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Broome State Forests

UNIT MANAGEMENT PLAN

DRAFT

Broome County Towns of Sanford, Windsor, Vestal and Kirkwood and the Tioga County Town of Owego

August 2020

DIVISION OF LANDS AND FORESTS
Bureau of State Land Management, Region 7

2715 State Highway 80
Sherburne, New York 13460
607-674-4036

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BROOME STATE FORESTS
UNIT MANAGEMENT PLAN

COVERING EIGHT STATE FORESTS IN BROOME AND TIOGA COUNTIES, NY:

HAWKINS POND – BROOME R.A. # 3
MARSH POND – BROOME R.A. #4
SKYLINE DRIVE – BROOME # 5
CASCADE VALLEY – BROOME # 6
BEAVER POND – BROOME #7
WHITAKER SSWAMP – BROOME #8
CAT HOLLOW – BROOME #9
TRACY CREEK – BROOME-TIOGA #1

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DEC's Mission

"The quality of our environment is fundamental to our concern for the quality of life. It is hereby declared to be the policy of the State of New York to conserve, improve and protect its natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being." - Environmental Conservation Law 1-0101(1)

* Highlighted (**bold**) terms are defined in the Glossary.

Vision Statement

State Forests on the Unit Name Unit (unit acronym, if commonly used) will be managed in a sustainable manner by promoting ecosystem health, enhancing landscape biodiversity, protecting soil productivity and water quality. In addition, the State Forests on this unit will continue to provide the many recreational, social and economic benefits valued so highly by the people of New York State. DEC will continue the legacy, which was started in 1929, of leaving these lands to the next generation in better condition than they are today.

This plan sets the stage for DEC to reach these ambitious goals by applying the latest research and science, with guidance from the public, whose land we have been entrusted to manage.

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Preface

State Forest Overview

The public lands comprising this unit play a unique role in the landscape. Generally, the State Forests of the unit are described as follows:

- large, publicly owned land areas;
- managed by professional Department of Environmental Conservation (DEC) foresters;
- green certified jointly by the Forest Stewardship Council (FSC) & Sustainable Forestry Initiative (SFI);
- set aside for the sustainable use of natural resources, and;
- open to recreational use.

Management will ensure the sustainability, **biological diversity**, and protection of functional **ecosystems** and optimize the ecological benefits that these State lands provide, including the following:

- maintenance/increase of local and regional **biodiversity**
- response to shifting land use trends that affect **habitat** availability
- mitigation of impacts from **invasive species**
- response to climate change through carbon sequestration and habitat, soil and water protection
-

Legal Considerations

Article 9, Titles 5 and 7, of the Environmental Conservation Law (ECL) authorize DEC to manage lands acquired outside the Adirondack and Catskill Parks. This management includes **watershed** protection, production of timber and other forest products, recreation, and kindred purposes. For additional information on DEC's legal rights and responsibilities, please review the statewide Strategic Plan for State Forest Management (SPSFM) at http://www.dec.ny.gov/lands/64567.html. Refer specifically to pages 33 and 317.

Management Planning Overview

The Broome State Forests Unit Management Plan (UMP) is based on a long-range vision for the management of Hawkins Pond, Marsh Pond, Skyline Drive, Cascade Valley, Beaver Pond, Whitaker Swamp, Cat Hollow, and Tracy Creek state forests balancing long-term ecosystem health with current and future demands. This Plan addresses management activities on this Unit for the next ten years, though some management recommendations will extend beyond the ten-year period. Factors such as budget constraints, wood product markets, and forest health problems may necessitate deviations from the scheduled management activities.

Strategic Plan for State Forest Management

This unit management plan is designed to implement DEC's statewide Strategic Plan for State Forest Management (SPSFM). Management actions are designed to meet local needs while supporting statewide and eco-regional goals and objectives.

The SPSFM is the statewide master document and Generic Environmental Impact Statement (GEIS) that guides the careful management of natural and recreational resources on State Forests. The plan aligns future management with principles of landscape ecology, **ecosystem management**, **multiple use** management and the latest research and science available at this time. It provides a foundation for the development of Unit Management Plans. The SPSFM divides the State into 80 geographic "units," composed of DEC administered State Forests that are adjacent and similar to one another. For more information on management planning, see SPSFM page 21 at http://www.dec.ny.gov/lands/64567.html.

DEC's Management Approach and Goals

Forest Certification of State Forests

In 2000, New York State DEC-Bureau of State Land Management received **Forest Stewardship Council®** (FSC®) certification under an independent audit conducted by the National Wildlife Federation - SmartWood Program. This certification included 720,000 acres of State Forests in DEC Regions 3 through 9 managed for water quality protection, recreation, wildlife habitat, timber and mineral resources (multiple-use). To become certified, the Department had to meet more than 75 rigorous criteria established by FSC. Meeting these criteria established a benchmark for forests managed for long-term ecological, social and economic health. The original certification and contract was for five years.

By 2005 the original audit contract with the SmartWood Program expired. Recognizing the importance and the value of dual certification, the Bureau sought bids from prospective auditing firms to reassess the Bureaus State Forest management system to the two most internationally accepted standards - FSC and the Sustainable Forestry Initiative® (SFI®) program. However, contract delays and funding shortfalls slowed the Departments ability to award a new agreement until early 2007.

Following the signed contract with NSF-International Strategic Registrations and Scientific Certification Systems, the Department was again audited for dual certification against FSC and additionally the 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.

State Forests continue to maintain certification under the most current FSC and SFI standards. Forest products derived from wood harvested off State Forests from this point forward may now be labeled as "certified" through chain-of-custody certificates. Forest certified labeling on wood products may assure consumers that the raw material was harvested from well-managed forests.

The Department is part of a growing number of public, industrial and private forest land owners throughout the United States and the world whose forests are certified as sustainably managed. The Department's State Forests can also be counted as part a growing number of working forest land in New York that is *third-party certified* as well managed to protect habitat, cultural resources, water, recreation, and economic values now and for future generations.

FSC
www.fsc.org

The mark of responsible forestry

FSC® C002027

SUSTAINABLE FORESTRY INITIATIVE
SFI-00102

Ecosystem Management Approach

State Forests on this unit will be managed using an ecosystem management approach which will holistically integrate principles of landscape ecology and multiple use management to promote habitat biodiversity, while enhancing the overall health and resiliency of the State Forests.

Landscape ecology seeks to improve landscape conditions, taking into account the existing habitats and land cover throughout the planning unit, including private lands

Ecosystem management is a process that considers the total environment - including all non-living and living components; from soil micro-organisms to large mammals, their complex interrelationships and habitat requirements and all social, cultural, and economic factors. For more information on ecosystem management, see SPSFM page 39 at http://www.dec.ny.gov/lands/64567.html.

Multiple-use Management

DEC will seek to simultaneously provide many resource values on the unit such as, fish and wildlife, wood products, recreation, aesthetics, minerals, watershed protection, and historic or scientific values.

Landscape Ecology

The guiding principle of multiple use management on the unit will be to provide a wide diversity of habitats that naturally occur within New York, while ensuring the protection of rare, endangered and threatened species and perpetuation of highly ranked unique natural communities. The

actions included in this plan have been developed following an analysis of habitat needs and overall landscape conditions within the planning unit (i.e. the geographical area surrounding and including the State Forests) the larger ecoregion and New York State.

Ecosystem Management Strategies
The following strategies are the tools at DEC's disposal, which will be carefully employed to practice landscape ecology and multiple-use management on the unit. The management strategy will affect species composition and habitat in both the short and long term. For more information on these management strategies, please see SPSFM page 81 at http://www.dec.ny.gov/lands/64567.html.

Passive Management
DEC foresters will employ passive management strategies through the designation of natural and protection areas, and buffers around those areas, such as along streams, ponds and other wetlands, where activity is limited.

Silviculture (Active Management)
DEC foresters will practice silviculture; the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands, in an effort to promote biodiversity and produce sustainable forest products. There are two fundamental silvicultural systems which can mimic the tree canopy openings and disturbances that occur naturally in all forests; even-aged management and uneven aged management. Each system favors a different set of tree species. In general, even-aged management includes creating wide openings for large groups of trees that require full sunlight to regenerate and grow together as a cohort, while uneven-aged management includes creating smaller patch openings for individual trees or small groups of trees that develop in the shade but need extra room to grow to their full potential.

State Forest Management Goals

Goal 1 – Provide Healthy and Biologically Diverse Ecosystems
Ecosystem health is measured in numerous ways. One is by the degree to which natural processes are able to take place. Another is by the amount of naturally occurring species that are present, and the absence of non-native species. No single measure can reveal the overall health of an ecosystem, but each is an important part of the larger picture. The Department will manage State Forests so that they demonstrate a high degree of health as measured by multiple criteria, including the biodiversity that they support.

Goal 2 – Maintain Man-made State Forest Assets
Man-made assets on State Forests include structures, boundary lines, trails, roads and any other object or infrastructure that exists because it was put there by people. Many of these items need no more than a periodic check to make sure they are still in working order. Others need regular maintenance to counteract the wear of regular use. It is the Department's intent to ensure that all man-made items on State Forests are adequately maintained to safely perform their intended function.

Goal 3 – Provide Recreational Opportunities for People of all Ages and Abilities

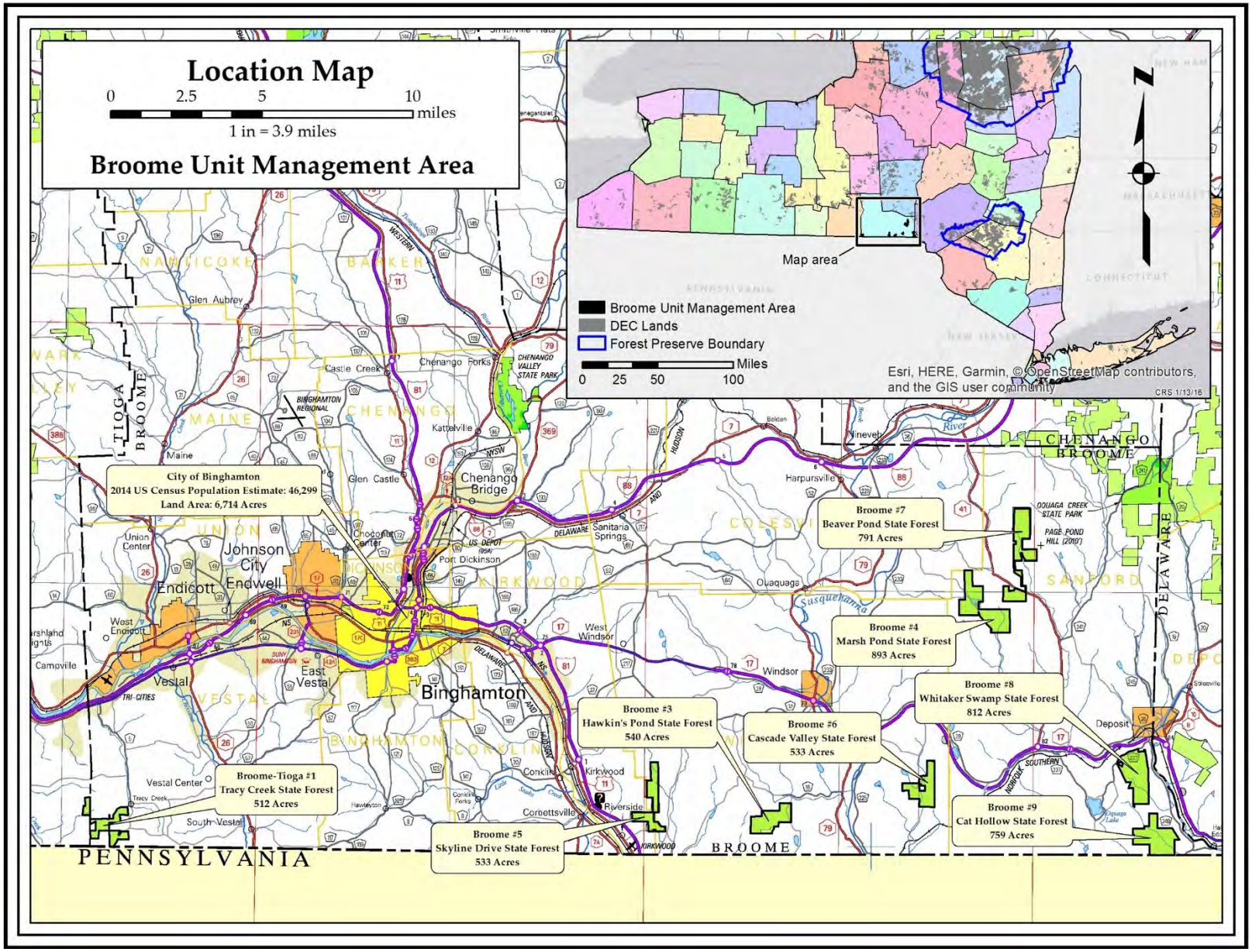
State Forests are suitable for a wide variety of outdoor recreational pursuits. Some of these activities are entirely compatible with one another, while others are best kept apart from each other. Equally varied are the people who undertake these activities, as well as their abilities, and their desire to challenge themselves. While not all people will be able to have the experience they desire on the same State Forest, the Department will endeavor to provide recreational opportunities to all those who wish to experience the outdoors in a relatively undeveloped setting.

Goal 4 – Provide Economic Benefits to the People of the State

ECL §1-0101(1) provides in relevant part that "It is hereby declared to be the policy of the State of New York to conserve, improve and protect its natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall **economic** and social well-being." (Emphasis added) In considering all proposed actions, the Department will attempt to balance environmental protection with realizing potential economic benefit.

Goal 5 – Provide a Legal Framework for Forest Conservation and Sustainable Management of State Forests

Staff must have clear and sound guidance to direct their decisions and actions. Likewise, the public must have clear information regarding what they are and are not allowed to do on State Forests. Both of these are provided by well-written laws, regulations and policies. The Department will work to improve existing legal guidance that has proved to be inadequate and create new guidance that is needed but does not yet exist.


Location Map
0 2.5 5 10 miles
1 in = 3.9 miles
Broome Unit Management Area
Map area
Broome Unit Management Area
DEC Lands
Forest Preserve Boundary
Miles
0 25 50 100
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
CRS 1/13/16
City of Binghamton
2014 US Census Population Estimate: 46,299
Land Area: 6,714 Acres
Broome #7
Beaver Pond State Forest
791 Acres
Broome #4
Marsh Pond State Forest
893 Acres
Broome #8
Whitaker Swamp State Forest
812 Acres
Broome #3
Hawkin's Pond State Forest
540 Acres
Broome #6
Cascade Valley State Forest
533 Acres
Broome-Tioga #1
Tracy Creek State Forest
512 Acres
Broome #5
Skyline Drive State Forest
533 Acres
Broome #9
Cat Hollow State Forest
759 Acres
Binghamton
Johnson City
Endwell
Endicott
Vestal
East Vestal
West Endicott
Union Center
Chenango Bridge
Port Dickinson
Chenango Forks
Castle Creek
Glen Aubrey
Kattelville
Maine
Glen Castle
Harpursville
Sanitaria Springs
Ouaquaga
West Windsor
Windsor
Deposit
Kirkwood
Riverside
Conklin
Corbettsville
Vestal Center
South Vestal
Tracy Creek
Campville
PENNSYLVANIA
BROOME
TIOGA
CHENANGO
DELAWARE
Susquehanna River
OQUAGA CREEK STATE PARK
PAGE POND HILL (2007)
CHENANGO VALLEY STATE PARK
BINGHAMTON REGIONAL

Historical Background Information

State Forest 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 90% of the woodlands were cleared for cultivation and pasture.

