

Division of Lands & Forests

**TIOUGHNIOGA
UNIT MANAGEMENT PLAN**

FINAL

Towns of Cazenovia, DeRuyter, Georgetown
and Nelson, County Madison

September 2007

NYS Department of Environmental Conservation
Region 7 Sherburne Sub-Office
2715 Route 80
Sherburne NY, 13460
(607) 674-4036

Prepared by:

Lance Clark - Senior Wildlife Biologist
Bruce Manuel - Principal Wildlife Technician
Robert Off - Senior Forester
Greg Owens - Senior Forester
David Riehlman - Senior Wildlife Biologist
Robert Slavicek - Supervising Forester - Team Leader
Wesley Stiles (Retired) - Senior Wildlife Biologist

Contributing Staff:

Donna Baddeley - Administration
Thomas Hart - Operations Supervisor I
Scott Healy - Forestry Technician
Randy Nemecek - Division of Mineral Resources
James Prunoske - Forest Ranger
Diane Bensley (Retired) - Administration



ELIOT SPITZER
GOVERNOR

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

ALEXANDER B. GRANNIS
COMMISSIONER

MEMORANDUM

TO: The Record

FROM: Alexander B. Grannis *ABG*

SUBJECT: Tioughnioga Unit Management Plan

DATE: **SEP 24 2007**

The unit management plan for the "Tioughnioga Unit" 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.

TABLE OF CONTENTS

PREFACE	i
VISION STATEMENT	ii
MAP OF UNIT	1
HISTORY	
A. Pre-Historic Period	2
B. Iroquois Confederacy	2
C. Local History	3
D. State Land History	5
INFORMATION ON THE UNIT	
A. Geography	8
B. Geology & Soils	10
C. Land Classifications & Stages Within the Unit	12
D. Wetlands & Water Resources	13
E. Forest Resources	14
F. Wildlife Resources	15
G. Fisheries Resources	17
H. Significant Plants & Plant Communities	18
I. Cultural Resources	18
J. Roads	19
K. Recreation	20
L. Other Facilities	21
M. Property Use Agreements	21
N. Mineral Resources	21
O. County & SUNY Properties	22
RESOURCE DEMANDS ON THE UNIT	
A. Timber Resources	23
B. Mineral Resources	25
C. Wildlife Resources	25
D. Fishery Resources	27
E. Recreational Resources	27
MANAGEMENT CONSTRAINTS ON THE UNIT	
A. Physical Constraints	29
B. Administrative Constraints	29
C. Societal Influences	29
D. Department Rules, Regulations & Laws	29
E. Local Laws	30
VISION STATEMENT	
GOALS AND OBJECTIVES	
I. Land Management Goal	34
Present & Objective Ecotype Distribution	35
Tioughnioga Unit Ecotype Comparisons	36
A. Ecosystem Objectives for Early Succession Stages	37
B. Ecosystem Objectives for Aquatic, Riparian & Wetland Areas	38
C. Forest Ecosystem Objectives	38
II. Public Use & Recreation Goal	50

A.	Public Use & Recreation Objectives	53
III.	Cooperative Management Goal	62
A.	Cooperative Management Objectives	62
MANAGEMENT ACTION SCHEDULES		
A.	Table of Land Management Actions	64
B.	Wood Products Harvesting Schedule	100
	Annual Summary of Acreage for Wood Products Harvesting	112
C.	Aspen Regeneration Cuts	113
D.	Non-Commercial Timber Stand Improvement	113
E.	Shrubland Releasing/Maintenance	114
F.	Open Field Creation and Maintenance	115
G.	Open Field Maintenance Schedule	116
H.	Apple Tree Release	117
I.	Construction Projects	121
J.	Forest Inventory	121
K.	Maintenance of Public Forest Access Roads	122
L.	Boundary Line Maintenance	122
M.	Boundary Line Surveys	122
N.	Forest Access Road Rehabilitation	122
BUDGET NEEDS		
123		
GLOSSARY		
126		
REFERENCES		
132		
APPENDIX I.	Wetlands on the Unit	136
APPENDIX II.	Ponds on the Unit	138
APPENDIX III.	Watercourses on the Unit	139
APPENDIX IV.	Local Laws and Ordinances	140
APPENDIX V.	Fish Stocking History of Stoney Pond (P5725)	141
APPENDIX VI.	Roads on the Unit	142
APPENDIX VII.	Breeding Species of Birds in the Vicinity of the Tioughnioga Unit..	143
APPENDIX VIII.	Occurrence of Wildlife on the Unit	152
APPENDIX IX.	Turkey Harvest Within the Unit	156
APPENDIX X.	Game Harvest Within the Unit	157
APPENDIX XI.	Beaver Populations Within the Unit	158
APPENDIX XII.	Property Taxes	159
APPENDIX XIII.	Abstracts of Codes, Rules & Regulations of New York State	160
APPENDIX XIV.	Comparisons & Contrasts Governing Wildlife Management	
	Areas & State Forests	162
APPENDIX XV.	Stoney Pond Cross-Country Ski Trail Survey- <i>Summary</i>	165
APPENDIX XVI.	Stoney Pond Camping Requirements	166
APPENDIX XVII.	Map of Stoney Pond Campground Proposed Changes	167
APPENDIX XVIII.	Present Facilities on the Unit	168
APPENDIX XIX.	Property Use Agreements	170
APPENDIX XX.	Additional Geologic Informantion on the Unit	171
APPENDIX XXI.	Tioughnioga Landscape Analysis	173
APPENDIX XXII.	Public Comments and Responses	174
APPENDIX XXIII.	SEQR Negative Declaration & Environmental Assessment Form ..	187
APPENDIX XXIV.	Maps	203

PREFACE

It is the policy of the Department to manage State forests and wildlife management areas for multiple uses to serve the People of New York State. The Tioughnioga Management Unit, comprised of three State Forests, and the Tioughnioga Wildlife Management Area is the basis for supporting a **multiple use*** goal through the implementation of specific objectives and management strategies. This management will ensure the sustainability and protection of the Unit's **ecosystems** and to optimize the many benefits to the public that these public lands provide. The multiple use goal will be accomplished through the applied integration of compatible and sound land management practices. The Tioughnioga Unit is comprised of a wildlife management area (49%) and three State forests (51%).

The Tioughnioga Unit Management Plan has been created based upon a long-range vision for the management area. Specific goals and objectives to support that vision have been based upon the rapidly evolving principles and technologies of ecosystem management. Further scientific advances are certain to occur within the 20 year projections of the Plan and could influence many of the options and activities proposed. All aspects of the Plan will be subject to a review, revision and update in 10 years. It should also be noted that factors such as wildlife population changes, wood product markets, changing social expectations, budget and staffing considerations and forest health problems may necessitate deviations from the schedule at the judgement of the Regional land managers.

The Department of Environmental Conservation, Morrisville State College and Madison County are cooperating in the development and implementation of this Plan.

Article 9, Titles 5 and 7, of the Environmental Conservation Law authorizes the Department of Environmental Conservation to provide for the management of lands acquired outside the Adirondack and Catskill Parks. Management as defined by these laws include watershed protection, the production of timber and other forest products, recreation and kindred purposes. The Draft State Forest Land Master Plan provides the overall direction and framework for meeting this legal mandate.

