	R. Maple	J. Larch	16.5	61	SST	134	110
A-39	R. Pine	J. Larch	N. Spruce	B. Cherry	Str. Maple	8.2	61	PT	254	148
A-53	R. Pine	R. Maple	W. Ash	W. Pine	Aspen	18.2	70	PT	258	126
A-59	R. Pine	W. Pine	W. Ash	Aspen		10.4	60	PT	396	193
B-09	W. Pine	R. Maple	Aspen	B. Birch	W. Ash	53.4	41	PT	260	120
B-58	R. Pine	R. Maple	W. Pine	S. Pine	B. Cherry	62.9	60	PT	279	172
Andersen Hill State Forest (Tioga No. 4)										
A-08	R. Pine	N. Spruce	R. Maple	W. Ash	B. Birch	37.6	61	SST	273	180
A-16	W. Spruce	R. Maple	N. Spruce	Aspen	B. Locust	14.0	68	PT	334	190
A-28	R. Pine	Aspen	B. Birch			4.4	40	PT	360	155
A-31	R. Pine	W. Ash	R. Maple	Aspen	W. Pine	15.6	40	PT	219	116
A-37	R. Pine	W. Pine	B. Cherry	W. Ash	R. Maple	7.4	60	SST	306	213
Potato Hill State Forest (Tompkins No. 4)										
A-02	R. Maple	R. Pine	Sugar Maple	W. Pine	B. Cherry	8.9	70	PT	202	130
A-04	R. Pine	W. Pine	R. Maple	Sugar Maple	B. Cherry	12.2	60	PT	267	159
A-10	R. Pine	E. Larch	N. Spruce			90.0	61	SST	97	94
A-18	W. Pine	W. Ash	B. Cherry	R. Pine	Apple	14.6	70	SST	184	128
A-20	W. Ash	Apple	T. Apple	S. Pine	R. Pine	8.9	70	PT	134	88
A-31	R. Pine	S. Pine	W. Ash	W. Pine	R. Maple	31.9	40	SST	192	134
A-33	J. Larch	W. Ash	B. Cherry	R. Maple	Sugar Maple	8.7	68	SST	233	162
B-07*	W. Ash	R. Maple	B. Birch	Aspen	Sugar Maple	11.5	68	PT	212	123
B-15	E. Larch	R. Pine	R. Maple	B. Cherry	Sugar Maple	6.9	62	PT	523	290
* White pine is species no. 9 in stand B-07.						**471.5**				

Many conifer plantations on the Unit are in poor health because they were established on previously eroded, strongly acid, heavy, fine textured, and poorly drained soils with seasonally high tables which promoted shallow rooting depths. Forest managers often refer to these areas as “marginal” sites. Conifers such as red pine, Scotch pine, Japanese larch, and pitch pine require coarse, deep, well drained soil for optimal growth. Many of the conifer plantations on the Unit are on shallow, fine to medium textured soils that are imperfectly drained.
As such, short lived conifer plantations on poor sites will gradually be converted to natural hardwood stands through even-aged cutting strategies. Specifically, seed tree, **shelterwood method**, row thinnings, regeneration cuts with wildlife and **seed tree** reserves, and **variable patch-retention** cuttings will be employed.

Action 1.5.4: Create new aspen stands.
Create about 92 acres of additional early successional wildlife habitat for wildlife species that require or benefit from young aspen forest cover by conducting aspen commercial and non-commercial regeneration cuts in the stands listed in **table 13**.

Table 13 - Stands Scheduled for Regeneration to Young Aspen for Wildlife										
Stand No.	**Species No. 1**	**Species No. 2**	**Species No. 3**	**Species No. 4**	**Species No. 5**	**Acres**	**Forest Type (DEC)**	**Size Class**	**Trees Per Acre**	**Basal Area (Ft2)**
Robinson Hollow State Forest (Tioga No. 3)										
A-56	Aspen	R. Maple	W. Pine	Sugar Maple		28.1	12	PT	122	80
B-01	W. Pine	R. Maple	B. Birch	Aspen		7.8	70	PT	200	96
B-03	R. Maple	W. Spruce	Aspen	W. Ash	W. Pine	7.7	71	PT	161	93
B-11	R. Maple	W. Spruce	Aspen	W. Ash	W. Pine	4.6	71	PT	160	91
B-12	R. Maple	W. Spruce	Aspen	W. Ash	W. Pine	18.3	71	PT	161	93
B-28	E. Larch	N. Spruce	R. Maple	R. Oak	Aspen	6.2	67	SST	250	200
B-29	R. Maple	Aspen	W. Ash	N. Spruce	R. Oak	8.3	32	PT	271	174
Andersen Hill State Forest (Tioga No. 4)										
A-12	Thor. Apple	Aspen	A. Elm	B. Cherry	W. Pine	1.8	12	PT	121	90
A-40	R. Maple	W. Ash	Aspen	R. Oak	Tall	3.6	15	PT	132	105
Potato Hill State Forest (Tompkins No. 4)										
A-14	W. Pine	Aspen	B. Cherry	R. Maple	Ironwood	5.1	70	SST	213	177
					Total	**91.5**				

Action 1.5.5: Manage for long-lived conifers.
Actively manage through the sustainable harvest of forest products 53 stands comprising an estimated 752 acres of long-lived conifers on the landscape. Specifically, 13 stands comprising of 159 acres with Norway spruce as a dominant species, and 19 stands comprising of 262 acres with hardwoods mixed with eastern hemlock or white pine.

Additionally, manage 33 stands comprising of 486 acres of mixed conifer stands with a long lived spruce component. Together, this equates to approximately 22% of the Tri-County Uplands Unit's land base. **Table 14** summarizes the Unit's long lived conifer stands by forest type.

Table 14 - Summary of Long Lived Conifer Stands by Forest Type		
Existing DEC Forest Type (Calculated)	**No. of Stands**	**Acres**
Northern Hardwood-Hemlock	15	230.1
Norway Spruce	13	159.0
Larch-Spruce	6	87.1
Red Pine-Spruce	3	82.5
Spruce (Naturalized Species)	5	64.9
Pine (Natural Species)	4	48.5
Scotch Pine-Spruce	1	38.1
Oak-Hemlock	3	24.1
Northern Hardwood-White Pine	1	7.3
Mixed Spruce	1	5.7
Other	1	5.0
TOTALS	**53**	**752.3**

Long term conifer stands and retention areas were identified through the forest inventory process because this cover type is especially important to wildlife, aesthetics, recreation, and for landscape diversity. For purposes of this assessment, long term conifers are long lived species - specifically eastern hemlock, eastern white pine and Norway spruce. Conifer stands provide valuable habitat for many groups of wildlife species, particularly white-tailed deer, grouse and wild turkey. In native eastern hemlock stands, total wildlife species richness increases with age (DeGraff et. al.,1986).

As a matter of State policy, previously abandoned agricultural lands were replanted with pine and spruce by the Civilian Conservation Corps. (CCC) in the 1930s and 1940s. The Conservation Department continued reforesting newly acquired lands until as recently as the late 1960s.

Norway spruce, a non-native tree species, can be managed for the long term - potentially as long as 150 years on better sites. Additionally, some **natural regeneration** of Norway spruce has been observed. Conversely, plantation conifer species such as red pine and Scots pine don't live as long in this region, and typically fail to regenerate in sufficient numbers to function as a long term conifer component.

Action 1.5.6: Retain tree species threatened by catastrophic insect and disease.
Mature healthy American beech and butternut trees are occasionally found growing on the Unit. Forest management activities will retain these potentially resistant trees using the following guidelines:

1. Retain trees with more than 70% live crown and with less than 20% of the combined circumference of the stem and root flares affected by symptoms;
2. Retain some dead or declining trees for their wildlife value (snags and/or coarse woody material);
3. Retain trees free of symptoms with at least 50% live crown and growing among diseased trees. These trees may be resistant and have value for the gene pool.

Beech, white ash, and butternut trees have been declining in recent years. **Beech bark disease** has damaged and killed many of the oldest beech trees. The disease is a pathogen complex involving a scale insect and a nectria fungus. The insect pierces the bark to feed, creating a place for the fungus to enter at a later date. The fungus begins to grow within the bark, resulting in round scars. Fungal activity interrupts the tree's normal physiological processes and a severely infected tree will most likely die. Trees that do not die will remain weak and become more susceptible to wind damage.

Ash decline has been used to describe the decline and death of ash trees by unknown pathogens. Some pathogens may include diseases, poor soil/sites, cankers, insects, winter injury, or drought. The discovery of the emerald ash borer in Michigan in 2002 may eventually contribute to regional ash decline and dieback. Ash yellows and ash anthracnose are two (2) additional diseases that negatively impact ash tree health. However, many healthy white ash trees can still be found within the Unit and the surrounding landscape at the time of this writing.

The forests in the Unit and its landscape are within the native range of butternut, but this species is rarely observed during forest inventory or casual observation. Unfortunately, Butternut is dying throughout its range as the result of infection by a fungus that researchers believe was introduced from outside North America. Initially, the disease, called **butternut canker**, infects trees through buds, leaf scars, and possibly insect wounds or other openings in the bark. Next, the fungus rapidly kills small branches and spreads throughout the tree. Fortunately, Butternut is the only natural host known to be killed by the fungus. However, the fungus can survive on dead trees for at least two years.

Action 1.5.7: Monitor and address changing deer populations.
The Department's Wildlife Biologists manage high deer populations through public education, citizen participation task forces and by issuing an appropriate number of antlerless deer hunting permits in the 720 square mile Wildlife Management Unit (WMU) 7R. Excessively high deer populations have a detrimental effect on species richness and natural reproduction of herbaceous and woody vegetation, such as: orchids, large white trillium, Canada mayflower, eastern hemlock, sugar maple, white ash, cucumber magnolia, northern red oak and eastern white pine (Rhoads, 2005).

Action 1.5.8: Address parcelization of the landscape.
As previously mentioned, the records from the New York State Office of Real Property Services show that landscape surrounding the Unit is gradually being divided into smaller parcels. **Parcelization** negatively impacts rural ecosystems as habitat becomes increasingly fragmented from land development. In the long term, the ability of rural watersheds to absorb, filter and transmit surface and ground water is impacted as well. To address parcelization, the Department will continue to build relationships and offer management advice free of charge to private forest landowners. Additionally, the agency will continue to collaborate with private and

public conservation organizations to help maintain ecosystem connectivity between public and private lands, particularly along riparian corridors. Thus, a combination of land owner education, voluntary land purchases, and voluntary conservation easements will be used to conserve environmentally significant lands from development.

Action 1.5.9: Address forest fragmentation.
Areas with continuous closed canopy conditions over 500 acres in size are noticeably lacking in the surrounding landscape. Future private land development will likely result in additional parcelization and forest fragmentation. To promote biodiversity and to fill this Gap, the Tri-County Uplands Unit will have a high canopy forest area. As such, 1,348 acres will be managed as high canopy forest areas. **Table 15** summarizes the high canopy forest stands by Department (DEC) forest type. It should be noted that natural and protection areas are strategically located to complement the late successional habitat characteristics associated with high canopy forest areas.

Table 15 - Summary of Future High Canopy Forest Areas by Existing Forest Type

Existing DEC Forest Type (Calculated)	No. of Stands	Acres
Northern Hardwood	21	264.4
Northern Hardwood-Eastern Hemlock	10	170.1
Northern Hardwood-White Pine	7	123.7
Swamp Hardwood	3	23.0
Black Locust	1	4.0
Oak-Hickory	1	6.5
Transition Hardwoods (NH-Oak)	11	192.0
Norway Spruce Plantation	11	141.9
Red Pine-Spruce Plantation	1	20.4
Mixed Conifer Plantation	2	37.7
Spruce (Natural Species)	4	33.1
Alder/Willow Wetland	1	5.5
Oak (Red, White, Chestnut, and Black)	2	72.6
Other	14	152.5
White Spruce Plantation	1	19.7
Pine (Natural Species)	2	52.6
Larch-Spruce Plantation	2	28.4
TOTALS	**94**	**1348.1**

High canopy forest areas are actively managed portions of Tri-County Uplands Unit that will be dedicated to establishing and maintaining forest stands with a minimum canopy closure of sixty-five (65) percent. These managed forests will be adaptively managed to provide late successional habitat. Such areas will be created and retained to provide habitat for wildlife species that require mature forest cover with minimal fragmentation of the forest canopy surrounding landscape matrix.

As time progresses, the high canopy forest areas will likely develop into either northern hardwood or northern hardwood-hemlock-Eastern white pine forest ecosystems. It should be noted that global climate change will likely impact the distribution of the northern hardwood forest type in the region. Transitional hardwood types (a mixture of northern hardwoods and oak types) may replace the northern hardwood type. Trees in the high canopy area will be grown to a large size and old age; therefore, long lived species such as sugar maple, eastern hemlock, white oak, chestnut oak, black oak, northern red oak, shagbark hickory, bitternut hickory, pignut hickory, and American beech will be encouraged. Uneven-aged forest management strategies will minimize fragmentation of the forest canopy. The high canopy forest will be centrally located within the Unit and linked with hydrologically sensitive buffers and natural areas.

Northern hardwood and transitional hardwood stands, managed uneven-aged, will be part of the high canopy forest area. Some trees will be grown to biologic maturity and left as biological legacies. Over time these trees will develop into den trees, snags and coarse woody material. High canopy stands will be managed on a long **rotation** (120 to 150 years) and a periodic cutting cycle of 15 to 25 years. A combination of single and group selection silviculture will be used to maintain a relatively continuous forest canopy.

In an effort to diversify vertical and horizontal forest structure, group selection will be employed on a case by case basis. Patches created by group selection will typically be 1/4 to 1/2 acre in size. While employing this strategy, mast producing trees like oak, cherry, hickory and healthy beech will be maintained in the stand as long as possible. However, with the passing of time, the shade intolerant oaks, black cherry, white ash, tulip tree and hickories will naturally be replaced by shade tolerant sugar maple, American beech and Eastern hemlock.

The casual observer will note that some of the high canopy forest area stands listed in **table 15** are immature hardwoods or plantations. Although currently even-aged in structure, some of these plantations will be managed to develop into a high canopy forest area. Most conifer plantations will be naturally regenerated to northern hardwood stands over time. Norway spruce plantations will be managed as mixed hardwood/softwood stands. The plantations will be managed in a similar fashion as uneven-aged hardwood stands. Treatments will be predominately single tree selection with a minimum residual **basal area** of 120 to 170 square feet. Forest canopy closure will range between 60% and 90% as measured with a **densitometer**. Group selection may also be done with groups no larger than ½ acre.

Storm damage and insect or disease infestation in a high canopy forest area may be salvaged or left as **coarse woody material**. Similarly, natural disturbances such as light storm damage or insect infestation may help create den trees, snags and coarse woody material. Catastrophic damage from weather events or insect and disease infestation may be salvaged for forest

health purposes and to reduce fire danger. When salvaging wood products from a natural catastrophic event, damaged and undamaged trees may be strategically left to help create den trees, snags and coarse woody material for wildlife.

Action 1.5.10:* Provide coarse woody material, den trees, and snag trees*.
Recent research conducted by forestry agencies, conservation organizations, and universities demonstrates that coarse woody material is an important component of a forest ecosystem. Coarse woody material stores moisture, cycles nutrients as it decays, and provides habitat niches for insects, reptiles, plants, and fungi. Coarse wood material naturally occurs when limbs break, trees are blown over, or dead trees (snags) fall.

Coarse woody material will be provided as follows:

- ❒ tops of felled trees will not be sold for firewood following sawtimber harvests, except along travel corridors or where aesthetics are important;
- ❒ non-commercial logs will be left in the woods during harvesting;
- ❒ minimum utilization limits will generally not be required in timber harvests;
- ❒ snags and natural coarse woody material will be retained, especially in no cut protection zones;
- ❒ whole tree harvesting will not be permitted.

Den and snag trees will be retained whenever possible during forest ecosystem management activities. This will provide foraging, perching, and nesting opportunities for cavity nesting birds (woodpeckers, owls, wrens, nuthatches, vultures, ducks) and cavity nesting mammals (raccoons, squirrels, bats, mice, opossum, black bear, porcupine) as well as insects. Snags will eventually become coarse woody material. To enhance existing and provide additional wildlife habitat, den and snag trees will be left near water, fields, and edges when possible. This wildlife management strategy will be applied in both even-aged and **all-aged** systems. In many instances, dens trees and snags are not present (i.e. red pine plantations). If den trees and snags do not exist, they will not be created. Declining trees will be retained to become future snag trees as needed on a case by case basis.

The Federal Occupational Safety and Health Administration (OHSA) considers snag trees to be an occupational hazard. During harvesting operations, loggers are required to stay two (2) tree lengths away from hazard trees, or fell the tree(s) to the ground. As such, it is challenging to retain snag trees across every acre of managed forest. However, high concentrations of snag trees will naturally develop in the Unit's designated natural, protected, and riparian buffer areas as time passes.

Action 1.5.11: Address the lack of old growth forests in the landscape.
Presently, there are no known old growth forests in the landscape surrounding the State Forest. The long term public ownership of State Forests in the Unit contributes landscape components that sustain and enhance biodiversity and provide landscape connectivity. As such, 44 stands comprising about 341 acres (about 10% of the Unit) have been designated as natural and protection areas.

Natural areas are defined as an area left in a natural condition, usually without direct human intervention, to gradually transform into a **climax forest** - the final stage of plant succession. By management direction, these areas are not managed for the production of wood products or mineral resources.

Protection areas encompass a variety of land covers types associated with water quality protection such as steep slopes, wetlands, ponds and stream corridors - and may include important cultural resources or significant wildlife habitat. As such, protection areas are special conservation areas that are primarily managed for water quality. By management direction, forest harvesting is not typically scheduled for these areas.

Forested natural and protection areas both provide late successional forest characteristics with relatively continuous closed canopy conditions. As such, they provide some old growth forest characteristics - such as large trees, canopy gaps, and coarse woody material.

Table 16 provides additional detail on the stands planned to be designated as natural and protection areas on the Unit.

Table 16 - Planned Future Natural and Protection Areas

State Forest	Stand No.	Acres	Species No. 1	Species No. 2	Species No. 3	DEC Forest Type (Calculated)
TOMPKINS 4	A-05	4.2	Red Maple	Sugar Maple	White Ash	Transitional Hardwood
TOMPKINS 4	A-11	5.6	Red Maple	Beech	White Ash	Transitional Hardwood
TOMPKINS 4	A-12	5.2	Wetland and Pond Area			
TOMPKINS 4	A-28	4.4	White Ash	Sugar Maple	Red Oak	Northern Hardwood
TOMPKINS 4	B-02	10.2	Sugar Maple	Black Cherry	Red Maple	Northern Hardwood
TOMPKINS 4	B-03	5.5				Non-forest (wetland)
TOMPKINS 4	B-04	4.5				Non-forest (wetland)
TOMPKINS 4	B-05	2.3				Non-forest (wetland)
TOMPKINS 4	B-09	4.8	Thornapple	Black Cherry		Non-forest (wetland)
TOMPKINS 4	B-16	4.6	Black Cherry	Sugar Maple	Red Maple	Northern Hardwood
TOMPKINS 4	B-20	4.4	Sugar Maple	Black Cherry	Red Maple	Northern Hardwood
TOMPKINS 4	B-25	24.4	Sugar Maple	White Ash	Red Maple	Transitional Hardwood
TOMPKINS 4	B-30	6.4	Yellow Birch	White Ash	Sugar Maple	Northern Hardwood
TIOGA 4	A-02	7.3	W. Pine	Red Maple	Black Cherry	N. Hardwood-W. Pine
TIOGA 4	A-17	33.8	Apple	Sugar Maple	White Ash	Transitional Hardwood
TIOGA 4	A-18	8.4				Non-forest (wetland)
TIOGA 4	A-22	2.6	White Spruce	Aspen	Black Cherry	Spruce (Natural)
TIOGA 4	A-25	3.7	Sugar Maple	Eastern	Beech	Northern Hardwood-Hemlock
TIOGA 4	A-34	7.3	Red Maple	Beech	White Ash	Transitional Hardwood
TIOGA 4	A-44	4.2				Non-forest (shrubs)
TIOGA 3	A-14	6.8	N. Spruce	Red Maple	W. Ash	N. Spruce (Plantation)
TIOGA 3	A-16	12.3	Red Maple	W. Spruce	W. Pine	Spruce (Natural)
TIOGA 3	A-27	2.9	N. Spruce	Red Maple	W. Pine	N. Spruce

Table 16 - Planned Future Natural and Protection Areas						
State Forest	**Stand No.**	**Acres**	**Species No. 1**	**Species No. 2**	**Species No. 3**	**DEC Forest Type (Calculated)**
TIOGA 3	A-31	1.9	N. Spruce	Red Maple	W. Pine	Spruce-W.Pine-Hardwood
TIOGA 3	A-32	8.7	Hemlock	Red Oak	W. Pine	Oak-Hemlock
TIOGA 3	A-33	14.3	Red Maple	Hemlock	W. Ash	N.Hardwood-Hemlock
TIOGA 3	A-35	20.9	Hemlock	Red Maple	B. Cherry	N.Hardwood-Hemlock
TIOGA 3	A-37	4.4	Red Oak	Red Maple	Hemlock	Oak-Hemlock
TIOGA 3	A-38	7.4	Hemlock	Red Maple	Aspen	N.Hardwood-Hemlock
TIOGA 3	A-41	10.6	Hemlock	Red Maple	Sugar Maple	N.Hardwood-Hemlock
TIOGA 3	A-47	7.2	Red Maple	Hemlock	Sugar Maple	N.Hardwood-Hemlock
TIOGA 3	A-49	5.4	Aspen	Sugar Maple	Red Maple	Other
TIOGA 3	A-50	3.5	Aspen	Sugar Maple	W. Ash	N.Hardwood-W.Pine
TIOGA 3	A-51	3.0	S ugar Maple	Red Oak	B. Cherry	Other
TIOGA 3	A-54	36.5	Hemlock	Red Maple	Beech	N. Hardwood-Hemlock
TIOGA 3	A-58	22.6	W. Pine	Red Maple	Sugar Maple	N.Hardwood-W.Pine
TIOGA 3	B-08	1.5	Beech	B. Birch	No Data	N. Hardwood
TIOGA 3	B-49	7.5	Red Oak	Sugar Maple	Red Maple	Other
TIOGA 3	B-60	4.6	W. Ash	Y.Birch	Aspen	Pioneer Hardwood
TIOGA 3	B-63	5.4	Apple	N. Spruce	Red Maple	Spruce (Natural)
TOTALS		**341.2**				

Objective 1.6: Provide for Species and Wildlife Habitat Diversity.

Action 1.6.1: Employ even-aged silviculture.
Manage 100 stands representing 1,528 (45%) acres using even-aged silvicultural systems to promote retention and reestablishment of shade intolerant plant species, particularly black cherry, white ash, oaks, eastern white pine and aspen.

Action 1.6.2: Employ uneven-aged silviculture.
Manage 144 stands representing 1,831 (53%) acres using primarily uneven-aged silvicultural systems (and by designation as natural or protection areas) to promote retention and reestablishment of long lived shade tolerant plant species, particularly American beech, eastern hemlock and sugar maple.

Action 1.6.3: Convert conifer plantations to natural forest ecosystems.
Gradually convert about 911 acres of pure conifer plantations to a mixture of conifer plantations and native hardwoods through a series of seed tree, shelterwood method, intermediate improvement thinnings, row thinnings, and regeneration harvests as regional forest product markets permit. This conversion will help diversify the landscape by increasing the amount of early successional (seedling/sapling) habitat available for wildlife. It will also provide a new generation of rapidly growing young trees that provide important ecosystem services such as carbon storage, oxygen, and nutrient uptake. Additionally, increase the presence of natural hardwoods and conifers by about 181 acres.

Action 1.6.4: Gradually increase the number and acreage of uneven-aged forest stands. **Table 17** illustrates that deliberately employing uneven-aged management strategies over the next several decades is predicted to increase the acreage of uneven-aged forest stands by nearly 1,290 acres (an increase of 229%). Correspondingly, the number and acreage of even-aged forest stands will decrease by an estimated 1,290 acres (a decrease of 46%). Gradual conversion of even-aged stands to uneven-aged stands will provide a greater amount of late successional habitat for keystone plant and animal species that require relatively closed interior conditions.

Table 17 - Summary of Present and Predicted Future Forest Stand Age Structure

	Present Stand Structure			*Predicted Future Stand Structure*			
	No. of Stands	**Structure**	**Acres**	**No. of Stands**	**Structure**	**Acres**	**Change (Acres)**
	202	Even-aged	2,817	100	Even-aged	1,527	(1,290)
	46	Uneven-aged	563	148	Uneven-aged	1,853	1,290
	11	Other	27	11	Other	27	0
TOTAL	**259**		**3,407**	**259**		**3,407**	

Table 18 shows the predicted change in land cover types on the Unit by year 2030. Fully employing the ecosystem management concepts outlined by this plan will increase early successional wildlife habitat from 3% to nearly 20% as conifer plantations mature and are converted to young native hardwoods through regeneration cutting. Additionally, some conifer plantations containing longer lived conifer trees such as Norway spruce and Eastern white pine will gradually be transformed into a mix of native hardwoods and conifers. As a result, the conifer plantations planted on former pasture and cropland between 40 and 75 years ago will be gradually transformed into a combination of early successional and mixed natural hardwood/conifer forest habitats. Both habitats are needed at the landscape scale. Adaptive ecosystem management will also slightly increase the acreage of natural conifer forests comprised of Eastern white pine and Eastern hemlock. No significant change in the total acreage of natural hardwoods is planned.

Table 18: Present vs. Objective Land Uses and Wildlife Habitat Cover Types					
Land Classification*	**Present Acres**	**Present Percent (%)**	**Year 2030 Objective Acres (estimated)**	**Objective Percent (%)**	**Net Change Acres**
Pond	8.9	0.3	8.9	0.3	0.0
Roads	26.2	0.8	26.2	0.8	0.0
Shale Pits	0.8	0.0	0.8	0.0	0.0
Wetlands	29.6	0.9	29.6	0.9	0.0
Early Successional (Seedling/Sapling)	113.2	3.3	618.2	18.0	505.0
Natural Conifer	69.2	2.0	132.6	3.9	63.4
Pure Conifer Plantations	910.8	26.7	42.6	1.3	-868.2
Conifer Plantations Mixed with Natural Hardwood	554.5	16.3	883.5	25.9	329.0
Natural Hardwood/ Conifer Mixed	476.0	14.0	329.7	9.7	-146.3
Natural Hardwood	1,218.0	35.7	1,335.1	39.2	117.1
Percent of Total	100.0	100.0	100.0	100.0	
TOTALS	**3,407.2**		**3,407.2**		**0.0**

Objective 1.7: Conserve, Protect, and Enhance Wildlife Habitat.

***Action 1.7.1: Protect active nesting sites for raptors listed as a species of Special Concern*.**
Many raptors in New York are listed as species of special concern. Within the Unit, these may include: Sharp-shinned Hawk, Cooper's Hawk, Goshawk and Red-shouldered Hawk. Each species has specific habitat requirements when nesting. Birds may occupy territory seasonally, or return to the same location yearly. During breeding season, usually between April and July, human activity near nests may disrupt breeding or cause the adult birds to abandon their young. DEC Bureau of Wildlife staff will be consulted and management activities will be adapted to minimize disturbance to birds that are known to be nesting on the Unit.