Early farming efforts met with limited success. As the less fertile soils proved to be unproductive, farms were abandoned and settlement was attempted elsewhere. This set the stage for vegetative **succession** and new forests of young **saplings** began to occupy the ground once cleared.

The State Reforestation Law of 1929 and the Hewitt Amendment (of the NYS Constitution) of 1931 set forth the legislation which authorized the Conservation Department to acquire land by gift or purchase for reforestation areas. This legislation was used to purchase the lands associated with seven of the **State Forests** addressed in this Unit Management Plan (UMP). These State Forests, consisting of not less than 500 acres of contiguous land 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 presently 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. Shortly after his inauguration in 1933, President Theodore Roosevelt signed legislation authorizing the Civilian Conservation Corps (CCC) program. Under the supervision of Army personnel, men between the ages of 18 and 26 were employed to plant trees, construct ponds, bridges and roads, as well as other forest improvement activities. Thousands of young men were assigned to plant millions of trees on the newly acquired State Forests. Most of the **plantations** of red pine and Norway Spruce on the forests of this Unit were planted in the 1930s by the CCC.

During the war years of 1941-1945, very little was accomplished on the **reforestation** areas. Plans for further planting, construction, facility maintenance, and similar tasks had to be curtailed. However, through postwar funding, conservation projects once again received needed attention. The Park and Recreation Land Acquisition Act of 1960, as well as the Environmental Quality Bond Acts of 1972 and 1986, contained provisions for the acquisition of additional State Forest lands, including in-holdings or parcels adjacent to existing State Forests. A total of 1,773.7 acres were purchased with these funds for acquisitions to the State Forests addressed in this UMP. All of these lands were acquired for the conservation and development of natural resources, including the preservation of scenic areas, watershed protection, **forestry**, and recreation.

In 1970, the New York State Department of Environmental Conservation (DEC) was established. This new agency took over the mission of the old Conservation Department with the addition of various State environmental quality Divisions such as air and water. DEC's Division of Lands & Forests is now responsible for the management and stewardship of the State Forests.

New York State totals just over 30 million acres. The state-owned Forest Preserves in the Adirondack and Catskill Parks contain nearly 3 million acres, or very nearly 10 percent of the State's land area. The New York State Constitution, Article XI, Section mandates that Forest Preserve land be "forever kept as wild forest lands". No timber may be cut from the Forest Preserves. State Forests outside of the Adirondack and Catskill Preserves total over 780,000 acres. These lands are managed for a wide variety of purposes such as timber production, hiking, skiing, fishing, trapping and hunting. These State Forests are of great economic importance to the People of New York State. These forests also contribute greatly, in many additional ways, to the health and well-being of our communities.

Local History

The first inhabitants of this land were the Native Americans, specifically the Iroquois. It is believed that they formed the Iroquois Confederacy or the "League of the Iroquois" in the middle of the 15th century as a means of maintaining peace between the nations, and each member nation was assigned a designated territory. The five nations of the League were the Onondagas, the Mohawks, the Senecas, the Cayugas, and the Oneidas. In 1712, the Tuscaroras were admitted to the League of the Iroquois as the "sixth nation" and they were assigned to a territory which included present day Broome county. One of the major settlements in this area was called Onaquaga and was located just north of present day Windsor, along the Susquehanna River. Others included Otseningo, located just north of Binghamton, and Ochenang, located nearer to present day Binghamton. There were smaller settlements at Chugnuts, Castle Creek and Vestal.

The first recorded European settlement in the area now known as Broome County was a trading post and mission established by the Church of England near the present village of Windsor around 1750.

On November 5, 1768, one of the greatest real estate transfers in history was signed at Fort Stanwix (present day Rome, NY). This treaty established a line of division between the English Territory and the Indian Territory. For the sum of $50,000, the land east and south of the treaty line was deeded from the Native Americans to King George III. One portion of the line was located near the present border between Broome and Delaware counties. The treaty line was drawn so that all of the State forests addressed in this plan would have been located on Indian Territory (or "beyond civilization") with the exception of the Tracy Creek State Forest.

In 1779, the Sullivan-Clinton campaign, or Sullivan's March, was carried out for the purpose of opening the frontier to European settlement and cutting off supplies to the British troops. This

military campaign resulted in the destruction of many Native American villages and marked the last year that this land would be occupied primarily by Native Americans. The significance of the Fort Stanwix Treaty Line had been greatly diminished. Lieutenant Erkuies Beatty, a soldier in Sullivan's March, reached the site of present day Binghamton on August 18, 1779 and described the land as "very rich and well-timbered country."

Many of the early settlers in this land were veterans of Sullivan's army who, impressed by the country seen during the Revolutionary War, came back to make their homes here.

In 1787, a compromise to the land disputes between New York and Massachusetts became known as the Boston Purchase. This included much of the eastern portion of Broome County, and a small portion of what is now the City of Binghamton. After the Revolutionary War, land was sold to land speculators such as William Bingham. Mr. Bingham, along with two other partners, was granted a patent for a tract of land comprised of 30,600 acres from the State of New York. This land included parts of the present day towns of Union, Vestal, Binghamton, Conklin, and Kirkwood.

Beginning in the year 1800, a system of roadways was established in the area. Perhaps the first road to penetrate the wilderness in this part of the country was one which followed the course of the Susquehanna River, along its northern banks in a westerly direction, to a point now known as Brandywine Creek. The Chenango Canal was built between 1833 and 1837 at a cost of $1,737,703. The canal was an important transportation corridor for moving products, including lumber, to and from the Broome County area. In 1835, work was begun to build a railroad through Broome County. By 1875, many railroads had been established in New York State causing the Chenango Canal to be closed as an artery of travel.

Broome County was founded on March 28, 1806. It is named after John Broome, who was the Lieutenant Governor of New York. By 1920, the current political boundaries of 16 towns, seven villages and the City of Binghamton were established in the county.

The following information and quotes have been obtained from the historic reference, Binghamton and Broome County: A History (1924). They are intended to provide an early-era view of the landscape within Broome County and to emphasize the historic importance of the forests in this area.

> "The forest trees of Broome county...originally covered every part of this territory. Many of the original forests have quite disappeared, although here and there may still be found tracts of good hemlock and maple, with now and then a small area of second growth pine. The question of reforestation is one which now (1924) occupies the attention of dwellers of the county."
>
> In reference to the Town of Union, "By the time the New York & Erie Railroad had passed through Union (1849), the timber had been for the most part removed and the settlers were directing their attention to farming."

> In April of 1793, the settlers of the Town of Union voted to pay a bounty of, "two pounds for every grown wolf and panther killed in the township, and 1 pound for every young animal of the same species."
>
> In reference to the Hamlet of Tracy Creek, "The Osincups and the Cambells, at a very early date, settled and carried on a lumbering business, the latter probably having built the first dwelling in the village."

Lumbering had begun in many areas of Broome County in the late 1700's. From 1800 to 1850, lumbering was the leading industry in the county. By 1875, this industry was beginning to decline due to the depletion of the forest resources in the area. By the turn of the 20th century, most of the land had been cleared of forest cover and lumbering had been reduced to a minor industry. Some of the first sawmills built included Nathan Lane's mill (prior to 1800) in the Town of Windsor and Nathan Dean's mill (1791) on Ouaquaga Creek near Deposit. By 1835, there were 15 sawmills operating in the Town of Windsor, 13 mills in the Town of Conklin, and nearly a dozen mills in each of the other townships. By 1838, sawmills were reported at one mile intervals along the West Branch Delaware River. Much of the lumber produced in the Broome county area was loaded onto rafts and floated down the Susquehanna or Delaware Rivers to markets of metropolitan areas such as Philadelphia. In the year 1875 alone, more than 3,000 rafts were floated down the Delaware River.

From a few settlers in 1790, the population of the county grew to 22,339 in 1840. By 1960, the population of Broome County was 212,661. The 2000 census for Broome County and the City of Binghamton lists the populations, respectively, as 212,160 and 53,008.

Binghamton is the largest city in Broome County and it is located at the junction of three main highway systems. Interstate 81 crosses the county from north to south, connecting to cities such as Syracuse and Scranton. Route 17/ I-86 crosses county from east to west, connecting to cities such as Middletown and Elmira. Interstate 88 connects Binghamton with the State capitol. The railroad system in Broome County is well established and continues to provide for the transportation of products through the county. Commercial airline service is available at the Broome County Airport.

The 1920 agricultural census lists 3,594 farms in Broome County. These farmlands comprised nearly 1/3 of the county acreage, or 133,807 acres. The 1960's probably represented the height of agriculture in the county. In 1964, about 46% of the county land, or 210,846 acres, was being utilized as farmland. Today, there are significantly fewer farms. The 1997 agricultural census shows a total of 511 farms in the county, covering a total of 85,804 acres. The amount of forest land in the county has increased greatly since the early part of the 20th century. In 1993, 57% of Broome county, or 260,600 acres, was identified as forest land.

During the past 20 years on several occasions, logging has stirred controversy in the county. Many concerned residents have expressed their desire to preserve the character of forests in both public and private ownership. Ordinances regulating timber harvesting were enacted in the Town of Vestal. The requirements of the Vestal ordinance are published on town web site. Proposals to harvest timber on County Park land were withdrawn after public comments in opposition were received. In 1996, a proposal by Broome County to harvest timber at the Aqua-Terra property generated much concern among county residents. As a result, the County formed the Aqua-Terra Advisory Committee to seek public input and make recommendations to the County Legislature regarding the vision and intended uses for the park. Passive recreational uses such as birdwatching, cross-country skiing, and picnicking were identified as the primary ownership goals. To preserve forest aesthetics, the proposed timber sale was cancelled. Forest management decisions continue to be an important issue in Broome County, especially when they relate to public lands.

The majority of the lands comprising Broome-Tioga 1 and Broome State Forests 3 thru 7 were acquired by New York State between 1933 and 1941. Nearly all of the lands now known as Broome 8 & 9 were acquired in 1964. The following table lists the acquisitions for each of the eight state forests in the Unit.

Table 1. Land Acquisition History – Broome State Forests Unit

Forest	Year of State Acquisition	Acres Acquired	Names of Previous Owners
Broome 3	1932	506.88	Thomas Beavan
	1997	30.17	Melious
	1998	3.17	Miller
Broome 4	1932	735.5	George Alger, G. Havens, L.J. Collins & J.M. Quick
	1933	157.86	R.A. Siefring
Broome 5	1933	533.03	H. Decker, Estella Underhill, E.&F. Colsten, C. Blatchley & Isabelle Roberts
Broome 6	1937	533.28	Franklin L. Goodenough
Broome 7	1940	530.57	Ray T. Cass, Harry Salisbury, Homer Hare & Edgar Fuller
	1941	237.27	Lester J. Skellett
	1981	0.37	Westfall
	1989	2313	Bonadio
Broome 8	1964	809.63	Elizabeth Wilson Graff
	1979	2.04	Gelatt
Broome 9	1964	758.54	Elizabeth Wilson Graff
Broome-Tioga 1	1933	509.45	Noyesm Lainhart, JKrom, Glenn, Mofitt & Fish

Recent History of the Broome State Forests Unit

The first unit management plan for the forests in the Broome State Forests Unit (BSF UMP, 2006) included a variety of land use and public use and recreation management objectives. The following is a review of the work done under BSF UMP, 2006 describing the status of those objectives that have been accomplished and those that were not completed for various reasons.

Land Management objectives described in BSF UMP, 2006 and new activities that have been accomplished:

- The BSF UMP, 2006 recommended timber harvests or non-commercial **thinning** treatments on approximately 1,726 acres of the Unit between 2005 and 2015. Harvests or non-commercial thinnings have been conducted on 471 acres (9% of the Unit) between 2005 and 2015 generating a direct revenue of approximately $285,000 to New York State and jobs and raw materials for the wood products industry.
- All of the 394 acres recommended for protection or management as Natural Areas have been maintained in that status. Additional areas have been designated for protection status as a result of field analysis indicating that those areas are best suited for non-timber management purposes.
- Since 2005, all taxes have been paid annually to local communities. See **Appendix VIII** for detailed information about taxes paid.

The status of the public use and recreation objectives in BSF UMP, 2006 are as follows:

- Rock barriers and a gate have been installed on Broome 8.

- A public use map and brochure was not produced. Instead the information was placed on the DEC website at: http://www.dec.ny.gov/lands/34531.html

- Install an informational kiosk on each forest on the Unit. A total of four kiosks have been installed so far, one each on Broome 3, 4, 6 & 8. Kiosks have not yet been installed on Broome 5, 7, 9 and Broome – Tioga 1.

- Two camp sites have been designated at Marsh Pond.

Management Objectives not completed:

The following projects were planned but not completed as outlined in the first approved UMP:

- Approximately 1,255 acres were scheduled for timber harvest or non-commercial thinning but were not treated.

  Reason: Lack of staffing is the principal reason why this work was not done. The forester position responsible for working on this unit has been vacant for many years following the retirement of the previous forester.

- Acquire appropriate parcels of private land from willing sellers. No parcels have been purchased since 2006.

  Reason: The acquisition process is limited to people willing to donate or sell their land to the State and there must be available funding for the purchase. The Department continues to pursue desirable acquisitions where there is a willing seller and available funding.

- Conduct an annual State Forest tour.

  Reason: Lack of staffing.

Information on the Unit

Geographic and Geologic Information on the Unit

Geography

The Broome State Forests Unit is located in the towns of Vestal, Kirkwood, Windsor, and Sanford within Broome County and in the town of Owego in Tioga County. Most of the State Forest land within the Unit is located south of Route 17, near the New York State - Pennsylvania border. Two of the State Forest lands are located north of Route 17, but still within 9 miles of the New York State - Pennsylvania boundary line. Broome-Tioga 1 and Broome 9 have portions of their property lines on the state boundary between New York and Pennsylvania. The forests in the Unit are strung out over a distance of 34 miles along the Pennsylvania border. The Unit is comprised of eight State forests:

Table 2. The Forests on the Unit

Reforestation Area #	State Forest Name	Acres*	Townships
Broome 3	Hawkins Pond State Forest	540.22	Windsor
http://www.dec.ny.gov/lands/8201.html			
Broome 4	Marsh Pond State Forest	893.36	Sanford
http://www.dec.ny.gov/lands/8168.html			
Broome 5	Skyline Drive State Forest	533.03	Kirkwood & Windsor
http://www.dec.ny.gov/lands/8117.html			
Broome 6	Cascade Valley State Forest	533.28	Windsor
http://www.dec.ny.gov/lands/8231.html			
Broome 7	Beaver Pond State Forest	791.34	Sanford
http://www.dec.ny.gov/lands/27317.html			
Broome 8	Whitaker Swamp State Forest	811.67	Sanford
http://www.dec.ny.gov/lands/8093.html			
Broome 9	Cat Hollow State Forest	758.54	Sanford
http://www.dec.ny.gov/lands/8228.html			
Broome-Tioga 1	Tracy Creek State Forest	509.45	Vestal & Owego
http://www.dec.ny.gov/lands/8102.html			
Total Acres		**5,370.89**	

* Acres from NYS DEC, Bureau of Real Property records

The largest community in the vicinity of the Unit is the City of Binghamton and its surrounding suburbs. Binghamton is within 8 miles of the Unit with the closest forest being Broome 5. According to the 2010 census, City of Binghamton had a population of 47,376 people. In addition,

the Greater Binghamton area consisting of Broome and Tioga counties and the communities of Binghamton, Johnson City, Vestal and Endicott had a 2010 population of 251,725 people. On the east side of the Unit, within ½ mile of Broome 8 is the Village of Deposit with a population of 1,663 people.