Article 11, Title 21 of the Environmental Conservation Law authorizes acquisition of land by the Department of Environmental Conservation for the purpose of establishing, maintaining and managing resources for public hunting, trapping and fishing grounds. By law and Department policy, such lands are used for the primary purposes of providing wildlife habitat, wildlife related research and wildlife related recreation.

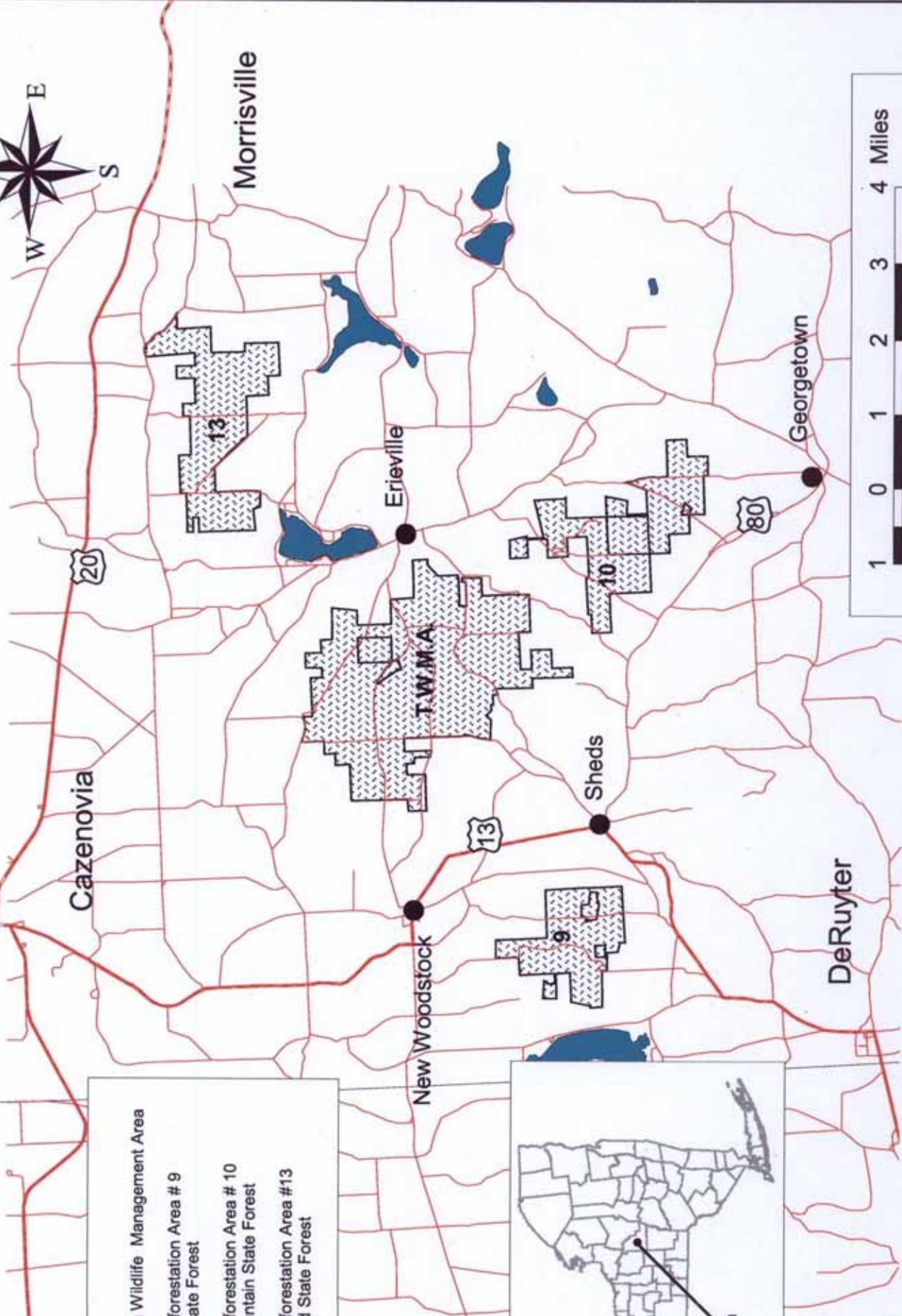
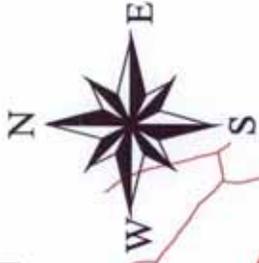
The development of the Management Action Schedules was created for the Draft plan. The majority of the actions for the years 2003 to 2006 have been completed.

***Highlighted terms are defined in the Glossary.**

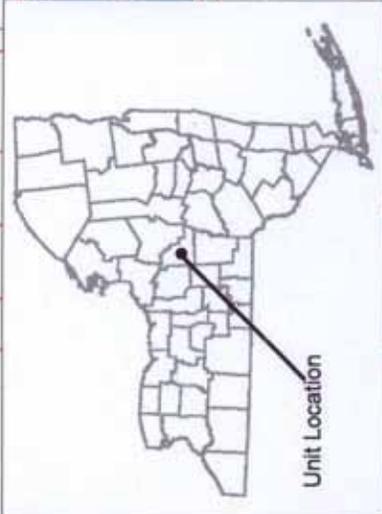
VISION STATEMENT

We recognize that the Tioughnioga Unit provides important environmental values within the changing rural landscape of Central New York. Our mission is to maintain ecological patterns and processes that support, sustain and enhance biological diversity and to provide opportunities for people to fulfill a basic human need for contact and experience with the natural world.

TIOUGHNIOGA MANAGEMENT UNIT



- T.W.M.A. - Tioughnioga Wildlife Management Area
- Madison Reforestation Area # 9 DeRuyter State Forest
- Madison Reforestation Area # 10 Morrow Mountain State Forest
- Madison Reforestation Area #13 Stoney Pond State Forest



Unit Location

HISTORY

A. Pre-Historic Period

Freely wandering bands of hunters began to penetrate northward into Central New York at the close of the last ice age. Man had become established along the major river valleys in what is now southern Ohio and southern Pennsylvania about 10,000 years ago. Around 6,000 BC a temperate deciduous forest was being established in the Northeast which set the stage for an extensive occupation by early man. Now present were deer and turkeys which were taking advantage of the rich **mast** producing forests. From 3,000 BC to 1,000 BC, hunter/gatherer groups had well adapted to the Northeast and bands would wander seasonally, following game and re-occupying past camps. Ultimately, permanent villages were established which included food storage and corn agriculture.

B. Iroquois Confederacy

By 1400 AD the Iroquois Culture was well established and included permanent villages (Ritchie, 1973). Of the Iroquois Confederacy which controlled this region of the Northeast, the Oneidas were dominant in what was to become Madison County. The Oneidas were one of five original tribes of the Iroquois Confederacy that included the Mohawks, Cayugas, Senecas and Onondagas. A sixth tribe, the Tuscaroras, joined the Confederacy in the early 18th century after migrating from North Carolina following wars with the colonists.