Adaptive management strategies and actions will be developed and applied on a case by case basis. These strategies may place restrictions on timber harvesting and gas exploration activities and could include: setbacks, no-cut or no disturbance zones, or seasonal restrictions. For recreational uses, actions may include trail closures or rerouting of trails. When specific management strategies for individual species are developed, they will be incorporated into the plan.

Action 1.7.2 a: Falconry.
Licensed falconers will be permitted to remove raptors from the Unit, in compliance with ECL Article 11 and 6 NYCRR Part 173.

Action 1.7.2 b: Monitoring and Research.
The Department will encourage monitoring and research on the status of northern goshawks to ensure sustainable populations, and to ensure that our knowledge of the natural history and ecology of these raptors continues to increase.

Action 1.7.3: Diversify the Unit's landscape.
Diversify the Unit's State Forest landscape through adaptive forest ecosystem management. Management activities will help provide critical habitat across the Unit's landscape. Specifically, 1,348 acres of high canopy forest, 752 acres of long-lived conifer forest, 564 acres of additional early successional wildlife habitat and 341 acres of natural and protection areas.

- ❒ maintain an oak component as previously described by action 1.5.1 for wildlife mast production;

- ❒ gradually convert about 564 acres (17% of the Unit) of short lived conifer plantations into natural hardwood seedling/sapling stands as previously described by action 1.5.3 and 1.5.4. This action will provide wildlife habitat for species that require early successional wildlife habitat;

- ❒ maintain and develop about 752 acres (22% of the Unit) of long term conifer areas as previously described by action 1.5.5. This conifer area will provide winter cover for wildlife, and habitat for animal species that require conifer cover;

- ❒ designate and sustain about 1,348 acres (40% of the Unit) of high canopy forest areas as previously described by action 1.5.9. This high canopy forest area will provide valuable habitat for amphibians, reptiles, and neotropical migrant songbirds;

- ❒ conserve, protect, and enhance about 341 acres (10% of the Unit) of natural and protection areas to develop climax ecosystems and protect water quality. Given the dignity of time, some of the natural areas will eventually develop into forest with old growth characteristics such as large trees, snags, and coarse woody material. Forests with old growth characteristics provide unique aesthetic and biological values.

Action 1.7.4: Build vernal pools/ponds.
Build 20 to 30 small vernal pools/ponds, 30 to 3,000 square feet in size. The pools will create additional habitat for species such as the Jefferson salamander, blue spotted, salmander, and woodfrog. Based on GIS based analysis of soils and topography, an estimated 22 sites covering about 105 acres of suitable woodland sites exist on the Unit. This project would require use of a small track-hoe excavator and/or bulldozer. Team up with DEC Bureau of Wildlife, Upper Susquehanna Watershed Coalition and U.S. Fish and Wildlife service for technical assistance and funding whenever possible. Some of this work may be accomplished during other forest ecosystem management activities such as timber harvesting. A list and map

of possible sites are included in the appendix of this plan. DEC has partnered with the Upper Susquehanna Watershed Coalition and U.S. Fish and Wildlife Service on similar projects in the past on other State Forest Units.

Objective 1.8: Ensure Compatibility of Oil and Gas Exploration and Recreational Development with Ecosystem Sustainability.

Action 1.8.1: Plan for oil and gas exploration and/or development.
Employ the four category hierarchical approach to siting oil and gas wells, pipelines, and access roads as described by Goal 3, Action 3.2.3, of this document.

Action 1.8.2: Plan for recreation.
Use the Region's Draft Recreation Plan for State Forests to guide development and maintenance of all recreational facilities. Maintain and enhance volunteer Adopt-A-Natural Resource partnerships to leverage State resources.

Objective 1.9: Conserve, Protect and Enhance Ecosystem Connectivity.

Action 1.9.1: Conserve Ecosystem Connectivity.
Seek opportunities to conserve ecosystem connectivity to adjacent private lands by collaborating with land conservation and planning organizations such as the Finger Lakes Land Trust, Finger Lakes Trail Conference, Nature Conservancy, and Tompkins County Planning Department as part of the Emerald Necklace Project as listed in the New York State Open Space Plan (2006). On a voluntary basis, acquire 33 private land parcels encompassing about 1,084 acres.

Action 1.9.2: Conserve the White Rock Gorge Natural Area.
Conserve the many natural resource values of the White Rock Gorge Natural Area as designated and mapped by the Tompkins County Planning Department. This plan designates large portions of the area as a riparian zone, natural area, and/or will be managed uneven-aged in order to maintain a relatively continuous forest canopy.

Action 1.9.3: Reduce forest fragmentation.
Work with private forest landowners and local government (on a voluntary basis) to reduce forest fragmentation and encourage private landowners to maintain and buffer important wildlife travel corridors, habitat, riparian zones, and hedgerows. DEC Service Foresters provide private forest landowners with ecosystem management advice, free of charge. The USDA Natural Resources Conservation Service and local Soil and Water Conservation Districts provide technical assistance and services to landowners as well. Additionally, not-for-profit groups such as Cornell Cooperative Extension's Master Forest Owner's Program and the New York Forest Owner's Association provide information to help private forest landowners make informed ecosystem based land management decisions.

Objective 2.0: Monitor Ecosystem Health and Plan Progress.

Action 2.0.1: Monitor ecosystem management progress.
Creatively find a way to develop a method of monitoring the effectiveness of the ecosystem management strategies recommended by this plan on the Unit's biodiversity and wildlife habitat species diversity. Seek additional opportunities to collaborate with SUNY ESF and similar educational institutions to develop and employ qualified interns or graduate students in such a project. Monitoring at a landscape (not Unit) scale will continue through the New York Natural Heritage Program.

GOAL 2: *Provide Forest-Based Recreational Opportunities Including Accommodations for People with CP-3 Permits*

Our goal is to provide a variety of rustic, forest-based recreational opportunities that are sustainable and compatible with forest resources. Trails are designed for family enjoyment for beginner to intermediate-level users. New recreational facilities will be designed to provide access for people with disabilities as required by the Americans with Disabilities Act (ADA). Construction will be guided by the Principles of **Universal Design**.

Compatible recreation is a mainstay in a use-oriented land management plan. Outdoor activities are widely enjoyed by millions of Americans. State Forests provide opportunities for both active and passive forms of recreation. Some of the important attributes that contribute to pleasurable recreational experiences include public safety, accessibility, aesthetic character and quality of facilities.

It should be noted that a landscape perspective was applied when evaluating recreational resources, opportunities and demands on the State Forests of the Tri-County Uplands Unit. The Natural Resources of the Unit sustains several types of rustic outdoor recreation, such as snowshoeing, informal camping, wild berry picking, hiking, fishing, hunting, trapping, bird watching, mountain biking and snowmobiling. The Department strives to provide quality multiple use opportunities throughout the Unit and the larger region on the land that it administers. Additional recreational opportunities can be found at private and public facilities throughout the region.

Objective 2.1: Maintain and Enhance Recreation Trails and Facilities.
The Department will focus resources on the maintenance of existing trail systems in a way that protects the resource and maintains the rural, rustic character of the State Forests in the Tri-County Uplands Unit. To achieve this objective, the Department will continue to work cooperatively with user groups through Adopt-A-Natural Resource Agreements to maintain existing trails. Volunteers with the Finger Lakes Trail Conference and Dryden-Caroline Drifters Snowmobile Club devote countless hours to maintenance of the trail systems on the Unit. The current trail system would not be possible without their dedicated support and commitment.

No new significant trail networks are currently planned on the Unit. However, to provide greater outdoor recreation access to people with CP-3 permits, the Department will build and maintain a 2.5 mile loop trail on the Robinson Hollow State Forest. Trail construction is currently scheduled for the year 2015.

Building trails without authorization from the Department is prohibited. Trail relocation requests will be considered on a case-by-case basis.

Action 2.1.1: Maintain the Finger Lakes Trail and Kimee lean-to.
Maintain the Finger Lakes Trail and Kimee lean-to with volunteers under the DEC's Adopt-A-Natural Resource (AANR) Program. As previously mentioned, Adopt-A-Natural Resource (AANR) Agreements currently exist with the Finger Lakes Trail Conference. Routine trail maintenance is performed by volunteers in cooperation with Department Foresters.

Action 2.1.2: Maintain snowmobile trails.
The Department has a formal Adopt-A-Natural Resource (AANR) Agreement with the Dryden-Caroline Drifters Snowmobile Club. Routine trail maintenance is performed by volunteers in cooperation with Department foresters. Funding for these activities is provided in part by the Snowmobile Trail Fund administered by New York State Office of Parks, Recreation and Historic Preservation (OPRHP). Snowmobiles primarily use corridor trails which pass through the State Forests in the Unit. Requests for additional corridor trail connections will be considered on a case-by-case basis through the Adopt-A-Natural Resource Agreement process.

Action 2.1.3: Establish Special Management Zones.
Special Management Zones of minimally disturbed vegetation will be left along DEC **designated recreational trails** to minimize the aesthetic impacts associated with ecosystem management. On the Tri-County Uplands Unit, such zones will typically range from 25' to 150' on each side of DEC designated recreational trails, depending on such factors as the width of the trail, vegetation type and the type of silviculture being applied. Tops and slash will be kept at least 25 feet back from the edge of trails. When possible, clear cutting will be avoided over and across a designated recreational trail. Exceptions will be made for scenic vistas, wildlife habitat regeneration harvests and selected ecosystem management demonstration areas. As always, the DEC will work with Adopt-A-Natural Resource Partners when planning and conducting ecosystem management projects along designated trails.

Action 2.1.4: Establish oil and gas exploration buffers.
Establish buffers along DEC designated recreational trails to minimize aesthetic impacts associated with oil and gas exploration and development. Surface disturbance related to oil and gas exploration/development will be avoided within 500 feet of designated trails. In some cases, trails may be re-located to minimize impacts from oil and gas exploration/development.

Action 2.1.5: Establish, Map and Conserve Recreation Areas for Informal Camping.
Establish and map five recreation areas totaling about 63 acres on Tioga No. 3 (Robinson Hollow State Forest). These recreation areas were identified during the forest/natural resource inventory of the Unit and are currently used as informal camping areas - particularly those near

Tri-County Pond. Ecosystem management activities will be designed to conserve the aesthetic values of these areas and strive to maintain a relatively continuous forest canopy. The Recreational Areas and Trail Systems map for Tioga No. 3 at the end of this plan shows the locations of the recreation areas.

Action 2.1.6: Continue stocking rainbow trout in Tri-County Pond
For several decades the pond's trout fishery has been managed under a put-grow-and-take trout basis which has been supported by an annual stocking of 200 rainbow trout.

Objective 2.2: Enhance Public Information and Access.

Action 2.2.1: Produce new brochures and maps.
Produce a public use brochure and map for all State Forests in the Tri-County Uplands Unit. The brochures are scheduled for production in 2015. The brochure will use at least 12-point type to accommodate the Principles of Universal Design.

Action 2.2.2: Construct informational kiosks.
Construct and install informational kiosks on all State Forests in the Unit.
Single panel kiosks are scheduled to be constructed and installed on Robinson Hollow (Tioga No. 3) in 2010 and on Andersen and Potato Hill State Forests in 2015. The kiosk will serve as a distribution point for brochures and maps of the forest.

Action 2.2.3: Provide additional parking.
Partner with the Finger Lakes Trail Conference (FLTC) and town of Richford officials to construct a 3 to 5 car parking area in 2010 at the Finger Lakes Trail (FLT) head along Robinson Hollow Road.

Objective 2.3: Restrict ATV (All Terrain Vehicle) Use to Protect Forest Sustainability.

Action 2.3.1: Restrict ATV use to CP-3 trails.
All-terrain vehicles (ATVs) are prohibited everywhere on the Unit, except for trails specifically signed for use by people with CP-3 permits. Permission for individuals to use these trails must be granted by the Department through a Temporary Revocable Permit (TRP) per Department policy known as Commissioner Policy (CP) three (3). This policy provides the criteria which is used to determine if a person qualifies for such TRPs. The policy also establishes a procedure for the appeal of TRPs which have been denied, suspended, or revoked. Overall, it is the policy of the Department to provide a qualified person with a certified mobility impairment access to appropriate lands under its jurisdiction.

To provide greater outdoor recreation access to people with CP-3 permits, the Department will build and maintain a 2.5 mile loop trail on the Robinson Hollow State Forest. Trail construction is currently scheduled for the year 2015. The construction of a new ATV trail system for the general public in this Unit is not proposed for the following reasons:

- According to the USDA soil survey, about 50% of the soils on the Unit are fine textured, have a high clay content, and are imperfectly or poorly drained, and therefore cannot sustainably support intense ATV use.

- ❑ Per Department policy, Public ATV riding is not a program on Reforestation, Multiple Use, and Unique Areas per se.

- ❑ Overall, appropriate soil conditions, maintenance and enforcement funds must exist to ensure that roads and trails can be maintained to prevent chronic envionmental damage or development of hazardous trail conditions. Currently, DEC resources for construction, and maintenance are very limited. An ATV system for the general public would require additional resources from DEC's office of public protection.

- ❑ Portions of Unit, through several small streams, drain into the West Branch of Owego Creek, an important trout fishery that is stocked by the Department and the County Sportsman Federation. Large scale public ATV use throughout the Unit could impact water quality.

- ❑ A viable ATV trail system must include at least 40 miles of trails. None of the State Forests in the Unit are large enough to support such a system.

Objective 2.4: Provide Recreational Opportunities for People with CP-3 Permits.
The following is a summary of the Americans with Disabilities Act (ADA) and its influence on management actions for recreation and related facilities.

The Americans with Disabilities Act (ADA), along with the Architectural Barriers Act of 1968 (ABA) and the Rehabilitation Act of 1973, Title V, Section 503, have had a profound effect on the manner by which people with disabilities are afforded equality in their recreational pursuits. The ADA is a comprehensive law that prohibits discrimination against people with disabilities in employment practices, in the use of public transportation, telecommunication facilities, and public accommodations. Title II of the ADA applies to the Department and requires, in part, that reasonable modifications must be made to its services and programs, so that when those services and programs are viewed in their entirety, they are readily accessible to and usable by people with disabilities. This must be done unless such modification would result in a fundamental alteration in the nature of the service, program, or activity or such modification would create an undue financial or administrative burden on the Department. Since recreation is an acknowledged public accommodation program of the Department, and there are services and activities associated with that program, the Department is obligated to comply with the ADA, Title II and ADA Accessibility Guidelines, as well as Section 504 of the Rehabilitation Act.

The ADA requires a public entity to thoroughly examine each of its programs and services to determine the level of accessibility provided. The examination involves the identification of all existing programs and services and a formal assessment to determine the degree of accessibility provided to each. The assessment includes the use of the standards established by Federal Department of Justice Rule as delineated by the Americans with Disabilities Act Accessibility Guidelines (ADAAG, either adopted or proposed) and/or the New York State Uniform Fire Prevention and Building Codes, as appropriate. This plan includes an inventory and assessment of all the recreational facilities that support the programs and services available on the two State Forests. The need for new or upgraded facilities is also included in this assessment. The Department is not required to make each of its existing facilities and assets accessible. The facilities or assets proposed in this plan are identified in the "Management Actions" section.

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) and Universal Design and the Americans with Disabilities Act (ADA) requires public agencies to employ specific guidelines to ensure that buildings, facilities, programs, and vehicles are accessible to people with disabilities. The Access Board, a federal government agency, has issued the ADAAG for this purpose. The Department of Justice Rule provides authority for these guidelines.

Currently adopted ADAAG address the built environment: buildings, ramps, sidewalks, and rooms within buildings. The Access Board has proposed guidelines to expand ADAAG to cover outdoor developed facilities: trails, campgrounds, picnic areas, and beaches. The proposed ADAAG is contained in the September 1999 Final Report of the Regulatory Negotiation Committee for Outdoor Developed Areas.

ADAAG apply to newly constructed structures and facilities and alterations to existing structures and facilities. Further, it applies to fixed structures or facilities, i.e., those that are attached to the earth or attached to another structure that is attached to the earth. When the Department is planning the construction of new recreational facilities or assets that support them, or the alteration of existing recreational facilities or assets that support them, it considers providing access to the facilities or elements for people with disabilities. The standards which exist in ADAAG or are contained in the proposed ADAAG also provide guidance to achieve modifications to trails, picnic areas, campgrounds (or campsites), and beaches in order to obtain programmatic compliance with the ADA.

Taking ADAAG one step further is the application of the Principles of Universal Design. Universal design makes products and environments usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. The intent of universal design is to make things easily usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities (Ron Mace, founder and program director of The Center for Universal Design, North Carolina State University, Raleigh, North Carolina).

Application of The Americans with Disabilities Act Accessibility Guidelines (ADAAG):
Current and proposed ADAAG and Principles of Universal Design will be used in the development and construction of new facilities. Management recommendations in this plan are proposed in accordance with the ADAAG for the built environment, the proposed ADAAG for outdoor developed areas, the New York State Uniform Fire Prevention and Building Codes, and other appropriate guiding documents. Until such time as the proposed ADAAG becomes an adopted rule of the Department of Justice, the Department is required to use the best information available to comply with ADA. This includes the proposed guidelines.

Action 2.4.1: Employ the Principles of Universal Design.
All new construction of facilities and trails on the forests will follow Americans with Disabilities Act (ADA) requirements, the Principles of Universal Design, and the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

GOAL 3: *Provide Economic Benefits to Local Communities and to the State of New York.*

Ecotourism
State Forests provide a base for eco-tourism business. Individuals using the forests for recreational purposes also frequent local businesses for other needs. Thus, the recreational services provided by the lands in the Tri-County Uplands Unit benefits the service and retail sectors of the local economy.

Renewable Resources
Managed forests produce sustainable forest products, produce oxygen and store carbon, a greenhouse gas component linked to global warming. Properly designed prescriptions and harvest plans promote biodiversity and forest health. At the same time, the State Forests of the Unit provides jobs and locally produced natural material to support the local economy.

Mineral Resources
The leasing and development of natural gas and oil resources can provide jobs and income to the State while increasing domestic energy supplies. Oil and natural gas are valuable resources which can provide energy and revenue, as well as the opportunity for improvements to the existing infrastructure of the Tri-County Unit (such as improving safe and restricted access through upgrading existing roads, culverts and gates) and creation of additional early successional wildlife habitat which may or may not enhance habitat diversity. As with any other human activity on State lands, oil and natural gas exploration and development can impact the environment. Most impacts are short term and occur during the siting and drilling phases of a well. Natural gas is a cleaner energy alternative to fossil fuels such as coal and diesel fuel.

Objective 3.1: <u>Provide a Steady Flow of Forest Products to Generate Income to the State of New York, Raw Materials to the Forest Products Industry and Create Local Jobs While Protecting Sensitive Areas and Other Management Objectives</u>.

Action 3.1.1: Manage forest ecosystems.
Designate 2,768 acres (81%) of the Unit as available for **sustainable forest management** and harvesting using science-based silvicultural systems.

Action 3.1.2: Salvage forest products.
Salvage forest stands that are destroyed or severely damaged by natural events before they lose significant value from decay and insect infestation. Leave some snag trees and coarse woody material for wildlife during salvage operations.

Action 3.1.3: Employ Best Management Practices (BMP's).
Reduce impacts related to timber harvesting on natural resources by employing best management practices (BMP's) as described by Objective 1.2.

Objective 3.2: <u>Lease Natural Gas Exploration and Development Rights while Protecting Sensitive Areas and Other Management Objectives</u>.

Action 3.2.1: Minimize impacts related to oil and natural gas exploration/development.
The properties covered by this plan were leased as part of the 2006 oil and gas lease sale. If no exploration or drilling takes place, the leases will expire in 2011, but may be subject to renewal.

As such, minimizing the impacts related to natural gas exploration and development on natural resources and other State Forest goals and objectives is a key part of this plan. For example, the Comprehensive Oil and Gas Exploration Maps at the end of the plan show that about 962 acres (28.2%) of the Unit's surface area is compatible with well, pad, road and utility development. Additional detail is provided by the maps and in action 3.2.2.

The Department will manage the surface disturbances associated with oil and natural gas exploration and development to protect sensitive habitats (riparian areas, wetlands, steep slopes, unique ecological communities, rare, threatened or endangered species), cultural resources, and formal recreational trail systems on the forests. Properly planned oil and gas exploration/development will have minimal impact on the early successional/brush, young forest and conifer plantation component at the landscape level. This plan identifies high use recreational areas, recreational trails, and special ecosystem areas that must be appropriately buffered from oil and natural gas well drilling sites. Developing a well pad may require as much as a 2 to 3 acre clearing, which removes and compacts the organic soil layer. As such, the original soil profile is altered. The topsoil is replaced during reclamation of the site. Surface runoff from well pad sites could potentially impact surface water quality if not properly filtered and buffered. Construction of well pads on slopes exceeding 15% would require significant additional mitigation measures and therefore are not recommended on the Unit.

To reduce potential conflicts, surface disturbances for oil and gas exploration and well siting will be consistent with the management objectives in this document. The unique impacts associated with oil and gas exploration and development were considered in formulating the actions below. A hierarchical approach was used to focus surface disturbances on the least sensitive areas of the Unit and to exclude the highly sensitive areas. The Division of Lands and Forests recommends that well density does not exceed one well per 320 acres. Current oil and gas leases for some of the Unit's lands require a Drilling Pad Development Plan to be submitted for the Department's approval if the drilling pad density exceeds one drilling pad per 320 acres. Additional well pad development would be required to be compatible with the Oil and Gas Exploration and Gas Exploration Hierarchy Maps and in consideration of all other goals and objectives of the plan. Maps depicting this oil and gas exploration hierarchy are included at the end of this document. Exceptions to these tract assessments are possible if additional analysis, protective measures, new technology, or other issues warrant a change in the compatibility status of an area.

Action 3.2.2*: The hierarchical approach classifies the forests into four categories.

> **Category A** - ***Compatible with well pad, road, and utility development***. Defined as areas compatible for pipelines, access roads and associated well pad development. These areas include existing shale pits and within 250 feet of existing public highways and public forest access roads. These areas are the least sensitive to surface disturbances and should be considered first for well placement to limit the overall impact of road and pipeline development. This category represents approximately 962 acres (28.2 %) of the Unit's land surface area and is depicted by green on the plan's Comprehensive Oil and Gas Exploration Maps. Any areas within this 250 feet zone that

had limitations related to soils, slope, streams and wetlands as well as high use recreational areas were excluded from this classification. Also excluded are high forest canopy areas and protected natural areas. The intent is to focus as much of the surface disturbances as possible in this zone to reduce the overall environmental impact.

Category B - ***High Forest Canopy Areas with one well per State Forest*****.** These areas will be managed to maintain or develop a high forest canopy through uneven-aged silvicultural methods. To reduce fragmentation of the canopy and limit disturbance of the soil profile, only one well pad per State Forest will be permitted in this category unless otherwise approved by the Department. Only roads and pipelines servicing category B wells will be permitted. This category represents approximately 456 acres of the 1,348 acre high canopy forest area. The remaining portion of the high canopy area is chiefly category D protection area.

Category B represents 13.4 % of the State Forest land area and is depicted by orange on the UMP Comprehensive Oil and Gas Exploration Maps located at the end of this document.

Category C - ***250 foot stream and designated recreational trail buffers*****. *Not compatible with well pad development; may be compatible with road and utility development***. This category includes the following:

- streams and a 250-foot buffer
- designated and signed recreational trails and a 500 foot buffer.

Category C represents approximately 254 acres (7.5 %) of the State Forest land area and is depicted by red slashes on the UMP Comprehensive Oil and Gas Exploration Maps located at the end of this document.

Category D - ***Protection areas. Not compatible with well pad, road, or utility development.*** This category includes*:*

- wetlands and a 250-foot buffer
- slope greater than 15%
- archeological and Cultural concerns
- rare and Endangered Species (Natural Heritage database occurrences)
- ponds and a 250 foot buffer
- no cut Natural Areas not related to buffers and slope
- spring seeps, vernal pools, and an appropriate buffer (determined in the field).

Category D represents 1,735 acres (50.9%) of the Unit's State Forest land area and is depicted by red shading on the UMP Comprehensive Oil and Gas Exploration Maps located at the end of this document

Action 3.2.3**: Permit utilities (pipelines) for the extraction and transport of natural gas. Utilities (pipelines) associated with gas well sites should parallel existing public highways and existing public forest access roads whenever possible. Pipelines along public highways and public State Forest access roads (PFAR's) are not subject to the same hierarchy as surface

disturbances and well siting. Pipeline siting will be reviewed on a case-by-case basis prior to well siting. A Temporary Revocable Permit (TRP) will be required to construct pipelines on the State Forests in the Unit.

Action 3.2.4**: New road development or rehabilitation.
Any new roads built to access well sites will be located in consideration of the hierarchy established above with the intent of protecting the resource and limiting the impact of roads on other uses of the forest. Placement of roads in the Unit will be reviewed and approved by Department Foresters on a case-by-case basis. As such, a Temporary Revocable Permit (TRP) will be required for any road construction.

Note 1*: Where criteria for these categories overlap, the most restrictive classification was applied. Note 2**: The Department will allow access to State Forest land in the Unit from adjacent private lands when such access is required to drill or develop wells and associated infrastructure. Access will only be permitted when written permission is provided from the private landowner granting access. The lessee will be required to build a gate to Department specifications at the State Boundary Line and must maintain the gate for the duration of the lease. *Access to private land across State Land will not be permitted.*

Objective 3.3: Provide Property Tax Income to Local Governments and Schools.

Action 3.3.1: Pay real property taxes.
The State Forests are subject to town, school, and fire district property taxes, but are exempted from county taxes. State Forest land is taxed at the same rate as private forest land. **Appendix A-8** of this plan estimates the Real Property taxes paid by the State Forests in the Unit.

Objective 3.4: Attract Forest-Based Tourism which Benefits the Local Economy.

Action 3.4.1: Enhance the Department's website.
Place downloadable trail maps on the Department's website by the year 2015.

GOAL 4: *Provide Sound Stewardship of the State Forests*

Objective 4.1: Protect the Cultural Resources on the State Forests.

Action 4.1.1: Protect stone walls and old foundations.
Stone walls and old foundations on the State Forests will be protected during management activities and recreational trail development. Should stone wall disturbances be necessary for access during forest product sales or oil and gas development, the contract will require that the structures be returned to their pre-impact condition.

Objective 4.2: Protect the Natural Resources on the State Forests.

Action 4.2.1: Protect the natural resources from wildfire.
A program of protection from wildfire will be maintained to assure minimum risk of loss to people, structures and forest resources. This program is the responsibility of Forest Rangers from the Department's Division of Forest Protection and Fire Management.

Action 4.2.2: Protect natural resources from insects, disease, and invasive species.
The protection of resources from injurious insects, diseases and invasive exotic (non-native) species will be accomplished through a program of Integrated Pest Management (IPM). This program includes elements of reconnaissance, analysis and determination of thresholds and controls when necessary.

Identification and control of invasive species is a complex task. When invasive species are identified on the Unit, the Department will conduct a literature search and collaborate with regional and Albany staff to determine whether it is reasonable, practical and environmentally responsible to implement a control program. The Department may use registered herbicides and/or mechanical methods such as hand pulling to remove invasive vegetation as human and capital resources permit. Other options will be considered as the scientific community identifies and develops environmentally sound ways to control invasive species. Moreover, aerial detection flights will be conducted annually to identify significant insect and disease problems as resources allow. On the ground follow up will be conducted when problems are identified.