Approximately 5,296 acres of these forests are located in Broome County and 75 acres are located in Tioga County. Due to the large percentage (98.5%) of land within Broome County, the following geographic information pertains only to Broome County.

Elevations on these State Forests range from 1170 to 2010 feet. The low elevation is at the northern end of Broome 5 and the high elevation is at the northern end of Broome #7. The surrounding topography within Broome County has a low elevation of about 800 feet near the Susquehanna River at the far west end of the county and a high elevation of 2085 feet at Slawson peak in the far east end of the county. The elevations found on the State Forest lands within the unit are relatively high in comparison with the elevations of other lands in Broome County. The elevation in the southern part of the county, where most of the State Forests are located, is consistently several hundred feet higher than the elevation in the northern part of the county due to the erosion-resistant sandstone that caps the hills in the area.

The Unit is located within two separate, major watersheds. Broome-Tioga 1, Broome 3, Broome 5, and Broome 6 all lie within the northern section of the Chesapeake Bay watershed. All of the watercourses on these lands flow into the Susquehanna River, which in turn flows to the Chesapeake Bay. Broome 7, Broome 8, and Broome 9 are located within the Delaware Basin watershed. All of the watercourses on these forests flow into the West Branch of the Delaware River. This river enters the Delaware Bay on the east coast, just north of the Chesapeake Bay. Broome 4 actually lies within both watersheds, with the watershed boundary running along the south and east shores of Marsh Pond. This pond has the unusual feature of two separate outflows. The primary outflow, in the northwest corner of the pond, flows into the Chesapeake Bay watershed. The second outflow, which is intermittent, flows into the Delaware Basin watershed. The major rivers within Broome County are the Susquehanna, the Chenango, and the Tioughnioga. The West Branch of the Delaware River forms a portion of the county boundary in the southeastern section, near Deposit. The Otselic River enters the northern part of the county. Other large streams are Nanticoke Creek, Choconut Creek, Snake Creek, Little Snake Creek, and Oquaga Creek.

Broome County has a humid, continental type of climate. The conditions are usually cold & dry when the atmospheric flow is from the north or northwest. However, it is usually warm and occasionally humid when the flow is from the south or southwest. The climate of the county favors a considerable amount of cloudiness. In fact, on average, there are 215 cloudy days each year in Broome County. The Great Lakes are too distant to have a significant effect on the climate of this area. A temperature of 90 degrees Fahrenheit or higher can be expected on an average of 2 to 4 days each year. A temperature of 0 degrees Fahrenheit or lower may occur on 6 to 10 days

each winter. Freezing temperatures usually do not occur between May 5th and October 5th. The average annual precipitation within Broome County varies by as much as 4 inches. It ranges from about 36 inches per year in the southwestern section of the county to about 40 inches per year in the northeastern section. The precipitation is usually in the form of rain showers or thunderstorms during the warm season, and in the form of snow or freezing rain during the winter months. The average annual snowfall ranges are between 55 to 70 inches in the lower regions of the county and between 85 to 95 inches in the uplands. Occasionally, the combination of melting snow and heavy springtime rains can cause significant flooding in the river valleys of the county. Severe flooding has occurred in the years of 1935, 1936, 1940, 1942, 1948, 1964, 1972, 1979, 1983, 1986, 1993, 1996, 2006 and 2011. The prevailing winds are usually from the west. The wind speeds are generally mild, but severe thunderstorms and vigorous storm systems have caused property damage in the county. Tornados in Broome County are rare, but they have occurred as recently as 1998, when a tornado damaged several homes and woodlands in the southern and eastern portions of the county.

Geology

Surficial Geology

Most surficial geology in the 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. The retreat of these glaciers left behind numerous sedimentary deposits and surficial features; including elongated scour features. Some elongate scour features filled with water, creating ponds and small lakes, while others simply channeled the flow of water; creating river valleys that inundate the region today. The resulting surface geology is very similar across all of the State forests in this Unit. It consists of glacial till (clays and silts that were deposited beneath glacial ice) as the dominant deposit in the area. Bedrock outcrops and subcrops of Upper Devonian shales, siltstones and intermittent limestones of the West Falls Group are located intermittently on the sides and crests of ridges and hills in these areas. These bedrock exposures are most likely due to the erosion of overlying glacial till. Further information on the surface geology of the region is provided by the: *Surficial Geologic Map of New York, New York State Museum - Geologic Survey - Map and Chart series #40, 1986.*

Bedrock Geology

Bedrock underlying the Allegheny Plateau of the Southern Tier of New York is inclusive of sedimentary rock units deposited in association with ancient seas and their marine-fluvial-deltaic environments of deposition during the Cambrian (542-488 million years ago (mya)), Ordovician (488-443 mya), Silurian (443-418 mya) and Devonian (418-359 mya) Periods of the Paleozoic Era.

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.

Geologic Structure

Regional structure of the area is a homocline that dips (is becoming deeper) to the south-southwest at an average dip angle of approximately one (1) degree or deepens 100 feet per each mile traveled to the south-southwest. 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. Lineament, faulting and anticlinal/synclinal structures 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 resulting strain associated with plate tectonics 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

Soils provide the foundation both figuratively and literally, of forested ecosystems. They support an immense number of micro-organisms, fungi, mosses, insects, herptofauna and small mammals which form the base of the food chain. They filter and store water and also provide and recycle nutrients essential for all plant life. For information on DEC's policies for the protection of forest soils, as well as water resources, please see SPSFM page 108 at http://www.dec.ny.gov/lands/64567.html

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 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. On the higher hills in the southern and eastern portions of the county, depth to sandstone is less than 40 inches. Oquaga soils are dominant in these areas, but smaller areas of Lordstown, Arnot, Tuller, and the moderately shallow Mardin soils also occur. The Oquaga soil series is characterized by well-drained, strongly acid loamy soils that formed in medium-textured till. These soils are found on slopes, ranging from gentle to steep. The root zone in these soils consists mostly of the 20 to 40 inches of permeable soil over bedrock. In general, these soils are well-suited for forest production. More detailed information on the soils in this area can be obtained from the Soil Survey of Broome County, New York (USDA 1971).

The predominant soil series found on the Broome State Forests Unit are Lordstown, Volusia, Cattaragus, Mardin and Morris which collectively comprise 88% of the Unit. Some of the other less

common but present soil series types on the Unit include Alden, Culvers, Oquaga and Wayland soils types.

The typical landscape for these soils consists of broad, rolling, or undulating uplands dissected by a few narrow valleys. Many of the soils on the Unit are typified by a fragipan layer or a seasonably high water table perched above the substratum. Soil slopes are commonly between 3 and 20 percent, but can range from 0 to 50 percent. Soils are generally deep to moderately deep with medium texture. Limitations of the soils are seasonally high water tables, low fertility, high acidity, and erosion on the steeper slopes. Plant rooting is frequently limited by a firm substratum or bedrock. These limitations impact the vegetative composition and growth, as well as management activities including the location and construction of forest roads, trails, and other facilities, and in particular the harvesting of forest products.

Although soil description provides information on subsurface characteristics, ground-level conditions reveal much about land use history and ecological complexity. The relatively smooth ground surface condition in most plantations is due in part to repeated plowing and cropping during the 19th and early 20th centuries. These soils typically have a well-defined plow layer and soil properties such as porosity and availability of nutrients have been altered from pre-settlement conditions. Stones and other impediments to plowing have been removed resulting in a relatively uniform soil texture. Unplowed soils in contrast, have an undulating surface condition with a well-developed hummock and hollow micro topography. Created when a tree becomes wind thrown, the hollows are the hole left from the upturned soil and tree root system, while the hummocks are the mounds formed of those same toppled remains.

More detailed information on the soils in this area can be obtained from the Soil Survey of Broome County, New York (USDA, 1971**).** A map displaying the location of soil types on the Unit is in **Appendix X**, Soil Series and Drainage Classes map.

History of the Forest Cover

Prior to settlement in the late 18th century, New York State was extensively forested. Large trees including American chestnut and white pine were common components of these forests. Throughout the 19th century, these forests were cleared for the use of the lumber and to raise agricultural crops on the land. Much of the cleared land, outside of the fertile river valleys, proved to be unsuccessful for farming. In the early 20th century, efforts were made to reforest these lands. Some areas were left to regenerate or reforest naturally, while other areas were planted. Many of the tree **species** planted were not native to this region including red pine, Norway spruce, Scotch pine, white spruce, and Japanese larch. The chestnut blight has led to the near extinction of American chestnut trees in the forests. The forests found in Broome County today contain several different species and the canopy structure is different from the virgin forests of the region. However, the forest cover is much more extensive today than it was during the early settlement

period. The forest land area in New York has increased from 7 million acres in 1870 to over 18 million acres today.

The forests presently found in the eastern United States are generally defined as eastern **deciduous** forests. This major **forest type** is comprised of hundreds of tree species, most of them **hardwoods**. In order to further define the forest **cover types** found in specific regions of the eastern United States, the eastern deciduous forest type can be divided into several subcategories. The three subcategories that are found in New York State are the oak-hickory type, the spruce-fir type, and the maple-birch-beech type. The south-central area of New York State, where all of the Broome state forests are located, has the oak-hickory forest cover type. As the name indicates, this forest cover type consists of a high percentage of oak and hickory tree species. However, this is still a broad category, and there are many more specific forest cover types found within the forests of the Broome Unit. These include the **northern hardwood** type, the oak-pine type, the northern hardwood-hemlock type, and several types of plantation species, such as red pine and Norway spruce. These forest cover types are listed on page 36, and they are defined by their component tree species.

The term "forest cover type" refers to the type of tree or vegetation that dominates the site. However, many more species of plants and animals are found within the type. The interrelationship of these species is known as an **ecological community**. Three of the most prevalent ecological communities found on the forests of the Broome State Forests Unit are the Appalachian Oak-Hickory Forest, the Beech-Maple **Mesic** Forest, and the Hemlock-Northern Hardwood Forest. The following descriptions (edited) of these communities were developed by the New York State Natural Heritage Program.

1.) Appalachian Oak-Hickory Forest: a hardwood forest that occurs on well-drained sites, usually on ridge tops, upper slopes, or south and west facing slopes. The soils are usually loams or sandy loams. The dominant trees include one or more of the following oaks: red oak, white oak, and black oak. Mixed with the oaks, usually at lower densities, are one or more of the following hickories: pignut, shagbark, and sweet pignut. Common associates are white ash, red maple and Eastern hop hornbeam. There is typically a sub-canopy stratum of small trees and tall shrubs including flowering dogwood, witch hazel, shadbush, and choke cherry. Common low shrubs include maple-leaf viburnum, blueberries, red raspberry, gray dogwood, and beaked hazelnut. The shrub layer and ground layer may be diverse. Characteristic herbs include wild sarsaparilla, false Solomon's seal, Pennsylvania sedge, tick-trefoil, black cohosh, rattlesnake root, white goldenrod, and hepatica. Characteristic animals include red-bellied woodpecker, whip-poor-will, and wild turkey.

2.) Beech-Maple Mesic Forest - A **hardwood** forest with sugar maple and beech co-dominant. These forests occur on moist, well-drained, usually acidic soils. The term "mesic" refers to the balanced moisture level of the **habitat**. The soils are not typically saturated or dry. Common associates are red maple, white ash, yellow birch, and Eastern hop hornbeam. There are relatively

few shrubs and herbs. Characteristic small trees or tall shrubs are American hornbeam, striped maple, witch hazel and alternate-leaf dogwood. Characteristic ground layer species are woodferns, Christmas fern, Pennsylvania sedge jack-in-the-pulpit, wild leek, Indian cucumber-root, false Solomon's seal and trout lily. There are many spring ephemerals which bloom before the canopy trees leaf out. Typically, there is also an abundance of tree seedlings, especially of sugar maple. Beech and sugar maple saplings are often the most abundant "shrubs" and small trees. Hemlock may be present at a low density. Characteristic birds include the American redstart, red-eyed vireo, ovenbird, black-throated blue warbler, least flycatcher, Acadian flycatcher and red-bellied woodpecker.

3.) Hemlock-Northern Hardwood Forest: a mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. In any one **stand**, hemlock is co-dominant with any one to three of the following: beech, sugar maple, red maple, black cherry, white pine, yellow birch, black birch, red oak, and basswood. The relative cover of hemlock is quite variable, ranging from nearly pure stands in some steep ravines to as little as 20% of the canopy cover. The shrub layer may be sparse. Characteristic shrubs are hobblebush, maple-leaf viburnum, and raspberries. Canopy cover can be quite dense, resulting in low light intensities on the forest floor and hence a relatively sparse ground layer. Characteristic ground layer plants are Indian cucumber-root, Canada mayflower, shining clubmoss, common wood fern, Christmas fern, star flower, bellwort, common wood-sorrel, partridge berry, foamflower, round-leaf violet, twisted stalk, and purple trillium. In forests that have beech as a co-dominant, beech-drops is a common herb. Characteristic birds include wild turkey, pileated woodpecker, golden-crowned kinglet, black-throated green warbler, and Acadian flycatcher.

There are about 30 different tree species that are commonly found on the Broome State forests. Although additional species exist, such as American chestnut, American elm, and butternut, their occurrence is quite rare. The following tables list of the most common tree species with their commercial and wildlife uses.

Table 3. Tree Species on the Unit

Native Hardwood Species

Tree Species	Commercial Use	Wildlife Use
Black cherry	Cabinetry, furniture, veneer, firewood	Fruit is eaten by birds & mammals
White ash	Baseball bats, tool handles, furniture, veneer, firewood	Seeds are a food source, a preferred deer browse species
American beech	Pallets, railroad ties, furniture, firewood	Nuts are an important food source, often a good **cavity tree**
Basswood	Moldings, a good easy carving wood	Tends to develop good cavities for shelter.
Red maple	Cabinetry, furniture, veneer, firewood	Seeds, buds and flowers are eaten by wildlife, a preferred deer browse species

Tree Species	Commercial Use	Wildlife Use
Sugar maple	Gymnasium flooring, dance floors, bowling alleys, bowling pins, baseball bats, cabinetry, furniture, veneer, firewood	Seeds, buds and flowers are eaten by wildlife, a preferred species for deer browse
Aspen (big tooth and quaking)	Boxes, pulpwood for making paper, wafer board plywood, veneer	Used by many species for habitat and food source. Preferred by beaver & grouse.
Northern red oak	Cabinetry, furniture, flooring, veneer, pallets, firewood	Acorns for food, a preferred species for deer browse
Black oak	Cabinetry, furniture, pallets, firewood	Same as red oak
White oak	Cabinetry, furniture, flooring, veneer, wine barrels, steam bending.	Same as red oak
Chestnut oak	Similar to white oak	Similar to white oak
Yellow birch	Plywood, veneer for doors, furniture and paneling	Seeds and buds eaten by birds, a preferred species for deer browse
Black birch	Little commercial value, firewood	Seeds and buds eaten by birds
Shagbark hickory	Tool handles, ladder rungs, flooring	Nuts are a food source, the shaggy bark provides places for bats to roost
Pignut hickory	Tool handles, ladder rungs, flooring	Nuts are a good food source
Bitternut hickory	Tool handles, ladder rungs, flooring	Nuts are a good food source
Black locust	Fence posts - rot resistant	Little value
American hornbeam (blue beech)	No commercial value	Seeds are eaten by birds and small mammals
Eastern hophornbeam (ironwood)	No commercial value	Seeds are eaten by birds and small mammals
Striped maple	No commercial value	Browse for rabbits, deer
Shadbush (serviceberry)	No commercial value	Berries eaten by birds and mammals
Apple	No commercial value	An important wildlife food source

Native Conifer Species

Tree Species	Commercial Use	Wildlife Use
Eastern hemlock	Local use construction lumber, low commercial timber value.	Provides cool climate along streams in summer, cover and shelter.
Eastern white pine	A common lumber species for many construction uses, pulpwood for paper.	A valuable species for wildlife. Seeds provide food, the tree provides cover and shelter.