During the Revolutionary War, Joseph Brant, a prominent Mohawk, was responsible for organizing the Confederacy to support the British in their war with the colonists. The steady loss of tribal lands to the colonists aroused in the Iroquois a pervasive anxiety that they might one day be reduced to the circumstances of the Algonquins to the east. Brant believed that the Confederacy could co-exist with the British but the expansionist fervor of the colonists, if not subdued, would lead to the Iroquois' demise. In 1768, in exchange for "lavish" gifts and protection from colonial expansion, the six nations agreed to cede lands they claimed in New York, Pennsylvania, West Virginia, Kentucky and Tennessee to the British Crown. Increasingly, the Iroquois became dependent on a steady supply of firearms, metal implements and other goods manufactured in Europe. This relationship ultimately strengthened Great Britain's strategic advantage over the colonists. Throughout the Revolutionary War, while the Confederacy was actively engaged in combat with the colonists, the Oneidas remained neutral. Subsequently, the American campaign of 1779 led by General John Sullivan to "strike a blow for the prompt and permanent overthrow of the Indian power" spared the villages and crops of the Oneidas. In retaliation for their neutrality however, Joseph Brant mounted an expedition against the Oneidas, forcing them to take refuge in the white settlements where they remained until the close of the war in active alliance with the colonists. Despite this alliance, a treaty drawn at Fort Stanwix in 1784 resulted in the Oneidas ceding to the Federal government much of their land west of the Unadilla. Governor George Clinton subsequently acquired for the State of New York all land owned by the

Iroquois with the exception of certain reservations. By 1822, many Oneidas had moved west to Wisconsin.

C. Local History

In 1794 a road was cut from east to west across Madison County, and in 1800 another road, now known as the Seneca Turnpike, was established. Land speculation companies, led by the Holland Land Company, now acquired vast acreage in Central and Western New York State and set about selling off lots to pioneers and other speculators. The nation of Holland had backed the colonists during the Revolutionary War and viewed the expansion of this young country into the "western lands" as a way to make vast sums of money. Agents from large Dutch banks were thus sent to America to handle purchases and resale of lands. Prominent among these agents were two men that would forever change the history of Madison County and what is now western New York and Pennsylvania. Theophile Cazenove and John Lincklaen arrived in Philadelphia in 1790 and 1791, respectively. Working for the Holland Company, Cazenove and Lincklaen set about purchasing and reselling vast amounts of land in New York State. In the summer of 1791, Lincklaen and another young Hollander by the name of Boon, set out on horseback to undertake an 800 mile journey to inspect lands in the interior. They traveled from Philadelphia to Owego and on to Canandaigua. From there they went east to Cooperstown and finally to Albany. Lincklaen spent the next 30 years selling land and encouraging development from Holland Company offices in what is present day Cazenovia.

The first white settlers occupied the hills as the lowlands were ill-drained and boggy and many believed the heights were less liable to frosts. Farming in Madison County was mostly tillage with large yields of potatoes and grain. Flax was grown, as were hops. Sheep were raised for wool. Dairying came in vogue gradually, spurred on by the Erie Canal (1825) which opened up grain lands to the west. The underground railroad, which spirited escaped slaves from the southern states to Canada existed in Madison County as revealed by an underground "hiding" room unearthed near the village of Eaton.

1. Town of Georgetown

Georgetown was formed from DeRuyter on April 7, 1815. Its name was chosen as a suggestion from the New York State Legislature after Washington, the residents' first choice, had been taken by a town in Dutchess County. The town is a hilly upland, broken by the Otselic River valley, which drains in a southerly direction. A portion of the headwaters of the Tioughnioga lie in the northwest corner of the town.

The history of Georgetown divides itself into four periods. First was the period of the pioneers, extending from 1804 to about 1825. Second was the period of transition or the passing of the log cabin and the entrance of the frame building which lasted from 1825 to about 1870. The third period was highlighted by the growing of hops which peaked between 1870 and 1890. The fourth period continues to this day with dairying the dominant agricultural enterprise.

The first settlement was made in 1804 by a man named Ezra Sexton of Litchfield, Connecticut. Sexton had served in the Revolutionary War as a captain in a militia company. Population and settlement steadily grew until by 1875, of the town's 23,770 acres, over 16,000 acres had been cleared or otherwise improved. Eleven school districts were established with over 350 students attending. Georgetown furnished 150 men to aid in the suppression of the rebellion (the Civil War).

The primary means of making a living in Georgetown was through agriculture, local retail business, milling, tanning and cheese manufacturing. Early farmers used sheep extensively as their presence helped keep down briars which would try to occupy newly cleared fields. After the Civil War, hop farming proved very profitable until a fungal disease, blue mould, and competition from western states forced a change to dairying. From numerous small farms to today's large dairies, Georgetown continues to evolve to an economy based on the pursuit of rural living and recreation.

2. Town of DeRuyter

DeRuyter was formed from Cazenovia on March 15, 1798, and was named at the suggestion of John Lincklaen for Admiral DeRuyter of the Dutch navy. DeRuyter's surface is a hilly upland, broken by the valley of the Tioughnioga. The town is abundantly watered by this stream and its many tributaries which flow in a general westerly direction. DeRuyter Reservoir was constructed in 1863 as a feeder to the Erie Canal. At one time there were nine common and one union free school districts in the town providing instruction for 420 students.

There were deep, forested valleys here in 1793 and 1794 when the town's first settlers, Elijah and Elias Benjamin from Dutchess County and Eli Colegrove from Rhode Island built homesteads here. What is now East Lake Road became the main route to Cazenovia and points north.

Saw and grist mills were constructed along the numerous streams of the town with some of these being converted to cheese factories. Tanning, soap and candle manufacturing were main enterprises for DeRuyter throughout the 19th Century. As this town also shifted its main economy to dairying, an interesting evolution occurred. The dairyman's unending search for replacement cows to keep his farm producing milk led to the formation of an association which bred and promoted the use of Holsteins. Well known in Holland for two thousand years, this breed adapted to New York State and is still indeed dominant on working dairy farms to this day.

3. Town of Nelson

Nelson was formed from Cazenovia on March 13, 1807, and named for Lord Nelson, the distinguished British Admiral. The town occupies a part of the elevated ridge which forms the watershed between the streams flowing north to Oneida Lake and south to the Susquehanna. The Erieville Reservoir, which covers an area of 340 acres, was constructed in 1850 as a feeder for the Erie Canal. There were fifteen common school districts in the town serving at one time 449 children.

Nelson was originally patented to Alexander Webster in 1793 but was purchased that same year by Colonel Lincklaen under whose auspices the settlements were made. Most of the town's earliest inhabitants came from Vermont and New Hampshire. Coopers, blacksmiths, mill operators, cobblers and all the other trades were well represented in the town of Nelson as it developed through the 19th Century. In 1807, as a town government was formed, ten dollars was voted on at a town meeting to be given to Jeremiah Clark for his services in attending the Legislature in connection with the formation of the town.

Sheep farming was an important part of early Nelson agriculture and in 1809 a tax of \$0.25 was imposed on every man who kept a dog; with the proceeds to be applied to the purchase of a Merino ram for the use of the inhabitants of the town. At the same time a bounty of \$20 in addition to the State bounty was voted for every wolf killed in the town. Protecting the sheep flocks of early Nelson was serious business.

Today, Nelson maintains strong ties to her agricultural past, yet in some ways, she has lapsed into a quiet, rural repose. In fact, one town settlement, 'Argos', has completely disappeared. Yet, like many other rural towns, Nelson remains as a buffer to the hurly-burly of urban life.