Objective 4.3: Prevent Illegal Activities on the State Forests.

Action 4.3.1: Patrol and enforce State and Local Regulations on the Unit.
Communicate closely with the Department's Forest Rangers and Conservation Officers to provide routine patrols and identify specific enforcement needs on the Unit. Encourage the public and DEC Adopt-A-Natural Resource partners to report specific information on illegal activities they observe to the DEC Forest Ranger and forest land manager.

Objective 4.4: Maintain Access Trails and Haul Roads.
Forest product access trails are not built to public forest access road (PFAR) standards. They are designed for low traffic volumes and speeds of up to 25 mph, and, therefore, require less maintenance, sufficient only to keep the road passable unless scheduled for an upgrade. Haul roads are used and maintained only during forest product sales.

Action 4.4.1: Mow shoulders of Public Forest Access Roads.

Action 4.4.2: Maintain forest access trails and haul roads during forest product sales.
Sale contracts will be written to include terms for road protection, repair and maintenance.

Objective 4.5: Maintain Boundary Lines and identify State Land to Users.
Timber theft is a significant threat to the natural resource assets of the Unit. Properly marked and maintained boundary lines are a significant deterrent to trespass and theft. Periodic maintenance of the 16.8 miles of boundary lines on the Tri-County Uplands Unit combined with surveying when necessary will maintain the integrity of the property lines.

Action 4.5.1: Maintain boundary lines.
Post State Forest signs every 0.1 mile along public roads passing through the State Forests in the Unit, replace witness posts (as needed) and repaint all 16.8 miles of boundary lines every seven years according to the following schedule:

Action 4.5.2: Survey boundary lines.
Survey boundary lines where location issues indicate there is a need to clarify their location.

Table 19 - State Forest Boundary Line Maintenance Schedule			
State Forests	**Boundary Line (Miles)**	**Year Last Painted/Signed**	**Year Next Painted/Signed**
Tioga No. 4 (Andersen Hill)	5.8	2006	2013
Tompkins No. 4 (Potato Hill)	11.0	2007	2014
Tioga No. 3 (Robinson Hollow)	12.2	2008	2015

Objective 4.6: Acquire Adjacent Land from Willing Sellers.

Action 4.6.1*: *Purchase additional parcels and/or conservation easements.
As resources and priorities allow, the Department intends to consider the purchase or acceptance of parcels and/or conservation easements in the area shown on the Tri-County Uplands Long Term Conceptual Acquisition and/or Conservation Easement Map found at the end of this plan and listed in Appendix A-7. Purchases would only be made from willing sellers. Parcels shown on the map and listed in A-7 would consolidate State ownership, provide ecosystem connectivity to adjacent State Lands, conserve habitats and protect open space. Acquisitions made for consolidation purposes would reduce management costs. This plan and the New York State Open Space Conservation Plan will be referenced when a potential acquisition or conservation easement is evaluated for suitability. Moreover, the Department will collaborate with conservation partners such as the Finger Lakes Land Trust, Tompkins County Planning Department and the Finger Lakes Trail Conference on land acquisition projects.

Objective 4.7: Maintain and Repair Impoundments (Dams).

Action 4.7.1: Maintain impoundment (dam) on Tioga No. 3 (Robinson Hollow).
Inspect and mow the dam every three years or when necessary. The Department's Bureau of Fisheries will be notified when maintenance activities are planned. At present, no draining for repairs, cleaning or dredging is expected.

Objective 4.8: Maintain Usable Shale Pits
Two inactive shale pits totaling about .8 acres in size may be occasionally used to supply a limited volume of shale for State Forest Public Access Road and Haul Road resurfacing and repairs. Shale from these pits may also be used for recreational trail maintenance on a case by case basis.

Action 4.8.1: Both shale pits are currently active and no immediate action is needed.
Natural vegetation currently covers most of the ground surface area. If the DEC proposes future mineral resource extraction within the Unit, the Regional Forester, Operations Supervisor and Mined Land Reclamation Specialist will determine if a mined land reclamation permit is required before excavation begins. If it is determined that the proposed annual extraction will be above present Mined Land Law thresholds, then a Mining and Reclamation Permit Application will be prepared and submitted to the Regional Mined Land Reclamation Specialist for review and approval before any excavation takes place. If it is determined that a Mined Land Reclamation Permit is not required, then basic mining and reclamation standards will be followed, including grading and seeding as needed.

FOREST ECOSYSTEM MANAGEMENT ACTIONS

Tables 20, 21, and 22 provide a list of forest ecosystem inventory codes. Next, table 23 lists planned forest management actions by year, State Forest, and administrative stand designation. Lastly, table 24 lists basic forest ecosystem inventory information for each managed stand.

Table 20 - Key to Forest Action Codes	
TA - 0 to 5 years	TI - local improvement sale
TAT - **apple tree release** for wildlife	TL - lottery (homeowner) firewood
TB - 6 to 10 years	TSI - **timber stand improvement** (non-commercial)
TC - 11 to 15 years	TRC - timber harvest (revenue contract)
TCR - crop tree **release**	TPR - patch and/or regeneration cuts for wildlife
TD - 16 to 20 years	TST - single tree selection
TE - 21 to 25 years	FUN - future uneven-aged management strategy
TG - group selection	TT - chronic trash problem
TIOGA 3 - Robinson Hollow State Forest	FE - future even-aged management strategy
TIOGA 4 - Andersen Hill State Forest	NMAS - no management action scheduled
TOMPKINS 4 - Potato Hill State Forest	TCT - intermediate commercial thinning
TS - salvage	T2R - two-aged rotation
TSS - shelterwood/seed tree	TNO - no treatment recommended

Table 21 - DEC Forest Inventory Tree Species Code List			
Code	**Species**	**Code**	**Species**
APL	Apple	JP	Japanese Larch
ASP	Aspen	NS	Norway Spruce
BAS	American Basswood	RM	Red Maple
BB	Black Birch	RO	Northern Red Oak
BBE	Blue Beech	RP	Red Pine
BL	Black Locust	SHR	Tall Shrubs
EL	European Larch	SP	Scotch Pine
ELM	American Elm	ST	Striped Maple
HEM	Eastern Hemlock	TAP	Thornapple
HM	Sugar Maple	WA	White Ash
IWD	Eastern Hophornbeam (Ironwood)	WP	Eastern White Pine
		YB	Yellow Birch

Table 22 - Key to DEC (Calculated) Forest Type Codes			
Code	**Forest Type**	**Code**	**Forest Type**
10	Northern Hardwood	43	Austrian Pine (Plantation)
11	Northern Hardwood (Hemlock)	44	Jack Pine (Plantation)
12	Northern Hardwood (White Pine)	45	Norway Spruce (Plantation)
13	Northern Hardwood (Spruce-Fir)	46	White Spruce (Plantation)
14	Pioneer Hardwood	47	Japanese Larch (Plantation)
15	Swamp Hardwood	48	European Larch (Plantation)
16	Oak	49	White Cedar (Plantation)
17	Black Locust	50	Douglas Fir (Plantation)
18	Oak -Hickory	51	Balsam Fir (Plantation)
19	Oak-Hemlock	52	Black Locust (Plantation)
20	Eastern Hemlock	53	Pitch Pine (Plantation)
21	Eastern White Pine	54	Misc. Pure Species (Plantation)
22	White Pine-Hemlock	60	Red Pine-White Pine (Plantation)

Table 22 - Key to DEC (Calculated) Forest Type Codes			
23	Spruce-Fir	61	Red Pine-Spruce (Plantation)
24	Spruce-Fir-Hemlock-WP	62	Red Pine-Larch (Plantation)
25	Cedar	63	White Pine-Spruce (Plantation)
26	Red Pine	64	White Pine-Larch (Plantation)
27	Pitch Pine	65	Scotch Pine-Spruce (Plantation)
28	Jack Pine	66	Scotch Pine-Larch (Plantation)
29	Tamarack	67	Larch-Spruce (Plantation)
30	Oak-Pine	68	Bucket Mixes (Plantation)
32	Other	70	Pine (Natural Species)
40	Red Pine (Plantation)	71	Spruce (Natural Species)
41	White Pine (Plantation)	97	Seedling/Sapling-Natural
42	Scotch Pine (Plantation)	98	Seedling/Sapling-Plantation
		99	Non forest

Table 23 - Forest Ecosystem Management Action Schedule by State Forest and Stand

State Forest	Stand	Acres	Forest Type	Future Structure	Primary Action	Secondary Action	Year
TIOGA 3	A-01	14.0	32	FUN	TL	TRC	2016
TIOGA 3	A-02	1.8	68	FE	TL		2021
TIOGA 3	A-03	2.8	10	FUN	TRC	TL	2016
TIOGA 3	A-04	4.1	10	FUN	TRC	TCT	2020
TIOGA 3	A-05	4.9	12	FUN	TNO		NMAS
TIOGA 3	A-06	8.1	32	FUN	TNO		NMAS
TIOGA 3	A-07	2.6	10	FUN	TL		2016
TIOGA 3	A-08	11.8	32	FUN	TRC	TCT	2013
TIOGA 3	A-09	10.9	70	FUN	TL		2021
TIOGA 3	A-10	7.2	68	FUN	TNO		NMAS
TIOGA 3	A-11	19.2	67	FE	TI	TSI	2019
TIOGA 3	A-12	7.6	68	FE	TNO		NMAS
TIOGA 3	A-13	10.6	67	FE	TI	TL	2021
TIOGA 3	A-17	3.3	10	FE	TNO		NMAS
TIOGA 3	A-18	27.9	61	FUN	TPR	TRC	2010
TIOGA 3	A-19	47.4	10	FUN	TNO		NMAS
TIOGA 3	A-20	33.4	61	FE	TNO		NMAS
TIOGA 3	A-21	4.3	10	FUN	TNO		NMAS

Table 23 - Forest Ecosystem Management Action Schedule by State Forest and Stand							
State Forest	Stand	Acres	Forest Type	Future Structure	Primary Action	Secondary Action	Year
TIOGA 3	A-22	14.3	40	FE	TNO		NMAS
TIOGA 3	A-23	15.1	70	FUN	TRC	TSS	2010
TIOGA 3	A-24	16.3	61	FUN	TPR	TSS	2010
TIOGA 3	A-25	7.3	15	FE	TRC	TST	2024
TIOGA 3	A-26	1.0	10	FUN	TL		2015
TIOGA 3	A-28	8.9	64	FUN	TPR	TRC	2024
TIOGA 3	A-29	9.2	32	FUN	TL		2015
TIOGA 3	A-30	6.2	11	FUN	TNO		NMAS
TIOGA 3	A-31	0.6	70	FE	TNO		NMAS
TIOGA 3	A-34	16.3	10	FUN	TNO		NMAS
TIOGA 3	A-36	9.5	10	FUN	TRC	TG	2024
TIOGA 3	A-39	8.3	61	FUN	TPR	TRC	2010
TIOGA 3	A-40	21.7	11	FUN	TRC	TG	2024
TIOGA 3	A-42	10.4	11	FUN	TRC		2013
TIOGA 3	A-43	25.0	11	FUN	TRC	TST	2016
TIOGA 3	A-44	19.3	71	FE	TL		2013
TIOGA 3	A-45	7.0	32	FE	TL		2013
TIOGA 3	A-46	9.8	32	FUN	TRC	TST	2024
TIOGA 3	A-48	18.7	32	FE	TRC	TST	2024
TIOGA 3	A-52	11.1	12	FE	TRC	TPR	2011
TIOGA 3	A-53	18.4	70	FE	TPR	TCT	2009
TIOGA 3	A-55	27.5	32	FE	TL	TRC	2019
TIOGA 3	A-56	24.2	12	FE	TPR		2019
TIOGA 3	A-57	27.2	32	FUN	TL	TCT	2019
TIOGA 3	A-59	10.5	60	FE	TPR		2009
TIOGA 3	A-60	7.7	10	FE	TL		2020
TIOGA 3	A-61	12.1	47	FE	TNO		NMAS
TIOGA 3	A-62	17.6	60	FE	TSI	TCT	2010
TIOGA 3	A-63	20.6	70	FE	TNO		NMAS
TIOGA 3	A-64	24.5	12	FUN	TI	TS	2022
TIOGA 3	B-01	7.9	70	FUN	TPR	TL	2016
TIOGA 3	B-02	5.1	32	FUN	TRC	TG	2016
TIOGA 3	B-03	7.8	71	FUN	TL		2019
TIOGA 3	B-04	5.3	10	FUN	TRC	TG	2016
TIOGA 3	B-05	2.0	10	FUN	TRC	TG	2009
TIOGA 3	B-06	15.2	10	FUN	TSI		2010
TIOGA 3	B-07	3.9	32	FUN	TSI		2010
TIOGA 3	B-09	53.4	41	FE	TPR	TL	2010
TIOGA 3	B-10	20.7	47	FUN	TRC	TS	2010

Table 23 - Forest Ecosystem Management Action Schedule by State Forest and Stand							
State Forest	Stand	Acres	Forest Type	Future Structure	Primary Action	Secondary Action	Year
TIOGA 3	B-11	4.6	71	FUN	TPR		2010
TIOGA 3	B-12	18.5	71	FUN	TPR		2010
TIOGA 3	B-13	3.7	40	FE	TRC	TPR	2010
TIOGA 3	B-14	5.8	45	FUN	TRC	TCT	2024
TIOGA 3	B-15	4.0	10	FUN	TNO		NMAS
TIOGA 3	B-16	17.9	46	FUN	TNO		NMAS
TIOGA 3	B-17	23.3	67	FE	TRC	TG	2013
TIOGA 3	B-18	5.5	31	FUN	TRC	TCT	2011
TIOGA 3	B-19	2.1	97	FE	TNO		NMAS
TIOGA 3	B-20	22.8	71	FUN	TRC	TPR	2021
TIOGA 3	B-21	3.9	32	FUN	TL		2015
TIOGA 3	B-22	4.6	67	FUN	TRC	TCT	2020
TIOGA 3	B-23	15.1	71	FUN	TRC	TPR	2020
TIOGA 3	B-24	3.9	71	FUN	TSI	TI	2024
TIOGA 3	B-25	6.4	32	FUN	TRC	TL	2011
TIOGA 3	B-26	9.3	32	FE	TI	TSI	2026
TIOGA 3	B-27	3.3	32	FUN	TNO		NMAS
TIOGA 3	B-28	5.8	67	FUN	TPR	TRC	2010
TIOGA 3	B-29	8.4	32	FUN	TPR		2010
TIOGA 3	B-30	26.3	32	FE	TL	TRC	2015
TIOGA 3	B-31	6.2	32	FUN	TSI		2013
TIOGA 3	B-32	10.8	11	FUN	TRC	TG	2011
TIOGA 3	B-33	6.4	10	FUN	TRC	TG	2009
TIOGA 3	B-34	2.6	31	FUN	TI	TSI	2026
TIOGA 3	B-35	15.9	32	FUN	TRC	TCT	2015
TIOGA 3	B-36	3.9	12	FUN	TCT	TRC	2010
TIOGA 3	B-37	25.4	16	FE	TRC	TCT	2015
TIOGA 3	B-38	9.6	31	FE	TCT	TCR	2015
TIOGA 3	B-39	38.8	65	FE	TNO		NMAS
TIOGA 3	B-40	9.0	71	FUN	TRC		2016
TIOGA 3	B-41	20.6	12	FUN	TRC	TPR	2015
TIOGA 3	B-42	3.1	31	FUN	TL	TSI	2016
TIOGA 3	B-43	4.8	32	FUN	TRC		2020
TIOGA 3	B-44	31.3	45	FUN	TRC	TCT	2013
TIOGA 3	B-45	30.4	70	FUN	TI	TCT	2022
TIOGA 3	B-46	33.4	12	FUN	TL		2010
TIOGA 3	B-47	26.2	60	FE	TNO		NMAS
TIOGA 3	B-48	10.9	31	FUN	TNO		NMAS
TIOGA 3	B-50	26.8	60	FE	TNO		NMAS

Table 23 - Forest Ecosystem Management Action Schedule by State Forest and Stand							
State Forest	Stand	Acres	Forest Type	Future Structure	Primary Action	Secondary Action	Year
TIOGA 3	B-51	12.2	32	FE	TL	TCT	2019
TIOGA 3	B-52	24.2	31	FUN	TNO		NMAS
TIOGA 3	B-53	6.9	10	FUN	TL	TRC	2020
TIOGA 3	B-54	5.8	32	FUN	TL	TSI	2020
TIOGA 3	B-55	14.6	32	FUN	TL	TCT	2020
TIOGA 3	B-56	45.4	16	FUN	TG	TST	2026
TIOGA 3	B-57	7.6	32	FUN	TL	TCT	2019
TIOGA 3	B-58	60.0	60	FE	TPR	TL	2013
TIOGA 3	B-59	4.4	10	FE	TCT	TST	2014
TIOGA 3	B-61	1.7	32	FUN	TG	TST	2014
TIOGA 3	B-62	14.3	45	FUN	TCT		2014
TIOGA 3	B-64	9.0	32	FUN	TCT		2014
TIOGA 3	B-65	12.7	10	FUN	TCT		2020
TIOGA 3	B-66	18.1	11	FUN	TNO		NMAS
TIOGA 3	B-67	15.2	32	FUN	TNO		NMAS
TIOGA 3	B-68	10.4	32	FUN	TNO		NMAS
TIOGA 3	B-69	12.1	12	FUN	TNO		NMAS
TIOGA 4	A-01	17.1	32	FE	TNO	TL	2010
TIOGA 4	A-03	1.2	32	FE	TPR	TL	2021
TIOGA 4	A-04	4.7	32	FUN	TL		2010
TIOGA 4	A-05	6.2	10	FUN	TI	TL	2025
TIOGA 4	A-06	7.8	32	FE	TL		2016
TIOGA 4	A-07	5.0	70	FE	TSI		2014
TIOGA 4	A-08	37.1	61	FE	TPR	TCT	2014
TIOGA 4	A-09	4.2	32	FE	TL		2011
TIOGA 4	A-10	8.0	32	FE	TL		2012
TIOGA 4	A-11	7.5	10	FE	TL	TCT	2016
TIOGA 4	A-12	1.8	12	FE	TL		2025
TIOGA 4	A-13	6.2	32	FE	TSI		2016
TIOGA 4	A-14	16.4	32	FUN	TI	TL	2013
TIOGA 4	A-15	48.2	10	FUN	TRC	TST	2016
TIOGA 4	A-16	13.8	68	FE	TPR	TI	2016
TIOGA 4	A-19	4.3	32	FE	TI	TSI	2025
TIOGA 4	A-20	4.5	31	FUN	TRC	TST	2021
TIOGA 4	A-21	32.4	32	FE	TI	TSI	2025
TIOGA 4	A-23	4.3	12	FE	TNO		NMAS
TIOGA 4	A-24	3.7	45	FUN	TI		2014
TIOGA 4	A-26	1.7	32	FE	TL		2021
TIOGA 4	A-27	5.6	68	FUN	TSI		2009

Table 23 - Forest Ecosystem Management Action Schedule by State Forest and Stand							
State Forest	Stand	Acres	Forest Type	Future Structure	Primary Action	Secondary Action	Year
TIOGA 4	A-28	4.3	40	FUN	TPR	TCT	2012
TIOGA 4	A-29	5.8	15	FE	TI	TL	2025
TIOGA 4	A-30	10.6	19	FUN	TSI		2016
TIOGA 4	A-31	8.8	40	FE	TPR	TSS	2025
TIOGA 4	A-32	8.6	32	FUN	TNO		NMAS
TIOGA 4	A-33	21.1	32	FE	TL		2021
TIOGA 4	A-35	2.9	12	FE	TI	TSI	2025
TIOGA 4	A-36	18.4	32	FE	TL		2016
TIOGA 4	A-37	6.7	60	FE	TPR	TI	2014
TIOGA 4	A-38	25.3	71	FE	TSS	TL	2013
TIOGA 4	A-39	9.4	45	FUN	TI		2014
TIOGA 4	A-40	3.6	15	FUN	TPR	TL	2017
TIOGA 4	A-41	25.5	32	FUN	TL		2012
TIOGA 4	A-42	24.3	45	FUN	TSI	TCT	2012
TIOGA 4	A-43	6.4	32	FUN	TRC	TL	2021
TIOGA 4	A-45	7.0	45	FUN	TI		2014
TIOGA 4	A-46	7.1	45	FUN	TSI		2009
TIOGA 4	A-47	10.5	45	FUN	TSI		2009
TIOGA 4	A-48	2.1	45	FUN	TI		2014
TOMPKINS 4	A-01	4.1	10	FE	TL	TCT	2011
TOMPKINS 4	A-02	8.8	70	FE	TPR	TSS	2025
TOMPKINS 4	A-03	2.6	97	FE	TNO		NMAS
TOMPKINS 4	A-04	11.0	60	FE	TPR	TSS	2017
TOMPKINS 4	A-06	6.1	60	FE	TSS		2019
TOMPKINS 4	A-07	24.8	97	FE	TNO		NMAS
TOMPKINS 4	A-08	4.0	68	FE	TSS		2014
TOMPKINS 4	A-09	8.7	60	FE	TSS	TST	2017
TOMPKINS 4	A-10	88.2	61	FE	TPR	TSS	2027
TOMPKINS 4	A-13	9.6	45	FE	TNO		NMAS
TOMPKINS 4	A-14	3.0	70	FE	TPR	TI	2019
TOMPKINS 4	A-15	4.9	10	FE	TL	TCT	2018
TOMPKINS 4	A-16	37.9	32	FE	TCT	TL	2023
TOMPKINS 4	A-17	3.2	97	FE	TNO		NMAS
TOMPKINS 4	A-18	14.4	70	FE	TPR	TL	2019
TOMPKINS 4	A-19	14.6	32	FE	TNO		NMAS
TOMPKINS 4	A-20	6.1	70	FE	TPR	TSS	2023
TOMPKINS 4	A-21	10.9	45	FE	TNO		NMAS
TOMPKINS 4	A-22	15.4	10	FE	TL	TCT	2011
TOMPKINS 4	A-23	4.9	10	FE	TL		2021

Table 23 - Forest Ecosystem Management Action Schedule by State Forest and Stand							
State Forest	Stand	Acres	Forest Type	Future Structure	Primary Action	Secondary Action	Year
TOMPKINS 4	A-24	16.1	67	FUN	TNO		NMAS
TOMPKINS 4	A-25	18.0	45	FUN	TRC		2012
TOMPKINS 4	A-26	9.3	32	FUN	TNO		NMAS
TOMPKINS 4	A-27	7.1	10	FUN	TRC	TST	2018
TOMPKINS 4	A-29	4.1	10	FUN	TNO		NMAS
TOMPKINS 4	A-30	1.6	15	FUN	TNO		NMAS
TOMPKINS 4	A-31	31.0	40	FE	TPR	TL	2010
TOMPKINS 4	A-32	9.5	45	FUN	TCT		2017
TOMPKINS 4	A-33	8.6	68	FE	TPR	TL	2010
TOMPKINS 4	A-34	3.8	10	FUN	TL	TSI	2018
TOMPKINS 4	A-35	29.7	47	FE	TSS	TL	2011
TOMPKINS 4	A-36	5.7	10	FE	TNO		NMAS
TOMPKINS 4	A-37	68.8	62	FE	TSS		2017
TOMPKINS 4	B-01	12.6	10	FUN	TRC	TCT	2014
TOMPKINS 4	B-06	6.7	68	FUN	TSS		2027
TOMPKINS 4	B-07	11.2	68	FE	TPR	TSS	2012
TOMPKINS 4	B-08	3.2	14	FE	TNO		NMAS
TOMPKINS 4	B-10	13.5	32	FUN	TSI		2018
TOMPKINS 4	B-11	7.1	11	FUN	TI	TSI	2025
TOMPKINS 4	B-12	3.4	10	FUN	TI	TSI	2027
TOMPKINS 4	B-13	8.3	11	FUN	TNO		2014
TOMPKINS 4	B-14	1.0	32	FUN	TSI	TCR	2018
TOMPKINS 4	B-15	6.7	62	FUN	TPR	TSS	2017
TOMPKINS 4	B-17	25.7	32	FUN	TCT	TRC	2023
TOMPKINS 4	B-18	14.1	10	FUN	TRC	TST	2018
TOMPKINS 4	B-19	6.6	10	FUN	TI	TSI	2025
TOMPKINS 4	B-21	8.6	32	FE	TL	TSI	2023
TOMPKINS 4	B-22	5.9	71	FUN	TS		2021
TOMPKINS 4	B-23	20.2	61	FUN	TST	TRC	2023
TOMPKINS 4	B-24	4.0	17	FUN	TNO		NMAS
TOMPKINS 4	B-26	31.9	71	FE	TSS	TL	2017
TOMPKINS 4	B-27	35.7	10	FUN	TL	TRC	2018
TOMPKINS 4	B-28	20.4	71	FUN	TNO		NMAS
TOMPKINS 4	B-29	18.9	10	FUN	TI	TSI	2027