Plantation Conifer Species

Tree Species	Commercial Use	Wildlife Use
Norway spruce	Construction lumber, Pulpwood for paper	Cover, shelter, seeds are a food source
Japanese larch	Fence posts, hop poles, pilings, rot resistant	Cover, shelter, seeds are a food source

Tree Species	Commercial Use	Wildlife Use
Red pine	Utility poles, log homes, fencing	Cover, shelter, seeds are a food source
Scotch pine	Utility poles, deck lumber, fencing	Cover, shelter, seeds are a food source

Major Land Classifications within the Unit

Table 4 below identifies eight major categories of land found within the Unit. Some of these categories are quite broad, but they are useful in developing forest management goals from a landscape perspective. Definitions for each category are listed below.

Table 4. Land Classifications on the Unit

Land Class	Acres	Acres by DBH Class				% of Total
		1" - 5"	6" - 11"	12"-18"	19"+	
Ponds	69	-	-	-	-	1
Old Fields & Shrubland	43	-	-	-	-	<1
Grass Fields	1	-	-	-	-	<1
Wetland	44	-	-	-	-	<1
Mixed Hwd/Natural Conifer	1,485	0	171	1,151	163	28
Natural Hardwood	2,843	262	615	1,825	141	53
Conifer Plantation	745	4	309	432	0	14
Mixed Hwd/Plantation Conifer	84	0	3	81	0	2
Shale Pits	1	-	-	-	-	<1
Roads	58	-	-	-	-	1
Totals	**5,373**	**266**	**1,098**	**3,489**	**304**	
% of Total Forested Area	**5,373**	**5**	**21**	**68**	**6**	**100**

* Note: The total acres used for this plan is based upon Arc GIS calculations and is slightly different than the deeded acres listed in Table 1.

The Land Class categories listed in Table 2 are described below:

Ponds include both man-made and natural origin ponds on the Unit.

Old fields are essentially treeless and contain a mix of grasses and **forbs** growing on upland **sites** that are not wetlands. These are old agricultural fields, from 1 to 20 acres in size, which have not reforested.

Shrub lands are early successional communities that are not on wetland sites and are dominated by woody shrubs, apple and thorn apple trees along with scattered openings and larger trees.

Wetlands include open wet meadows and areas dominated by alders or other shrub species on wetland sites. Scattered trees may be mixed with the shrubs.

Mixed hardwood/natural conifer stands are comprised of at least 10% native **conifers** (eastern white pine, eastern hemlock, balsam fir, or cedar) in a mixture with hardwoods. This category also includes 211 acres of forested wetlands containing native conifers.

Natural hardwoods consist of areas where at least 90% of the forest cover within these stands consists of native hardwood species (white ash, red maple, sugar maple, beech, black cherry, aspen, etc.).

Conifer plantations contain planted trees of species such as red pine, Norway spruce, white spruce, Scotch pine, larch and white pine.

Mixed hardwood/plantation conifer includes those stands dominated by native hardwoods, where less than 50% of the trees are planted conifers.

Shale pits include the pits on the Unit used to maintain the road system.

Roads include the area occupied by forest access roads and town roads on the Unit. The full road **corridor width** is considered to be 50 feet and may contain trees, shrubs, or **grassland** habitat along its **edges**.

As the above table shows, the forests on the Unit are dominated by pole (6"-11") and saw timber (12"+) size trees which together comprise 95% of the Unit's forest cover. In comparison, only 266 acres (5%) of the forested area on the Unit are in seedling/sapling sized trees, 1"-5" in diameter. Early-successional habitat consisting of open or shrub lands combined with seedling or sapling size forested areas comprise 310 acres or about 6% of the unit.

Detailed information about vegetative communities can be found in the Department of Environmental Conservation publication Ecological Communities of New York State (Edinger et al. 2014).

High Conservation Value Forests

High Conservation Value Forests (HCVF) are those portions of State Forests which have known high conservation values that the Department feels should take precedent over all other land use and management decisions. Areas that are identified as having exceptional values may be managed for timber, wildlife and/or recreation, however management activities must maintain or enhance the high conservation values present. Currently, HCVF's are assigned to one or more of five land classifications, of which only the first four may be found on State Forests:

1. Rare community- Forest areas that are in or contain rare, threatened or endangered ecosystems.

2. Special treatment- Forest areas that contain rare, threatened or endangered ecosystems.

3. Cultural Heritage- Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and are critical to their traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities.

4. Watershed- Forest areas that provide safe drinking water to local municipalities.

5. Forest Preserve- Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

On the Broome State Forests Unit, areas of HCVF have been designated for the west side of Broome 4 and all areas of Broome 3, 5, 6, and Broome-Tioga 1. Collectively, these areas total 2,116 acres. These areas are designated as HCVF since they are within the Susquehanna River watershed which supplies the drinking water for the City of Binghamton and other nearby communities.

For more information on HCVFs please see http://www.dec.ny.gov/lands/42947.html.

Wetlands and Water Resources

Wetlands

Wetlands vary widely, across the landscape, because of differences in characteristics such as: hydrology (temporarily/seasonally flooded to permanently flooded), soils, topography, and vegetation (submergent aquatic plants to forested tree cover). Common freshwater wetlands include marshes, bogs, fens, swamps, vernal pools, **forested wetland**s, and spring seeps. Wetlands perform many functions that provide numerous benefits to people, fish, and wildlife. Wetlands provide flood protection and abatement; erosion control and containment of sedimentation; improved water quality; recharge of groundwater supplies; regulation of surface water flows; essential fish and wildlife habitat; production and recycling of nutrients; recreational opportunities; open space; and biological diversity.

Both the federal and State government regulate use of wetlands to protect the numerous functions and benefits of wetlands. Wetlands are protected pursuant section 404 of the Federal Clean Water Act. It is the public policy of New York State, as set forth in the Freshwater Wetlands

Act, to preserve, protect, and conserve freshwater wetlands and the benefits derived from them. All freshwater wetlands larger than 5 hectares (approximately 12.4 acres) are protected. A freshwater wetland smaller than 5 hectares may be protected if it is demonstrated that the wetland is locally unique or significant. In all cases an upland area 100 feet wide surrounding a protected wetland, defined as the adjacent area, is also protected.

The Act recognizes the values and functions of wetlands; flood and storm water control, wildlife habitat, water quality, recreation, open space, education and scientific research, among others, and serves to prevent unnecessary loss of these values and functions in a manner consistent with the general welfare and beneficial economic, social, and agricultural development of the State.

Two implementing regulations have been developed to direct the Department's efforts in meeting the intent of the Act. Part 664 establishes 4 classes of wetland based on each wetland's specific type, characteristics, size and location in the landscape. Part 663 defines actions that require permits and sets forth the procedures the Department must follow in reviewing applications for required permits.

There is a total of three class II wetlands located within the Broome State Forests Unit, one each within Broome 4, Broome 7, and Broome 8. The classification of these wetlands is based on two characteristics: 1. They are adjacent or contiguous with streams classified C(t) or higher, and 2. They are located within a publicly owned recreation area. There are other freshwater wetlands located within the Unit which are not protected by the Act because they are less than 5 hectares in size. Information on all wetland resources within the Unit is found in **Appendix I**.

There are other wetlands on the Unit that are not classified under Federal or State Laws. These non-classified wetlands include spring seeps, riparian areas, and other types of wetlands. All of these wetlands will be protected from activities such as timber harvesting and mineral or gas exploration through the implementation of Special Management Zone rules developed by the Division of Lands and Forests, and the use of **best management practices**. However, gaining access to other managed sections of the forests may require crossing some of these wetlands. If a crossing is necessary, measures such as temporary bridges, seasonal restrictions, or surface mats will be utilized to limit the impact to the wetland.

Wetlands are characterized by soils saturated for a significant period during the growing season which support a plant community adapted to life in those saturated conditions. Wetlands can be dominated by trees, shrubs, grasses and herbs or a combination of these plant types thriving in saturated or inundated soils.

DEC has an inventory of wetlands, vernal pools, spring seeps, intermittent streams, perennial streams, rivers and water bodies on the unit. This data is used to establish special management zones and plan appropriate stream crossings for the protection of water resources. See **Appendix I**

for additional information about the wetlands regulated under the New York State Freshwater Wetland Act

Ponds

Ponds and lakes are typically open bodies of water not demonstrating wetland characteristics although, in some cases, very shallow ponds and the shallow areas of lakes support wetland plant communities. Marsh Pond, Beaver Pond and Whitaker Swamp, located within the Broome State Forests Unit, are examples of ponds that are considered wetlands. Shallow ponds are susceptible to a condition known as "winter kill". During winters when deep snow covers the ice, photosynthesis slows, and oxygen levels in the water decline. As a result, fish may begin to die in the pond, with the largest fish dying first.

There are nine ponds on the Unit comprising 68 acres. All these ponds are of natural origin. For the location of the ponds, see the Water Resources and Special Management Zones map in **Appendix XI**.

Streams

All the perennial streams on the state forests within the unit are classified as either C(t), C, or D. A stream is given a C(t) classification if it is suitable for the survival and propagation of trout, as well as other fish species. The C classification is given to steams that are suitable for fish (not including trout) survival and propagation. The D classification means that the stream is suitable for fish survival, but not propagation. The intermittent streams on the forests are not classified.

The small streams of the Unit support varying levels of wild trout reproduction. Class C(t) streams are located on Broome 4, 6, 8 & 9. Of these streams, only Marsh Creek on Broome 4 is significant enough to have been named. See Water Resources and Special Management Zones map in **Appendix XI** for their locations.

Mineral Resources

The Southern Tier of New York State is of interest to the natural gas industry because of events that happened millions of years ago. Millions of years ago, this portion of New York State was under water. Organic material containing hydrocarbons from dead aquatic organisms collected in muddy sediments at the bottom of the sea. As they decomposed, oxygen was depleted from the stagnant water and anaerobic bacteria began to transform the large, complex organic molecules into simpler compounds. As sediment continued to be buried deeper, temperature and pressure increased, and organic decomposition continued. Over geologic time, the bacterial activity created a large range of gaseous, liquid, and solid organic compounds, one of these being natural gas.

Once natural gas was formed, the fluids were squeezed out of the muddy sediments over millions of years by compaction and migrated upward to fill the pore spaces or fractures of adjacent beds. The sediments gradually became rock having tiny pore spaces within them. The interconnection of these voids or pore spaces is called permeability. The higher the porosity and permeability of a formation, the easier it is to extract natural gas from the reservoir rocks.

The two reservoir rocks with historic and current natural gas production within the Broome State Forest Unit are the Trenton/Black River formation consisting of limestone/dolostone and the Oriskany formation consisting of rounded and sub-rounded sand grains in a rock matrix. The porosity of these two rock formations enable efficient extraction of natural gas from them.

Oil, Gas and Solution Exploration and Development

Title 11 Section 23-1101 of the Environmental Conservation 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.

Oil and natural gas are valuable resources which may be located under State Forests. The extraction of these resources generates revenue and provides raw material for energy products. Due to the infrastructure necessary to extract oil and natural gas resources, as with any other human activity on State lands, oil and natural gas exploration and development of these resources can have negative impacts on the environment. Some of the impacts are short term such as those occurring during the well siting and drilling phases of development. Other impacts, such as forest **fragmentation,** are more persistent.

Oil and gas production from State Forest lands, where the mineral rights are owned by the state, are only undertaken under the terms and conditions of an oil and gas lease. In all areas covered by this Unit Management Plan, New York State manages the surface estate through the NYSDEC Division of Lands and Forests, and the mineral estate is managed through the NYSDEC Division of Mineral Resources. Currently, there are no leases for oil or gas exploration or development on the Unit.

As surface managers, the Division of Lands and Forests will evaluate any concerns as they pertain to new natural gas leases on State Forest lands. Consistent with past practice, prior to any new leases, DEC will hold public meetings to discuss all possible leasing options and environmental impacts. A comprehensive tract assessment will be completed as part of this process. For more information on natural gas and other mineral resource policies, please see SPSFM Chapter 5, page 225 at http://www.dec.ny.gov/lands/64567.html.

Shale Pits

The shale pits on State land were created when the **Public Forest Access Roads** were being constructed. Today, shale is occasionally removed from these pits primarily for hardening log

landings and resurfacing Public Forest Access Roads. Shale pits are also sometimes used for target shooting. The Broome State Forests Unit contains one shale pit located on Broome 5.

Wildlife Resources

The Unit and the landscape surrounding the Unit contain a variety of wildlife including many species of mammals, birds, amphibians, reptiles, fish, and invertebrates such as snails, mussels, insects, spiders and worms. Many resources were consulted to assess the variety of wildlife and wildlife habitat in and around the Unit.

Wildlife on the Unit

Species of Greatest Conservation Need

In 2015, the Department released New York State Wildlife Action Plan. It can be found at: https://www.dec.ny.gov/animals/7179.html
This plan addresses the conservation of those "species of greatest conservation need" (SGCN). This list of species was developed by DEC staff in consultation with experts and scientists from across the State. In the plan, the State is examined by major watersheds to determine those species in greatest need of conservation. The Unit is in the Susquehanna Basin portion of the plan. Table 5 lists those SGCN species known to be on or in-the-vicinity of the Unit and their population trends.

Table 5. SGCN Species by Species Group Found On or In the Vicinity of the Unit
SGCN Birds: Species Surveyed on or in the Vicinity of the Unit,
NYS Breeding Bird Atlas 2000 – 2005 data.

Bird Species	Population Trend
Grassland Birds*	
Bobolink	Decreasing
Eastern Meadowlark	Decreasing
Grasshopper Sparrow	Decreasing

Early successional forest/shrubland birds	
American Woodcock	Decreasing
Black-billed Cuckoo	Decreasing
Blue-winged Warbler	Decreasing
Brown Thrasher	Decreasing
Canada Warbler	Decreasing
Prairie Warbler	Increasing
Ruffed Grouse	Decreasing

Forest birds

Black-throated Blue Warbler	Decreasing
Cerulean Warbler	Increasing
Wood Thrush	Decreasing

Forest Breeding Raptors	
Northern Goshawk	Increasing
Red-shouldered Hawk	Increasing
Bald eagle	Increasing

* These are upland grass dependent species that likely use large fields found outside the Unit. Suitable habitat for these species does not exist on the Unit.