4. Town of Cazenovia

Cazenovia was formed from Whitestown and Paris, March 5, 1795, and derives its name from Theophilus Cazenove, the first agent of the Holland Land Company. The town is a rolling upland broken by the deep and rugged valleys of Chittenango and Limestone Creeks. Cazenovia Lake forms a reservoir for the Erie Canal, for which it was brought into service in 1867. There were fifteen common and one Union school districts in the town which served over 1,000 students during the late 19th Century.

Due to its many miles of cascading streams, numerous mills were erected to serve the burgeoning lumber and agricultural industries. Lying in the center of transportation for a developing state, highways and several rail lines added to the growth of this town. In 1803, the "Cherry Valley Turnpike," now U.S. rte. 20, was started and proved to be a boon to the development of the town. Chittenango Creek, flowing north to Oneida Lake, provided the site of many industries including milling and garment manufacturing. But by the 1930s manufacturing in all but a few of the mills had ceased and most of the buildings razed. Again, as with the other towns we have discussed, Cazenovia turned to agriculture as its primary economic force. But in recent times Cazenovia, more so than Nelson, DeRuyter and Georgetown, developed into a bedroom community for the City of Syracuse. And to this day, the landscape of the town of Cazenovia continues to sprout homes intimately tied to the economy of the Syracuse Metropolitan Area.

D. State Land History

The forest lands outside the Adirondack and Catskill regions owe their present character, in large part, to the impact of pioneer settlement. Following the close of 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 history, purposes and legal framework differ subtly between State forest land and Wildlife Management Areas.

The State Reforestation Law of 1929 and the Hewitt Amendment of 1931 set forth the legislation which authorized the Conservation Department to acquire land by gift or purchase for reforestation areas.

The State Forest properties are 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." This broad program is authorized under Article 9, Title 5 of the 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) was begun. Thousands of young men were assigned to plant millions of trees on the newly acquired State lands. In addition to tree planting, these men were engaged in road and trail building, erosion control, watershed restoration, forest protection and other projects.

CCC Camp S-103, located in DeRuyter, was established in 1935 and closed in 1937. The Camp was reoccupied in 1939 and was permanently closed on October 31, 1941. Recruits from Camp S-103 were responsible for reforestation and truck trail construction within the Unit, and in 1939 erected the 67' Georgetown Hill firetower and observation cabin. The tower was dismantled in the late 1970s. In 1971, a 100' guyed tower and a 8'x8'x14' metal building were erected atop Georgetown Hill to support the New York State Police radio network.

Like State forests, Wildlife Management Areas have a varied history of acquisition. Article 11, Title 21 of the Environmental Conservation Law authorized acquisition of land by the Department of Environmental Conservation for the purpose of establishing and regulating use of, and managing resources of public hunting, trapping and fishing grounds.

Many of the State's Wildlife Management Areas were gifted to New York State by the Federal Government or other cooperating public or private organizations. Some parcels were purchased with Environmental Bond Act funds or Federal Aid in Wildlife Restoration Program funds.

While the State of New York was acquiring properties for public hunting, trapping and fishing grounds in the 1930s, the Federal government was also purchasing land from individuals under the Federal Resettlement Administration and leasing them to the

states to manage.

The Tioughnioga Wildlife Management Area was acquired in 1937 via a 99 year lease from the Federal Resettlement Administration. This agency had purchased properties from individual owners primarily during the Depression years of the 1930s. In 1964, the lease was canceled and full title was transferred to the New York State Conservation Department.

When purchased by the Federal government, the Tioughnioga WMA was 1/3 pasture, 1/3 cropland and 1/3 wooded. Early development work was to plant open fields to trees and shrubs. A management plan was developed shortly thereafter, with the goal of "maintain a cover pattern that will meet the year round requirements of resident wildlife, the most important of which are deer, grouse, cottontails, and squirrels, with some varying hare, woodcock and ducks. This is coupled with the desire to facilitate an orderly, adequate harvest by providing the necessary access roads, trails and parking spots."

During the war years of 1941-45, very little was accomplished on the State lands. However, through postwar funding, conservation projects once again received needed attention. The Parks and Recreation Land Acquisition Act of 1960 and the Environmental Quality Bond Acts of 1972 and 1986 continued provisions for the acquisition of State lands. These lands would serve multiple purposes involving the conservation and development of natural resources, including the preservation of scenic areas, watershed protection, forestry, wildlife management and recreation.

Today there are 700,000 acres of State forestland and 300,000 acres of Wildlife Management Areas throughout the State. The use of these lands for a wide variety of purposes such as timber production, hiking, skiing, fishing, trapping and hunting is of tremendous importance economically as well as to the health and well-being of the people of the State.

More recently, in response to increased recreational demand on the unit, a number of facilities were established on Stoney Pond State Forest including a campground and day use area, fishing and boat access and thirteen miles of Nordic ski trails.

Numerous wildlife management activities have been put into practice on the WMA over the past three decades. Some examples include the creation of grasslands as well as their maintenance. Wetlands and associated impoundments have been managed and rehabilitated to improve habitat for numerous wildlife species. Early successional habitats have been created and maintained through clearcutting and the use of prescribed burns. The release of apples to maintain their wildlife values as a food source has been extensive as a result of cooperation with public and private agencies. Many population surveys have been undertaken on the WMA covering studies on biodiversity, breeding birds and reptiles and amphibians.

INFORMATION ON THE UNIT

A. Geography

The Tioughnioga Unit is located within the southwestern Madison County townships of Cazenovia, DeRuyter, Georgetown and Nelson. This landscape is a mosaic of forest and open fields where visual patterns are defined as much by topography, vegetation and climate as by a common history of forest clearing and regrowth. Second and third growth forest dominate the upland sites while open fields, farms and residential areas occupy much of the valley floors. State Highways 13, 80 and 26, together with a network of county and town roads, link the Villages of Cazenovia, Georgetown and DeRuyter with the smaller hamlets of Sheds, Erieville and New Woodstock. These communities support a number of schools, churches, libraries and other cultural institutions and are the centers of local social and economic activity.

The 2000 census reveals that the population of the four townships is 10,923 with fifty nine percent residing within the Town of Cazenovia. On a more local level, population data reveals that the area defined by much of Nelson township, the southern portion of Cazenovia township, and the northern portions of DeRuyter and Georgetown townships has a population density of 45 people per square mile, well below the County average of 105 people per square mile.

While population data provides information on local demographics, county tax rolls reveal a changing pattern of land ownership. **Parcelization**, whereby private properties are subdivided into smaller units, is increasing throughout the region. Between 1988 and 2000 there was an 18% increase in the number of parcels in the four townships with the largest increase occurring in Georgetown where 28% more parcels were added to the tax rolls. Trends in parcelization appear to be driven by residential subdivision and increasing demand for vacation properties or second homes. A number of new residential subdivisions have been built or are planned for Cazenovia and Nelson and many parcels along state and county highways throughout the four townships have been developed for residential use. Furthermore, as much as 50% of parcels in remote forested sections of the four townships are currently owned by individuals with permanent addresses outside of Madison County, suggesting that land ownership is for leisure or other recreational pursuits. The process of parcelization has introduced new features and activities into the landscape that have changed both the configuration of land ownership and perhaps, more importantly, how people use and value natural resources.