Table 24 - Basic Forest Inventory Data for Managed Stands

Top Five Tree Species

Unit	Stand	Acres	Type	Future Age Struc.	Primary Treat.	Basal Area (Ft2)	SP1	SP2	SP3	SP4	SP5	MSD	Trees Per Acre	Size Class	HC	Year
TIOGA 3	A-01	14.0	32	FUN	TL	116	RM	HM	BE	WA	BB	10.6	163	C	Y	2016
TIOGA 3	A-02	1.8	68	FE	TL	110	RM	HM	ASP	BB	WS	8.5	190	B		2021
TIOGA 3	A-03	2.8	10	FUN	TRC	130	RM	HM	BE	SHR		10.0	219	C	Y	2016
TIOGA 3	A-04	4.1	10	FUN	TRC	130	HM	WA	RM	RO	BE	9.8	250	C		2020
TIOGA 3	A-05	4.9	12	FUN	TNO	53	RM	WP	RO	HE		8.9	93	C		****
TIOGA 3	A-06	8.1	32	FUN	TNO	50	PC	HM	BE	WA	RO	3.6	699	A		****
TIOGA 3	A-07	2.6	10	FUN	TL	90	RM	WP				8.8	172	C		2016
TIOGA 3	A-08	11.8	32	FUN	TRC	98	RM	RO	BB	IWD	BC	10.5	150	C		2013
TIOGA 3	A-09	10.9	70	FUN	TL	123	RM	NS	DF	WP	WA	8.5	222	B		2021
TIOGA 3	A-10	7.2	68	FUN	TNO	90	HM	RM	APL	JL	BC	9.9	102	C	Y	****
TIOGA 3	A-11	19.2	67	FUN	TI	161	NS	RM	JL	APL		8.6	387	C		2019
TIOGA 3	A-12	7.6	68	FUN	TNO	60	SP	RP	RM	BC	WA	8.6	129	C		****
TIOGA 3	A-13	10.6	67	FUN	TI	193	NS	RM	JL	DF	WP	8.7	421	C		2021
TIOGA 3	A-17	3.3	10	FUN	TNO	15	BC	WA	RM			8.5	38	B		****
TIOGA 3	A-18	27.9	61	FUN	TPR	249	RP	NS	RM	WA	WP	9.1	517	C		2010
TIOGA 3	A-19	47.4	10	FUN	TNO	136	HM	WA	RM	BAS	BC	10.6	222	C	Y	****
TIOGA 3	A-20	33.4	61	FE	TNO	129	NS	JL	RP	HM	WA	12.6	140	D		****
TIOGA 3	A-21	4.3	10	FUN	TNO	140	HM	BE	RO	BAS	RM	11.0	204	C	Y	****
TIOGA 3	A-22	14.3	40	FE	TNO	118	RP	RM	WA	WP		8.6	262	C		****
TIOGA 3	A-23	15.1	70	FUN	TRC	135	WA	RM	HM	WP	ASP	10.0	216	C	Y	2010
TIOGA 3	A-24	16.3	61	FUN	TPR	110	RP	WA	NS	RM	JL	11.5	134	C		2010
TIOGA 3	A-25	7.3	15	FE	TRC	165	WA	RM	NS	RP	ASP	10.2	233	C		2024
TIOGA 3	A-26	1.0	10	FUN	TL	110	RM	WA	BAS	HM	ASP	8.8	248	C		2015
TIOGA 3	A-28	8.9	64	FUN	TRC	108	WP	RM	HM	RO	HE	10.6	167	C	Y	2024
TIOGA 3	A-29	9.2	32	FUN	TL	130	HM	WA	RO	BAS	ASP	9.7	202	C		2015
TIOGA 3	A-30	6.2	11	FUN	TNO	120	RM	HE	BE	HM	WA	10.8	178	C	Y	****
TIOGA 3	A-31	0.6	70	FE	TNO	168	NS	RM	WP	ASP	HM	9.0	348	C		****
TIOGA 3	A-34	16.3	10	FUN	TNO	97	HM	WA	BAS	BE	BC	10.4	160	C	Y	****
TIOGA 3	A-36	9.5	10	FUN	TRC	116	HM	WA	RM	BE	BC	10.6	174	C	Y	2024
TIOGA 3	A-39	8.3	61	FUN	TPR	148	RP	JL	NS	BC	STM	10.1	254	C		2010
TIOGA 3	A-40	21.7	11	FUN	TRC	104	HE	RM	BE	BAS	PC	10.2	149	C	Y	2024
TIOGA 3	A-42	10.4	11	FUN	TRC	147	HE	ASP	BE	RM	RO	11.2	204	C	Y	2013
TIOGA 3	A-43	25.0	11	FUN	TRC	163	RO	RM	HE	WP	HM	11.6	208	D	Y	2016
TIOGA 3	A-44	19.3	71	FE	TL	117	WA	BL	WS	RM	HM	11.2	168	C		2013
TIOGA 3	A-45	7.0	32	FE	TL	130	RO	ASP	HM	RM	WA	10.2	204	C		2013

Table 24 - Basic Forest Inventory Data for Managed Stands

Top Five Tree Species

Unit	Stand	Acres	Type	Future Age Struc.	Primary Treat.	Basal Area (Ft2)	SP1	SP2	SP3	SP4	SP5	MSD	Trees Per Acre	Size Class	HC	Year
TIOGA 3	A-46	9.8	32	FUN	TRC	135	RM	HM	BE	RO	BAS	10.6	206	C		2024
TIOGA 3	A-48	18.7	32	FE	TRC	150	RM	RO	ASP	BE	WA	10.5	226	C		2024
TIOGA 3	A-52	11.1	12	FE	TRC	108	RO	RM	WP	WA	BE	9.8	201	C	Y	2011
TIOGA 3	A-53	18.4	70	FE	TPR	126	RP	RM	WA	WP	ASP	9.2	258	C		2009
TIOGA 3	A-55	27.5	32	FE	TL	163	BE	RM	RO	HM	BAS	10.5	213	C		2019
TIOGA 3	A-56	24.2	12	FE	TPR	80	ASP	RM	WP	HM		9.2	122	C		2019
TIOGA 3	A-57	27.2	32	FUN	TL	144	HM	RM	RO	WA	ASP	10.9	187	C	Y	2019
TIOGA 3	A-59	10.5	60	FE	TPR	193	RP	WP	WA	ASP		9.5	396	C		2009
TIOGA 3	A-60	7.7	10	FE	TL	107	HM	RM	BAS	BE	ASP	11.0	152	C		2020
TIOGA 3	A-61	12.1	47	FE	TNO	43	JL					8.5	102	B		****
TIOGA 3	A-62	17.6	60	FE	TSI	225	RP	RM	WP	NS	BC	10.9	337	C		2010
TIOGA 3	A-63	20.6	70	FE	TNO	20	WA	WP	BC	RP	ASP	9.0	45	C		****
TIOGA 3	A-64	24.5	12	FUN	TI	170	WP	RM	RO	BC	HM	10.6	253	C	Y	2022
TIOGA 3	B-01	7.9	70	FUN	TPR	96	WP	RM	BB	ASP		9.2	200	C		2016
TIOGA 3	B-02	5.1	32	FUN	TRC	95	HM	RM	RO	BB	ASP	9.0	187	C	Y	2016
TIOGA 3	B-03	7.8	71	FUN	TPR	93	RM	WS	ASP	WA	WP	8.9	161	C	Y	2019
TIOGA 3	B-04	5.3	10	FUN	TRC	100	HM	WA	BC	RO	RM	10.5	153	C	Y	2016
TIOGA 3	B-05	2.0	10	FUN	TRC	117	HM	BC	RO	WA		12.3	142	D	Y	2009
TIOGA 3	B-06	15.2	10	FUN	TSI	90	RM	HM	WA			8.8	157	C	Y	2010
TIOGA 3	B-07	3.9	32	FUN	TSI	95	ASP	RM	WA	YB	BB	9.5	161	C	Y	2010
TIOGA 3	B-09	53.4	41	FE	TPR	120	WP	RM	ASP	BB	WA	9.1	260	C		2010
TIOGA 3	B-10	20.7	47	FUN	TRC	133	JL	WP				9.1	294	C		2010
TIOGA 3	B-11	4.6	71	FUN	TPR	91	RM	WS	ASP	WA	WP	8.9	160	C		2010
TIOGA 3	B-12	18.5	71	FUN	TPR	93	RM	WS	ASP	WA	WP	8.9	161	C		2010
TIOGA 3	B-13	3.7	40	FE	TRC	130	RP	RM				8.5	266	B		2010
TIOGA 3	B-14	5.8	45	FUN	TRC	120	NS	RM	RO			8.5	233	B		2024
TIOGA 3	B-15	4.0	10	FUN	TNO	33	WA	HM	BC	RM		9.3	57	C	Y	****
TIOGA 3	B-16	17.9	46	FUN	TNO	63	WS	WP	RM	WA	APL	8.5	130	B	Y	****
TIOGA 3	B-17	23.3	67	FE	TRC	179	EL	NS	HM	RM	WA	11.8	222	D		2013
TIOGA 3	B-18	5.5	31	FUN	TRC	145	RM	RO	HM	WA	BC	10.0	254	C		2011
TIOGA 3	B-19	2.1	97	FE	TNO	0						0.0	0	A		****
TIOGA 3	B-20	22.8	71	FUN	TRC	134	NS	ASP	RM	EL	WA	11.4	179	C		2021
TIOGA 3	B-21	3.9	32	FUN	TSI	107	BB	RM	ASP	RO	WA	9.3	218	C	Y	2015
TIOGA 3	B-22	4.6	67	FUN	TRC	112	EL	NS	WA	RM	ASP	13.2	116	D		2020

Table 24 - Basic Forest Inventory Data for Managed Stands

Top Five Tree Species

Unit	Stand	Acres	Type	Future Age Struc.	Primary Treat.	Basal Area (Ft2)	SP1	SP2	SP3	SP4	SP5	MSD	Trees Per Acre	Size Class	HC	Year
TIOGA 3	B-23	15.1	71	FUN	TRC	137	NS	WC	RM	ASP	WA	11.0	170	C		2020
TIOGA 3	B-24	3.9	71	FUN	TSI	108	RM	ASP	WS	WA	BC	8.8	125	C	Y	2024
TIOGA 3	B-25	6.4	32	FUN	TRC	122	RM	RO	BB	OTH	BE	11.8	144	D	Y	2011
TIOGA 3	B-26	9.3	32	FE	TI	112	RO	RM	HM	ASP	BC	10.1	177	C		2026
TIOGA 3	B-27	3.3	32	FUN	TNO	57	HM	BE	RM	BB	RO	12.1	67	D		****
TIOGA 3	B-28	5.8	67	FUN	TPR	200	EL	NS	RM	RO	ASP	12.1	250	D		2010
TIOGA 3	B-29	8.4	32	FUN	TNO	174	RM	ASP	WA	NS	RO	9.2	271	C		2010
TIOGA 3	B-30	26.3	32	FE	TL	166	RO	WA	RM	HM	BE	10.6	248	C		2015
TIOGA 3	B-31	6.2	32	FUN	TSI	116	RM	RO	HM	BAS	WA	10.0	183	C	Y	2013
TIOGA 3	B-32	10.8	11	FUN	TRC	123	HE	RM	RO	HM	BE	10.9	177	C	Y	2011
TIOGA 3	B-33	6.4	10	FUN	TRC	116	HM	WA	RO	BC		11.6	155	D	Y	2009
TIOGA 3	B-34	2.6	31	FUN	TI	87	HM	RO	RM	BE	WA	13.4	85	D		2026
TIOGA 3	B-35	15.9	32	FUN	TRC	115	RM	RO	HM	WA	BE	10.4	164	C		2015
TIOGA 3	B-36	3.9	12	FUN	TCT	157	WP	HM	RM	BC		12.5	185	D	Y	2010
TIOGA 3	B-37	25.4	16	FE	TRC	104	RO	BE	RM	HE	BB	12.8	103	D	Y	2015
TIOGA 3	B-38	9.6	31	FE	TCT	155	HM	RO	WA	BAS	RM	12.2	186	D		2015
TIOGA 3	B-39	38.8	65	FE	TNO	82	NS	SP	RM	HM	WA	10.8	125	C		****
TIOGA 3	B-40	9.0	71	FUN	TRC	108	NS	HM	BB	BC	TAP	11.1	149	C	Y	2016
TIOGA 3	B-41	20.6	12	FUN	TRC	118	RM	WP	ASP	OTH	HM	10.8	178	C	Y	2015
TIOGA 3	B-42	3.1	31	FUN	TL	87	HM	RO	WA	RM	BE	12.6	77	D		2016
TIOGA 3	B-43	4.8	32	FUN	TRC	137	RO	RM	ASP	BE	BC	12.9	142	D	Y	2020
TIOGA 3	B-44	31.3	45	FUN	TRC	115	NS	IWD	WA	RM	BE	11.4	157	C	Y	2013
TIOGA 3	B-45	30.4	70	FUN	TI	127	NS	RM	WP	WA	ASP	8.9	205	C	Y	2022
TIOGA 3	B-46	33.4	12	FUN	TNO	85	RO	RM	WA	WP	HM	10.4	123	C	Y	2010
TIOGA 3	B-47	26.2	60	FE	TNO	93	RP	WP	WA	SHR	BC	10.3	161	C		****
TIOGA 3	B-48	10.9	31	FUN	TNO	87	RO	RM	BC	HM	WA	12.8	79	D	Y	****
TIOGA 3	B-50	26.8	60	FE	TNO	79	RP	WP	BC	HM	RM	12.1	96	D		****
TIOGA 3	B-51	12.2	32	FE	TL	106	HM	RM	WA	RO	BC	10.9	140	C		2019
TIOGA 3	B-52	24.2	31	FUN	TNO	35	YB	HM	RO	RM	WA	5.7	113	B	Y	****
TIOGA 3	B-53	6.9	10	FUN	TL	130	HM	WA	BAS	BC	STM	10.8	178	C		2020
TIOGA 3	B-54	5.8	32	FUN	TL	149	RO	RM	BE	ASP	HM	11.6	169	D	Y	2020
TIOGA 3	B-55	14.6	32	FUN	TL	144	RM	RO	WA	WP	ASP	10.8	207	C		2020
TIOGA 3	B-56	45.4	16	FUN	TG	111	RO	RM	HM	ASP	BE	11.4	143	C	Y	2026
TIOGA 3	B-57	7.6	32	FUN	TL	160	HM	WA	RO	BC	ELM	10.7	240	C	Y	2019
TIOGA 3	B-58	60.0	60	FE	TPR	172	RP	RM	WP	SP	BC	10.0	279	C		2013
TIOGA 3	B-59	4.4	10	FE	TCT	215	BC	RM	WA	HM	RP	11.3	287	C		2014

Table 24 - Basic Forest Inventory Data for Managed Stands

Top Five Tree Species

Unit	Stand	Acres	Type	Future Age Struc.	Primary Treat.	Basal Area (Ft2)	SP1	SP2	SP3	SP4	SP5	MSD	Trees Per Acre	Size Class	HC	Year
TIOGA 3	B-61	1.7	32	FUN	TG	170	HE	RM	RO	BB		10.8	265	C	Y	2014
TIOGA 3	B-62	14.3	45	FUN	TCT	148	NS	BC	WA	RO	RM	10.7	231	C	Y	2014
TIOGA 3	B-64	9.0	32	FUN	TCT	130	RM	BB	RO	ASP	BE	9.5	255	C	Y	2014
TIOGA 3	B-65	12.7	10	FUN	TCT	118	HM	WA	BAS	BC	BE	13.3	119	D	Y	2020
TIOGA 3	B-66	18.1	11	FUN	TNO	123	HE	RM	WA	WP	YB	10.5	179	C	Y	****
TIOGA 3	B-67	15.2	32	FUN	TNO	90	RM	HM	ASP	WA	BE	9.2	158	C	Y	****
TIOGA 3	B-68	10.4	32	FUN	TNO	105	ASP	WA	RM	BE	BB	9.4	187	C	Y	****
TIOGA 3	B-69	12.1	12	FUN	TNO	125	RM	WP	ASP	BB	BE	8.6	258	C	Y	****
TIOGA 4	A-01	17.1	32	FE	TL	139	RM	WA	BB	RO	ASP	10.6	211	C		2010
TIOGA 4	A-03	1.2	32	FE	TPR	140	RM	WA	BB	BE	YB	9.3	255	C		2021
TIOGA 4	A-04	4.7	32	FUN	TNO	107	RM	HM	BB	WA	RO	10.1	190	C	Y	2010
TIOGA 4	A-05	6.2	10	FE	TI	107	BE	RM	WA	HM	RO	9.9	169	C		2025
TIOGA 4	A-06	7.8	32	FE	TL	120	RM	RO	WA	BC	BB	12.9	125	D		2016
TIOGA 4	A-07	5.0	70	FE	TSI	180	RM	AP	BC	WA	SHR	9.5	307	C		2014
TIOGA 4	A-08	37.1	61	FE	TPR	180	RP	NS	RM	WA	BB	10.8	273	C		2014
TIOGA 4	A-09	4.2	32	FE	TL	103	RO	RM	BE	WA	YB	11.3	125	C		2011
TIOGA 4	A-10	8.0	32	FE	TL	120	BE	HM	BAS	IWD	WA	10.5	122	C		2012
TIOGA 4	A-11	7.5	10	FE	TL	295	RM	HM	WA	BE	BAS	11.6	305	D		2016
TIOGA 4	A-12	1.8	12	FE	TL	90	TAP	ASP	ELM	BC	WP	9.9	121	C		2025
TIOGA 4	A-13	6.2	32	FE	TSI	160	RM	TAP	RO	BE	WA	9.6	246	C		2016
TIOGA 4	A-14	16.4	32	FUN	TI	101	HM	BE	WA	RM	BAS	10.6	151	C		2013
TIOGA 4	A-15	48.2	10	FUN	TRC	160	HM	WA	BE	BAS	RM	12.3	167	D	Y	2016
TIOGA 4	A-16	13.8	68	FE	TPR	190	WS	RM	NS	ASP	BL	10.0	334	C		2016
TIOGA 4	A-19	4.3	32	FUN	TI	107	RO	BE	HM	RM	BC	10.4	169	C		2025
TIOGA 4	A-20	4.5	31	FUN	TRC	143	RO	BE	RM	HM	WA	12.6	154	D	Y	2021
TIOGA 4	A-21	32.4	32	FE	TI	136	RM	BE	WA	BB	BC	8.9	156	C		2025
TIOGA 4	A-23	4.3	12	FE	TNO	130	WP	BC	RM	RO	BBE	10.1	197	C		****
TIOGA 4	A-24	3.7	45	FUN	TI	190	NS	WP	BC			9.2	409	C	Y	2014
TIOGA 4	A-26	1.7	32	FUN	TL	110	WA	BC	ASP	WP		10.8	142	C		2021
TIOGA 4	A-27	5.6	68	FUN	TSI	110	NS	WS	RM	WA	ASP	8.7	226	C	Y	2009
TIOGA 4	A-28	4.3	40	FUN	TPR	155	RP	ASP	BB			8.9	360	C		2012
TIOGA 4	A-29	5.8	15	FUN	TI	100	RM	RO	WA	BAS	ASP	11.5	122	C		2025
TIOGA 4	A-30	10.6	19	FUN	TSI	163	HE	WP	RO	RM	HM	12.8	172	D	Y	2016
TIOGA 4	A-31	8.8	40	FE	TPR	116	RP	WA	RM	ASP	WP	9.4	219	C		2025
TIOGA 4	A-32	8.6	32	FUN	TNO	105	RO	RM	ASP	YB	HE	10.2	153	C	Y	****
TIOGA 4	A-33	21.1	32	FE	TL	103	RM	WA	BC	HM	RO	10.7	148	C		2021

Table 24 - Basic Forest Inventory Data for Managed Stands

Top Five Tree Species

Unit	Stand	Acres	Type	Future Age Struc.	Primary Treat.	Basal Area (Ft2)	SP1	SP2	SP3	SP4	SP5	MSD	Trees Per Acre	Size Class	HC	Year
TIOGA 4	A-35	2.9	12	FE	TI	155	RM	WP	RO	BBE	YB	10.8	205	C		2025
TIOGA 4	A-36	18.4	32	FE	TL	118	RM	WA	BE	RO	HM	10.8	156	C		2016
TIOGA 4	A-37	6.7	60	FE	TPR	213	RP	WP	BC	WA	RM	11.1	306	C		2014
TIOGA 4	A-38	25.3	71	FE	TSS	158	RM	WS	SHR	HM	BC	9.4	272	C		2013
TIOGA 4	A-39	9.4	45	FUN	TI	160	NS	RM	WA	ASP		8.8	342	C	Y	2014
TIOGA 4	A-40	3.6	15	FUN	TPR	105	RM	WA	BC	RO	SHR	10.2	132	C		2017
TIOGA 4	A-41	25.5	32	FUN	TL	103	RM	RO	ASP	WA	YB	9.7	170	C	Y	2012
TIOGA 4	A-42	24.3	45	FUN	TSI	156	NS	HM	BC	RM		8.9	320	C	Y	2012
TIOGA 4	A-43	6.4	32	FUN	TRC	130	RO	RM	WA	BC	IWD	10.5	194	C	Y	2021
TIOGA 4	A-45	7.0	45	FUN	TI	217	NS	RM				8.6	454	C	Y	2014
TIOGA 4	A-46	7.1	45	FUN	TSI	147	NS	BC				8.7	310	C	Y	2009
TIOGA 4	A-47	10.5	45	FUN	TSI	160	NS	RM				8.8	361	C	Y	2009
TIOGA 4	A-48	2.1	45	FUN	TI	190	NS	RM	RO	BC	APL	9.1	331	C	Y	2014
TOMPKINS 4	A-01	4.1	10	FE	TL	147	RM	HM	WA	BC	BE	10.2	243	C		2011
TOMPKINS 4	A-02	8.8	70	FE	TPR	130	RM	RP	HM	WP	BC	10.4	202	C		2025
TOMPKINS 4	A-03	2.6	97	FE	TNO	0						0.0	0	A		****
TOMPKINS 4	A-04	11.0	60	FE	TPR	159	RP	WP	RM	HM	BC	10.2	267	C		2017
TOMPKINS 4	A-06	6.1	60	FE	TSS	170	HM	WP	RP	SP	BC	10.1	209	C		2019
TOMPKINS 4	A-07	24.8	97	FE	TNO	0						0.0	0	A		****
TOMPKINS 4	A-08	4.0	68	FE	TSS	194	RP	HM	BC	WP	SP	10.0	328	C		2014
TOMPKINS 4	A-09	8.7	60	FE	TSS	130	RP	WP	SP	WA	BC	11.1	193	C		2017
TOMPKINS 4	A-10	88.2	61	FE	TPR	94	RP	EL	NS			13.3	97	D		2027
TOMPKINS 4	A-13	9.6	45	FE	TNO	58	NS	BC				11.8	76	D		0
TOMPKINS 4	A-14	3.0	70	FE	TPR	177	WP	ASP	BC	RM	IWD	11.9	213	D		2019
TOMPKINS 4	A-15	4.9	10	FE	TL	117	RM	HM	WA	BE	BC	11.1	168	C		2018
TOMPKINS 4	A-16	37.9	32	FE	TCT	102	HM	RM	BC	BE	WA	10.8	129	C		2023
TOMPKINS 4	A-17	3.2	97	FE	TNO	0						0.0	0	A		****
TOMPKINS 4	A-18	14.4	70	FE	TPR	128	WP	WA	BC	RP	APL	10.7	184	C		2019
TOMPKINS 4	A-19	14.6	32	FE	TNO	44	WA	BC	PC	BE	RM	4.1	390	A		****
TOMPKINS 4	A-20	6.1	70	FE	TPR	88	WA	APL	TAP	SP	RP	10.1	134	C		2023
TOMPKINS 4	A-21	10.9	45	FE	TNO	82	NS	RM	WA	HM	BC	12.4	97	D		****
TOMPKINS 4	A-22	15.4	10	FE	TL	140	HM	WA	BC	BE	RM	10.9	194	C		2011
TOMPKINS 4	A-23	4.9	10	FE	TL	145	RM	HM	WA	BE	BC	10.5	212	C		2021
TOMPKINS 4	A-24	16.1	67	FUN	TNO	80	NS	JL	WC	BC	WA	11.8	101	D	Y	****
TOMPKINS 4	A-25	18.0	45	FUN	TRC	126	NS	WA	RM	HM	BC	12.0	148	D	Y	2012
TOMPKINS 4	A-26	9.3	32	FUN	TNO	80	HM	BE	WA	IWD		9.4	76	C	Y	****

Table 24 - Basic Forest Inventory Data for Managed Stands

Top Five Tree Species

Unit	Stand	Acres	Type	Future Age Struc.	Primary Treat.	Basal Area (Ft2)	SP1	SP2	SP3	SP4	SP5	MSD	Trees Per Acre	Size Class	HC	Year
TOMPKINS 4	A-27	7.1	10	FUN	TRC	133	HM	WA	IWD	RM	BC	10.3	190	C	Y	2018
TOMPKINS 4	A-29	4.1	10	FUN	TNO	65	HM	BAS	BE			13.1	64	D	Y	****
TOMPKINS 4	A-30	1.6	15	FUN	TNO	80	RM	WP	WA	ASP	YB	10.3	138	C	Y	****
TOMPKINS 4	A-31	31.0	40	FE	TPR	134	RP	SP	WA	WP	RM	11.1	192	C		2010
TOMPKINS 4	A-32	9.5	45	FUN	TCT	243	NS	WA	RM	BL	BC	10.2	411	C	Y	2017
TOMPKINS 4	A-33	8.6	68	FE	TPR	162	JL	WA	BC	RM	HM	10.5	233	C		2010
TOMPKINS 4	A-34	3.8	10	FUN	TL	187	HM	WA	RM	BAS	IWD	10.3	263	C	Y	2018
TOMPKINS 4	A-35	29.7	47	FUN	TSS	229	JL	WA	HM	SP	RM	9.8	364	C		2011
TOMPKINS 4	A-36	5.7	10	FUN	TNO	87	BE	HM	RM			12.4	72	D		****
TOMPKINS 4	A-37	68.8	62	FUN	TSS	164	JL	NS	RP	RM	BC	10.8	249	C		2017
TOMPKINS 4	B-01	12.6	10	FUN	TRC	184	HM	BE	BAS	WA	HE	11.4	241	C	Y	2014
TOMPKINS 4	B-06	6.7	68	FUN	TSS	83	WA	HM	PP	BE	BB	10.8	110	C		2027
TOMPKINS 4	B-07	11.2	68	FUN	TPR	123	WA	RM	BB	ASP	HM	9.3	212	C		2012
TOMPKINS 4	B-08	3.2	14	FUN	TPR	75	WA	ASP	BBE	RM	BC	10.1	81	C		****
TOMPKINS 4	B-10	13.5	32	FUN	TSI	136	HM	BE	BB	STM	WA	11.3	127	C	Y	2018
TOMPKINS 4	B-11	7.1	11	FUN	TI	125	HM	HE	RM	BE	WA	11.6	164	D	Y	2025
TOMPKINS 4	B-12	3.4	10	FUN	TI	80	HM	WA	BB	BE	RM	10.9	123	C	Y	2027
TOMPKINS 4	B-13	8.3	11	FUN	TNO	215	HE	RM	BB	BE	HM	11.3	291	C	Y	2014
TOMPKINS 4	B-14	1.0	32	FUN	TSI	125	RM	HM	BC	WP	BBE	9.2	172	C		2018
TOMPKINS 4	B-15	6.7	62	FUN	TPR	290	EL	RP	RM	BC	HM	10.0	523	C		2017
TOMPKINS 4	B-17	25.7	32	FUN	TCT	89	HM	WA	RM	BE	BB	11.5	109	D	Y	2023
TOMPKINS 4	B-18	14.1	10	FUN	TRC	124	RM	HM	WA	BC	BB	10.7	184	C		2018
TOMPKINS 4	B-19	6.6	10	FUN	TI	110	RM	WA	HM	BC	BB	13.8	105	D		2025
TOMPKINS 4	B-21	8.6	32	FUN	TL	74	HM	WA	RM	BB	STM	9.2	112	C		2023
TOMPKINS 4	B-22	5.9	71	FUN	TS	115	NS	RM	WA	BB	DF	9.7	209	C	Y	2021
TOMPKINS 4	B-23	20.2	61	FUN	TST	110	NS	RP	BC	WA	ASP	11.5	145	D	Y	2023
TOMPKINS 4	B-24	4.0	17	FUN	TNO	40	BL	APL	BC	ASP	HM	12.3	49	D	Y	****
TOMPKINS 4	B-26	31.9	71	FUN	TSS	140	JL	WA	HM	NS	RP	11.8	169	D		2017
TOMPKINS 4	B-27	35.7	10	FUN	TL	139	HM	WA	BC	BE	BAS	11.5	176	D	Y	2018
TOMPKINS 4	B-28	20.4	71	FUN	TNO	150	BL	WA	HM	NS	BC	10.2	235	C		****
TOMPKINS 4	B-29	18.9	10	FUN	TI	96	HM	WA	RM	BE	RO	12.3	115	D	Y	2027
Total Acres		**2,767.7**														