SGCN Reptiles & Amphibians: Species Surveyed on or in the Vicinity of the Unit, NYS Amphibian and Reptile Atlas Project, 1990 – 1999 data**.**

Species Group	Species	Population Trend
Lake/ River Reptiles	Eastern Ribbon Snake	Unknown
	Wood Turtle	Unknown
Woodland/Grassland Snakes	Smooth greensnake	Unknown
	Timber Rattlesnake	Decreasing
Snapping turtle	Snapping turtle	Unknown

SGCN Mammals: Species Likely to be on or in the Vicinity of the Unit, The New York Gap Program, U.S. EPA EMAP Hexagons 443, 474, 477 & 480.

Species Group	Species	Population Trend
Tree Bats	Eastern red bat	Unknown
	Hoary bat	Unknown
	Silver-haired bat	Unknown

As shown in the table above, the many species with decreasing population trends are those bird species that require early successional forest/shrublands or grasslands for habitat. These types of habitats are declining throughout the northeast as abandoned agricultural lands revert to forest cover. Historically, these habitats were created by periodic **disturbances** such as fire, beaver flooding, river flooding, Native American burning activities, and wind storms. Elsewhere, native grasslands have been used for agriculture. Today, most of the disturbance factors have been minimized or eliminated to accommodate the needs of society. Provision of these habitats for species dependent upon them will largely depend upon active management in the future.

Birds

Records compiled from 2000-2005 for New York State Breeding Bird Atlas 2000 list all bird species that are considered possible, probable or confirmed breeders in any given Atlas block surveyed. For the blocks in which the Unit is located, 122 species were identified (see Appendix III). A comparison of the 2000-2005 data with the 1980-1985 data reveals several grassland dependent species that were no longer found in the second bird survey. The missing grassland species include Henslow's sparrow, horned lark, Northern harrier and vesper sparrow. The yellow-breasted chat, an early successional dependent species was also missing form the second bird census. A likely reason for this may be due to declining amounts of suitable grassland habitat available for these species.

The New York State Breeding Bird Atlas is a comprehensive, statewide survey that reveals the distribution and protective status of breeding birds in New York State. The most recent data, for the Breeding Bird Atlas, was collected from 2000 to 2005. Thirteen Breeding Bird Atlas blocks (4065C & D, 4365C & D, 4465C & D, 4466D, 4565B & D, 4566A & C, 4664A, 4665C) were assessed to determine the possible, probable, and confirmed breeding bird species found on the Unit and surrounding vicinity. The Breeding Bird Atlas confirmed or predicted that there are 122 bird species breeding on the Unit or the surrounding vicinity. **Appendix III** shows these species by common name, scientific name, breeding status, and protective status. For information about rare bird species, see section G. 3. Significant Animals portion of this plan.

Amphibians and Reptiles

The Amphibian and Reptile Atlas Project was a survey, conducted by the DEC, which documented the geographic distribution of New York's amphibians and reptiles. The survey was conducted from 1990 to 1998. The project predicts 26 species of amphibians and reptiles on or in the vicinity of the Unit. A complete list of the 26 species, by common name, scientific name, and protective status is found in **Appendix IV**.

Mammals

The New York GAP Mammal Hexagon Database was used to determine the distribution of mammals on or in the vicinity of the Unit. Other sources were used to determine the protective status of these species. The sources include: the NYS DEC public website, the U.S. Fish and Wildlife Service website, and the New York Natural Heritage Program (NYNHP) website.

The New York State GAP confirmed or predicted 56 mammalian species on or in the vicinity of the Unit. A complete list of mammals that were confirmed or predicted, on the Unit or surrounding area, can be found in **Appendix V**. For information about rare mammal species, see Section H. 3. Significant Animals portion of this plan.

Fish

Ponds: The impoundments on the unit are all small and likely too shallow to support fish life although no formal fisheries surveys have been done on them. Anoxic conditions generally occur in shallow ponds with an abundance of organic material. Once permanent ice cover forms, pond water can no longer be re-oxygenated at the surface. Through the winter, aerobic decay of organic matter, along with respiration of plants and animals, depletes the limited oxygen supply under the ice. Depending on the amount of organic matter, duration of ice cover, and the depth of snow, complete exhaustion of oxygen can occur. A heavy snow cover will exacerbate the situation by blocking light penetration and shutting down any photosynthesis which would otherwise add oxygen to the water. This condition can render a pond incapable of supporting any fish through the winter in some years. Some fish, like bullheads, are more tolerant of low oxygen levels than other fish and larger fish will usually succumb before smaller ones.

Streams: The streams on the unit are mostly small headwater streams which likely support a minimal level of sport fishing. Some of the streams have had fisheries surveys conducted on them.

The streams on the Unit are composed of the typical species associated with headwater streams in the Susquehanna River drainage. Species typically found in these waters include longnose dace, blacknose dace, central stoneroller, common shiner and creek chub. Several classified trout (C (t)) streams are located on the Unit. All of the C(T), and likely several C classified, streams in the unit presumably contain trout at least part of the year.

A list of fish species on the Unit found on previous fish surveys is found in **Appendix VI**, Fish.

Game Species

There are many game species located on or in the vicinity of the Unit including a variety of birds and mammals. Game species are protected by regulated hunting/trapping seasons. They provide outdoor recreation opportunities that contribute to the local economy. More details of some of the major game species can be found below.

White-tailed deer - Deer are an important component of the Unit's faunal community. However, excessive deer population levels can be detrimental to forested **ecosystems**. Deer can alter the forest **understory** by over-browsing. Over-browsing can completely eliminate certain tree, shrub, and herbaceous species. This process may eliminate the forest understory layer, which can cause increased nest predation to ground-nesting and shrub-nesting birds, alters food sources for a variety of wildlife, can impact the forest's future composition and structure. More information on the relationship between deer populations and the vegetation composition of the forest can be found in this plan under Section L, Forest Health.

The Department's Bureau of Wildlife manages the deer population within Wildlife Management Units (WMU). Deer Management Permits and Deer Management Assistance Permits are the major tools which provide for a prescribed removal of adult females during the annual hunting seasons.

In instances where localized high populations are responsible for unacceptable damage to agricultural or forest industry crops, deer nuisance permits are authorized for removal of animals outside of the usual hunting seasons.

The Bureau of Wildlife uses several methods of obtaining the information necessary to develop management goals. Citizen Task Forces are formed for each WMU. Made up of various representatives of community interests, the task force considers hunting and agricultural interests, deer/auto collision data, residential shrubbery damage and other impacts. The Task Force then makes recommendations as to a preferred future deer population. Mandatory reporting by successful hunters, data from examination of deer at deer check stations, meat processing facilities and random road side checks during the hunting season rounds out the information gathering necessary for a successful deer management program.

Bear - The Broome State Forests Unit is southwest of the primary Catskill black bear range. Bear are becoming more common in the Unit. More sightings have been reported in recent years, and the number of nuisance complaints has risen as well. Black bears may be hunted for on the Unit.

Turkey - Once extirpated from New York State as a result of over-hunting and habitat loss, the wild turkey currently has a secure population throughout the State. Wild turkeys are protected as a game species and can be hunted during two seasons (Spring and Fall).

Ruffed grouse and American woodcock - These are upland game birds that are also SGCN species. Their populations are in decline in the northeast, primarily due to the declining amount of open, shrub and young forest habitat which they are dependent upon.

Furbearers - There are many species, on or in the vicinity of the Unit, that are considered furbearers. Within the Unit, some of the furbearers that can be hunted and/or trapped include the beaver, mink, muskrat, short-tailed weasel, long-tailed weasel, fisher, bobcat, red fox, gray fox, raccoon, Eastern coyote, and the striped skunk.

Important Habitat Features

The Broome State Forests Unit and the surrounding landscape provide diverse habitats for a variety of wildlife species. The assessments conducted above, along with forest inventories, have revealed important habitat features within the Unit. The following habitat features must be considered to ensure a healthy diverse wildlife population:

Coniferous Forest Cover Type

Coniferous (evergreen) or mixed conifer-hardwood conditions comprise 42% of the Unit compared to 30% of the surrounding landscape. Some birds require a conifer component as part of their habitat. Some of the conifer dependent birds, which are confirmed or predicted to be on or near

the Unit, include pine siskin, purple finch, hermit thrush, yellow-rumped warbler, blackburnian warbler, magnolia warbler, pine warbler, black-throated green warbler, dark-eyed junco, red crossbill, golden-crowned kinglet, red breasted nuthatch, winter wren, and the blue-headed vireo.

There are also mammals that require and/or benefit from conifer or mixed conifer-hardwood conditions. Mammals that require and/or benefit from the coniferous forests on the Unit include the red squirrel, deer mouse, Southern red-backed vole, porcupine, white-tailed deer, and Hoary bat.

Continuous Forest Canopy

State forests provide large blocks of continuous forest cover in a landscape that is often dominated by relatively fragmented forest areas. Some species prefer large forested areas for their habitat. These areas contain a variety of forest canopy conditions ranging from young forest to **late successional** habitat that are remote with minimal amounts of non-forest cover. The Cooper's hawk, Northern goshawk, red-shouldered hawk, and sharp-shinned hawk have some variations in their habitat requirements, but they all prefer a continuous forest canopy. Many Neotropical migratory songbirds are considered to be forest interior breeders. Some of these species which are often found on the Unit include the wood thrush, red-eyed vireo, ovenbird, black-throated blue warbler, black-throated green warbler, and scarlet tanager among others. Other bird species that also prefer a continuous forest canopy include the pileated woodpecker, common raven, and broad-winged hawk. Fewer mammals tend to be dependent upon blocks of continuous forest canopy. Mammals that prefer this type of habitat include the fisher, porcupine and Northern flying squirrel.

Multi-Layered Forest Canopy Structure

There are many bird species, on or near the Unit, that require a multi-layered forest canopy structure as a habitat requirement. Some of the birds that require a multi-layered forest canopy structure are the golden-crowned kinglet, hermit thrush, black-throated green warbler, yellow-rumped warbler, ovenbird, red-eyed vireo, warbling vireo, black-and-white warbler, least flycatcher, scarlet tanager, yellow-throated vireo, black-throated blue warbler, Canada warbler, American redstart and veery.

Cavity Trees/Snags/Course Woody Material

Many wildlife species use **cavity trees**, **snags,** or **Coarse Woody Material (CWM)** for perching, feeding, nesting, and/or roosting. Some wildlife use live cavity trees while others use dead cavity trees.

Some of the bird species, on or near the Unit, that use cavity trees include: red-breasted nuthatch, brown creeper, Eastern bluebird, house wren, Northern mockingbird, tree swallow, American

kestrel, Eastern screech owl, barred owl, black-capped chickadee, pileated woodpecker, tufted titmouse, downy woodpecker, great-crested flycatcher, Northern flicker, white-breasted nuthatch, hairy woodpecker, Carolina wren, winter wren, common merganser, hooded merganser, and wood duck.

Some of the mammals, in or around the Unit, that use cavity trees include: Indiana bat, little brown bat, silver-haired bat, big brown bat, Virginia opossum, gray squirrel, Northern flying squirrel, porcupine, gray fox, raccoon, fisher, short-tailed weasel, and long-tailed weasel.

Snags may or may not have cavities. Those without cavities are used mostly as perches or foraging sites. Birds, on or near the Unit, that utilize snags include: sharp-shinned hawk, Cooper's hawk, broad-winged hawk, red-tailed hawk, turkey vulture, American kestrel, bald eagle, brown creeper, great blue heron, green heron, great-horned owl, pileated woodpecker, and barred owl.

Mammalian species that may den in CWM include the Virginia opossum, Eastern chipmunk, Southern red-backed vole, gray fox, black bear, fisher, short-tailed weasel, and long-tailed weasel, mink, striped skunk, and bobcat. CWM is home to many wood-decaying insects that are a food source for many birds, mammals, amphibians, and reptiles. Many species of amphibians and reptiles live in or under the moist, soft, decaying wood of CWM.

Wetlands/Riparian Areas

Although all wildlife needs water to survive, there are many wildlife species that use water as their primary habitat. Many wildlife species depend upon the presence of wetlands or riparian areas including spring seeps, vernal pools, swamps, bogs, ponds, and streams. The birds, on or near the Unit, that utilize water as their primary habitat include the Canada goose, common merganser, hooded merganser, great blue heron, green heron, mallard, belted kingfisher, spotted sandpiper, swamp sparrow, willow flycatcher, American black duck, wood duck, Northern waterthrush and common yellowthroat.

Mammals on or in the vicinity of the Unit, that use water as part of their primary habitat include the beaver, muskrat, Southern bog lemming, big brown bat, little brown bat, Northern myotis, Indiana myotis, silver-haired bat, star-nosed mole, raccoon, mink, long-tailed weasel, and river otter.

Nearly all the amphibians and reptiles, on or near the Unit, require water for at least part of their life cycles.

Early Successional Habitat

Early successional habitats consist of largely open areas dominated by grasses, forbes, shrubs, and seedling to sapling size trees. They may be of natural origin, such as wet meadows made by beaver

activity, or they can be man-made by activities such as mowing or using even-aged silvicultural methods such as clearcutting to harvest timber and regenerate areas to a new crop of young trees. Early successional conditions may be found in either wetland habitats or on drier upland sites.

The Unit does not contain sufficient grassland habitat for species dependent upon those conditions. However, the Unit does have both upland shrub and wetland early successional habitat. As shown in **Table 4**, 266 acres (5%) of the forested area on the Unit is in seedling/sapling sized trees, 1"-5" in diameter. The early successional habitat on the Unit consisting of upland open and shrub lands combined with seedling or sapling size forested areas comprise 310 acres or 6% of the unit.

Shrubs and **pioneer** tree species become established on open lands. Shrubs and seedling/sapling sized trees provide habitat to a variety of wildlife species. This early successional habitat is used by a number of bird species found in and around the Unit. The bird species include the ruffed grouse, Canada warbler, yellow-rumped warbler, Nashville warbler, mourning warbler, yellow warbler, American crow, killdeer, white-throated sparrow, field sparrow, song sparrow, chipping sparrow, indigo bunting, Eastern bluebird, mourning dove, red-tailed hawk, turkey vulture, American goldfinch, American robin, American woodcock, cedar waxwing, Eastern towhee, gray catbird, house wren, Baltimore oriole, Northern mockingbird, and Eastern phoebe.

Many mammals also depend on early successional habitat for food and cover. Mammals on or in the vicinity of the Unit that utilize early successional habitat include the black bear, red fox, gray fox, white-tailed deer, Eastern cottontail, woodland vole, woodchuck, Southern bog lemming, and meadow jumping mouse.

Rare Species and Significant Ecological Communities

The New York Natural Heritage Program (NHP) is a partnership between DEC and The State university of New York - College of Environmental Science and Forestry. The NHP conducts inventories for rare plants, animals, and significant ecological communities. These inventories are used to identify, track, protect and help manage biodiversity. In 2004, NHP staff conducted a comprehensive inventory of all state forests in DEC's Region 7.

The presence of at-risk species and communities on the Broome Unit and in the surrounding landscape has been investigated to inform appropriate management actions and protections. This investigation was conducted in development of this UMP and the associated inventory of State Forest resources. A more focused assessment will be conducted before undertaking specific management activities in sensitive sites. Appropriate protections may include reserving areas from management activity or mitigating impacts of activity. For more information on protection of at-risk species, please see http://www.dec.ny.gov/lands/64567.html.