Madison County agricultural statistics indicate that for the ten year period ending in 1997 approximately 29,000 acres of farm land went out of production and during the same period the County's dairy herd was reduced by 24%. Traditional agricultural land uses are shifting to ones that focus on occupancy and amenity values resulting in observable changes in landscape character. As roadside pastures and cropland are

transformed into building lots there is a corresponding increase in the number of houses, utilities and paved surfaces while on remote sites, in the absence of plowing and grazing, open fields are replaced by shrub land and young forest. On forested parcels, woodlots formerly harvested to supplement farm income are now valued by absentee owners for wildlife habitat or as "rural retreats."

Together, these landscape-level changes have the potential of impacting State land management in many ways. With a shift in land use, there is a corresponding change in cover type, habitat characteristics and scenic quality. Such changes have the potential of impacting the frequency and distribution of wildlife populations. Changing demographics and land ownership patterns may shift public use and expectations of State lands, creating increased demand for outdoor recreational facilities, greater emphasis on visual quality or the need to improve public awareness about natural resource management. Furthermore, as the rate of township-wide parcelization has increased, State lands within the Tioughnioga Unit have emerged as the largest properties under single ownership. This phenomena suggests the need for a management program focusing on those resources that are increasingly scarce within the larger, more parcelized, private landscape.

The four State properties within the Tioughnioga Unit are located on upland sites ranging in elevation from 1,460' along Limestone Creek in the Wildlife Management Area to 2,142' within Morrow Mountain State Forest. The latter site is also the highest elevation in Madison County. Climatic conditions can vary dramatically between upland sites and other locations within the region but data recorded at Morrisville, elevation 1,327', reveals that average temperatures range between 21 degrees F in winter and 60 degrees in summer. Annual precipitation averages 37.84 inches and the average annual snowfall is 110.3 inches.

Sixty-two percent of the Unit is located within Nelson Township with Georgetown, DeRuyter and Cazenovia each having 18, 13 and 7 percent of the total acreage respectively.

The following table is a summary of the four separate properties within the Unit, their acreage and percentage of the total land area within each township.

State Land	Forest #	Acres	Cazenovia	DeRuyter	Georgetown	Nelson
DeRuyter S.F.	9	972	51	921	0	0
Morrow S.F.	10	1290	0	0	1248	42
Stoney Pond S.F.	13	1469	0	0	0	1469
Tioughnioga W.M.A.		3675	423	0	137	3115
TOTAL		7406	474 (6%)	921 (13%)	1385 (18%)	4626 (62%)

B. Geology and Soils

The Tioughnioga Unit is located within the Allegheny Plateau physiographic province, a large upland area extending throughout much of south central and western New York State and into the northern portion of Pennsylvania. The "high" plateau of southern Madison County is characterized by large, rounded, bedrock-controlled hills and ridges. Hilltops are nearly level and, because of glacial scouring of stream channels and valley floors, the upland plateau has a rugged and rolling appearance.

Geologically, Madison County is underlain by bedrock that includes Pre-Cambrian Era age rocks comprised of igneous and metamorphic type rocks. These rocks are generally referred to as basement rocks and are found at depths greater than 5,000 feet. (More geologic information appears in Appendix XX)

The majority of soils occurring on the Unit were formed in glacial till derived from local sandstone, shale and siltstone and have a brittle subsurface horizon know as a fragipan. A fragipan is an extremely dense layer of compacted soil that tends to restrict water movement and root development. The Mardin-Volusia and the Volusia-Chippewa associations are most representative of the soils occurring on the Unit. The Mardin series consists of deep, moderately well drained to poorly drained soils that occur on gently rolling to moderately steep slopes. These soils have a seasonal high water table that is perched above the slowly permeable fragipan layer during spring and other wet periods. The Volusia series consists of somewhat poorly drained soils that occur on nearly level ground. With a fragipan layer at a shallower depth than the Mardin series, Volusia soils tend to be saturated for longer periods of time. The Chippewa series are

deep and poorly drained soils that occur on nearly level ground and in low areas. They have a water table near the surface resulting in prolonged seasonal wetness and severe limitations for agriculture and other land management activities.

In addition to the dominant soil associations, a limited acreage of the Unit is occupied by Stockbridge, Stockbridge-Bath and Lordstown soils. The Stockbridge series consist of deep, well drained soils on gently sloping to moderately steep slopes and valley sides. A seasonal high water table occurs for very brief periods in the spring and rooting depth is generally unrestricted. Bath soils are deep and well drained and occur on hilltops and the upper parts of hillsides. They have a fragipan at a depth of 26"-36" which tends to impede root penetration but not to the extent of Mardin, Volusia and Chippewa series. Lordstown soils are deep and well drained and in the absence of a fragipan, they do not have a seasonal high water table or any severe limitations on root development.

Although soil description provides information on surface and subsurface characteristics, above ground conditions reveal much about land use history and ecological complexity. For example, the relatively smooth surface condition observable within most plantation sites is due to repeated plowing and cropping prior to reforestation in the 19th and early 20th centuries. These soils typically have a well defined plow layer and many properties such as porosity and the availability of nutrients have been altered from pre-settlement conditions. Stones and other impediments to plowing and planting have been removed and decades of cultivation have created a nearly level ground plane condition. Unplowed forest soils, in contrast, have an undulating character with a well developed hummock and hollow micro topography. The hollows are created when trees are wind thrown, while hummocks are the decayed and toppled remains of the tree's root system. Partially decomposed logs, branches and other **coarse woody debris** contribute further to the structural complexity of the forest floor providing habitat for insects, fungi and a diversity of other organisms. Furthermore, coarse woody debris contributes to nutrient recycling (the moving of nutrients from wood to the soil), **mycorrhizae** production and, with its capacity to store large amounts of water, acts as a reservoir during periods of prolonged drought.

C. Land Classifications and Stages Within the Unit

Table I
Present Land Classification, Acreage and
Size Class Distribution

Land Class.	Acres	1-5" DBH* Acres	6-11" DBH Acres	12"+ DBH Acres	% of Total
Ponds	77				<1
Open	204				3
Shrub	521				7
Wetland	277				4
Mixed Hdwd/Conifer	486	6	247	233	7
Natural Hdwd.	2764	573	1599	602	38
Shale pit	7				<1
Roads	82				1
Conifer Plantations	<u>2978</u>	<u>190</u>	<u>2387</u>	<u>203</u>	<u>40</u>
Totals	7406				100

*DBH means Diameter (measured at) Breast Height

The above data was compiled from existing inventory records. The land classification categories are explained as follows:

Shale pits are un-vegetated, disturbed sites where material has been extracted, providing surfacing material for infrastructure needs.

Ponds are man-made impoundments for enhancing wildlife habitat and providing recreational opportunities.

Open lands are essentially treeless and contain varying mixtures of grasses, brambles and forbes.

Shrublands are early successional communities commonly containing shrubs, apple and thornapple trees along with scattered openings.

Wetlands range from open wet meadows to wooded swamps.

Mixed natural hardwood/natural conifer stands contain trees that have been established without human intervention and are composed of at least 10% eastern white pine or

eastern hemlock in mixture with natural hardwoods.

Natural hardwood stands contain some planted hardwoods, but consist mostly of trees established without human intervention but consist entirely or nearly entirely of hardwood species such as sugar maple, red maple, beech, white ash and black cherry. Conifer plantations contain trees which have been established by hand or mechanized planting and are composed of species such as red, white and Scotch pines, Norway or white spruce, Douglas fir and larch.