Please note; HC refers to High Canopy

Table 25 - Facility Maintenance and Improvement Projects by Priority - *(20 Year Planning Period)*						
State Forest	**Project Description**	**Year(s)**	**Estimated *Total* Cost**	**Priority**	**L&F Days**	**Other Days**
Annual Projects						
TIOGA 3	Stock Tri-County Pond with rainbow trout (DEC Bureau of Fisheries).	Annually	$10,000	1		0.5
UNIT WIDE	Trash pick-up.	Annually	$10,000	1	5.0	20.0
UNIT WIDE	Mark and inspect homeowner firewood, commercial product sales, and wildlife habitat improvement projects as staff, markets and weather permit (averaging about 110 acres per year if fully implemented).	Annually		1	1,053.0	10.0
UNIT WIDE	Coordination with DEC Adopt-A-Natural Resource volunteers.	Annually		1	20.0	10.0
UNIT WIDE	Coordination with other agencies or DEC divisions, including DEC Forest Rangers, Environmental Conservation Officers (includes monitoring of illegal use).	Annually		1	20.0	10.0
UNIT WIDE	Monitor forest health.	Annually		1	20.0	10.0
			$20,000.00		**1,118.0**	**60.5**
Acquisition Projects						
	Acquire up to 1,528 acres on 53 private property parcels from willing sellers at appraised value, or from donors with Conservation Partners such as the Finger Lakes Land Trust, Tompkins County Planning Department and Finger Lakes Trail Conference.		**$2,800,000.00**		**30.0**	**60.0**
New Projects						
TIOGA 3	Build a 3 to 5 car parking lot on the Robinson Hollow Road Finger Lakes Trail head.	2010	$2,500.00	1	1.0	5.0
TIOGA 3	Install single panel kiosk at Tri-County Pond parking lot.	2010	$2,500.00	2	0.5	1.0
TIOGA 4	Proposal C: Monument and survey an estimated 1,700 feet of property line between West Creek Road and Andersen Hill Rd.	2010	$2,550.00	1		3.0
TIOGA 3	Survey proposal U; the proposal was never filed surveyed. A survey would include marking, painting, and monumenting 3,800 feet of boundary line.	2010	$5,700.00	1		4.0
TIOGA 4	Proposal F: Survey entire proposal; 6,300 +/- feet of property line to be marked and monumented; 2,400 +/- feet of road frontage.	2012	$13,200.00	2		5.0
TIOGA 3	Develop 2.5 miles of ATV trail for individuals with CP-3 permits. Build a 3 to 5 car parking lot.	2015	$27,000.00	1	5.0	8.0
TOMPKINS 4	Install large 25 mph speed limit sign on PFAR	2015	$750.00	1		0.5
TIOGA 3	Install new State Forest sign at Robinson Hollow Road and Lacey Rd.	2015	$750.00	2		0.5
TIOGA 4	Install single panel kiosk; create brochure/map; place on Dept. web site.	2015	$3,000.00	2	0.5	1.0
TOMPKINS 4	Install single panel kiosk; create brochure/map; place on Dept. web site.	2015	$3,000.00	2	0.5	1.0
TOMPKINS 4	Install two (2) new large State Forest signs at key entry points of entry; create brochure/map; place on Dept. web site.	2015	$2,000.00	3		1.0
			$62,950.00		**7.5**	**30.0**
Periodic Projects						
TIOGA 3	Brush out Lacey Rd. State Forest sign.	2009	$50.00	1		0.5
TIOGA 3	Maintain 12.2 miles of boundary.	2009	$3,000.00	1		12.0
TIOGA 4	Mow both shoulders of 1.6 mile PFAR.	2009	$400.00	1		1.0
TOMPKINS 4	Grade .4 miles of PFAR, clean culverts, replace culvert markers.	2009	$400.00			2.0
TIOGA 3	Mow and inspect Tri-Country Pond dam.	2009	$500.00	2		1.0
TIOGA 4	Grade 1.6 miles of Public Forest Access Rd. (PFAR), clean culverts, replace culvert markers.	2009	$2,000.00	2		3.0

Table 25 - Facility Maintenance and Improvement Projects by Priority - *(20 Year Planning Period)*

State Forest	Project Description	Year(s)	Estimated *Total* Cost	Priority	L&F Days	Other Days
TOMPKINS 4	Mow shoulders of PFAR.	2009	$150.00	2		1.0
TIOGA 3	Mow and inspect Tri-Country pond dam.	2011	$500.00	2		1.0
TIOGA 4	Maintain 6 miles of boundary	2013	$1,500.00	1		6.0
TOMPKINS 4	Mow shoulders of PFAR.	2013	$150.00	1		1.0
TIOGA 4	Grade 1.6 miles of Public Forest Access Rd. (PFAR), clean culverts, replace culvert markers.	2013	$2,000.00	2		3.0
TIOGA 4	Mow both shoulders of 1.6 mile PFAR.	2013	$400.00	2		1.0
TOMPKINS 4	Grade .4 miles of PFAR, clean culverts, replace culvert markers.	2013	$400.00	2		2.0
TIOGA 3	Mow and inspect Tri-Country pond dam.	2014	$500.00	1		1.0
TIOGA 4	Conduct natural resource inventory.	2014	$1,600.00	1	14.0	
TOMPKINS 4	Maintain 11 miles of boundary.	2014	$2,750.00	1		11.0
TOMPKINS 4	Conduct natural resource inventory.	2014	$2,700.00	1	23.0	
TIOGA 3	Conduct natural resource inventory.	2014	$5,800.00	2	48.0	
TIOGA 3	Maintain pond parking lot, kiosk, and paint gate.	2015	$100.00	1		1.0
TIOGA 3	Maintain 12.2 miles of boundary.	2015	$3,000.00	2		12.0
TIOGA 4	Replace large State Forest sign.	2015	$750.00	2		0.5
TIOGA 3	Mow and inspect Tri-Country pond dam.	2017	$500.00	1		1.0
TIOGA 4	Resurface 1.6 miles of PFAR, replace culverts as needed	2018	$55,000.00	1		10.0
TOMPKINS 4	Resurface .4 miles of PFAR, replace culverts as needed	2018	$14,000.00	1		5.0
TOMPKINS 4	Grade .4 miles of PFAR, clean culverts, replace culvert markers.	2018	$400.00	1		2.0
TOMPKINS 4	Mow shoulders of PFAR.	2018	$150.00	1		1.0
TIOGA 4	Mow both shoulders of 1.6 mile PFAR.	2018	$400.00	3		1.0
TIOGA 3	Mow and inspect Tri-Country pond dam.	2020	$500.00	1		0.5
TIOGA 3	Replace large State Forest on Lacey Rd. across from parking lot	2020	$750.00	1		0.5
TIOGA 4	Maintain 6 miles of boundary	2020	$1,500.00	1		6.0
TIOGA 3	Maintain pond parking lot, kiosk, and paint gate.	2020	$100.00	2		0.5
TOMPKINS 4	Maintain 11 miles of boundary.	2021	$2,750.00	2		11.0
TIOGA 3	Maintain 12.2 miles of boundary.	2022	$3,000.00	1		12.0
TIOGA 4	Grade 1.6 miles of Public Forest Access Rd. (PFAR), clean culverts, replace culvert markers.	2023	$2,000.00	1		3.0
TIOGA 4	Mow both shoulders of 1.6 mile PFAR.	2023	$400.00	1		1.0
TOMPKINS 4	Mow shoulders of PFAR.	2023	$150.00	1		1.0
TIOGA 3	Mow and inspect Tri-Country pond dam.	2023	$500.00	2		1.0
TOMPKINS 4	Grade .4 miles of PFAR, clean culverts, replace culvert markers.	2023	$400.00	2		2.0
TIOGA 3	Conduct natural resource inventory.	2024	$5,800.00	1	48.0	
TIOGA 4	Conduct natural resource inventory.	2024	$1,600.00	1	14.0	
TOMPKINS 4	Conduct natural resource inventory.	2024	$2,700.00		23.0	
TIOGA 3	Maintain pond parking lot, kiosk, and paint gate.	2025	$100.00	1		0.5
TIOGA 3	Mow and inspect Tri-Country pond dam.	2026	$500.00	1		1.0
TIOGA 4	Maintain 6 miles of boundary	2027	$1,500.00	1		1.0
			$123,350.00		**1 70.0**	**121.0**
Please note: L&F days refers to DEC lands and forests staff; Oth (other) includes DEC operations, real property, fisheries, and wildlife. Days and costs are estimates, and are subject to change.						
Total Estimated Costs			**$3,006,300.00**		**1,325.5**	**271.5**

Appendices

A-1. Amphibians and Reptiles (Herps) Predicted or Confirmed by the New York GAP Program U.S. EPA EMAP Hexagon 420 and 450

Please note: Shaded species are not listed in the New York State Herp Atlas

Ref. No.	Nature Conservancy Name	Scientific Name	Model Status
1	Allegheny Dusky Salamander	*Desmognathus ochrophaeus*	Confirmed and Predicted
2	Black Rat Snake	*Elaphe o. obsoleta*	Confirmed and Predicted
3	Bullfrog	*Rana catesbeiana*	Confirmed and Predicted
4	Common Snapping Turtle	*Chelydra s. serpentina*	Confirmed and Predicted
5	Common Mudpuppy	*Necturus maculosus*	Predicted
6	Common Garter Snake	*Thamnophis sirtalis*	Confirmed and Predicted
7	Eastern Ribbon Snake	*Thamnophis sauritus*	Predicted
8	Eastern American Toad	*Bufo a. americanus*	Confirmed and Predicted
9	Eastern Milk Snake	*Lampropeltis t. triangulum*	Confirmed and Predicted
10	Four-Toed Salamander	*Hemidactylium scutatum*	Confirmed and Predicted
11	Gray Treefrog	*Hyla versicolor*	Confirmed and Predicted
12	Green Frog	*Rana clamitans melanota*	Confirmed and Predicted
13	Jefferson Salamander Complex	*Ambystoma jeffersonianum x laterale*	Predicted
14	Jefferson Salamander	*Ambystoma jeffersonianum*	Confirmed and Predicted
15	Longtail Salamander	*Eurycea l. longicauda*	Predicted
16	Northern Red Salamander	*Pseudotriton r. ruber*	Confirmed and Predicted
17	Northern Black Racer	*Coluber c. constrictor*	Predicted
18	Northern Coal Skink	*Eumeces a. anthracinus*	Confirmed and Predicted
19	Northern Spring Salamander	*Gyrinophilus p. porphyriticus*	Confirmed and Predicted
20	Northern Dusky Salamander	*Desmognathus fuscus*	Confirmed and Predicted
21	Northern Two-lined Salamander	*Eurycea bislineata*	Confirmed and Predicted
22	Northern Slimy Salamander	*Plethodon glutinosus*	Confirmed and Predicted
23	Northern Water Snake	*Nerodia s. sipedon*	Confirmed and Predicted
24	Northern Leopard Frog	*Rana pipiens*	Confirmed and Predicted
25	Northern Redback Salamander	*Plethodon c. cinereus*	Confirmed and Predicted
26	Northern Ringneck Snake	*Diadophis punctatus edwardsii*	Confirmed and Predicted
27	Northern Spring Peeper	*Pseudacris c. crucifer*	Confirmed and Predicted
28	Northern Redbelly Snake	*Storeria o. occipitomaculata*	Confirmed and Predicted
29	Northern Brown Snake	*Storeria d. dekayi*	Confirmed and Predicted
30	Painted Turtle	*Chrysemys picta*	Confirmed and Predicted
31	Pickerel Frog	*Rana palustris*	Confirmed and Predicted
32	Red-spotted Newt	*Notophthalmus v. viridescens*	Confirmed and Predicted
33	Smooth Green Snake	*Liochlorophis vernalis*	Confirmed and Predicted
34	Spotted Salamander	*Ambystoma maculatum*	Confirmed and Predicted
35	Wood Frog	*Rana sylvatica*	Confirmed and Predicted
36	Wood Turtle	*Clemmys insculpta*	Confirmed and Predicted

Please note: Information retrieved from the NY GAP Analysis Program in table A-1 was reviewed with DEC Region 7 Wildlife Biologists, compared to information in the New York State Herp Atlas and modified as needed.

A-2. Mammals Predicted or Confirmed by the New York GAP Program U.S. EPA EMAP Hexagon 420 and 450			
Ref. No.	**Nature Conservancy Name**	**Scientific Name**	**Model Status**
1	American Beaver	*Castor canadensis*	Confirmed and Predicted
2	Big Brown Bat	*Eptesicus fuscus*	Confirmed and Predicted
3	Black Bear	*Ursus americanus*	Predicted
4	Bobcat	*Lynx rufus*	Predicted
5	Common Raccoon	*Procyon lotor*	Confirmed and Predicted
6	Common Muskrat	*Ondatra zibethicus*	Confirmed and Predicted
7	Coyote	*Canis latrans*	Confirmed and Predicted
8	Deer Mouse	*Peromyscus maniculatus*	Confirmed and Predicted
9	E. Small-footed Myotis (bat)	*Myotis leibii*	Predicted
10	Eastern Red Bat	*Lasiurus borealis*	Confirmed and Predicted
11	Eastern Pipistrelle	*Pipistrellus subflavus*	Confirmed and Predicted
12	Eastern Cottontail	*Sylvilagus floridanus*	Confirmed and Predicted
13	Eastern Gray Squirrel	*Sciurus carolinensis*	Confirmed and Predicted
14	Eastern Chipmunk	*Tamias striatus*	Confirmed and Predicted
15	Fisher	*Martes pennanti*	Predicted
16	Fox Squirrel	*Sciurus niger*	Confirmed and Predicted
17	Gray Fox	*Urocyon cinereoargentus*	Confirmed and Predicted
18	Hairy-tailed Mole	*Parascalops breweri*	Confirmed and Predicted
19	Hoary Bat	*Lasiurus cinereus*	Confirmed and Predicted
20	House Mouse	*Mus musculus*	Confirmed and Predicted
21	Indiana Myotis (bat)	*Myotis sodalis*	Predicted
22	Least Shrew	*Cryptotis parva*	Predicted
23	Little Brown Myotis (bat)	*Myotis lucifugus*	Confirmed and Predicted
24	Long-tailed Weasel	*Mustela frenata*	Confirmed and Predicted
25	Masked Shrew	*Sorex cinereus*	Confirmed and Predicted
26	Meadow Vole	*Microtus pennsylvanicus*	Confirmed and Predicted
27	Meadow Jumping Mouse	*Zapus hudsonius*	Confirmed and Predicted
28	Mink	*Mustela vison*	Confirmed and Predicted
29	N. Short-tailed Shrew	*Blarina brevicauda*	Confirmed and Predicted
30	Northern Myotis (Keen's Myotis)	*Myotis septentrionalis*	Confirmed and Predicted
31	Northern Flying Squirrel	*Glaucomys sabrinus*	Confirmed and Predicted
32	Norway Rat	*Rattus norvegicus*	Confirmed and Predicted
33	Porcupine	*Erethizon dorsatum*	Predicted
34	Pygmy Shrew	*Sorex hoyi*	Confirmed and Predicted
35	Red Squirrel	*Tamiasciurus hudsonicus*	Confirmed and Predicted
36	Red Fox	*Vulpes vulpes*	Confirmed and Predicted
37	River Otter	*Lutra canadensis*	Confirmed and Predicted
38	Short-tailed Weasel (Ermine)	*Mustela erminea*	Confirmed and Predicted
39	Silver-haired Bat	*Lasionycteris noctivagans*	Confirmed and Predicted
40	Smoky Shrew	*Sorex fumeus*	Confirmed and Predicted
41	Snowshoe Hare	*Lepus americanus*	Confirmed and Predicted
42	Southern Flying Squirrel	*Glaucomys volans*	Confirmed and Predicted
43	Southern Bog Lemming	*Synaptomys cooperi*	Confirmed and Predicted
44	Southern Red-backed Vole	*Clethrionomys gapperi*	Confirmed and Predicted
45	Star-nosed Mole	*Condylura cristata*	Confirmed and Predicted
46	Striped Skunk	*Mephitis mephitis*	Confirmed and Predicted
47	Virginia Opossum	*Didelphis virginiana*	Confirmed and Predicted
48	White-footed Mouse	*Peromyscus leucopus*	Confirmed and Predicted
49	White-tailed Deer	*Odocoileus virginianus*	Confirmed and Predicted

A-2. Mammals Predicted or Confirmed by the New York GAP Program U.S. EPA EMAP Hexagon 420 and 450			
Ref. No.	**Nature Conservancy Name**	**Scientific Name**	**Model Status**
50	Woodchuck	*Marmota monax*	Confirmed and Predicted
51	Woodland Jumping Mouse	*Napaeozapus insignis*	Confirmed and Predicted
52	Woodland Vole	*Microtus pinetorum*	Confirmed and Predicted

A-3. Breeding Bird Atlas (BBA) Data - List of Birds Observed in the Blocks
BBA Blocks 3868B, 3869D, 3968A, 3969A, 3969C - 1985 and 2000 Data

Please Note: Shaded species are those not represented in the preliminary 2000 atlas data.

Common Name	Scientific Name	Protection, Federal	Protection, New York State	Global Rank	State Rank
American Black Duck	*Anas rubripes*	MBTA	Game Species	G4	S4
American Crow	*Corvus brachyrhynchos*	MBTA	Game Species	G5	S5
American Goldfinch	*Carduelis tristis*	MBTA	Protected	G5	S5
American Kestrel	*Falco sparverius*	MBTA	Protected	G5	S5
American Redstart	*Setophaga ruticilla*	MBTA	Protected	G5	S5
American Robin	*Turdus migratorius*	MBTA	Protected	G5	S5
American Woodcock	*Scolopax minor*	MBTA	Game Species	G5	S5
Baltimore Oriole	*Icterus galbula*	MBTA	Protected	G5	S5
Bank Swallow	*Riparia riparia*	MBTA	Protected	G5	S5
Barn Swallow	*Hirundo rustica*	MBTA	Protected	G5	S5
Barred Owl	*Strix varia*	MBTA	Protected	G5	S5
Belted Kingfisher	*Ceryle alcyon*	MBTA	Protected	G5	S5
Black-and-white Warbler	*Mniotilta varia*	MBTA	Protected	G5	S5
Black-billed Cuckoo	*Coccyzus erythropthalmus*	MBTA	Protected	G5	S5
Black-capped Chickadee	*Poecile atricapillus*	MBTA	Protected	G5	S5
Black-throated Blue	*Dendroica caerulescens*	MBTA	Protected	G5	S5
Black-throated Green	*Dendroica virens*	MBTA	Protected	G5	S5
Blue Jay	*Cyanocitta cristata*	MBTA	Protected	G5	S5
Blue-gray Gnatcatcher	*Polioptila caerulea*	MBTA	Protected	G5	S5
Blue-headed Vireo	*Vireo solitarius*	MBTA	Protected	G5	S5
Blue-winged Warbler	*Vermivora pinus*	MBTA	Protected	G5	S5
Bobolink	*Dolichonyx oryzivorus*	MBTA	Protected	G5	S5
Broad-winged Hawk	*Buteo platypterus*	MBTA	Protected	G5	S5
Brown Creeper	*Certhia americana*	MBTA	Protected	G5	S5
Brown Thrasher	*Toxostoma rufum*	MBTA	Protected	G5	S5
Brown-headed Cowbird	*Molothrus ater*	MBTA	Protected	G5	S5
Canada Warbler	*Wilsonia canadensis*	MBTA	Protected	G5	S5
Cedar Waxwing	*Bombycilla cedrorum*	MBTA	Protected	G5	S5

A-3. Breeding Bird Atlas (BBA) Data - List of Birds Observed in the Blocks
BBA Blocks 3868B, 3869D, 3968A, 3969A, 3969C - 1985 and 2000 Data

Please Note: Shaded species are those not represented in the preliminary 2000 atlas data.

Common Name	Scientific Name	Protection, Federal	Protection, New York State	Global Rank	State Rank
Chestnut-sided Warbler	*Dendroica pensylvanica*	MBTA	Protected	G5	S5
Chimney Swift	*Chaetura pelagica*	MBTA	Protected	G5	S5
Chipping Sparrow	*Spizella passerina*	MBTA	Protected	G5	S5
Common Moorhen	*Gallinula chloropus*	MBTA	Game Species	G5	S4
Common Snipe	*Gallinago gallinago*	MBTA	Game Species	G5	S5
Common Yellowthroat	*Geothlypis trichas*	MBTA	Protected	G5	S5
Cooper's Hawk	*Accipiter cooperii*	MBTA	**Protected-Special**	G4	S4
Dark-eyed Junco	*Junco hyemalis*	MBTA	Protected	G5	S5
Downy Woodpecker	*Picoides pubescens*	MBTA	Protected	G5	S5
Eastern Bluebird	*Sialia sialis*	MBTA	**Protected-Special**	G5	S5
Eastern Kingbird	*Tyrannus tyrannus*	MBTA	Protected	G5	S5
Eastern Meadowlark	*Sturnella magna*	MBTA	Protected	G5	S5
Eastern Phoebe	*Sayornis phoebe*	MBTA	Protected	G5	S5
Eastern Screech-Owl	*Otus asio*	MBTA	Protected	G5	S5
Eastern Towhee	*Pipilo erythrophthalmus*	MBTA	Protected	G5	S5
Eastern Wood-Pewee	*Contopus virens*	MBTA	Protected	G5	S5
European Starling	*Sturnus vulgaris*	Unprotected	Unprotected	G5	SE
Field Sparrow	*Spizella pusilla*	MBTA	Protected	G5	S5
Golden-crowned Kinglet	*Regulus satrapa*	MBTA	Protected	G5	S5
Grasshopper Sparrow	*Ammodramus savannarum*	MBTA	**Protected-Special**	G4	S4
Gray Catbird	*Dumetella carolinensis*	MBTA	Protected	G5	S5
Great Blue Heron	*Ardea herodias*	MBTA	Protected	G5	S5
Great Crested Flycatcher	*Myiarchus crinitus*	MBTA	Protected	G5	S5
Great Horned Owl	*Bubo virginianus*	MBTA	Protected	G5	S5
Green Heron	*Butorides virescens*	MBTA	Protected	G5	S5
Hairy Woodpecker	*Picoides villosus*	MBTA	Protected	G5	S5
Hermit Thrush	*Catharus guttatus*	MBTA	Protected	G5	S5
Hooded Merganser	*Lophodytes cucullatus*	MBTA	Game Species	G5	S4
Horned Lark	*Eremophila alpestris*	MBTA	Protected	G5	S5
House Finch	*Carpodacus mexicanus*	MBTA	Protected	G5	SE
House Sparrow	*Passer domesticus*	Unprotected	Unprotected	G5	SE
House Wren	*Troglodytes aedon*	MBTA	Protected	G5	S5
Indigo Bunting	*Passerina cyanea*	MBTA	Protected	G5	S5
Killdeer	*Charadrius vociferus*	MBTA	Protected	G5	S5

A-3. Breeding Bird Atlas (BBA) Data - List of Birds Observed in the Blocks
BBA Blocks 3868B, 3869D, 3968A, 3969A, 3969C - 1985 and 2000 Data

Please Note: Shaded species are those not represented in the preliminary 2000 atlas data.

Common Name	Scientific Name	Protection, Federal	Protection, New York State	Global Rank	State Rank
Least Flycatcher	*Empidonax minimus*	MBTA	Protected	G5	S5
Louisiana Waterthrush	*Seiurus motacilla*	MBTA	Protected	G5	S5
Magnolia Warbler	*Dendroica magnolia*	MBTA	Protected	G5	S5
Mallard	*Anas platyrhynchos*	MBTA	Game Species	G5	S5
Mourning Dove	*Zenaida macroura*	MBTA	Protected	G5	S5
Mourning Warbler	*Oporornis philadelphia*	MBTA	Protected	G5	S5
Nashville Warbler	*Vermivora ruficapilla*	MBTA	Protected	G5	S5
Northern Cardinal	*Cardinalis cardinalis*	MBTA	Protected	G5	S5
Northern Flicker	*Colaptes auratus*	MBTA	Protected	G5	S5
Northern Goshawk	*Accipiter gentilis*	MBTA	**Protected-Special**	G4	S4
Northern Harrier	*Circus cyaneus*	MBTA	**Threatened**	G5	S3
Northern Mockingbird	*Mimus polyglottos*	MBTA	Protected	G5	S5
Northern Waterthrush	*Seiurus noveboracensis*	MBTA	Protected	G5	S5
Ovenbird	*Seiurus aurocapillus*	MBTA	Protected	G5	S5
Pileated Woodpecker	*Dryocopus pileatus*	MBTA	Protected	G5	S5
Pine Siskin	*Carduelis pinus*	MBTA	Protected	G5	S5
Prairie Warbler	*Dendroica discolor*	MBTA	Protected	G5	S5
Purple Finch	*Carpodacus purpureus*	MBTA	Protected	G5	S5
Red-bellied Woodpecker	*Melanerpes carolinus*	MBTA	Protected	G5	S5
Red-breasted Nuthatch	*Sitta canadensis*	MBTA	Protected	G5	S5
Red-eyed Vireo	*Vireo olivaceus*	MBTA	Protected	G5	S5
Red-shouldered Hawk	*Buteo lineatus*	MBTA	**Protected-Special**	G5	S4
Red-tailed Hawk	*Buteo jamaicensis*	MBTA	Protected	G5	S5
Red-winged Blackbird	*Agelaius phoeniceus*	MBTA	Protected	G5	S5
Ring-necked Pheasant	*Phasianus colchicus*	Unprotected	Game Species	G5	SE
Rock Dove	*Columba livia*	Unprotected	Unprotected	G5	SE
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	MBTA	Protected	G5	S5
Ruby-throated	*Archilochus colubris*	MBTA	Protected	G5	S5
Ruffed Grouse	*Bonasa umbellus*	Unprotected	Game Species	G5	S5
Savannah Sparrow	*Passerculus sandwichensis*	MBTA	Protected	G5	S5
Scarlet Tanager	*Piranga olivacea*	MBTA	Protected	G5	S5
Sharp-shinned Hawk	*Accipiter striatus*	MBTA	**Protected-Special**	G5	S4
Song Sparrow	*Melospiza melodia*	MBTA	Protected	G5	S5
Spotted Sandpiper	*Actitis macularia*	MBTA	Protected	G5	S5

A-3. Breeding Bird Atlas (BBA) Data - List of Birds Observed in the Blocks
BBA Blocks 3868B, 3869D, 3968A, 3969A, 3969C - 1985 and 2000 Data

Please Note: Shaded species are those not represented in the preliminary 2000 atlas data.

Common Name	Scientific Name	Protection, Federal	Protection, New York State	Global Rank	State Rank
Swamp Sparrow	*Melospiza georgiana*	MBTA	Protected	G5	S5
Tree Swallow	*Tachycineta bicolor*	MBTA	Protected	G5	S5
Tufted Titmouse	*Baeolophus bicolor*	MBTA	Protected	G5	S5
Turkey Vulture	*Cathartes aura*	MBTA	Protected	G5	S4
Veery	*Catharus fuscescens*	MBTA	Protected	G5	S5
Vesper Sparrow	*Pooecetes gramineus*	MBTA	**Protected-Special**	G5	S5
Warbling Vireo	*Vireo gilvus*	MBTA	Protected	G5	S5
White-breasted Nuthatch	*Sitta carolinensis*	MBTA	Protected	G5	S5
White-eyed Vireo	*Vireo griseus*	MBTA	Protected	G5	S4
White-throated Sparrow	*Zonotrichia albicollis*	MBTA	Protected	G5	S5
Wild Turkey	*Meleagris gallopavo*	Unprotected	Game Species	G5	S5
Willow Flycatcher	*Empidonax traillii*	MBTA	Protected	G5	S5
Wood Duck	*Aix sponsa*	MBTA	Game Species	G5	S5
Wood Thrush	*Hylocichla mustelina*	MBTA	Protected	G5	S5
Yellow Warbler	*Dendroica petechia*	MBTA	Protected	G5	S5
Yellow-bellied Sapsucker	*Sphyrapicus varius*	MBTA	Protected	G5	S5
Yellow-billed Cuckoo	*Coccyzus americanus*	MBTA	Protected	G5	S5
Yellow-breasted Chat	*Icteria virens*	MBTA	**Protected-Special**	G5	S3
Yellow-rumped Warbler	*Dendroica coronata*	MBTA	Protected	G5	S5
Yellow-throated Vireo	*Vireo flavifrons*	MBTA	Protected	G5	S5

Key to Breeding Bird Atlas Field Codes

Protection Status (Federal) - Federal legal status as of January 1994.
MBTA - **M**igratory **B**ird **T**reaty **A**ct.