Investigation included the following:

- A formal plant survey was conducted on this unit by the New York Natural Heritage Program.
- Element Occurrence Records for the New York Natural Heritage Program's Biological and Conservation Data System were consulted for information.
- Consultation of the NYS Comprehensive Wildlife Conservation Strategy

Ecological Communities

A survey of the Unit by the NHP did not find any significant ecological communities on the Unit.

Representative Sample Areas

Representative Sample Areas (RSA) are stands that represent *common* ecological communities (i.e. forest types) of high or exceptional quality in their natural state. RSAs are setup to serve one or more of the following purposes:

1. To establish and/or maintain an ecological reference condition; or
2. To create or maintain an under-represented ecological condition (i.e. includes samples of successional phases, forest types, ecosystems, and/or ecological communities); or
3. To serve as a set of protected areas or refugia for species, communities and community types not captured in other protection standards such as an **endangered species** or a High Conservation Value Forest.

RSAs can simply be viewed as an effort to keep high quality examples of common ecosystems or assemblages from becoming rare in the landscape. An RSA designation does not prevent future management and in certain cases might require silvicultural treatment to achieve site conditions that will perpetuate the representative community. In addition, treatment of an RSA to mitigate unfavorable conditions that threaten the continuation of the target community will be allowed (ex. fire, natural pests or pathogens). Although allowed, silvicultural treatment or infrastructure development should not impact the RSA in a way that will degrade or eliminate the viability of the specific assemblage or community. For more information on RSAs please go to http://www.dec.ny.gov/lands/42947.html.

There are no RSAs located on the Unit.

Resource Protection Areas

In the course of practicing active forest management, it is important to identify areas on the landscape that are either reserved from management activity or where activity is conducted in such a manner as to provide direct protection and enhancement of habitat and ecosystem functions. For more information on these protective measures, see SPSFM page 85 at http://www.dec.ny.gov/lands/64567.html.

Special Management Zones (SMZs) provide continuous over-story shading of riparian areas and adjacent waters, by retaining sufficient tree cover to maintain acceptable aquatic habitat and protect riparian areas from soil compaction and other impacts. DEC's buffer guidelines also maintain corridors for movement and migration of all wildlife species, both terrestrial and aquatic. Buffers are required within SMZs extending from wetland boundaries, high-water marks on perennial and intermittent streams, vernal pools, spring seeps, ponds, lakes, recreational trails, campsites and other land features requiring special consideration. See Figure 1 for a map of the SMZs as applied on the unit

Significant Plants

The NHP does not have any records of current or historical occurrences of rare plant species on the unit.

Significant Animals

Significant animals are rare species listed as Endangered, **Threatened**, or as Species of Special Concern. Species of Special Concern are those not yet recognized as Threatened or Endangered, but for which documented concern exists for their continued welfare in New York State.

Birds

The Atlas of Breeding Birds in New York State lists the breeding status of birds in the state. The atlas is based upon field observations of birds by volunteers and classifies their breeding status as either confirmed, probable or possible. The Atlas lists occurrences of the following rare bird species on the Unit:

Table 6: Rare Birds Possibly Occurring on the Unit Based on the Breeding Bird Survey Blocks Including the Unit

Common Name	Breeding Status	NY Legal Status	Key Breeding Habitat
Bald eagle	Confirmed	Threatened	Tall mature trees near large bodies of water with good fish habitat and away from areas of human activity.
Cerulean warbler	Possible	SSC	Deciduous forests with open understory
Cooper's hawk	Confirmed	SSC	Forests
Grasshopper sparrow	Possible	SSC	Grasslands
Northern goshawk	Possible	SSC	Extensive forests
Osprey	Possible	SSC	Lakes and rivers having good fish habitat
Red-shouldered hawk	Possible	SSC	Extensive forests with wetlands
Sharp-shinned hawk	Possible	SSC	Dense forests

Source: New York State Breeding Bird Atlas 2000-2005; SSC – Species of Special Concern

Of the rare birds on the list above, four of them are forest breeding raptors that nest in forest areas with a high percentage of canopy closure (Crocoll 2013). The species include the Cooper's hawk, northern goshawk, red-shouldered hawk and sharp-shinned hawk. The sharp-shinned hawk requires dense coniferous or mixed woods for nesting habitat and is the most sensitive of the four species to canopy disturbance. However, maintaining a high percentage of forest cover around nesting sites is important for all of the four species.

The greatest threat for forest raptors is the loss of forest cover and the development of existing habitat. Due to limited research, little specific information is available on management recommendations for the individual species. However, there are two general management recommendations that are valid for all raptors. Avoid nesting disturbance and maintain existing habitat, particularly around the nest site.

The Osprey and Bald eagle are fish eating raptors that typically nest in large trees or snags. There are no known nesting sites for either of these species on the Unit. The Cerulean Warbler is a forest bird but prefers areas with sparse understory conditions. The Grasshopper sparrow is dependent on large grasslands. It is not using habitat on the unit as there are not suitable grasslands for this species on State land.

Mammals

Three rare bat species may be in-the-vicinity of the Unit. The Indiana Myotis, (*Myotis sodalis*) or Indiana bat is predicted on or in-the-vicinity of the Unit and is listed as Endangered, by both the State and the Federal government. The Eastern small-footed Myotis, (*Myotis leibii*) is listed by New York State as a Species of Special Concern. Lastly, the Northern long-eared bat is federally listed as a threatened species under the Endangered Species Act.

These bats share some habitat-requirement characteristics and they all feed on beetles, ants and insects. During the winter, they hibernate in caves or mines. When they emerge from their winter hibernacula, the Indiana bat and the Eastern small-footed bat hunt for insects near bodies of water, streams or wetlands. The Northern long-eared bat prefers to search for insects in the understory of forested areas.

Due to the lack of hibernacula, any use of the Unit by any of these bat species would be while they are on their summer range. On their summer ranges, each species has somewhat different roosting habits. The Indiana bat prefers to roost under the bark of living or dead trees. The Northern long-eared bat roosts under tree bark, in tree cavities or in caves and mines. The small-footed bat is the most adaptable and it will utilize caves, rock crevices, areas behind loose tree bark, and even abandoned buildings or the underside of bridges for their summer roosting sites.

The most serious threat to these bats is white-nose syndrome (WNS). Thousands of dead bats have been found in their hibernacula with evidence of WNS. WNS is associated with a newly identified fungus (Geomyces sp.) that thrives in the cold and humid conditions characteristic of the bat's hibernacula. This fungus may be directly responsible for bat deaths or it could be a secondary factor.

There are several management recommendations applicable to the management of the forested summer habitat of these three bat species. These recommendations include:

- Maintaining a mosaic of over-mature hardwoods, forest openings, water sources, and linear elements such as trails and roads.

- Retention of large snag trees within stands, along stream courses, and around wetlands. Trees and snags with loose or fractured bark can be utilized as roost sites. Harvesting trees on the south side of roost sites to aid in thermal heating of roosts.

- Maintain cavity trees.

- Preserve wetlands and other water bodies and establish and maintain areas of regenerating forest as feeding grounds.

Reptiles & Amphibians

Based upon data from the New York State Amphibian and Reptile Atlas Project, there are two rare reptile species which may possibly be found on or in the vicinity of the Unit. The timber rattlesnake, *Crotalus horridus,* is listed as a Threatened species in New York State. However, there are no known sightings of this species on the Unit.

The second rare reptile that could be present is the wood turtle, *Clemmys insculpta,* which is listed in New York State as a Special Concern species. Home ranges include some form of water habitat, typically a river or stream bordered by a mix of woodlands and meadows. Within these areas they tend to occupy open sites with low canopy cover. They are rarely associated with solid stands of habitat, instead preferring a mosaic of various forest types, meadows, active agricultural fields, swamps and other wetland habitats. The greatest threat to wood turtle populations is habitat fragmentation and modification.

Cultural Resources

The New York State Archeological Historic Preservation Act protects resources of cultural importance because of their historical significance. **Cultural resources** are finite and non-renewable resources that once destroyed cannot be returned to their original state. As a state agency, DEC is required to avoid or mitigate adverse impacts to cultural resources on the lands they manage.

The term cultural resources encompass 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 SEQR (ECL Article 8) as well as Article 9 of Environmental Conservation Law, 6NYCRR Section 190.8 (g) and Section 233 of Education Law to include such resources in the range of environmental values that are managed on public lands. For more information on protection of historic and cultural resources, please see SPSFM page 139 at http://www.dec.ny.gov/lands/64567.html.

A review of the GIS data set for archaeological sites of historical significance maintained by the state Historic Preservation Office or the New York State Museum indicates that there are no identified sites of historical significance on the Unit.

The New York State Archaeological Inventory establishes a list of places where evidence of past human activities, from all periods of the human past, have been found. These sites include settler homesteads, mills, villages, cemeteries, sites with prehistoric artifacts, and other sites with historic significance. There are also many ordinary cultural artifacts including cellar holes, foundation remnants, and stone walls that provide clues about past settlement and land use. Each helps to tell the story of forest clearing and its transformation into a working landscape.

These sites may be legally protected if they meet the criteria for listing in the State and National Registers of Historic Places (Registers). Stone walls are not listed in the Archaeological Inventory and they do not usually qualify, individually, as State or National Register resources. However, the stone walls from the early settlement period are still important cultural resources. There are numerous stone walls on the forests of the Broome State Forests Unit. Most of these walls were constructed by the early settlers who began farming the land. Some of the walls may date back to the late 1700's. When these lands were first cleared for farming, the land owners removed the stones from the fields and then used the stones to construct walls along their property boundaries or the borders of the fields. These stone walls are now part of the landscape and they provide us with information about past land uses and human history.

Although these cultural resources are not specifically protected by regulations, the Department has implemented management practices to preserve the integrity of the walls. Since the value of field stone has increased significantly in the past 10 years, many stone walls on privately owned land are being dismantled for the purpose of selling the stones. The Department does not sell field stones from the State forests. On New York State forest lands, no materials can be removed from any cultural historic sites.

Archaeological Site Protection
The archaeological sites located within this land unit as well as additional 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 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. 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.

Recreational Resources

State Forests are managed with a minimal amount of improvements to accommodate rustic, forest based recreational opportunities while providing for resource protection; public health and

safety; and access for individuals of all ability levels. For more information on infrastructure policies, please see SPSFM page 157 at http://www.dec.ny.gov/lands/64567.html.

New York's State forests offer many outdoor recreational opportunities for the public. The types of recreational activities associated with State forests include hiking, camping, hunting, fishing, cross country skiing, mountain biking, horseback riding, and snowmobiling.

State Forests are managed for multiple uses. One of these uses is to provide the public with opportunities for many recreational pursuits in remote settings compatible with a rustic or primitive scale of development. For example, there are abundant opportunities for camping, but the camp sites are not developed to the extent that they are in State Parks or private campgrounds. Facilities on State forests, such as recreational trails, camping sites, or parking areas are primitive in design. Camping sites on State forests may have a fireplace, a picnic table, and an outhouse, but they do not have the amenities typically found in State parks such as paved access roads, plumbing or electricity.

Table 7. Recreational Trails on the Unit

Forest	Trail Length (miles)	Allowed Uses
Broome 3	1.6	Cross country skiing, walking
Broome 6	0.6	Multiple use – hiking, horse riding, biking, skiing, snowmobiling
Broome 8	2.2	Multiple use – hiking, horse riding, biking, skiing, snowmobiling. Also motorized vehicle use by permitted people with disabilities.
Total	**4.4 miles**	

Recreation Activities

Hunting and Trapping

The most popular recreational activity on the forests of the Unit is big game hunting for white-tailed deer. Turkey and squirrel hunting are also popular activities. Other available hunting opportunities include the pursuit of upland game birds like grouse and woodcock and hunting for coyote and fox. The Unit also provides good opportunities for furbearer trapping. Hunting and trapping are allowed on all of the Broome State forests by persons who possess a valid New York State hunting or trapping license, and who abide by the regulations.

Camping

Primitive style camping is available on State forests. Two primitive camp sites are located on Broome 4, Marsh Pond State Forest. There are no other facilities offered here except for camp spots and fire pits. The regulations for camping on State forests are listed in Title 6, Chapter II, Part

190 of the NYS Environmental Conservation Law. **Appendix IX** lists these regulations. There is no fee for camping on State forests.

Cross Country Skiing

A designated cross-country ski trail having a total length of 1.6 miles is on the Hawkins Pond State Forest. This trail was created as an extension of the ski trails on the adjacent Broome County park land. The trail has received little maintenance since it was established in 1979. The ski trail is intended to be a primitive-style recreation facility, therefore it is not groomed. The trail is designed for skiers with a beginning or intermediate ability. Although this trail is the only designated ski trail on the Broome State Forests Unit, there are several abandoned and unplowed roads on the forests that offer good opportunities for skiing. These include the abandoned roads on Beaver Pond State Forest, Whitaker Swamp State Forest, Cat Hollow State Forest, and the Public Forest Access Road on Skyline Drive State Forest.

Snowmobiling

There are few opportunities for snowmobiling on the forests of the Broome Unit. Since the New York State snowmobile corridor trail system does not extend into the unit, there are no long-distance trail systems available. The length of the unplowed roads on the forests of the Broome Unit are quite short in view of what most people would prefer for snowmobiling. For example, the unplowed Public Forest Access Road on Skyline Drive State Forest is occasionally used by snowmobilers, but this road is only about 2.2 miles in length. There are unplowed town roads, but none connect to a trail system, so activity is typically limited to local use.

Mountain Biking

There are currently no designated trails for mountain biking on the forests of the Unit, although this activity is allowed unless restricted by signs. Unauthorized trail clearing is prohibited. Mountain biking has greatly increased in popularity since 1990 and there is some activity on the forests. Most of the demand for mountain biking opportunities is being met by other recreation areas in the county. Chenango Valley State Park and Greenwood County Park have established trail systems.

Fishing

Marsh Pond is the most popular location for fishing on the properties of the Unit. Catfish and sunfish are common in the pond. Other popular fisheries within the landscape of the Unit include the Susquehanna River, Tioughnioga River, Chenango River, and the West Branch of the Delaware River. Public access to these rivers is available at several locations. The Water Resources Maps in **Appendix XI** of this plan show the locations and classifications of the Unit's ponds and streams.

Horseback Riding

There are no long-distance horseback riding trail systems connecting with any of the Broome State Forests, so the opportunities for this activity are limited. Many of the town roads in the areas surrounding the State forests are rural and infrequently traveled. These may be compatible for horseback riding, and in combination with abandoned roads or Public Forest Access Roads, may provide a satisfactory distance. An extensive horse trail system exists on State forest land in Madison County. The Brookfield Horse Trail System is located approximately 70 miles from Binghamton and offers 130 miles of trails. This trail system, which is located on 13,000 acres of State forest land, is close enough to the Broome County area to provide a popular day-trip destination for horseback riding. Two less extensive horse trail systems exist on State forests within 30 miles of the Binghamton area.

The Jenksville State Forest in Tioga County offers 12 miles of designated horse trails and the Tuller Hill State Forest in Cortland County offers 9 miles of trails.

Hiking, Snowshoeing, and Nature Observation

Though there are no designated hiking trails on the Unit, these activities can be enjoyed anywhere on the Broome State forests. The variety of topography, forest cover, and wildlife habitat provides an attractive and ever-changing setting when exploring these lands.

Overall Assessment of the Level of Recreational Development

It is important that recreational uses are not allowed to incrementally increase to unsustainable levels. DEC must consider the impact on the unit from an increase of any particular recreational use on other management goals or recreational uses. DEC must consider the full range of impacts, including long-term maintenance and balance of multiple uses.