Detailed information about vegetative communities can be found in the Department of Environmental Conservation publication Ecological Communities of N.Y.S. by Carol Reschke.

D. Wetlands and Water Resources

The Unit's dominant hydrological feature is the divide that exists between the Ontario-St. Lawrence and the Susquehanna drainage basins. In the northern portion of the Unit, tributaries to the Chittenango and Limestone Creeks discharge water into the Ontario-St. Lawrence drainage basin while to the south and east, tributaries to the Chenango, Otselic and Tioughnioga Rivers are part of the Susquehanna River drainage basin which ultimately feeds the Chesapeake Bay. Another important hydrological feature of the larger landscape within which the Unit is located are the various impoundments constructed in the 19th century to maintain water levels in both the Erie and Chenango Canals. While these canals no longer exist, DeRuyter, Tuscarora and Eaton Reservoirs are three of the largest impoundments that today provide year-round recreational opportunities and habitat for fish and migratory waterfowl.

Within the Unit, Stoney Pond is the largest body of water. It was constructed in the 1960s using Federal wildlife funds and has since evolved into an important regional recreational resource for boating and fishing with nearby facilities for camping and cross country skiing. Stoney Pond has a surface area of 44 acres and a maximum depth of 11 feet. The pond has an irregular shoreline, several islands and peninsulas which are beneficial for spawning and rearing resident fish. The islands and peninsulas also provide holding areas (structure) for adult fish and subsequently, good areas to fish.

In New York State, wetlands qualify as legally protected if they meet the criteria found in Section 24-0107 (1) of the Freshwater Wetlands Act, are locally significant or occupy at least 12.4 acres of surface area. The Act establishes four separate classes that rank wetlands based on their ability to perform specifically defined wetland functions and benefits. Class I wetlands have the highest rank and the ranking descends through classes II, III and IV. The Tioughnioga Unit contains 77 acres of one Class II wetland located on Madison #13. In addition to the one classified wetland, 210 acres of non classified open and forested wetlands are located within the Unit. While these wetlands provide important ecological benefits and are off limits to silvicultural treatments and other intensive management activities, they do not meet the regulatory criteria necessary for statutory protection. Appendix I lists the protected and unprotected

wetlands on the Unit.

The New York State surface water classification system, regulations and accompanying authority are found in the Environmental Conservation Law (ECL), Sections 15-0303 and 17-0301. Classification of streams and other surface waters are made in accordance with consideration of their best uses and any discharge shall not cause impairment of the best uses at the location of discharge and at other locations that may be affected by such discharges. The Codes, Rules and Regulations of New York State (6NYCRR Part 701) lists eight classes of fresh surface waters with corresponding best uses. The Tioughnioga Unit has 11.8 miles of Class "C" streams with fishing identified as the best use. Class "C" streams shall have waters suitable for fish propagation and survival and, although factors may limit such uses, water quality shall also be suitable for swimming, boating and fishing. In addition to the classified streams located on the unit, 435 acres of adjacent land have been designated as riparian protection areas where active management is restricted. The purpose of this designation is to limit stream-side soil disturbance, protect riparian vegetation and enhance overall watershed quality.

E. Forest Resources

The dominant forest cover on the Unit consists of northern hardwoods and **conifer plantations**. Forty-one percent of the Unit is in plantation cover. Northern **hardwoods** are native throughout much of New York and include several distinct forest cover types. The sugar maple-beech-yellow birch type (Berglund, 1980) best describe local northern hardwood conditions with sugar maple the dominant component in most stands. The majority of stands have experienced some level of past human disturbance. These disturbances range from forest conversion to agricultural fields and subsequent regrowth to less intensive disturbance associated with selective cutting, fire and livestock grazing. Within this cover type, associated species include white ash, red maple, black cherry, basswood and hemlock, and, depending on land use history and site characteristics, any one of these trees can represent the majority of stand stocking. Best development of the sugar maple-beech-yellow birch type occurs on moist, well drained loamy soils while on wet sites a mixture of red maple-yellow birch-hemlock is more common. Pure stands of hemlock often occur on wet sites, along riparian zones and within steep ravines and gullies. In addition to tree seedlings, understory vegetation include serviceberry, eastern hophornbeam, striped maple, viburnums and witch hazel. Reschke (1990) identifies blue cohosh, Christmas fern, jack-in-the-pulpit, white baneberry, wild leek, wild ginger, false Solomon's seal and bloodroot as characteristic groundlayer species.

Conifer plantations were established throughout the Unit on former agricultural land, primarily during the 1930s but with additional acreage planted since that time. Even-aged monocultures best describe conifer plantations with more than 90% of the stocking in one species. Red pine and Norway spruce are the dominant plantation

types, however there is significant acreage in white spruce and Scotch pine. Other plantation types include European larch, Japanese larch, white pine, jack pine, Douglas fir and mixed stands including a limited acreage of conifer species planted with red oak. Reschke reports that groundlayer vegetation is limited to speedwell (*Veronica officinalis*) but depending on silvicultural treatments and other stand-level disturbance, both understory and groundlayer vegetation can include a diversity of trees, shrubs and herbaceous vegetation. In particular, existing conditions in red pine plantations demonstrate the increased diversification in both species composition and stand structure that have resulted following fifty years of silvicultural treatments. Richards (1994) suggests that "if it is desirable to maintain a red pine component in the (Allegheny Uplands) landscape for various resource values, this may be most easily done by conserving existing plantations through conservative treatment over relatively long rotations; more in keeping with the ecological characteristics of this species."

F. Wildlife Resources

The Tioughnioga Unit lies in the Central Appalachian sub-zone of the Appalachian Plateau physiographic zone (Dickenson, 1983). The many hills and valleys of the region form a rolling topography. In pre-colonial times most of the unit would have consisted largely of unbroken woodlands. By 1900, over 75% of the land had been cleared for agricultural uses after which the abandonment of marginal farm lands, which continues today, resulted in the reforestation of much of the area. Presently 66% of the landscape is in forested condition.

The dramatic shifts in cover types over the last 200 years, along with other human influences, resulted in shifts in the wildlife common to the area. Species which occurred in the pre-colonial forests, such as wolves and cougars, have lost their place, whereas other forest dwelling species lost during the 1800s, such as turkeys and squirrels, have been able to return. Grasslands species that gained an advantage during the 1800s, such as bobolinks and meadow larks, gradually declined during the 1900s and species that thrived as farmlands turned to shrub land, such as the cottontail rabbit, have suffered as additional land transitions to forest.

The future seems to hold promise for woodland species not dependent on extensive unbroken forests and lesser promise for species dependent on open or shrub land, particularly those dependent on sizeable areas of these early successional stage habitats. Even as the area continues to reforest to some degree, forest fragmentation resulting from parcelization of properties and new housing will impact the quality of these forests from a wildlife perspective. Species with small home ranges may do well, but species with large home ranges, those dependent on large contiguous tracts of forest cover and those sensitive to human disturbance, will not.

No comprehensive wildlife surveys specific to the state properties in the Unit have been conducted. However several projects have collected data which lend themselves to

developing likely species lists for this Unit. Chambers' handbook, Integrating Timber and Wildlife Management (1983), also provides a useful reference as to mammals, birds, reptiles and amphibians which may occur in this physiographic zone and for different forest types and stages.