Protection Status (State of New York) - New York State legal status as of January 1994.

Game Species - (defined in Environmental Conservation Law section 11-0103): any of a variety of big game or small game species as stated in the Environmental Conservation Law; many normally have an open season for at least part of the year, and are protected at other times.

Protected - (defined in Environmental Conservation Law section 11-0103): wild game, protected wild birds, and endangered species of wildlife.

Protected - Special (Concern) - those species which are not yet recognized as endangered or threatened, but for which documented concern exists for their continued welfare in New York. Unlike the first two categories, species of special concern receive no additional legal protection under Environmental Conservation Law section 11-0535 (Endangered and Threatened Species).

Global and State Ranks
Each element has a global and state rank as determined by the New York Natural Heritage Program. These ranks carry no legal weight. The global rank reflects the rarity of the element throughout the world and the state rank reflects the rarity within New York State. Infraspecific taxa are also assigned a taxon rank to reflect the infraspecific taxon's rank throughout the world.

Global Rank - New York Natural Heritage program global rank as of January 1994.
G1: Critically imperiled; typically 5 or fewer occurences or 1,000 or fewer individuals

G2: Imperiled; typically 6 to 20 occurrences or 1,000 to 3,000 individuals G3 Rare or uncommon but not imperiled; typically 21 to 100 occurrences or 3,000 to 10,000 individuals G4 Uncommon but not rare; apparently secure, but with cause for some long-term concern; usually more than 100 occurrences or 10,000 individuals G5 Common; demonstrably widespread, abundant, and secure.

G3: Rare or uncommon but not imperiled; typically 21 to 100 occurrences or 3,000 to 10,000 individuals.

G4: Uncommon but not rare; apparently secure, but with cause for some long-term concern; usually more than 100 occurrences or 10,000 individuals

G5: Common; demonstrably widespread, abundant, and secure.

State Rank - The state rank reflects the rarity of the animal within New York State

S1: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.

S2: Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.

S3: Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

S4: Apparently secure in New York State.

S5: Demonstrably secure in New York State.

SE: Exotic, not native to New York State.

A-4. New Birds Observed, Preliminary Year 2000 BBA Data BBA Blocks 3868B, 3869D, 3968A, 3969A, 3969C					
Common Name	**Scientific Name**	**Protection, Federal**	**Protection, New York State**	**Global Rank**	**State Rank**
Adler Flycatcher	*Empidonax alnorum*	MBTA	Protected	G5	S5
Blackburnian Warbler	*Dendroica fusca*	MBTA	Protected	G5	S5
Canada Goose	*Branta canadensis*	MBTA	Game Species	G5	S5
Common Grackle	*Quiscalus quiscula*	MBTA	Protected	G5	S5
Carolina Wren	*Thryothorus ludovicianus*	MBTA	Protected	G5	S5
Common Raven	*Corvus corax*	MBTA	Protected	G5	S4
Evening Grosbeak	*Coccothraustes*	MBTA	Protected	G5	S5
Golden Winged Warbler	*Vermivora chrysoptera*	MBTA	Protected	G4	S4
Hooded Warbler	*Wilsonia citrina*	MBTA	Protected	G5	S5
Northern Rough-winged swallow	*Stelgidopteryx serripennis*	MBTA	Protected	G5	S5
Pied-billed Grebe	*Podilymbus podiceps*	MBTA	**Threatened**	G5	S3
Virginia Rail	*Rallus limicola*	MBTA	Game Species	G5	S5
Winter Wren	*Troglodytes troglodytes*	MBTA	Protected	G5	S5

A-5. Additional Breeding Birds, Town Level, 1985 Data Towns of Caroline, Harford, and Richford					
Common Name	**Scientific Name**	**Protection, Federal**	**Protection, New York State**	**Global Rank**	**State Rank**
Acadian Flycatcher	*Empidonax virescens*	MBTA	Protected	G5	S3
Alder Flycatcher	*Empidonax alnorum*	MBTA	Protected	G5	S5
American Bittern	*Botaurus lentiginosus*	MBTA	Protected	G4	S4
Barn Owl	*Tyto alba*	MBTA	**Protected-Special**	G5	S3
Blackburnian Warbler	*Dendroica fusca*	MBTA	Protected	G5	S5
Blue-winged Teal	*Anas discors*	MBTA	Game Species	G5	S5
Canada Goose	*Branta canadensis*	MBTA	Game Species	G5	S5
Carolina Wren	*Thryothorus ludovicianus*	MBTA	Protected	G5	S5
Cerulean Warbler	*Dendroica cerulea*	MBTA	**Protected-Special**	G5	S3
Common Grackle	*Quiscalus quiscula*	MBTA	Protected	G5	S5
Common Nighthawk	*Chordeiles minor*	MBTA	**Protected-Special**	G5	S4
Golden-winged Warbler	*Vermivora chrysoptera*	MBTA	**Protected-Special**	G4	S4
Gray Catbird	*Dumetella carolinensis*	MBTA	Protected	G5	S5
Henslow's Sparrow	*Ammodramus henslowii*	MBTA	**Threatened**	G4	S3
Least Bittern	*Ixobrychus exilis*	MBTA	**Protected-Special**	G5	S3
Marsh Wren	*Cistothorus palustris*	MBTA	Protected	G5	S5
Northern Bobwhite	*Colinus virginianus*	Unprotected	Game Species	G5	S4
Northern Saw-whet Owl	*Aegolius acadicus*	MBTA	Protected	G5	S3

A-5. Additional Breeding Birds, Town Level, 1985 Data Towns of Caroline, Harford, and Richford					
Common Name	**Scientific Name**	**Protection, Federal**	**Protection, New York State**	**Global Rank**	**State Rank**
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	MBTA	Protected	G5	S5
Red-headed Woodpecker	*Melanerpes erythrocephalus*	MBTA	Protected	G5	S4
Red Crossbill	*Loxia curvirostra*	MBTA	Protected	G5	S3
Sora	*Porzana carolina*	MBTA	Game Species	G5	S4
Swainson's Thrush	*Catharus ustulatus*	MBTA	Protected	G5	S5
Tufted Titmouse	*Baeolophus bicolor*	MBTA	Protected	G5	S5
Upland Sandpiper	*Bartramia longicauda*	MBTA	**Threatened**	G5	S3
Virginia Rail	*Rallus limicola*	MBTA	Game Species	G5	S5
White-winged Crossbill	*Loxia leucoptera*	MBTA	Protected	G5	S2S3
Winter Wren	*Troglodytes troglodytes*	MBTA	Protected	G5	S5
Worm-eating Warbler	*Helmitheros vermivorus*	MBTA	Protected	G5	S4

A-6. Possible Vernal Pool Locations					
Unit	**Stand No.**	**Soil Name**	**Symbol**	**Forest Type**	**Acres**
TIOGA 3	7170301005.00	Volusia channery silt loam	VbB	Other	4.0
TIOGA 3	7170301007.00	Tuller channery silt loam	TeA	Other	2.5
TIOGA 3	7170301014.00	Ellery, Chippewa, and Alden soils	EcA	Norway Spruce	3.0
TIOGA 3	7170302018.00	Volusia channery silt loam	VbB	Transition Hardwoods (NH - Oak)	1.7
TIOGA 3	7170302019.00	Volusia channery silt loam	VbB	Seedling/Sapling - Natural	0.8
TIOGA 3	7170302020.00	Volusia channery silt loam	VbB	Spruce - Natural Species	2.3
TIOGA 4	7170401033.00	Volusia channery silt loam	VbB	Northern Hardwood	12.1
TIOGA 4	7170401046.00	Volusia channery silt loam	VbB	Norway Spruce	5.0
TIOGA 4	7170401047.00	Volusia channery silt loam	VbB	Norway Spruce	5.4
TOMPKINS 4	7180401005.00	Volusia channery silt loam	VbB	Transition Hardwoods (NH - Oak)	2.8
TOMPKINS 4	7180401010.00	Volusia channery silt loam	VbB	Red Pine - Spruce	9.5
TOMPKINS 4	7180401010.00	Volusia channery silt loam	VbB	Red Pine - Spruce	7.0
TOMPKINS 4	7180401011.00	Volusia channery silt loam	VbB	Northern Hardwood	5.5
TOMPKINS 4	7180401012.00	Volusia channery silt loam	VbB	Non Forest	5.0
TOMPKINS 4	7180401014.00	Volusia channery silt loam	VbB	White Pine	2.8
TOMPKINS 4	7180401015.00	Volusia channery silt loam	VbB	Northern Hardwood	1.7
TOMPKINS 4	7180401021.00	Volusia-Chippewa channery silt loam	VoA	Norway Spruce	2.0
TOMPKINS 4	7180401024.00	Volusia-Chippewa channery silt loam	VoA	Larch - Spruce	6.9
TOMPKINS 4	7180401031.00	Volusia channery silt loam	VbB	Pine - Natural Species	18.6
TOMPKINS 4	7180401032.00	Volusia channery silt loam	VbB	Norway Spruce	3.6
TOMPKINS 4	7180402009.00	Wayland and Papakating soils	Hk	Non Forest	0.3
TOMPKINS 4	7180402016.00	Wayland and Papakating soils	Hk	Northern Hardwood	2.2
				Total	**104.7**

A-7. Conceptual Property and/or Conservation Easement Acquisitions by Tax Map Number
Please note*: Assumes sufficient funding is available and that the owner(s) are willing to sell.
If these conditions are met, the DEC would conduct a physical inspection and appraisal before making a purchase offer. A conceptual map is included at the end of this Plan.

Tax Map Number	Municipal Code	School	General Location Description	Acres	Structures or Buildings
30.-1-7.9	502000	492602	Level Green Rd	6.8	N
29.-1-10	502000	492602	Level Green Rd	98.6	N
14.00-1-10	493200	492602	Andersen Hill Rd	127.6	Y
20.-1-13.3	502000	492602	Blackman Hill Rd	5.7	N
20.-1-14	502000	492602	Blackman Hill Rd	30.0	N
20.-1-13.2	502000	492602	Blackman Hill Rd	86.6	N
20.-1-11	502000	500700	Level Green Rd	3.7	N
20.-1-8	502000	492602	Blackman Hill Rd	162.9	Y
20.-1-1	502000	500700	Blackman Hill Rd	14.1	Y
14.00-1-23	493200	492602	Andersen Hill Rd	20.3	N
20.-1-3.2	502000	500700	Blackman Hill Rd	33.2	Y
10.00-1-18	493200	492602	West Creek Rd.	5.6	N
20.-1-3.3	502000	500700	Blackman Hill Rd	1.0	Y
10.00-1-11	493200	492602	Andersen Hill Rd	20.8	Y
20.-1-5	502000	500700	Blackman Hill Rd	94.9	Y
10.00-1-20	493200	492602	Route 79	35.7	N
10.00-1-21	493200	492602	Route 79	2.7	Y
10.00-1-22	493200	492602	Route 79	8.9	Y
10.00-1-7.10	493200	492602	Route 79	39.0	N
10.00-1-23	493200	492602	Route 79	0.3	Y
10.00-1-24	493200	492602	Route 79	3.4	Y
6.00-1-22.10	493200	492602	Route 79	34.8	N
5.00-1-28	493200	492602	Route 79	24.5	Y
5.00-1-29.11	493200	492602	Route 79	5.1	Y
5.00-1-29.12	493200	492602	Route 79	10.6	N
5.00-1-30.22	493200	492602	Route 79	2.8	Y
5.00-1-30.21	493200	492602	Route 79	9.5	Y
5.00-1-32.12	493200	492602	Route 79	27.8	N
5.00-1-36.21	493200	492602	Route 79	1.4	N
5.00-1-34	493200	492602	Route 79	2.9	N
5.00-1-35.20	493200	492602	Route 79	5.5	N
5.00-1-35.10	493200	492602	Route 79	5.5	N
18.-1-17.2	502000	500700	Slaterville Rd	9.0	Y
18.-1-24.1	502000	500700	Slaterville Rd	10.6	Y
18.-1-15	502000	500700	Slaterville Rd	5.1	Y
18.-1-17.3	502000	500700	Slaterville Rd	12.4	N
5.00-1-4	493200	492602	Route 79	11.1	Y
5.00-1-40.612	493200	500700	Light Rd	2.5	N
5.00-1-40.43	493200	500700	Elishaburg Rd	53.8	N
5.00-1-39	493200	492602	Route 79	117.1	N
5.00-1-42	493200	500700	Elishaburg Rd	61.7	Y
5.00-1-12.11	493200	492602	Robinson Hollow Rd	12.7	Y
5.00-1-12.12	493200	492602	Robinson Hollow Rd	4.9	N
5.00-1-2	493200	500700	Elishaburg Rd	27.6	N
5.00-1-18	493200	492602	Robinson Hollow Rd	0.8	N

A-7. Conceptual Property and/or Conservation Easement Acquisitions by Tax Map Number
Please note*: Assumes sufficient funding is available and that the owner(s) are willing to sell.
If these conditions are met, the DEC would conduct a physical inspection and appraisal before making a purchase offer. A conceptual map is included at the end of this Plan.

Tax Map Number	Municipal Code	School	General Location Description	Acres	Structures or Buildings
5.00-1-16	493200	492602	Welch Rd	8.4	Y
5.00-1-17	493200	492602	Lacey Rd.	11.9	Y
5.00-1-15	493200	492602	Welch Rd	23.9	N
2.00-1-18	493200	492602	Robinson Hollow Rd	16.0	N
1.00-1-19	493200	492602	Robinson Hollow Rd	113.2	N
6.-1-20	502000	502401	Harford Rd	68.3	N
6.-1-18	502000	502401	Harford Rd	21.8	N
6.-1-18	493200	492602	Lacey Rd.	3.1	N
TOTAL				**1528.1**	

A-8. Estimated Taxes Paid on State Forests in the Tri-County Uplands Unit (2003 School and 2004 General Tax Rolls)

Town	State Forest	Acres	Assessment	Town Taxes	School Taxes	Fire District Taxes
Richford	Robinson Hollow	1,938	$440,600.00	$6,435.00	$11,155.00	$932.00
	Andersen Hill	554	$127,100.00	$1,857.00	$3,244.00	$268.10
Caroline	Potato Hill	915	$611,000.00	$4,515.00	$12,485.00	$991.00
Total		**3,407**	**$1,178,700.00**	**$12,807.00**	**$26,884.00**	**$2,191.10**

A-9. Estimated Tax Exempt Acreage 1960 Bond Act Purchases

Town	State Forest	Acres
Richford	Robinson Hollow	201
	Andersen Hill	140
Caroline	Robinson Hollow	117
Harford	Robinson Hollow	172
TOTAL		**630**

A-10. Stratigraphic Profile of Southwestern New York (modified after Van Tyne and Copley)

PERIOD		GROUP	UNIT	LITHOLOGY	
Pennsylvanian		Pottsville	Olean		quartz pebble conglomerate and sandstone, quartz pebble, conglomerate, sandstone, and minor shale
Mississippian		Pocono	Knapp		
Devonian	Upper	Conewango			shale and sandstone scattered conglomerates
		Conneaut	Chadakon		shale and sandstone scattered conglomerates
		Canadaway	Undifferentiated	oil/gas	shale and siltstone
			Perrysburg	oil/gas	minor sandstone
		West Falls	Java Nunda Rhinestreet		shale and siltstone apollaceous limestone
		Sonyea	Middlesex	gas	shale and siltstone
		Genesee			shale with minor siltstone and limstone
	Middle		Tully	gas	limestone with minor siltstone and sandstone
		Hamilton	Moscow Ludlowville Skaneateles Marcellus	gas	shale with minor sandstone and conglomerate
			Onondaga	oil/gas	limestone
	Lower	Tristates	Oriskany	gas	sandstone
		Helderberg	Manlius Rondout		limestone and dolostone
Silurian	Upper		Akron	oil/gas	dolostone
		Salina	Camillus Syracuse Vernon		shale, siltstone, anhydrite, and halite
		Lockport	Lockport	gas	limestone and dolostone
		Clinton	Rochester Irondequoit		shale and sandstone
	Lower		Sodus Reynales Thorold		limestone and dolostone

A-10. Stratigraphic Profile of Southwestern New York (modified after Van Tyne and Copley)

PERIOD		GROUP	UNIT	LITHOLOGY	
		Medina	Grimsby Whirlpool	gas gas	sandstone and shale quartz sandstone
Ordovician	Upper		Queenston Oswego Lorraine Utica	gas gas	shale and siltstone with minor sandstone
	Middle	Trenton- Black River	Trenton Black River	gas	limestone and minor dolostone
	Lower	Beekmantown	Tribes Hill Chuctanunda		limestone
Cambrian	Upper		Little Falls Galway (Theresa) Potsdam	 gas gas	quartz sandstone and dolostone; sandstone and sandy dolostone; conglomerate base
Precambrian			Gneiss, Marble, Quartzite		metamorphic and igneous rocks

A-11. Tree Planting Summary by Species - Tri-County Unit, 1935 to 1981

HARDWOODS

Species	Number
Black locust	16,350
Northern red oak	18,900
Silver maple	15,450
White ash	5,400
Total	**56,100**
Percentage	**3.1**

TOP TEN SPECIES

Species	Rank
Norway spruce	1
Eastern white pine	2
Red pine	3
White spruce	4
Japanese larch	5
White cedar	6
Scotch pine	7
European larch	8
Jack pine	9
Ponderosa pine	10

SOFTWOODS

Species	Number	Percentage
Austrian pine	11,050	0.6
Balsam fir	6,900	0.4
Chihuahua Pine (Yellow Pine)	11,000	0.6
Douglas fir	19,800	1.1
Dunkled larch	6,000	0.3
European larch	76,200	4.2
Eastern hemlock	4,900	0.3
Japanese larch	103,450	5.7
Jack pine	40,300	2.2
Lobolly pine	150	0.0
Norway spruce	463,450	25.3
Pitch pine	18,100	1.0
Ponderosa pine	21,000	1.2
Red pine	320,050	17.5
Scotch pine	95,850	5.3
Toringo crabapple	3,500	0.2
White cedar	100,200	5.5
Eastern white pine	336,100	18.4
White spruce	125,900	6.9
Western white pine	4,500	0.2
Total	**1,768,400**	**96.9**

A-12. Department Rules, Regulations, Laws, and Policies

A. New York Code Rules and Regulations

Title 6

Chapter I	Fish and Wildlife
Chapter II	Lands and Forests
Chapter III	Air Resources
Chapter IV	Quality Services
Chapter V	Resource Management Services
Chapter VI	State Environmental Quality Review
Chapter VII	Sub-Chapter A - Implementation of Environmental Quality Bond Act of 1972
Chapter X	Division of Water Resources

B. Environmental Conservation Laws

ECL Article 8	Environmental Quality Review
ECL Article 9	Lands and Forests
ECL Article 11	Fish and Wildlife
ECL Article 15	Water Resources
ECL Article 23	Mineral Resources
ECL Article 24	Freshwater Wetlands
ECL Article 33	Pesticides
ECL Article 49, Title 2	State Land Acquisition Projects
ECL Article 51	Implementation of Environmental Quality Bond Act/1972
ECL Article 52	Implementation of Environmental Quality Bond Act/1972
ECL Article 54, Title 3,	Open Space Land Conservation Projects
ECL Article 71	Enforcement

C. Other Laws

New York State Historic Preservation Act

Article 14 PRHPL

Education Law

Section 233 State Museum Collections

D. Department Policies

Public Use
Temporary Revocable Permits
Motor Vehicle Use
Timber Management
Unit Management Planning
Pesticides
ATV use by People with CP-3 Permits
Prescribed Fire
State Forest Master Plan
Inventory
Acquisition
Road Construction
Recreational Use

A-13. Tri-County Unit Management Plan Public Comment Summary and Response

Background

Public participation is an important part of the DEC's planning process. It adds significant value by enhancing communication and helps sustain and create new partnerships between the DEC and State Forest stakeholders. The DEC greatly appreciates the many comments, observations and suggestions received from the public during the development of the unit management plan. Additionally, the DEC recognizes and appreciates the Adopt-A-Natural resource volunteers that maintain the 10 miles of recreational trails on the Unit. These trails would not be possible without their advocacy and support.

Comments regarding the draft Tri-County Uplands UMP were received by the Region 7 Division of Lands and Forests Office before, during and after development of the draft plan. Potentially affected interests such as DEC Adopt-A-Natural Resource partners, recreation groups, sporting organizations, local government officials, local residents and forest industry were invited to participate.

A public meeting was held on January 13, 2009 at Tompkins-Cortland Community College in Dryden, New York. About 35 people attended and several people made verbal comments. Written comments were accepted until February 13, 2009. Draft plans were available before the public meeting at local libraries, DEC offices, by mail and on the Internet. Most stakeholders chose to provide comments in-person at the public meeting or by email. Two letters were also received.

Initial written and oral comments specific to the proposed oil and natural gas lease sale were received at public meetings in Cortland on June 27 - 28, 2005 and in Elmira on June 28 - 29, 2005. The proposed lease sale included 21,000 acres of State Reforestation and Multiple Use lands in Broome, Cayuga, Chemung, Cortland, Schuyler, Steuben, Tioga and Tompkins counties for oil and gas exploration and development. The oil and natural gas lease sale included the three State Forests in the Tri-County Uplands Unit. Written comments concerning the oil and natural gas lease sale were accepted until October 7, 2005.

Many of the public comments on the draft plan related to observations, concerns and recommendations associated with oil and gas leasing, recreation, aesthetics and ecosystem management. To help conserve space and for reading efficiency, the following public comments and responses are summarized by topic.

A-13. Public Comment Summary and Response	
Comment(s)	***Response***
Topic: Acquisition	
The Tompkins County Conservation plan notes the need for securing land along the Finger Lakes Trail corridor north and south of Potato Hill State Forest. The plan specifically identifies the need for securing conservation easements from willing land owners along the West Branch of Owego Creek and along the Finger Lakes Trail near Old Seventy Six Road. Securing land in these areas for the trail could create connections to Hammond Hill and Shindagin Hollow respectively which would also support corridors for wildlife.	The final plan has been modified and includes a map entitled "Tri-County Uplands Unit Long Term Conceptual Acquisition and/or Conservation Easement Vision". The map shows parcels that the Department is conceptually interested in acquiring by direct purchase or through conservation easements in cooperation with conservation partners such as the Finger Lakes Land Trust, Tompkins and Tioga County Planning Departments and Finger Lakes Trail Conference. It provides ecosystem connectivity between state land parcels. Any fee simple (direct) or conservation easement purchases would be done on a voluntary basis from a willing seller.
I support the voluntary land acquisitions mentioned in the plan. The land acquisitions would make more land available for public use and keep these lands from becoming developments.	Besides making more land available for public use and creating open space, the identified voluntary acquisitions may enhance rare, endangered or threatened species or habitat, retain habitat connectivity, improve administrative access and lower management costs.
Topic: Economics	
Harvesting timber on State Forests brings in revenue for the State. It is difficult to determine how much timber will be harvested through the life of the plan. The plan states that the demand for timber has increased, but the plan does not address the increased demand.	Besides bringing revenue into the State harvesting timber on State Forests: provides jobs and raw materials to support the local economy, helps provide diverse wildlife habitat, enhances biodiversity and improves forest health. State Forest timber sales also provide an opportunity to demonstrate the art and science of forestry to the public. The Plan does not specify volumes of timber to remove, but it does schedule harvests to provide wildlife habitat, conserve and enhance biodiversity and provide a steady supply of sustainably grown forest products. As such, the plan calls for harvesting of up to 140 acres of the 3,407 acre Unit (4%) per year. The harvesting schedule is based on ecological conditions, forest health needs and plan goals.

A-13. Public Comment Summary and Response	
Comment(s)	***Response***
I am concerned that current and future DEC staffing levels are inadequate for the implementation of the plan. DEC's staff should be increased; in particular additional staff should be assigned to timber management duties so that the DEC can get closer to their allowable cut and bring in revenue to the State.	The current fiscal situation makes it very difficult for the DEC to increase current staffing levels, although UMPs provide an estimate of the required staff time to fully implement the plans. By completing all the UMPs the DEC can effectively illustrate staffing needs on a Regional and Statewide basis. The DEC's continued commitment to Green Certification will require adequate staff.
There should be minimal sale related work associated with forest product sales and contracts should be approved on a timelier basis. Less sale related work and timelier contracts would encourage more bidders, which would increase revenues from forest product sales.	Sale related work is sometimes the only way for the DEC to accomplish much needed construction, maintenance, recreation and wildlife habitat improvement projects. If it were not for sale related work, many of these projects would not be accomplished. Sale related work is an essential tool used to accomplish the goals, objectives and actions set forth in the plan. Revenue sales (sales selling for $10,000 or more) have to go through a thorough review process. The Bureau of Public Lands has taken many steps to expedite the process within areas of their administrative control and plans to work with the Office of State Contracts in the Spring of 2009 to develop a "quick contract" process. In many cases delays are related to errors or emissions on the part of the buyer.
Topic: Ecosystem Management	
Comment(s)	***Response***
Is managing for timber and managing for legacy trees compatible on the same stands or should the legacy trees be managed for in old growth areas to be set aside?	Yes, managing for timber and legacy trees is compatible. In many situations, only 1 to 2 legacy trees per acre are retained. A legacy tree is typically a large old tree that is deliberately retained after a harvest or natural disturbance (please see the plan glossary for additional information). Legacy trees often have little or no timber value. Legacy trees typically have unusual character, were once open-grown, were once part of an old hedgerow, have large cavities and will eventually become large snags and large coarse woody material. They often provide nuts, seeds or acorns for wildlife.

A-13. Public Comment Summary and Response	
Comment(s)	***Response***
I am concerned that leaving legacy trees, in areas managed for timber will ultimately lead to managing all areas for old growth which will limit access to timber.	To manage State Forests, the DEC uses an ecosystem management strategy which includes retention of older legacy trees, dead standing trees and large woody material. Legacy trees provide wildlife habitat when they are alive - and when they eventually die. Harvesting trees is used as a tool to create, enhance or conserve ecosystem health. Managing for a sustainable supply of forest products and legacy trees in the same stand is fully compatible with the UMPs goals and objectives and helps meet Green Certification requirements.
Timber management is compatible with other uses such as recreation and wildlife and this plan does a nice job putting all compatible uses together. We applaud the DEC for the comprehensive examination of management activities in the UMP.	Thank you. The plan uses adaptive management principles to balance the many values, demands and uses of State Forest lands.
Action 1.2.2: Establish Special Management Zones (Objective 1.2: Protect Soil and Water Resources) outlines that riparian buffer areas should maintain an average 100 foot setback from each side of the stream. We recommend that this setback be measured from the top of stream bank. Our research indicates that a riparian buffer of 330 feet should be maintained to adequately support riparian wildlife habitat. We further recommend an action addressing the riparian buffers of this size to enhance wildlife habitat under Objective 1.7: Conserve, Protect and Enhance Wildlife Habitat.	The DEC Division of Lands and Forests has developed statewide management rules for establishment of Special Management Zones (SMZ's) on State Forests. A variety of references were consulted to develop the SMZs. Additionally, many references were consulted during the development of the UMP. Although nearly everyone agrees stream and water resource protection is important, there are many different recommendations for buffer (setback) distance based on scientific findings. Based on a review of the current literature and the scientific evidence provided by it, a distance of 100 feet (200 foot total buffer width) is adequate for water quality and wildlife habitat protection, particularly when managed forest, not developed land, is the dominant land use. In some instances, buffers may extend beyond the 100 foot minimum standard. Exceptions to the SMZs may also occur, following administrative review, on a case by case basis.