The Unit currently has a low level of recreational development consistent with the level of recreational demands in this area. These forests are best suited to provide opportunities for dispersed recreational activities, requiring a low level of development in a remote setting. Activities such as hunting, snowmobiling, hiking, nature observation, trapping and geocaching are all consistent with the character and features of the Unit.

Visual Resources

The aesthetic quality of State Forests is considered in management activity across the unit. However, some areas have greater potential to preserve or create unique opportunities for public enjoyment. These especially scenic areas are inventoried below. For information on the protection of visual resources, please see SPSFM page 81 at http://www.dec.ny.gov/lands/64567.html.

Table 8. Visual Resources on the Unit

Forest	Visual Resource

Broome 4	Marsh Pond
Broome 5	Skyline Drive – scenic vista across the Susquehanna River valley, esp. during the leaf-off seasons.
Broome 6	Small pond/wetland
Broome 7	Beaver pond
Broome 8	Small pond

Universal Access

DEC has an essential role in providing universal access to recreational activities that are often rustic and challenging by nature, and ensuring that facilities are not only safe, attractive and sustainable, but also compatible with resources. For more information on universal access policies, please see SPSFM page 173 at http://www.dec.ny.gov/lands/64567.html.

Broome RA #8, Whitaker Swamp State Forest has a motorized access trail which provides for permitted access by people with disabilities. This trail is 2.2 miles in length, with parking areas at each end of it, and provides people with disabilities the opportunity for off road access through the center of this forest.

Application of the Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA), along with the Architectural Barriers Act of 1968 (ABA) and the Rehabilitation Act of 1973; Title V, Section 504, have had a profound effect on the manner in which people with disabilities are afforded equality in their recreational pursuits. The ADA is a comprehensive law prohibiting discrimination against people with disabilities in employment practices, use of public transportation, use of telecommunication facilities and use of public accommodations. Title II of the ADA requires, in part, that reasonable modifications must be made to the services and programs of public entities, 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 an undue financial or administrative burden.

Title II also requires that new facilities, and parts of facilities that are newly constructed for public use, are to be accessible to people with disabilities. In rare circumstances where accessibility is determined to be structurally impracticable due to terrain, the facility, or part of facility is to be accessible to the greatest extent possible and to people with various types of disabilities.

Consistent with ADA requirements, the Department incorporates accessibility for people with disabilities into the planning, construction and alteration of recreational facilities and assets supporting them. This UMP incorporates an inventory of all the recreational facilities or assets supporting the programs and services available on the unit, and an assessment of the programs, services and facilities on the unit to determine the level of accessibility provided. In conducting

this assessment, DEC employs guidelines which ensure that programs are accessible, including buildings, facilities, and vehicles, in terms of architecture and design, transportation and communication to individuals with disabilities.

Any new facilities, assets and accessibility improvements to existing facilities or assets proposed in this UMP are identified in the section containing proposed management actions.

The Department is not required to make each of its existing facilities and assets accessible as long as the Department's programs, taken as a whole, are accessible.

For copies of any of the above mentioned laws or guidelines relating to accessibility, contact the DEC Universal Access Program Coordinator at 518-402-9428 or UniversalAccessProgram@dec.ny.gov

Regulations Applicable to Recreational Activities on State Forests

No fees are charged to the users of State Forest lands for recreational activities. However, a permit may be required for group activities or events. A **Temporary Revocable Permit (TRP)** is required for the following types of recreational activities on State Forests: organized and advertised events such as club-sponsored pleasure rides or scouting camporees; events having groups of 20 or more people; or competitive events such as those involving horse riding and orienteering tournaments. Chapter 5 of the Strategic Plan for State Forest Management provides specific details on the permitting process and the requirements for liability insurance.

Other Facilities

State Forest boundary lines

The boundary line of each State Forest needs to be maintained in order to effectively manage the property. State Forest boundary lines are identified with metal signs, approximately 7"x10" in size, with the Department logo on a yellow background. The trees on the boundary line are also blazed with yellow paint. Periodic maintenance of the signs and paint, as well as survey records, are needed to protect the integrity of the boundary lines. The boundary lines are maintained on a seven year cycle.

For more information of boundary line maintenance, please see SPSFM at http://www.dec.ny.gov/lands/64567.html.

Table 9. Boundary Line Maintenance Schedule

Year	State Forest	Miles*
2021	Broome 3	4.6
2023	Broome 4	7.7

Year	State Forest	Miles*
2020	Broome 5	7.5
2021	Broome 6	6.0
2023	Broome 7	11.2
2022	Broome 8	6.0
2022	Broome 9	5.7
2021	Broome-Tioga 1	9.6
Total		**58.3**

* Length determined by GIS boundary data.

State Forest Identification Signs.

State forests are typically identified with an identification sign, displaying the name of the forest and its acreage. The wooden signs are approximately 3' x 4' in size with yellow lettering on a brown background and fastened to a free standing wooden sign post. Table 10 below lists the forest identification signs present on the Unit.

Table 10. Forest Identification Signs on the Unit

Forest	# of Signs	Location
Broome 3	1	Intersection of McAllister & Scouten Hill roads
Broome 4	1	Marsh Pond Road @ Bryce Road
Broome 5	1	Grange Hall Road @ Skyline Drive
Broome 6	1	Cascade Valley Road
Broome 7	None	
Broome 8	1	Oquaga Lake Road
Broome 9	None	
Broome-Tioga 1	None	

Kiosks and Map Boards

State Forest Information Kiosks are weatherproof panels containing, photographs, maps, and written information relating to a specific State Forest. The Division of Lands & Forests in Region 7 is moving forward with a proposal to establish an Information Kiosk at each State Forest in the Region (9 Counties). All State Forests addressed in this UMP will have Information Kiosks installed in the near future as Department labor and funding permits.

Table 11. Kiosks and Map Boards on the Unit

Forest	Location
Broome 3	McAllister Road
Broome 4	Marsh Pond Road

Forest	Location
Broome 5	None
Broome 6	Cascade Valley Road
Broome 7	None
Broome 8	Oquaga Lake Road
Broome 9	None
Broome-Tioga 1	None

Impoundments

There are none on the Unit.

Parking Areas and Pull-off Sites

This Unit has four defined, designated, parking areas located on Broome 6, 8 and 9. Each parking lot has a capacity of two to four vehicles. In addition, there are numerous other roadside pull-offs, log landing sites, or vehicle turn-arounds where people routinely park to access the Unit.

Roads

Roadways found on the Unit include Public Forest Access Roads, **Haul Roads**, **Access Trails**, Town Roads, County Roads, and Abandoned Town Roads. From this group, the Public Forest Access Roads, Town Roads, and County Roads are all designed for public use with motor vehicles.

Public Forest Access Roads have been built by and are maintained by the DEC. On this Unit, Pubic Forest Access Roads are also called Truck Trails (TT). The roads are constructed to standards that will provide reasonably safe travel and keep maintenance costs at a minimum. These roads are not normally plowed or sanded in the winter. Haul Roads are designed to facilitate forest products removal (e.g., use by log trucks). Access Trails have a low level of maintenance and provide limited access on the unit and may require a 4-wheel drive vehicle for travel. The entrances to haul Roads or Access Trails may be gated or otherwise barricaded. The historic corridors from some Abandoned Town Roads may also be found on the State Forests. These lanes are no longer suitable for passenger vehicles or log trucks; however, some are designated for use as recreational trails. These corridors remain important for their historic values and provide information about the cultural development of these lands. The following roads on the Unit are maintained to provide access for passenger vehicles or log trucks:

Table 12. DEC Roads on the Unit

Forest	Description/Location	Length (miles)	Number of Culverts
Public Forest Access Roads			
Broome 3	Hawkins Pond road	0.2	3

Forest	Description/Location	Length (miles)	Number of Culverts
Broome 5	Skyline Drive	2.2	22
Haul Roads			
Broome 8	Whitaker Swamp haul road	0.2	0
Abandoned Roads			
Broome 7	Huggins Road	0.9	Unknown
Broome 9	Cat Hollow Road	1.3	Unknown
Motorized Access Trail for Permitted People with Disabilities			
Broome 8	Off road trail	2.2	Unknown

Shale pits

There is one shale pit on Broome 5 and an old inactive pit is located on Broome 3.

Gates

Gates are located on the Unit at the locations listed in the table below.

Table 13. Gates on the Unit

Forest	# of Gates	Location	Purpose
Broome 3	1	McAllister Road	Prevent vehicle use on abandoned road.
Broome 8	2	North and south ends of multi-use trail.	Prevent illegal off-road vehicle use on multi-use trail.

Supporting Local Communities

Tourism

State Forests can be an economic asset to the local communities that surround them. It is estimated that more than three out of every four Americans participate in active outdoor recreation of some sort each year. When they do, they spend money, generate jobs, and support local communities. For more information, please see SPSFM page 245 at http://www.dec.ny.gov/lands/64567.html.

The DEC is open to possible partnerships with local recreation groups that would support or improve forest-based tourism activities that are consistent with this plan and State forest rules and regulations. Department publications

Taxes Paid

The New York State Real Property Tax Law provides that all reforestation areas are subject to taxation for school and town purposes. Some reforestation areas are also subject to taxation for county purposes. Most unique areas and multiple use areas are exempt from taxation. All of these lands are assessed as if privately owned. Please see Appendix VIII for additional information on taxes paid on the Broome unit.

Property Use Agreements

Deeded Rights-of-Way and Easements

None identified.

Property Reservations

Broome 6

A spring & water right reservation exists on Proposal A. The spring is located approximately 587 feet east of the southwest corner of the 22.97-acre private parcel. The water is piped to buildings on the private land.

Broome 7

A spring & water right reservation exists on Proposal A. One spring is located near the northern boundary line of the northern parcel of Proposal A. The water is piped for a distance of approximately 330 feet onto private land. A second spring is located on the southern parcel of Proposal A, near the northwest corner of the 10.67-acre private parcel. The water is piped approximately 308 feet to the northwest corner of the private land. The deed for Proposal D, dated 12-26-40, describes a third spring & water right reservation.

Revocable Permits, Utility R.O.W., Easements

Broome 3

A Temporary Revocable Permit (TRP) was issued to the Broome County Parks & Recreation Department for the purpose of constructing cross country ski trails in 1978 & 1979. Broome 3 was then known as the Aspen Grove State Forest.

Broome 8

A Right-of Way was established on this property in 1925 by the New York State Gas & Electric Company for the purpose of maintaining electric transmission lines. The R.O.W. is 30 feet in width and goes across the northwest portion of the forest.

Broome 9

An aerial telephone line traverses across the forest, roughly parallel and north of the abandoned road. This line is documented on the 1963 survey map of the forest.

Broome-Tioga 1

A Temporary Revocable Permit was issued to NYSEG for the installation of an electric service line along Collins Road in 1974. The line provides service to Dr. Thomas Nytch. The line is on the highway R.O.W., but two anchors are on the state land. NYSEG relocated one pole and one anchor onto state land along power lines on each of Tracy Creek Road and Collins Road. This was done in 1976. NYSEG relocated four poles and four anchors onto state land along the electric service line on Crumm Road. This was done in 1978.

Uses of State Lands Established Without Known Permits or Easements

While there are no known records for construction, the following utility lines are maintained though issuance of TRPs.

Broome 3
New York State Electric & Gas (NYSEG) power line along Scouten Hill Road.

Broome 6
NYSEG power line along Cascade Valley Road.

Broome 7
NYSEG power line crossing the forest through the north part of stand 32.
TRPs have been issued to NYSEG for the maintenance of the lines on Broome 6 & 7.

Trespasses
Ongoing possible trespasses are located on Broome 4, stand 27 and Broome-Tioga 1, stand 22. Surveys will be needed to determine the extent of these possible violations.

Land Acquisition

Acquisition of property from willing sellers on the landscape surrounding the unit may be considered in the following priority areas:

- in-holdings and adjoining properties that would reduce management costs and benefit resource protection and public access goals
- the mineral estate wherever it is split from a State Forest tract
- properties within identified matrix forest blocks and connectivity corridors
- forested lands in underserved areas of the state
- forested lands in areas that are in need of watershed protection

For more information on land acquisition, please see SPSFM page 147 at http://www.dec.ny.gov/lands/64567.html.

Forest Health

Forest health is pursued with the goal of maintaining biodiversity. Any agent that decreases biodiversity can have a negative effect on the forest and its ability to withstand stress from damaging agents. Maintaining native species and natural communities or species that can thrive on site conditions without negatively impacting biodiversity promotes forest health. For more information on forest health, please see SPSFM http://www.dec.ny.gov/lands/64567.html

Many factors influence forest health including species of insects, diseases, pollutants and deer. All play important roles in the ecology of the forested landscape. Insects and diseases that affect trees are constant natural forces that shape the forest. Most insects and diseases have only negligible impacts to overall forest health, and on a small scale even provide beneficial impacts. Some however, particularly invasive exotic species can be especially damaging. Important factors that currently or could potentially affect the forest health on the Unit are described below.

Deer Impacts on the Vegetative Composition of the Forest

It is important to understand that forests are ecosystems and not simply groups of trees. A forest is a combination of all the physical and biological elements in the environment and their interrelationships. One of the significant relationships in the forest exists between white-tailed deer and understory vegetation. The understory layer of the forest (between ground level and about 6 feet above the ground) is the feeding zone for white-tailed deer. High quality deer habitat includes areas with abundant food and cover in this zone. Typically this is described as an area with a mix of fields, shrub land, agricultural crops, **mast** trees such as beech or oaks and forest edges with some conifers for shelter. In contrast, poor quality habitat is characterized by large areas with little food or cover in the understory, such as in dense conifer stands, where often little undergrowth exists. High quality habitat can sustain a larger deer herd while also maintaining the biodiversity of forest plant species. Deer living in areas with a greater abundance and diversity of food resources are believed to spend less time feeding in the forest. The lands on the Unit are of

moderate to poor habitat quality, in part due to deer over-browsing, while better quality habitat is available on private lands in the vicinity of the Unit.

In the forest, deer have "favorite foods". Species that deer prefer to eat include sugar maple, white ash, red maple and red oak, while vegetation they tend to avoid eating includes American beech, striped maple, and hophornbeam. While many plants can survive occasional browsing, repeated browsing can often cause direct mortality. The species that deer tend to avoid are also generally resistant to the effects of repeated browsing. When deer populations are high, relative to the quality of the habitat, repeated, preferential browsing over many years can lead to a decrease in plant diversity and an increase in the abundance of unpalatable species. Without the recruitment of a wide variety of young trees and shrub species, the understory layer is eventually reduced to a small collection of undesirable species including, fern, striped maple, American beech and hophornbeam. Over time, these species can become established in very high densities, casting dense shade that interferes or prevents other more desirable species from growing.

The presence of interfering species above threshold stocking levels will prevent the establishment of other tree species, resulting in greatly reduced vegetation diversity and severely limited potential for future timber production (Bashant & Nyland, et al., 2005). Excessive deer browsing can also reduce understory plant species diversity. Forest herbaceous species sensitive to deer **browse** include trillium, Canada mayflower, and Indian cucumber. Furthermore, excessive deer browsing can have secondary impacts in the forest due to the resulting altered, and generally simplified structure of the understory vegetation. In turn, these changes to the understory may result in other impacts such as a reduced diversity of breeding birds.