The Atlas of Breeding Birds in New York State (1988) based on survey work conducted from 1980-1985 provides data on birds known or suspected of breeding in the area. Data on possible, probable, and confirmed breeders is recorded based on 10 x 10 km surveys blocks. A review of blocks which cover the Unit resulted in a list of bird species likely to be found on these State lands. (See Appendix VII)

Field survey work for The New York State Amphibian and Reptile Atlas Project was completed in 1998. This survey provides data on the occurrence of reptiles and amphibians by USGS quad sheet. A list of species likely to occur on this Unit was developed by reviewing data for those USGS quads which cover or lie adjacent to this Unit. (See Appendix VIII)

In the early 1980's wildlife surveys were conducted on several of Region 7's Wildlife Management Areas. Though the Tioughnioga WMA was not surveyed, the Pharsalia WMA which lies in the same physiographic zone approximately 12 miles to the south was. The mammal species list developed for the Pharsalia WMA provides a useful reference for species likely to occur within this Unit. (See Appendix VIII)

New York's Natural Heritage Program conducted a biodiversity survey of the Tioughnioga WMA in 1995-96. A review of historical records and field work sought to identify rare plants, rare animals and significant ecological communities. This work did not identify any rare, threatened or endangered wildlife species on the area.

A great deal of work has been done researching the needs and status of Neotropical migrant birds. Three broad suites of birds species; grasslands, shrubland and forest are recognized. The grassland species are considered the most at risk with shrubland species second and forest species least at risk. The predominating forest cover in the Unit would indicate these risk levels apply here.

Wildlife management activities strive to provide several benefits. Creating and maintaining habitats suitable for diverse species, with an emphasis on species known to have limited or declining habitat is a key goal. On the WMA, in keeping with the basis for its acquisition, an emphasis is also placed on game species, including deer, turkey and grouse. Wildlife management commonly involves efforts to protect habitats such as wetlands and riparian areas and to create and maintain early successional stage habitats. Mowing, prescribed fire, clearcuts and apple tree releases are a few of the techniques used to provide a diversity of habitats on State land. Wildlife management practices also serve to create demonstration areas which show individuals ways to benefit wildlife on their own property.

G. Fisheries Resources

There are 10 miles of streams on the Unit, of which 7.7 miles are protected (ECL Sections 15-0303 and 17-0301), and 2.3 miles are unprotected. Protected status was given to streams which sustained trout or were considered to be suitable for trout when first surveyed in the early part of the 20th century.

Past fisheries surveys and other information indicate small but fishable populations of wild brook trout may exist in the following streams located within the Tioughnioga Wildlife Management Area. Information in parenthesis catalogues a stream into a drainage basin. In the Unit, water follows into Lake Ontario (Ont) or the Susquehanna River (SR).

1. Limestone Creek East Branch (Ont-66-11-P26-37-6-2) beginning one half mile downstream from the source.
2. Chittenango Creek tributary (Ont-66-P26-37-47-4) which originates just north of Tinsley Hill Road.
3. Tioughnioga River East Branch tributary (SR-44-14-59-37-3) along Dugway Road.
4. Tioughnioga River East Branch tributaries (SR-44-14-59-37 and 37-5) just east of Corkinsville Road.
5. Otselic River tributary (SR-44-14-27-63) originating just east of Mayerle Road.

Past surveys have revealed the presence of several fish species other than trout. Following is a list of fish species collected or observed during stream surveys within the Tioughnioga Wildlife Management Area. Wild brown trout have been collected in Limestone Creek East Branch downstream from the management area's west boundary.

Brook trout	<i>Salvelinus fontinalis</i>
Slimy sculpin	<i>Cottus cognatus</i>
Blacknose dace	<i>Rhinichthys atratulus</i>
Longnose dace	<i>Rhinichthy cataractae</i>
Creek chub	<i>Semotilus atromaculatus</i>
White sucker	<i>Catostomus commersoni</i>
Redside dace	<i>Clinostomu elongatus</i>
Common shiner	<i>Notropis cornutus</i>

A small impoundment (SR-P5720) located at the AT&T right-of-way in the eastern part of the management area may support populations of warm-water fish.

Initially, Stoney Pond was managed as a trout fishery. The Pond was first stocked in November 1960 with young wild rainbow trout from Grout Brook. Stocking continued with domestic rainbow trout, brook trout and brown trout continued through the early 1970's. However, low dissolved oxygen at depths required by trout coupled with growing populations of competing fish led to the termination of trout stocking by about 1975.

Today, Stoney Pond offers excellent fishing opportunity for largemouth bass, chain pickerel, sunfish and brown bullhead. Largemouth bass up to 17.5 inches in length and chain pickerel up to 21.6 inches in length were collected during the last Stoney Pond electrofishing survey carried out on June 13, 1979. Following is a list of fish species collected during that survey.

Largemouth bass	<i>Micropterus salmonides</i>
Rock bass	<i>Ambloplites rupestris</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Chain pickerel	<i>Esox niger</i>
Brown bullhead	<i>Ictalurus nebulosus</i>

H. Significant Plants and Plant Communities

Rare plants and plant communities have been systematically surveyed by New York's Natural Heritage Program on Tioughnioga Wildlife Management Area (New York Natural Heritage Program, March 1998). One significant community, a one acre rich sloping fen, was found. In New York State there are fewer than 20 occurrences of a rich sloping fen.

A rich sloping fen is a small, gently sloping **minerotrophic** wetland with shallow peat deposits that occurs in a shallow depression on a slope composed of calcareous glacial deposits. Sloping fens are fed by small spring or groundwater seepage. The structure of the community is variable, usually there are scattered trees and shrubs and a nearly continuous ground layer of plants and ferns.

No other rare plant communities or rare, threatened or endangered plants have been identified on this management Unit.

I. Cultural Resources

The New York State Archeological Site Index Map indicates that there are no sites within the Unit that are protected under the Archeological and Historic Preservation Act. However, using a broader definition of the terms culture and resources reveals that contemporary landscape conditions are the result of an historic and ongoing relationship between people and nature. Culture is a pattern of shared living that emerges from the unique character of a particular locale: its climate, soils and

vegetation. Cultural resources are those landscape features, such as farm sites, canals, field systems, plantations, vernacular architecture and even contemporary roadside developments, that provide us with meaning about the relationship between people and nature. Landscape is a visual manifestation of this relationship and it offers clues about both historic patterns of living and contemporary culture. As the geographer Peirce Lewis (1979) writes “all human landscape has cultural meaning” and “the ordinary run of the mill things that humans have created and put on the earth - provides strong evidence of the kind of people we are, and were, and are in the process of becoming.”

The 1875 Atlas of Madison County reveals that in addition to the mills, schoolhouses and graveyards, the Tioughnioga Unit was the location of numerous farms and estates that were part of the region’s dominant agricultural economy. Evidence of late 19th century society can be found in the cellar holes, stone walls, orchards and abandoned lanes that are located throughout the Unit. Together, these ordinary features represent cultural activity in response to the soils, climate and vegetation of a particular place. The transformation of natural elements by human labor is expressed in a cultural landscape and the interpretation of such landscapes provides us with meaning about historic relations between people and nature. The processes of forest clearing, abandonment and regrowth reveal both the ecological resilience of the native forest and the economic and social conditions that prevailed in 19th century New York.