A-13. Public Comment Summary and Response	
Comment(s)	***Response***
Topic: Oil & Gas Development	
1. Is drilling for oil and gas currently allowed on these forests?	1. Oil and gas leases have been negotiated with operators for all of the properties in this UMP area as the result of the Department's 2006 Lease Sale. The terms and conditions of these lease agreements determine where drilling can occur. Operators must obtain permits from the Department before drilling can occur on these properties.
2. There should be public meetings to address oil and gas leasing on Public land.	2. Public Meetings on the proposed 2006 Lease Sale that involved the UMP properties were held in Cortland on June 27 and 28, 2005 and in Elmira on June 28 and 29, 2005. Comments were received at these meetings and by letters and emails until October 7, 2005 and addressed in a response document dated May 30, 2006.
3. It seems that the other wells within a close geographic range have been dry holes, so to sacrifice some 60 acres, plus access points, to a gamble seems shortsighted.	3. Although there may have been past attempts to drill for natural gas in the area, new technologies that enhance production from previously non-commercially productive formations (e.g. Marcellus Shale), access to markets, gas prices and many other factors determine whether or not a well is economical to drill and produce. Some of the previous "dry holes" may now be able to become economically feasible wells. Leasing state land generates significant revenue for the state even though a successful well may never be drilled. There is no gamble associated with the income generated from the bonus payments associated with leasing state land.
4. Oil and gas exploration should not be conducted on State Forests until oil and gas companies can demonstrate positive environmental stewardship on private lands.	4. A well drilled on state land is subject to the same rigorous drilling permit process as any well drilled in New York, whether on private or public land. State land wells are also subject to additional specific requirements contained within the state oil and gas lease and special conditions. The Department's surface manager evaluates sensitive habitats, seasonal limitations, unique areas, and acreage with high public activity, among other factors, in determining whether or not to approve a parcel for leasing. Surface activity on state land must be approved by the surface manager through a Temporary Revocable Permit containing safeguards

A-13. Public Comment Summary and Response	
Comment(s)	***Response***
	and restrictions specific to the activity. Site specific SEQR reviews conducted by Mineral Resources staff are required for all well sites and environmental impacts associated with drilling operations are addressed prior to issuing a permit. When a permit application is received for a well on state land, one or more pre-work meetings are held between the company, the surface manager, and Mineral Resources staff which reaffirm site-specific requirements contained in the lease agreements and permits.
Topic: Recreation	
I am happy that motorized vehicles are restricted; ATVs destroy State land and encountering an ATV on the trail would be very dangerous.	Illegal ATV and 4x4 use is a serious problem throughout the Unit. The plan calls for continued patrols and enforcement on the State Forests as well as installation of barriers to discourage illegal use.
While it is a great reassurance to read in the plan that ATV's, dirt bikes, and off-road trucks are not permitted anywhere in these particular forests, except for that rare permit granted to someone with accessibility problems, may we ask that these plans also echo the admirable sentiment stated clearly in the Region 7 Draft Recreation Plan that designated foot trails (meaning here, of course, the FLT/North Country Trail) should NOT endure other usages, specifically horse and bicycle traffic? It is so critical to the experience of a hiker that he or she not be subjected to fast mechanical users or the tread destruction caused by horses that we will continue to lobby for this feature; human foot travel ONLY on designated hiking trails. It is just plain not the same place when bicycles share the space, and most hikers go where they go for spending quality time with the PLACE. Please help us preserve that quality with the	Title 6 Part 190 of the Official Compilation of Codes, Rules and Regulations of the State of New York prohibits horses from designated foot paths, but currently does not restrict mountain bikes. The DEC can restrict mountain bikes, from designated foot trails, by posting signs stating as such. The DEC shall restrict mountain bikes from select designated foot trails on this management Unit by posting signs as needed.

A-13. Public Comment Summary and Response	
Comment(s)	***Response***
wording in your UMPs.	
I am concerned about policing of the ATV access which is part of (the) Americans with Disabilities Act (ADA). My experience with numerous encounters with ATV'ers runs like this: "You know you are on a restricted trail?" (And) the response is "I saw tracks so I thought it was OK." With the increasing need to do more jobs with less money, and that off road ATV use is already a bit of problem in these State Forests, this seems like a new can of worms.	The proposed 2.5 mile ATV trail for people with mobility impairments, will be signed and patrolled by the DEC Division of Law Enforcement (State Forest Ranger and Environmental Conservation Officers) and provide good hunting access. Additionally, the UMP calls for an informational kiosk to be installed on the Forest. This kiosk will state that ATVs are not allowed on the Forests except for designated trails with an appropriate permit.
The UMP Objective 2.1: Maintain and Enhance Recreation Trails and Facilities should address the conservation of lands that support the functions of the Unit that fall outside its boundaries.	The UMP does take a landscape approach to planning. DEC staff used geographic information system (GIS) technology to assess the land cover within a 20 mile radius of the UMP planning area and developed land management strategies based on ecosystem management concepts. The Department does address the conservation of lands that support the functions of the Unit that fall outside its boundaries as shown by the Tri-County Uplands Unit Long Term Conceptual Acquisition and/or Conservation Map. The map shows about 1,528 acres that the DEC is interested in protecting from long term development through direct acquisition and/or conservation easements for ecosystem connectivity and open space enhancement purposes.
The UMP Action 2.2.2: Construct Informational Kiosks (Objective 2.2: Enhance Public Information and Access) calls for the development of an information kiosk in Potato Hill State Forest. This supports an identified action item in the Tompkins County Conservation Plan. We encourage and would appreciate involvement with the implementation of this item.	The DEC welcomes, encourages and appreciates input and assistance into the development of informational kiosks from all stakeholders.

A.14. State Environmental Quality Review Act (SEQR) Negative Declaration

12-12-79 (3/99)-9c **SEQR**

State Environmental Quality Review
NEGATIVE DECLARATION
Notice of Determination of Non-Significance

Identifying # 2009-SLM-7-274

Date September 16, 2009

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review Act) of the Environmental Conservation Law.

The NYS Department of Environmental Conservation as lead agency, has determined that the proposed action described below will not have a significant environmental impact and a Draft Environmental Impact Statement will not be prepared.

Name of Action: Adoption of the Tri-County Uplands Unit Management Plan (UMP)

SEQR Status: **Type 1** X
Unlisted ___

Conditioned Negative Declaration: ___ **Yes**
X **No**

Description of Action:

Background
The Tri-County Uplands Unit Management Plan (UMP) sets forth the proposed goals, objectives, management actions, values, environmental benefits, ecological services, environmental impacts and economic costs associated with 3,407 acres of State land in the Tioga, Tompkins, and Cortland County towns of Richford, Caroline, and Harford, respectively. The plan details all proposed management activities for a 10-year period, and outlines potential projects for the next 20 years. A review and update of the UMP will take place at the end of the 10 year planning period. Public input has been sought through direct mailings to potentially affected parties, press releases, public notices and a public meeting.

SEQR NEGATIVE DECLARATION

Public participation is an important part of the Department of Environmental Conservation's (DEC) planning process. It adds significant value by enhancing communication between the DEC and its State Forest potentially affected interests. Also, public participation helps sustain and create new relationships between the Department and its State Forest stakeholders. Ultimately, public participation improves the quality of the final plan.

Natural Resource Assessment
Development of a comprehensive UMP requires extensive natural resource assessment. Natural resource observations were made in the field and evaluated with computer based geographic information system (GIS) tools and combined with DEC staff knowledge, expertise and public input to make informed land use decisions and craft management actions.

Management Plan
The Plan schedules and estimates the costs of capital improvement, routine maintenance and land acquisition projects. Additionally, it lists forest ecosystem management, fisheries, and wildlife habitat actions by location, year, silvicultural management strategy and forest treatment type.

Management activities planned for the Unit include maintenance of recreational trails, State Forest roads, boundary lines, signs, witness posts, pond impoundments, fish stocking and regularly scheduled trash clean-up. Construction activities include, a loop trail, two parking lots, vernal pool establishment and oil and/or natural gas exploration and/or development.

Location: (Include street address and the name of the municipality/county. A location map of appropriate scale is also recommended.)
Please note: see attached map at the end of this document.

A. Andersen Hill State Forest (Tioga County Reforestation Area No. 4).
554 acres - located in the Tioga County town of Richford.; accessible by Andersen Hill Rd.

B. Potato Hill State Forest (Tompkins County Reforestation Area No. 4).
915 acres - located in the Tompkins County town of Caroline; accessible by Blackman Hill Rd. and Green Rd.

C. Robinson Hollow State Forest (Tioga County Reforestation Area No.3).
1,938 acres - located in the Tioga, Tompkins and Cortland County towns of Richford, Caroline and Harford, respectively; accessible by Lacey Rd. and Robinson Hollow Rd.

SEQR NEGATIVE DECLARATION

Reasons Supporting This Determination:
(See 617.7(a)-(c) for requirements of this determination; see 617.7(d) for Conditioned Negative Declaration)

1. Summary

The Tri-County Uplands (UMP) includes an assessment of the Unit's natural resources on a landscape scale. It also makes informed land use decisions, and outlines stewardship management actions for the next 10 to 20 years. In doing so, the Plan will establish stewardship benchmarks for the Unit's ecosystems. Several projects will be accomplished through DEC Adopt-A-Natural resource volunteer partnerships.

A Long Environmental Assessment Form (EAF) was prepared to help evaluate the potential for significant adverse impacts caused by implementation of the UMP.

None of the proposed management actions will cause potentially large impacts on air quality, traffic, solid waste production, flooding, significant fish and wildlife habitats, rare, threatened or endangered species of plants or animals, historic or cultural resources, community character, recreation, open space, public access, energy use, agriculture, human health, wetlands or aesthetic visual resources.

Small scale aesthetic impacts may be created during the harvesting of forest products and the establishment of oil and gas well pads. Aesthetic impacts will be minimized by locating log landings off road, establishing vegetative buffer zones along roads when possible and limiting the size of wildlife habitat regeneration harvests to 40 acres.

Additionally, all commercial forestry operations and oil and gas development will follow the guidelines established by applicable State and Federal regulations, the Generic Environmental Impact Statement (GEIS) for Oil Gas and Solution Mining Regulatory Program, the Programmatic EIS's for State Forest Commercial Product Sales and Wildlife Habitat Management Programs on State Forests, DEC Policy and the UMP. Each well drilling site will require an additional site specific environmental analysis and an individual drilling plan approved by DEC's Division of Mineral Resources and the DEC Region 7 Regional Forester or his/her designee.

In the vast majority of cases, the management actions listed in the plan will maintain or increase the number of plants and animals (biodiversity) while protecting water quality. For example, about 752 acres (22% of the Unit) will be managed for long term conifer habitat, 341 acres (10% of the Unit) of minimally disturbed late successional protection and natural areas will be established on the Unit, with an additional 1,348 acres (40%) of the Unit being actively managed as late-successional forest to provide habitat for wildlife species such as the Cerulean warbler, Scarlet tanager, Northern goshawk, Canada warbler and Black-throated blue warbler. Additionally, the UMP calls for the creation of 564 acres (14% of the

Unit) of early successional habitat (brush and shrubs) for bird species that are in regional decline such as the Golden-winged warbler, Ruffed grouse, and the American woodcock and calls for the creation of 92 acres (3% of the Unit) of new aspen stands for wildlife through commercial regeneration cuts.

No new significant recreational trail networks are planned on the Unit. However, to provide greater outdoor recreational access to people with limited mobility, the Department will build and maintain a 2.5 mile loop trail on the Robinson Hill State Forest. Trail construction is currently scheduled for the year 2015.

No new roads or buildings are planned for the site. Total available parking capacity on the Unit will increase from 10 to 20 cars with construction of two new parking lots. One new 3 to 5 car parking lot will be constructed on the Robinson Hollow (Tioga Reforestation Area No. 3) State Forest to provide improved access to the Finger Lakes (hiking) Trail. A second 3 to 5 car parking lot will be constructed on the Robinson Hollow State Forest to provide access for people with limited mobility. The new parking lots will be surfaced with gravel. Only a very small increase in local traffic is expected to occur from the construction of the new parking lots.

No significant change in existing land use or land cover will occur during implementation of the UMP as the vast majority (about 85%) of the Unit's landscape will remain covered by forest at any given point in time. Activities planned for the Unit will be covered by the following Generic Environmental Impact Statements (GEIS) and Environmental Impact Statements (EIS); 1) Plan and Final GEIS for Conserving Open Space in New York State, 2) PEIS for Recreational Use on State Forests, 3) DEC Division of Minerals GEIS on the Oil, Gas and Solution Mining Regulatory Program and 4) the DEC Programmatic EIS for Wildlife Habitat Management and 5) the DEC Progammatic EIS for the State Forest Commercial Product Sales Program. After final approval of the plan, if activities are added to the plan to provide better management of the Unit and are not covered under this Negative Declaration or cited under the GEIS and/or PEIS, the Department will undertake a site specific environmental review.

Herbicide use may be necessary to control non-native invasive species and for other ecosystem management purposes. Prior to any herbicide use, a site specific environmental review will be completed along with an Herbicide Application Plan.

The following best management practices will be followed during the parking area and trail construction projects.

Parking Areas

• locating parking lots to minimize necessary cut and fill;
• locating parking lots away from streams, wetlands, and unstable slopes wherever possible;

• locating parking lots on flat, stable, well-drained sites;
• locating parking lots in areas that require a minimum amount of tree cutting;
• limiting construction to periods of low or normal rainfall;
• wherever possible, using wooded buffers to screen parking lots from roads;
• limiting the size of the parking lot to the minimum necessary to address the intended use.

Trails
• locating trails to minimize necessary cut and fill;
• wherever possible, lay out trails on existing old roads or clear or partially cleared areas;
• locating trails away from streams, wetlands, and unstable slopes wherever possible;
• use of proper drainage devices such as water bars and broad-based dips;
• constructing stream crossings at right angles to the stream;
• locating trails to minimize grade;
• using stream crossings with low, stable banks, firm stream bottom and gentle approach slopes;
• limiting stream crossing construction to periods of low or normal flow;
• using natural materials to blend the structure into the natural surroundings;
• using stream bank stabilizing structures made of natural materials such as rock or wooden timbers.

2. Potential Impacts of Specific Unit Management Plan Actions

The Tri-County Uplands Unit Management Plan (UMP) lists the following management actions on the three State Forests in the Unit. None of the following actions will extensively impact the existing environment and/or surrounding community.

Plan Action 1.2.2 - Protection of streams, wetlands, ponds and unique wildlife habitats on the Unit by establishing appropriate vegetative Special Management Zones (SMZ's) and/or minimally disturbed natural areas.

Impact(s): none.

Plan Action 1.7.3 - Creation of a shifting mosaic of early and late successional wildlife habitats by strategically applying both even and uneven-aged silvicultural techniques, and by establishing 341 acres of natural and protection areas.

Impact(s): very limited. Creation of diverse habitat will be achieved through application of scientifically based forest ecosystem management. Periodic harvesting of forest products from the Unit will be designed to mimic natural disturbance regimes and provide about 564

acres (about 14% of the Unit's land cover) of early successional cover - a land cover type that is rapidly diminishing in the Unit as the surrounding agricultural land regrows into forest and/or is sub-divided into residential building lots.

Plan Action 1.7.4 - Build 20 to 30 small vernal pools/ponds, 30 to 3,000 square feet in size. The pools will create additional habitat for species such as the Jefferson salamander, blue spotted salamander and woodfrog. Based on GIS based analysis of soils and topography, an estimated 22 sites covering about 105 acres of suitable woodland sites exist on the Unit. This project would require use of a small track-hoe excavator and/or bulldozer. Some of this work may be accomplished during other forest ecosystem management activities such as timber harvesting. A list and map of possible sites are included in the appendix of the Tri-County UMP. Historically, DEC has collaborated with the Upper Susquehanna Watershed Coalition and the U.S. Fish and Wildlife Service on similar projects on other State Forest Units. Construction would take place during periods of dry weather. Best management practices (BMP's) will be followed to minimize any potential erosion or sedimentation problems to surrounding water bodies. These may include the use of hay and/or filter fabric to stabilize the soil surface.

Impact(s): very limited. Creation of vernal pools requires minor soil disturbance which quickly recovers. Vernal pools are important habitat components and positively impact ecosystem health and function.

Plan Actions 2.1.1 and 2.1.2 - Maintenance of 9.9 miles of highly valued snowmobile and hiking trails on the Unit in partnership with DEC Adopt-A-Natural Resource (AANR) volunteers.

Impact(s): very limited. Maintenance typically involves periodic grading, installing of geotextile fabric, ditching, and trimming of vegetation with hand tools. Regular maintenance reduces soil erosion and associated water quality impacts.

Plan Action 2.1.6 - Continued fish stocking of Tri-County Pond by DEC's Bureau of Fisheries.

Impact(s): none. Fish stocking helps add to the diversity of plants and animals on the Unit and provides family based recreational opportunities. All fish stocking projects will be in compliance with the "*Programmatic Environmental Impact Statement on Fish Species Management Activities of the Department of Environmental Conservation, Division of Fish and Wildlife,"* dated December 1979.

Plan Action 2.2.3 - Construction of two additional 3 to 5 car parking lots and informational kiosks for each State Forest.

Impact(s): very limited. Parking lots and kiosk placement will require some soil movement and grading and the use of geotextile fabric and gravel. The parking lots will be limited in size and surfaced with gravel to minimize storm water drainage impacts.

Plan Action 2.3.1 - Restrict ATV use to CP-3 trails; construct and maintain of 2.5 miles of ATV loop trail on the Robinson Hollow State Forest for people with limited mobility. The trail will be located in the interior of the forest away from private property parcels as shown on the plan's Recreational Areas and Trail System map.

Impact(s): very limited*.* The trail will be designed by DEC staff and constructed on gentle slopes and cross slopes on well drained soils. Construction and maintenance typically involves grading, limited live and dead tree removal, installation of geotextile fabric, ditching and trimming of vegetation. Regular maintenance will reduce soil erosion and associated water quality impacts.

Plan Action 3.1.3 - Continued implementation of Best Management Practices (BMP's) to sustain or enhance ecosystem health, reduce soil erosion, protect water quality and implementation of Special Management Zones (SMZ's) along sensitive hydrologic areas such as streams, wetlands, spring seeps, vernal pools and ponds.

Impact(s): none. Implementation of BMP's benefits ecosystem health and sustainability.

Plan Actions 3.2.1 thru 3.2.4 - Leasing of State Forests in the Unit for oil and natural gas exploration/ development with significant surface occupancy restrictions on the construction of well pads and pipelines (and related surface disturbances) which will minimize impacts to aesthetics, recreational trails, soils, late successional forests, natural areas, wetlands, streams and unique wildlife habitats.

Impact(s): limited. Based on public input and the natural resource assessment of the Unit, surface occupancy by well pads and pipelines will be limited and specifically located to minimize environmental impact. Well site development will require an additional temporary revocable permit (TRP) from the DEC Division of Lands and Forests and require development of a site specific plan designed to minimize soil erosion and manage storm water during and after construction of well pads and pipelines. Additionally, the DEC will require that the site be reclaimed with native vegetation.

Plan Actions 4.4.1 and 4.4.2 - Maintenance of 2.5 miles of public forest access roads (PFAR) and forest product haul roads on the Unit including mowing of shoulders.

Impact(s): very limited. Regular maintenance includes mowing, grading, culvert replacement, ditching, clearing of brush from the road shoulder and occasional use of shale

from existing pits on the State Forest. Major road resurfacing will require gravel from a commercial source. All of the shale pits will be reclaimed per DEC guidelines**.**

Plan Action 4.5.1 - Routine maintenance of State Forest boundary lines in the Unit.

Impact(s): none. Boundary lines will be painted and in some instances blazed. Trees will not be significantly damaged by blazing during the boundary line marking.

Plan Action 4.5.2 - Land Survey. Survey, blaze, and paint about 11,800 feet of boundary line on Robinson Hollow (Tioga No. 3) and Andersen Hill (Tioga No. 4) State Forests.

Impact(s): none. Boundary lines will be painted. Trees will not be significantly damaged by blazing during the land survey.

Plan Action 4.6.1 - Possible purchase of up to 1,528 acres of privately owned land adjacent to the State Forests in the Unit through simple fee and/or conservation easements from willing sellers or through gifts. The DEC will collaborate with local government and non-governmental organizations such as the Tompkins County Planning Department, Tioga County Planning Department, Finger Lakes Land Trust and Finger Lakes Trail Council to accomplish this action. About 455 acres (30%) of the lands conceptually identified in the UMP are currently within agricultural districts; 281 acres are within Tompkins County Agricultural District No. 1 and 174 acres are within Tioga Agricutural District No. 3. It should be noted that according to New York State Real Property data, only one parcel about 33 acres in size is classified as being used specifically for agricultural use. This parcel is listed under real property class code 241 and is described as “primarily residential also used in agricultural production.” The remaining parcels are chiefly classified as recreational use, private wild/forest lands and residential vacant land over ten acres in size.

Impact(s): limited. State ownership of the land and/or acquisition of conservation easements from willing sellers would reduce parcelization and consolidate boundary lines. It would also protect/enhance ecosystem connectivity. About 183 acres of the lands listed and mapped for conceptual acquisition are within the floodplain of Owego Creek and as such sustainable development potential is very limited. It should be noted that State Forest land pays school, town and fire district taxes. Most of the undeveloped land that was once tilled or used for pasture or hay is gradually reverting back to young forest.

Plan Action 4.7.1 - Mowing and maintenance of pond outlet/impoundment.

Impact(s): none. Maintaining the pond outlet/impoundment in grass is critical to the long term sustainability of the structure. Mowing will help provide grassland habitat for insects and birds that need early successional and grassland habitat.

SEQR NEGATIVE DECLARATION

If Conditioned Negative Declaration, provide on attachment the specific itigation measures imposed, and identify comment period (not less than 30 days from date of publication in the ENB)

For Further Information:
Contact Person: John M. Clancy, Senior Forester
Address: NYS DEC, Lands & Forests, 1285 Fisher Ave, Cortland, NY 13045-1090
Telephone Number: (607) 753-3095, ext. 258 or jmclancy@gw.dec.state.ny.us

For Type 1 Actions and Conditioned Negative Declarations, a Copy of this Notice is sent to:

Region 7 Office of the Department of Environmental Conservation

Cortland County Legislature
The Honorable John R. Daniels - Chairperson
County Office Building
60 Central Ave Cortland, New York 13045-2746

Town of Harford
The Honorable Raymond H. Marsh
394 Liddington Hill Rd., Marathon NY 13803

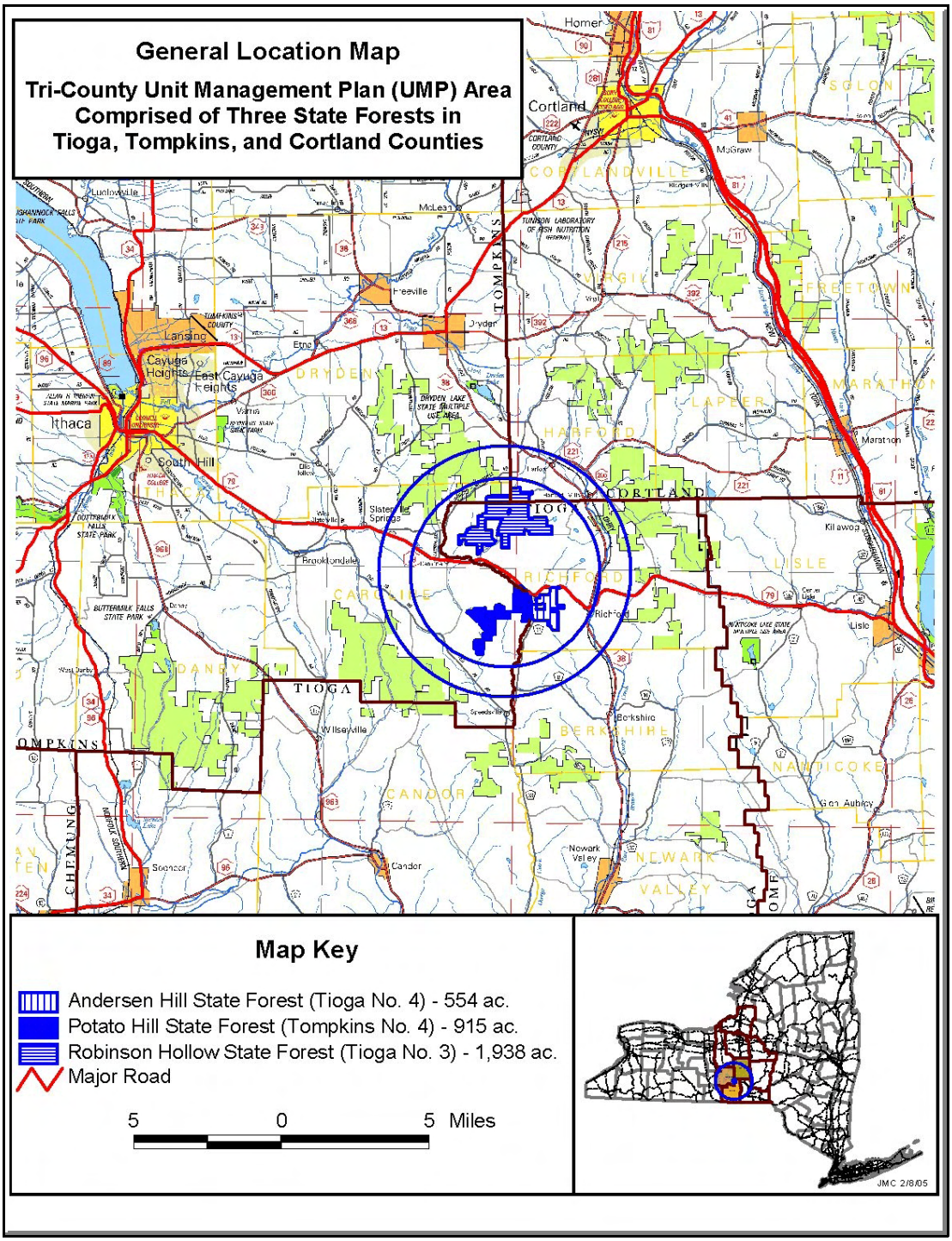
Tioga County Legislature
The Honorable Dale N. Weston - Chair
56 Main Street, Owego, NY 13827

Town of Richford
The Honorable Martin Wilcox - Supervisor
PO Box 144, Richford, NY 13835

Tompkins County Legislature
The Honorable Michael Koplinka-Loehr - Chair
320 North Tioga Street, Ithaca, NY 14850

Town of Caroline
The Honorable Donald L. Barber - Supervisor
108 Landon Rd., Ithaca, NY 14850

Applicant
Environmental Notice Bulletin - NYS DEC - 625 Broadway - Albany, NY 12233-1750 (Type One Action Only)


General Location Map
Tri-County Unit Management Plan (UMP) Area
Comprised of Three State Forests in
Tioga, Tompkins, and Cortland Counties
Map Key
Andersen Hill State Forest (Tioga No. 4) - 554 ac.
Potato Hill State Forest (Tompkins No. 4) - 915 ac.
Robinson Hollow State Forest (Tioga No. 3) - 1,938 ac.
Major Road
5 0 5 Miles
JMC 2/8/05

Unit Management Plan Glossary of Terms

Access trails - temporary, unpaved roads which do not provide all weather access within the Unit. They are not designed for long term and repeated use by heavy equipment. These corridors were originally constructed for the seasonal removal of forest products by skidding to log landings or other staging areas. Constructed according to best management practices, these trails may be used to support other management objectives such as recreational access corridors. Maintenance is limited to activities which minimally support seasonal access objectives. (L)

Adaptive management - a dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met. (E)

Aesthetics - forest value, rooted in beauty and visual appreciation and providing a distinct visual quality. (G)

Age class(es) - trees of a similar size and/or age originating from a single natural event or regeneration activity.