Although cultural resources are often associated with historic and pre-historic features, contemporary culture is revealed in the condition of today’s landscape. Similar to 19th century farm sites, the organization of a modern dairy facility with its free stall barn, silage bunkers and large acreage under cultivation tell much about the current agricultural economy. Land parcelization, manufactured housing and cell phone towers are characteristic of the contemporary cultural landscape and depict patterns of living in the 21st century. Within the Tioughnioga Unit a clearly identifiable cultural landscape has emerged following large scale reforestation efforts of the early 20th century. Plantations of spruce and pine identify State land as a place distinct from private property and at the same time reveal an important period in the history of American conservation. Furthermore, the network of trails and other recreational facilities can be interpreted as cultural resources in that they provide evidence of how a segment of contemporary society chooses to experience nature.

J. Roads

The State forest road system provides for both public and administrative access to State lands. There are three types of roads that the DEC administers: public forest access roads, haul road and access roads. Some public forest access roads and access roads on the WMA are gated from mid-December to late April to prevent road degradation. Other roads are gated and provide access only for wildlife management program purposes.

Public forest access roads are constructed to standards that will provide reasonably safe travel and keep maintenance costs at a minimum. These dead-end roads are not normally plowed or sanded in winter. The maximum speed limit is 25 mph. Appendix VI lists these roads and their mileage on the Unit.

Access onto the Tioughnioga Wildlife Management Area is provided by two county highways: Dugway and Damon Roads. Additional access is provided by a series of town roads within or adjacent to the Wildlife Management Area.

State forests on the Unit are accessed by town roads within their respective townships. Additional access is provided by the public forest access road system.

Town roads that are no longer maintained include qualified abandoned roads and abandoned roads. When a road is designated as "qualified abandoned" by the town government with jurisdiction over that roadway, all town maintenance on that road ceases. The roadway will then be removed from the public highway system, but the public right-of-way is not extinguished. Access and maintenance are then the responsibility of the adjacent landowner(s). Records of official abandonment status by the towns are often difficult to find, if they exist at all. Any abandoned town roads that are completely within State ownership on this Unit have been fully abandoned over the years.

A list of abandoned town roads within the Unit can be found in Appendix VI. These roads can be upgraded by the Department for access purposes.

K. Recreation

A broad range of outdoor recreational opportunities exist on the Unit, including developed facilities for camping, boating, cross country skiing and remote sites for hunting, biking or simply observing the natural world.

A focus of recreational use on the Unit is Stoney Pond State Forest where 14 designated campsites, a day use area, 13 miles of marked cross country ski trails and boat access onto the 44-acre pond provide opportunities for year-round recreation. The Forest also receives relatively heavy use from mountain bikers who utilize the network of trails for their recreational pursuits.

Hunting is an important use throughout the Unit. The greatest number of hunter days occur during the regular deer season, but there is also ample use during the archery deer season and during the late muzzleloader deer season. Additionally, since small game hunting is still pursued by many license holders, there is undoubtedly a substantial amount of small game hunting on the Unit, especially during the spring and fall turkey seasons. While there are no exact figures for other small game species, we can assume that some hunters find enjoyment pursuing squirrels, grouse, rabbits and

various furbearers.

Wildlife viewing is a pursuit that should also not be overlooked, as this outdoor activity is practiced by many people who expend a great deal of money in our increasingly suburban/urban society (New York wildlife-related recreation survey 2001, USF&WS). This can be of a passive nature (i.e. a Sunday drive through the forest) or of a more active type such as active birders trying to add species to their life lists.

Fishing opportunities on the Unit are available at Stoney Pond, along nearly 12 miles of classified trout streams, and in numerous smaller impoundments within the Wildlife Management Area. Outside the Unit, there are additional public fishing opportunities on many of the former canal reservoirs and along classified streams where the State has acquired easements for fishing access.

Horseback riding is increasingly an important recreational pursuit on the Unit with various trails currently experiencing informal use.

Other recreational facilities include 0.5 and 0.25 miles of designated snowmobile trails on DeRuyter and Morrow Mountain State Forests respectively. These two forests also have 2.4 miles of public forest access roads that provide opportunities for auto touring and other recreational pursuits. All terrain vehicle (ATV) use is prohibited on all State lands in this Unit except where signed for permitted individuals with mobility impaired disabilities.

Camping is currently allowed for up to three nights for groups of less than ten persons without a permit on State forests within the Unit. Camping is not allowed within 150 feet of a road, trail or water body unless otherwise signed. Elsewhere on State forests, camping is otherwise not restricted.

Camping on the Tioughnioga Wildlife Management Area (WMA) requires a permit for each night of use. Different regulations are in place for camping on the WMA because of different goals, program costs and management objectives than on the State forests. Camping is allowed by permit from October 1 to December 15. Permits are issued at no cost through the Bureau of Wildlife, Cortland.

L. Other Facilities

(See Appendix XVIII for Other Facilities Located On the Unit)

M. Property Use Agreements

(See Appendix XIX)

N. Mineral Resources

Title 11, Section 23-1101 of the ECL authorizes the Department to make leases on

behalf of the State for exploration, production and development of oil and gas on State lands. Gas rights on Stoney Pond State Forest were leased to Consolidated Gas from 1967 to 1974 but no wells were drilled. In transferring lands currently occupied by the Tioughnioga Wildlife Area, the federal Bureau of Land Management retained 75% of the subsurface mineral rights but, to date, no leasing has occurred on this property. Other properties within the Unit have had no leasing activity for oil and gas. Exploration within the Unit would be considered a wildcat operation since no past or present producing oil or gas fields exists within one mile of the Unit.

O. County and SUNY Properties

Contiguous with State lands within the Tioughnioga Unit are forest properties managed by Madison County and the State University of New York (SUNY) at Morrisville. Madison County manages three parcels totaling 431 acres that are contiguous with Stoney Pond and Morrow Mountain State Forests and the TWMA. County Forests were acquired and reforested under Section 219 of the County Law which requires that such lands be forever devoted to watershed protection, timber production and for recreation and kindred purposes. Approximately 80% of the County Forest acreage was reforested in the 1920s using Norway spruce, red pine, white pine and Scotch pine. The remaining acreage is in northern hardwoods or open shrubland. Most stands have received pre-commercial or commercial treatments directed at timber stand improvement. A segment of the Madison County Link Trail passes through the Dugway Road parcel and at Jones Road a parking area and informal trail network provide access for hunting, hiking and cross country skiing. Because of the predominance of mature conifer plantations, the overall condition of County Forests is quite similar to State lands.

SUNY Morrisville manages a 181 acre forest property contiguous with Morrow Mountain State Forest. Also known as the "Georgetown woodlot," the property was donated to the College in 1910 with a deed covenant stipulating that the land be used for "practicing forestry." SUNY's goal for the property is to enhance the educational experience of their students, particularly those enrolled in the School of Agriculture and Natural Resources. To this end, specific management objectives have been developed that include: maintaining a continuous forest canopy, promoting multiple ages classes, maintaining existing species mix and resisting the introduction and establishment of alien species. Silvicultural prescriptions for achieving management objectives are developed as a component of student curriculum and have included both commercial and non commercial stand treatments. The majority of the property is in northern hardwoods with a small reforestation area. A classroom building is located east of Mack Road and access onto the property is restricted.

Representatives from both Madison County and SUNY have been actively involved in the Tioughnioga planning process. There is general recognition that co-management is mutually beneficial and that developing objectives in partnership will enhance the public forest resources of southern Madison County.