All-aged - a condition of a forest or stand that contains trees of all or almost all age classes. (B)

Apple tree release - a management action; the act of removing an overstory of trees and/or competing vegetation that are shading and potentially inhibiting apple tree growth and fruit production. (G)

Ash decline - the progressive loss of vigor and health causing the death of ash trees by a combination of factors. Some factors may include diseases, poor soil/sites, cankers, insects, winter injury, or drought. (G)

Basal area - the cross sectional area, measured in square feet, of a single stem, including the bark, measured at breast height (4.5 ft above the ground). (E)

Beech bark disease - a insect and disease pathogen complex involving a scale insect (*Cryptococcus fagi*) and a nectria fungus (*Nectria coccinea* var. *faginata*). The insect pierces the bark to feed, allowing a place for the fungus to enter the tree. Fungal activity interrupts the tree's normal physiological processes and a severely infected tree will most likely die. (G)

Best Management Practices (BMP's) - a practice or a combination of practices that are designed for the protection of water quality of water bodies and riparian areas, and determined to be the most effective and practicable means of controlling water pollutants. (E)

Biological diversity (Biodiversity) - the variety, abundance and interactions of life forms found in areas ranging in size from local through regional to global. Biodiversity also encompasses processes - both ecological and evolutionary that allow organisms to keep adapting and evolving. Genetic diversity (unique combinations of genes found within and among organisms), species diversity (number of species in an area), ecological diversity (organization of species into natural

communities and the interplay of these communities with the physical environment - interactions among organisms and between organisms and their environment is the key here). Landscape diversity (refers to the geography of different ecosystems across large areas and the connections between them). (M)

Biological legacy - an organism, living or dead, inherited from a previous ecosystem - *note*: biological legacies often include large trees, snags, and down logs left after timber harvesting. (E)

Blowdown - tree or trees felled or broken off by wind. (E)

Browse - portions of woody plants including twigs, shoots, and leaves consumed by animals such as deer. (G)

Buffer zone(s)/buffer strip - a vegetation strip or management zone of varying size, shape, and character maintained along a stream, lake, road, recreation site, or other vegetative zone to mitigate the impacts of actions on adjacent lands, to enhance aesthetic values, or as a best management practice. (E)

Butternut canker - a disease of butternut trees caused by a fungus *(Sirococcus clavigignenti-juglandacearum)* that most often kills the tree. (G)

Cavity tree/den tree - a tree containing an excavation sufficiently large for nesting, dens or shelter; tree may be alive or dead. (G)

Climax forest - an ecological community that represents the culminating stage of a natural forest succession for its locality / environment. (E)

Coarse filter approach - a strategy for conserving biodiversity that involves maintaining a variety of native ecosystems within a landscape context. A coarse filter approach would ensure the availability of grasslands, shrublands, open wetlands, forest wetlands, riparian zones, northern hardwood forest and mixed northern hardwood/conifer forest in various stages of successional development. This approach assumes that a representative array of native ecosystems will contain the vast majority of species in a region. (G)

Coarse Woody Material (CWM) - any piece(s) of dead woody material on the ground in forest stands or in streams. (E)

Cohort - a population of trees that originate after some type of disturbance. (G)

Community - 1, an assemblage of plants and animals interacting with one another, occupying a habitat, and often modifying the habitat; a variable assemblage of plant and animal populations sharing a common environment and occurring repeatedly in the landscape. 2, A group of people living in a particular local area. (H) (T)
Conifer - a cone-bearing tree, also referred to as softwood; *note*: the term often refers to gymnosperms in general. (E)

Conversion - a change from one silvicultural system to another or from one tree species to another. (E)

Corridor(s) - a linear strip of land identified for the present or future location of a designed use within its boundaries. *Examples*: recreational trails, transportation or utility rights-of-way. When referring to wildlife, a corridor may be a defined tract of land connecting two or more areas of similar management or habitat type through which a species can travel from one area to another to fulfill any variety of life-sustaining needs. (E)

Cover type(s) - the plant species forming a majority of composition across a given area. (E)

CP-3 (DEC Commissioner Policy three). A temporary revocable permit (TRP) that provides a qualified person with a certified disability access to State land by a suitable motor vehicle, where either the desired location is closed to motor vehicles or is open to certain motor vehicles, but not the type of motor vehicle desired to be used by that person. By DEC policy, the CP-3 permit allows individuals to operate a motor vehicle as designated in the permit on all roads, trails and geographical areas designated by the Department for such use and elsewhere as specifically approved, consistent with current law and rules and regulations. (G)

Crown - the part of a tree or woody plant bearing live branches and foliage. (E)

Crown class - a category of tree based on its crown position relative to those of adjacent trees. Examples:

dominant: a tree whose crown extends above the general level of the main canopy and receives full light from above and partial to full light from the sides.
co-dominant: a tree whose crown helps to form the general level of the main canopy and receives full light from above and comparatively little from the sides.
intermediate: a tree whose crown extends into the lower portion of the main canopy and receives little direct light from above and none from the sides.
suppressed / overtopped: a tree whose crown is completely overtopped by the crowns of one or more neighboring trees and receives little or no direct sunlight. (E)

Crown closure - the stage in the development of a forest stand at which the branches of adjacent trees touch. (G)

Cultural resources - significant historical or archaeological assets on sites as a result of past human activity which are distinguishable from natural resources. (G)

Cutting interval - the number of years between harvest or regeneration cuts in a stand. (G)

Deciduous - tree and shrub species that lose their leaves or needles in autumn. (G)

Densitometer - a tool with a mirror that is used to measure forest canopy closure (G).

Designated recreational trail(s) - a Department authorized recreational trail that is signed and/or mapped. (G)

Diameter (at) Breast Height (DBH) - the diameter of the stem of a tree (outside bark) measured at breast height (4.5 ft) from the ground. (E)

Disturbance - a natural or human-induced environmental change that alters one or more of the floral, faunal, and microbial communities within an ecosystem. Timber harvesting is the most common human disturbance. Wind or ice storms are examples of natural disturbance. (A)

Early successional wildlife habitat(s) - wildlife habitats which have early vegetative stages such as grass, shrubs or aspen. (G)

Ecosystem - a spatially explicit, relatively homogeneous unit of the earth that includes all interacting organisms and components of the abiotic environment within its boundaries - *note*: an ecosystem can be of any size, e.g., a log, pond, field, forest or the earth's biosphere. (E)

Ecosystem management - the appropriate integration of ecological, economic, and social factors in order to maintain and enhance the quality of the environment to best meet our current and future needs. Involves management at the landscape level, prompting the biodiversity of natural communities of plants, animals, and seeking to maintain healthy and productive environments. (D)

Edge(s) - the more or less well-defined boundary between two or more elements of the environment, e.g., a field adjacent to a woodland or the boundary of different silvicultural treatments. (E)

Endangered species - any species of plant or animal defined through the Endangered Species Act of 1976 as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register. (E)

Even-aged - a class of forest or stand composed of trees of about the same age. The maximum age difference is generally 10-20 years. (J)

Even-aged (silviculture) - a program of forest management directed to the establishment and maintenance of stands of trees having relatively little (10-20 yrs) variation in ages. The guidelines to be applied in using this system at all stages of tree development are uniquely different from the uneven-aged system. (G)

Exotic - any species introduced from another country or geographic region outside its natural range. (E)

Flood plain(s) - the level or nearly level land with alluvial soils on either or both sides of a stream or river that is subject to overflow flooding during periods of high water level. (E)

Forestry - the profession embracing the science, art, and practice of creating, managing, using, and conserving forests and associated resources for human benefit and in a sustainable manner to meet desired goals, needs, and values. (E)

Forest/Stand development stages - the various stages of forest stand growth and development ranging from a stand initiation (seedling establishment) stage to an old-growth stage. (I)

Forest type(s) - a community of trees defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees. (E)

Forested wetland - an area characterized by woody vegetation where soil is periodically saturated with or covered by water. (G)

Fragipan - a dense and brittle layer of soil. Its hardness results mainly from extreme density or compactness rather than from high clay content. The material may be dense enough to restrict root, nutrient, and water penetration. (G)

Fragmentation - 1.) the condition by which a landscape is broken into small islands of forest within a mosaic of other forms of land use or ownership. 2.) islands of a particular age class that remain in areas of younger-aged forest. (E)

Gaps - communities, habitats, successional stages, or organisms which have been identified as lacking in the landscape. (G)

Geocaching - a high-tech, hide and seek, outdoor activity for utilizing the Global Positioning System (GPS). (G)

Geographic Information System (GIS) - an organized collection of computer hardware, software, geographic and descriptive data, personnel, knowledge and procedures designed to efficiently capture, store, update, manipulate, analyze, report and display the forms of geographically referenced information and descriptive information. (E)

Grassland(s) - land on which the vegetation is dominated by grasses, grasslike plants, or forbs. (E)

Group selection - a type of uneven-aged forest management used to create openings in the forest canopy to promote future stand diversity and the establishment of shade intolerant species. New age classes are established in place of the small groups of trees that were removed. (G)

Suite - species similar in their habitat needs which may respond similarly to habitat changes. (A)

Habitat - the geographically defined area where environmental conditions (e.g., climate, topography, etc.) meet the life needs (e.g., food, shelter, etc.) of an organism, population, or community. (A)

Hardwoods - broad-leafed, deciduous trees belonging to the botanical group Angiospermae. (E)

Haul roads - permanent, unpaved roads which are not designed for all-weather travel, but may have hardened or improved surfaces with artificial drainage. They are constructed according to best management practices primarily for the removal of forest products, providing limited access within the Unit by log trucks and other heavy equipment. These roads may or may not be open for public motor vehicle use, depending on management priorities and objectives. They may serve as recreational access corridors, but are not maintained according to specific standards or schedules. (N)

Herbicide(s) - a chemical used for killing or controlling the growth of plants. (E)

High canopy forest area(s) - a portion of a State Forest that will be dedicated to establishing and maintaining managed forest stands with high canopy cover. The areas will be created to provide

habitat for wildlife species that require mature forests - with late successional characteristics such as course woody material, snags, and larger diameter trees. These areas will be strategically managed using uneven-aged management systems. Management will be predominately single tree selection. Group selection may also be done on a limited basis to regenerate sunlight demanding mast producing trees like oak, cherry and hickory. The areas will be managed to limit the size of human made forest canopy openings to no greater than ½ acre in size. Ecosystem management strategies will include retention of biological legacy trees, den trees, snags and course woody material. Overall canopy density will typically be 65% or greater.

Homocline - A general term for a series of rock strata having the same dip, e.g., one limb of a fold, a tilted fault block **.** (T)

Improvement improvement thinning(s) - the removal of less desirable trees of any species in a stand of poles or larger trees, primarily to improve composition and quality. (E)

Indicator species - species with such specialized ecological needs that they can be used for assessing the quality, condition, or extent of an ecosystem on the basis of their presence and density, or the accumulation and effect of materials in their tissues. (A)

Invasive species - species that have become established outside their natural range which spread prolifically, displacing other species, and sometimes causing environmental damage. *see* **exotic** (G)

Keystone species - a plant or animal species that strongly influences that functioning of an entire ecosystem. For example, the way beaver influence wetlands. (G)

Landscape Matrix - the most extensive and connected landscape element type present, which plays the dominant role in landscape functioning. For example, New York's South-Central Highlands (Central Appalachian) landscape is dominantly forest cover; thus, the landscape matrix is forest cover. (Q)

Large poles - trees that are 9 to 11 inches in diameter at breast height. (G)

Large sawtimber - trees that are 24 inches or greater in diameter at breast height. (G)

Late successional forest - a forest beyond the age of economic maturity, generally beyond 100 years of age. These forests are older, have larger trees, and have more structural complexity than mature forest, and they are either are in the process of or have developed old characteristics. They may exhibit evidence of past human or natural disturbances. These forests may exist as entire stands or as smaller patches within younger stands. (P)

Lean-to - a small, open fronted log shelter used for overnight camping. (G)

Log landing(s)/(Log deck) - a cleared area to which logs are skidded and are temporarily stored before being loaded onto trucks for transport. (G)

Long-lived conifers - conifers that are capable of living 135 years or more on forest sites in Central New York. Tree species typically include eastern hemlock, eastern white pine, Norway spruce and northen white cedar. (G)

Mast - all fruits of trees and shrubs used as food for wildlife. Hard mast includes nut-like fruits such as acorns, beechnuts and chestnuts. Soft mast includes the fleshy fruits of black cherry, dogwood and serviceberry. (A)

Mature forest cover - pertaining to an even-aged stand that has attained most of its potential height growth, or has reached merchantability standards. Within uneven-aged stands, individual trees may become mature but the stand itself consists of trees of diverse ages and stages of development. (E)

Medium sawtimber - trees that are 18-23 inches in diameter at breast height. (G)

Mesic - of sites or habitats characterized by intermediate moisture conditions, i.e., neither decidedly wet nor dry. (E)

Multiple use - a strategy of land management fulfilling two or more objectives, e.g. forest products removal and recreation. (G)

Native animal and plant species - an indigenous species that is normally found as part of a particular ecosystem. (E)

Natural area(s) - An area allowed to develop naturally. Intervention will be considered to protect forest health (e.g. fire or invasive plant or animal invasive species), to enhance structural or species diversity, to protect, restore or enhance significant habitats or to exploit or create regeneration opportunities for desired plant species. (G)

Natural regeneration - the establishment of a forest stand from natural seeding, sprouting, suckering or layering. (E)

Neotropical migratory birds (migrants) - birds that breed in Canada and the United States and spend our winter in Mexico, Central America, South America or the Caribbean islands. These species represent more than 50% (340 of the 600 species) of North American birds. (G)

Northern hardwood forest - a forest type usually made up of sugar and red maple, American beech, yellow birch, and to a lesser extent black cherry and white ash. This type represents about 70 percent of all forests in New York State. (A)

Old growth - an abundance of late successional tree species, at least 180 - 200 years of age in a contiguous forested landscape that has evolved and reproduced itself naturally, with the capacity for self perpetuation, arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor, featuring canopy gaps formed by natural disturbances creating an uneven canopy, and a conspicuous absence of multiple stemmed trees. Old growth forest sites typically are characterized by an irregular forest floor containing an abundance of coarse

woody materials which are often covered by mosses and lichens; show limited signs of artificial disturbance and have distinct soil horizons. The understory displays well developed and diverse surface herbaceous layers. Single, isolated trees may be considered as old growth if they meet some of the above criteria. (G)

Overstory - that portion of the trees in a forest forming the upper or uppermost canopy layer. (E)

Parcelization - the subdivision of land into smaller ownership blocks. This intrudes new features and activities into the forest and changes its character, but does not necessarily fragment it in biophysical terms. (M)

Pioneer Hardwood- a plant capable of invading bare sites (newly exposed soil) and persisting there or colonizing them until supplanted by successional species. (E)

Plantation(s) - a stand composed primarily of trees established by planting or artificial seeding - a plantation may have tree or understory components that have resulted from natural regeneration. (E)

Poletimber - trees that are generally 6-11 inches diameter at breast height. (G)

Protection area(s) - land excluded from most active management to protect sensitive sites. Exclusions include: wood product management, oil and gas exploration and development and some recreational activities. These sites most often include steep slopes, wet woodlands and riparian zones along stream corridors. (G)

Public Forest Access Roads (PFAR)- permanent, unpaved roads which may be designed for all-weather use depending upon their location, surfacing and drainage. These roads provide primary access for administration and public use within the Unit. The design standards for these roads are those of the Class A and Class B access roads as provided in the Unpaved Forest Road Handbook (8/74). As a general guideline, sufficient access is typically achieved when 1 mile of PFAR is developed for each 500 acres of state land, and no position within the Unit lies more than 1 half mile from a PFAR or public highway. (L) (N)

Pulpwood - low grade or small diameter logs used to make paper products, wood chips, etc. (G)

Reforestation - the re-establishment of forest cover by natural or artificial means. (A)

Regeneration - seedlings or saplings of any origin. (M)

Release - 1.) a treatment designed to free trees from undesirable, usually overtopping, competing vegetation. (E)
2.) a treatment designed to free young trees not past the sapling stage from undesirable competing vegetation that overtops or closely surrounds them. (F)

Riparian buffer (zone) - areas of transition between terrestrial and aquatic ecological systems. They are characterized as having soils and vegetation analogous to floodplains, or areas transitional to upland zones. These areas help protect the water by removing or buffering the effects of excessive nutrients, sediments, organic matter, pesticides, or pollutants. (A)

Rotation - the period of years between stand establishment and timber harvest as designated by management decisions. (M)

Salvage cutting - the removal of dead trees or trees damaged or dying because of injurious agents other than competition, to recover economic value that would otherwise be lost. (E)

Sapling - a small tree, usually defined as being between 1 and 5 inches diameter at breast height. (G)

Sawtimber - trees that are generally 12 inches and larger diameter at breast height. (G)

Seedling(s) - a young tree originating from seed that is less than1 inch in diameter. (A)

Seedling(s)/sapling(s) - trees less than 6 inches diameter at breast height. (G)

Seed tree reserves cut/method - the removal of the mature timber in one cutting, except for a small number of trees left singly, or in small groups, as a source of seed for natural regeneration. (I)

Shade tolerance - the ability of a tree species to germinate and grow at various levels of shade.
Shade tolerant: having the capacity to compete for survival under shaded conditions
Shade intolerant: having the capacity to compete for survival only under direct sunlight conditions; light demanding species. (E) (G)

Shelterwood cut/method - a regeneration action designed to stimulate reproduction by implementing a series of cuts over several years that will gradually remove the overstory trees. Gradual reduction of stand density protects understory trees and provides a seed source for stand regeneration. (A)

Silviculture - the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis. (E)

Site - the area in which a plant or forest stand grows, considered in terms of its environment, particularly as this determines the type and quality of the vegetation the area can support. (E)

Skid trail(s) - a temporary or permanent trail used to skid or forward felled trees from the stumps to the log landing. (G)

Small poles - trees 6-8 inches diameter at breast height. (G)

Small sawtimber - trees 12-17 inches in diameter at breast height. (G)

Snags - standing, dead trees, with or without cavities; function as perches, foraging sites and/or a source of cavities for dens, roosting and/or nesting for wildlife. (G)

Softwoods - generally refers to needle and/or cone bearing trees (conifers) belonging to the botanical group Gymnospermae. (G)

Spatial analysis - an examination of data in the context of where it occurs geographically or “on the ground”. This is usually accomplished by tying database information to GIS based maps. (G)

Species - the main category of taxonomic classification into which genera are subdivided, comprising a group of similar interbreeding individuals sharing a common morphology, physiology and reproductive process. (E)

Species richness - the number of different species present within a defined area. (A)

Stand(s) - a contiguous group of trees sufficiently uniform in age-class distribution, composition and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit. (E)

Stand structure - the horizontal and vertical distribution of components of a forest stand including the height, diameter, crown layers and stems of trees, shrubs, herbaceous understory, snags and down woody materials. (E)

State Forest / State Reforestation Area - lands owned by the State of New York, administered by the Department of Environmental Conservation Division of Lands & Forests, and authorized by Environmental Conservation Law to be devoted to the establishment and maintenance of forests for watershed protection, the production of timber and other forest products, and for recreation and kindred purposes. These forests shall be forever devoted to the planting, growth, and harvesting of such trees (Title 3 Article 9-0303 ECL). (G)

Stocking - the activity of supplying a stock of something; "he supervised the stocking of the stream with trout". (T)

Succession - the natural series of replacements of one plant community (and the associated fauna) by another over time and in the absence of disturbance. (A)

Sustainable forest management - management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things, while providing environmental, economic, social and cultural opportunities for present and future generations. (A)

Temporary revocable permit (TRP)- a Department permit which authorizes the use of State land for a specific purpose for a prescribed length of time. (G)

Thinning(s) - a silvicultural treatment made to reduce stand density of trees primarily to improve growth of remaining trees, enhance forest health, or recover potential mortality. (E)

Threatened species - a species likely to become endangered in the foreseeable future, throughout all or a significant portion of its range, unless protected. (A)

Timber Stand Improvement (TSI) - pre-commercial silvicultural treatments, intended to regulate stand density and species composition, while improving wood product quality and fostering individual tree health and vigor through the removal of undesirable trees. (G)

Understory - the smaller vegetation (shrubs, seedlings, saplings, small trees) within a forest stand, occupying the vertical zone between the overstory and the herbaceous plants of the forest floor. (A)

Group selection - a type of uneven-aged forest management used to create openings in the forest canopy to promote future stand diversity and the establishment of shade intolerant species. New age classes are established in place of the small groups of trees that were removed. (G)

Uneven-aged system - a planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes. (E)

Uneven-aged stand/forest - a stand with trees of three or more distinct age classes, either intimately mixed or in small groups. (E)

Universal Design - Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. For additional information, see http://www.design.ncsu.edu/cud/about_ud/about_ud.htm (S)

Variable patch retention (harvest system) - an approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the harvested stand for integration into the new stand to achieve various ecological objectives. (E)

Watershed - a region or area defined by a network of stream drainage. A watershed includes all the land from which a particular stream or river is supplied. (G)

Wetland(s) - a transitional area between aquatic and terrestrial ecosystems that is inundated or saturated for periods long enough to produce hydric soils and support hydrophytic vegetation. (E)

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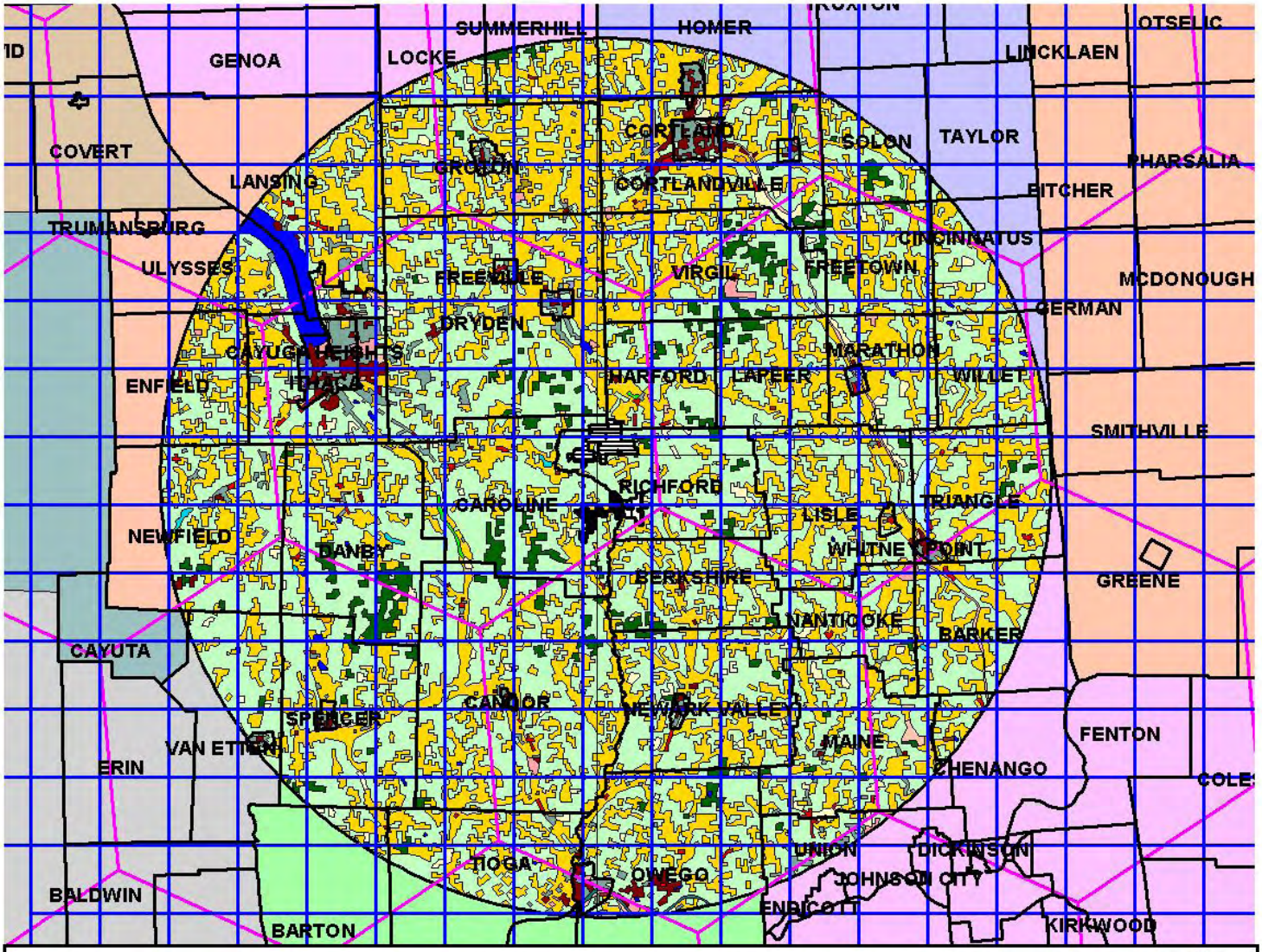

Tri-County Unit Management Plan (UMP) Area
Landscape Matrix Analysis Map

- Andersen Hill State Forest (Tioga No. 4) - 554 ac.
- Potato Hill State Forest (Tompkins No. 4) - 915 ac.
- Robinson Hollow State Forest (Tioga No. 3) - 1,938 ac.

Landscape Matrix - 20 Mile Radius

- Cropland and Pasture
- Mixed Forest Land
- Residential
- Evergreen Forest Land
- Shrub & Brush Rangeland
- Commercial and Services
- Mixed Urban/Built-up Land
- Other Urban/Built-up Land
- Other Agricultural Land
- Lakes
- Mines and Quarries
- Reservoirs
- Transportation and Utilities
- Nonforested Wetland
- Forested Wetland
- Industrial
- Streams and Canals
- Orchards, Vineyards, and Nurseries
- Transitional Areas
- EMAP Hexagon
- Breeding Bird Atlas Block

10 0 10 Miles

JMC - 2/10/05