New York fern, hay-scented fern, American beech, striped maple, and hophornbeam are the primary species of interfering vegetation on the Unit. Some stands on the Unit have dense interfering vegetation that is preventing the establishment of desirable **regeneration**. **Sustainable forest management** requires regeneration of the forest to desirable species following harvesting.

There is limited ability to manage deer impacts using silvicultural systems. The most effective method of keeping deer impacts in line with management objectives is to monitor impacts while working with the Division of Fish, Wildlife and Marine Resources to observe and manage the herd. On properties where deer are suspected of impacting values and objectives associated with biodiversity and timber management, such impacts must be inventoried and assessed. For more information on managing deer impacts, please see SPSFM page 291 at http://www.dec.ny.gov/lands/64567.html.

Insects

Hemlock Woolly Adelgid (*Adelges tsugae*) - This **exotic**, or non-native insect from Asia is currently posing a significant threat to the health of eastern hemlock across much of its natural range. Adelgid infestations can cause rapid **defoliation** of hemlock trees and can result in the complete

mortality of all hemlock trees in affected stands within four years. This insect has been the focus of many recent studies in an attempt to discover methods of reducing its impact. Presently, the adelgid has been found throughout most of Broome County and it is assumed that it is present on the unit. This insect pest has been devastating to hemlock in the lower Delaware and Hudson River valleys. It is highly likely that in the near future, this invasive insect will be found killing hemlock on the Unit. The adelgid attacks and kills all sizes of hemlock. Eastern hemlock is one of only a few native conifers found on the Unit and is currently the most abundant. It is considered a keystone species, because it is valuable in so many ways to native habitats. It stabilizes the soil in moist areas and on slopes. It cools riparian areas in the heat of summer and provides thermal cover for deer and other wildlife during winter. Many wildlife species such as red squirrels and black-throated green warblers are strongly associated with hemlock. There are currently two strategies being employed to save hemlock trees from this insect. Bio-control efforts focus on the release of a beetle native to western North America where it preys on the hemlock wooly adelgid and other native adelgid species. Several other beetles are also being tested for control. If these biological controls prove unsuccessful, the long-term consequence could be the elimination of eastern hemlock from the landscape. The second method is the use of chemical control through the application of insecticides to trees. The insecticide treatment protects the trees for up to five years and may be a useful strategy to use until effective bio-control efforts are developed.

Gypsy Moth (*Lymantria dispar*) - This insect has received much notoriety since it was introduced into the United States in 1868. Populations of this insect can periodically build to "outbreak levels" resulting in widespread forest defoliation. Gypsy moths will defoliate many species of northeastern trees, but they favor oaks. The most recent, significant outbreaks of gypsy moth in Broome County occurred in 1981-83 and 1990-92. An estimated 15,000 acres of oak forest in the county were defoliated by the 1990 outbreak. Many oak trees on the Skyline Drive State Forest and the Hawkins Pond State Forest were killed by these infestations.

Timber sales were conducted on Broome #5 in 1983 and 1993 to salvage dead and dying oak resulting from the gypsy moth defoliation combined with drought. High populations of gypsy moths do not typically persist more than three years before they collapse. Until recently, a virus (*NucleoPolyhedrosis* Virus) has usually caused the rapid decline of Gypsy Moth populations. In recent years however, a fungus (*Entomophaga maimaiga*) has also proved to be effective in reducing moth populations. This fungus was introduced to the U.S. from Japan in 1910 and again in 1985. Its effectiveness had been dismissed until its presence was identified in seven states in 1989. Because of the presence of both the virus and the fungus, it is hoped that future Gypsy Moth outbreaks will be less severe and less frequent

Forest Tent Caterpillar (*Malacosoma disstria*) – This insect can be a serious defoliator of sugar maple. Unlike other "tent caterpillars", the Forest Tent Caterpillar does not construct a tent on the tree branches. Most healthy hardwoods can withstand a single defoliation from this insect. The most significant outbreak in recent years within Broome County occurred in 1994. Unfortunately, the 1994 defoliation was accompanied by an Anthracnose infection which killed the

year's second crop of leaves. As a result, extensive sugar maple mortality occurred after only one defoliation by the Forest Tent Caterpillar. In 1995, approximately 135 acres of dead sugar maple timber was salvaged on Broome 8 and Broome 9. The summer seasons from 2004 through 2008 had heavy infestations of the forest tent caterpillar in localized areas of central New York. Numerous patches of forest canopy were defoliated on the hilltops during the summers of 2008 and 2009. Many of the trees, especially sugar maple, did not survive the consecutive defoliations.

Eastern Tent Caterpillar (*Malacosoma americanum*) - This is the most common "tent maker" in New York State. The caterpillars build the nests in the crotches of tree branches. They prefer cherry trees and apples trees. The nests are formed in late April or early May each year and the caterpillars feed on the leaves. Most of the feeding is done from dusk through the evening hours.

Pear Thrips (*Taeniothrips inconsequens*) - Introduced from Europe to the United States in 1904. It attacks a variety of orchard and forest trees. There were several population explosions of Pear thrips in the northeast during the late 1980s. The outbreak of 1988 damaged or defoliated more than 1.5 million acres of sugar maple trees. In addition to causing leaf damage, Pear Thrips may also be capable of transmitting a fungal disease, maple anthracnose. This disease often coincides with Pear Thrip infestations. Maple anthracnose decreases the photosynthetic ability of leaves, which can kill trees, if they are severely infected. Thrips damage to the forests of the Unit has so far been insignificant.

Elm Spanworm (*Ennomos subsignarius*) (and other species of loopers) - The common name of this insect is deceiving, as it is not only associated with elm trees, but will defoliate beech, oak, hickory, maple, and ash as well. More than 20 major outbreaks have occurred in the past century. The forests in the southern tier of New York State and much of Pennsylvania were heavily defoliated by these insects in 1994. Typically, outbreaks of the Elm Spanworm succumb to mortality from a complex of natural agents, including egg parasites and larval diseases.

Peach Bark Beetle (*Phloeotribus liminaris*) - This insect has recently gained increased attention from foresters in the northeast due to the amount of damage it has caused to black cherry trees. Infestations of this insect can result in large amounts of gum deposits on the trunks of black cherry. The damage can significantly reduce the value of the timber and it causes a general decline in tree health. Peach Bark Beetle populations build up in the tree tops following the harvest of cherry timber. **Residual**, healthy cherry trees are then attacked. Cultural practices (e.g. reducing quantities of slash and seasonal cutting) are being investigated to minimize the negative impacts of peach bark beetles.

Asian Longhorned Beetle (*Anoplophora glabripennis*) - This black & white beetle with long antennae, is a native of Asia. Potential impacts from this invasive insect may be very devastating since it attacks a range of hardwood species. It prefers maple species in particular, which are major components of the northeastern forest and also important to the wood product industry. This insect was first detected in New York City in 1996. The nearest known infestations of this

beetle to the Unit are populations located in central Massachusetts as well as in Brooklyn and Amityville, NY. Host trees are predominantly maples. Since this pest is extremely destructive and has the potential to spread at a rapid rate, authorities are destroying all trees discovered with infestations. As of 2010, over 8,000 infested trees had been identified and removed in New York City and Long Island alone. There are no known natural factors which will limit the spread of this insect.

Emerald Ash Borer (*Agrilus planipennis* Fairmaire) - This metallic green beetle is native to Asia. It was first discovered in the US (Michigan) in 2002. Since that time, it has killed tens of millions of ash trees in southeastern Michigan alone, with tens of millions more lost in the eastern United States, including New York State. The emerald ash borer (EAB) larva feed on the inner bark of ash trees. They will feed on trees of any size and will usually kill the tree within 3 years of infestation.

EAB was first discovered in New York State in 2009, at a site in Cattaraugus County and has since been found in many counties across New York State. As of 2015, the closest known infestation to the Unit is in Binghamton. The City of Binghamton as well as the towns of Binghamton, Kirkwood and Conklin are in an EAB quarantine area. Broome 5, Skyline Drive State Forest is in a zone defined by DEC as having "Severe Risk" of infestation. Additional infestations within 20 miles of the Unit are found in the Town of Nichols to the west and in the Unadilla area to the east. EAB will likely become established throughout the state within the next 10 years. In 2010, the Department released the *Emerald Ash Borer Management Response Plan* which defines goals to slow ash mortality in New York State. Quarantine zones have been established to restrict the transportation of infected wood. To date this approach is showing signs of success at slowing the EAB outbreak. Unless an effective control is discovered, nearly all white ash will be killed within the next ten years.

European Pine Shoot Beetle (*Tomicus piniperda*) - This beetle, native to Europe and Asia, attacks the new shoots of pine trees, including scotch pine and red pine, stunting the growth of the tree. The USDA's Animal and Plant Health Inspection Service (APHIS) has issued regulations resulting in "quarantines" within the infested counties of New York State, and other states, to prevent the spread of this insect. These quarantines are of significance because they affect the transportation of pine logs. In general, the regulation restricts the transportation of pine logs from a quarantined area to a non-quarantined area. In 2004, nearly every county in New York State was listed as quarantined, with the exception of the eastern-most counties and the downstate area. Broome County is in this Federal quarantine area which regulates and limits the transportation of pine logs to sawmills out of the area.

Sirex Woodwasp (*Sirex noctilio*) - This exotic pest was first discovered in New York State in 2004 in Fulton, NY (Oswego County). The Sirex woodwasp is native to Europe, Asia and Northern Africa, and it attacks most species of pine trees, including red pine and white pine, which are common in New York. The female woodwasp carries a fungus (*Amylostereum areolatum*) that it deposits in the tree while laying eggs. This fungus can kill the host trees in just a few weeks. It is anticipated

that the woodwasp will easily adapt to most U.S. climates. As of late summer 2006, the Sirex woodwasp had been confirmed in most counties of central New York. Control methods for the woodwasp are being researched, including a biological control involving the use of parasitic nematodes.

Viburnum leaf beetle (*Pyrrhalta viburni*) - A non-native beetle that first appeared in NYS along Lake Ontario in 1996. It currently infests almost all of New York State except Long Island. Both larvae and adults feed on viburnum shrubs. This insect has had a significant impact on native stands of arrowwood (*Viburnum dentatum*).

Additional information on invasive insects in New York State can be found at:
http://www.dec.ny.gov/animals/265.html

Diseases

Beech Bark Disease - This disease has caused a widespread decline in the health of American beech, and it limits the life span of these trees. Beech trees are infected when the beech scale (*Cryptococcus fagi*) punctures the bark, allowing the spores of the fungus (*Nectria coccinea*) to enter the tree. American beech saplings are still abundant in the understory of northeastern forests, however mature beech trees are declining and becoming less common.

Dutch Elm Disease - This disease entered North America in 1930, and it has killed most of the American elm trees in the northeastern United States. The causal agent is a fungus (*Certatocystis ulmi*) which is spread by elm bark beetles. Although the disease has killed most elms, a few resistant individuals have survived. It is still possible to find mature elm trees within Broome County.

Chestnut Blight - This is one of the most famous plant diseases in North America. It has resulted in the near extinction of American chestnut trees throughout their natural range. The blight is caused by a fungus (*Cryphonectria parasitica*) that enters through wounds in the bark. American chestnut saplings can still be found in a few, isolated areas of the forests in Broome County, but it is rare for a tree to survive long enough to attain a stem diameter greater than six inches.

Sirococcus Shoot Blight – This disease is caused by the fungus *Sirococcus strobilinus* and is known to infect a wide variety of North American conifer species in the northern United States and Canada, including red pine. It has recently been observed to be affecting many of the Norway spruce plantations on the Unit. Observed symptoms are generally thinning tree crowns and tree crowns dying from the bottom-up. In addition, it commonly kills Norway spruce seedlings growing in the understory of infected stands. Field observations seem to indicate that it is most common in dense plantations and areas sheltered from winds. It is uncertain what the long-term impacts of this disease will be on the Norway spruce plantation of the Unit. At a minimum it will cause

reduced growth rates of surviving trees due to their smaller crowns. It will also make regeneration of Norway spruce difficult or impossible in some stands.

Invasive Plant Species

As global trade and travel have increased, so have the introduction of non-**native species**. While many of these non-native species do not have adverse effects on the areas in which they are introduced, some become invasive in their new ranges, disrupting ecosystem function, reducing biodiversity and degrading natural areas. Invasive species have been identified as one of the greatest threats to biodiversity, second only to habitat loss. Invasive species can damage native habitats by altering hydrology, fire frequency, soil fertility and other ecosystem processes.

Across the landscape, people are constantly travelling to and from distant locations. Invasive species may potentially be introduced through natural means via wind or animals, or by humans through the movement of firewood, off-road motor vehicles or equipment, the planting of infested vegetation or inadvertent transport of contaminated soil to the site by visitors. The invasive plant species likely to be present on the Unit include buckthorn sp., garlic mustard, Japanese barberry, Morrow's honeysuckle, multiflora rose, pale swallowwort, phragmites, Japanese knotweed, St. John's Wort and gypsy weed. State-wide efforts to prioritize, develop effective strategies for control, and allocate resources are needed to address these invasive species.

Landscape Conditions and Trends

Current Landscape Conditions

To determine the current landscape conditions, a three mile buffer was placed around the Unit to define the landscape used for analysis. This area does not include the Unit. This 268 square mile landscape includes two areas. The main area surrounds the State forests east of Binghamton. A second, smaller landscape area surrounds Broome – Tioga 1. Collectively, these areas span an east-west distance of over 42 miles straddling the NY-PA border. The west area includes the communities of Tioga Terrace on its north side and Tracy Creek on the east side. The main landscape east of Binghamton includes several communities, including the hamlets of Kirkwood, Cascade Valley, Damascus, Doraville, North Sanford, Sanford, Hale Eddy, Oquaga Lake and the Village of Deposit.

The analysis of the surrounding landscape was done using the National Land Cover Multi-Resolution Land Characteristics, 2011 data set from the DEC Master Habitat Database (MHDB). This data was analyzed using ArcGeographic Information System (GIS) software.

Observations from the landscape analysis are as follows:

- The landscape is in the central portion of the High Allegheny Plateau Ecoregion. The east edge is in the Delaware River watershed. The remaining area is in the Susquehanna River watershed.

- Broome-Tioga 1 is isolated from the remaining forests on the Unit since it is nearly 17 miles west of Broome 5. When a 3 mile landscape boundary is placed around Broome-Tioga 1 it results in an isolated landscape area. For the purposes of this analysis, all numerical data is a summary of both landscape areas around the Unit.

- The forests on the Unit are small disconnected islands within this landscape sprawling across a distance of 34 miles from east to west.

- The landscape is 68.9% forest cover. This is identical to the percentage of forest cover for the surrounding Ecoregion. The statewide average is 62%.

- The Unit is in a generally forested landscape of rolling hills whose tops rise 700 feet or more in elevation from the adjacent valley floors. Many of the hills have steep slopes rising from the West Branch Delaware River or Susquehanna River valleys.

- The landscape is fragmented by open and developed areas. Other fragmenting features in this landscape include major transportation corridors for interstate highways and railroads. Interstate highways 81 and 86 are within ¼ mile of Broome 5 and Broome 8 respectively. Two railroad lines run southeast from Binghamton, along the Susquehanna River, through the landscape and continue between Broome 6 and Broome 8 to the Delaware River valley. These major highways and railroad corridors likely represent barriers to the movement of some animal species across the landscape between the forests on the Unit.

- The landscape also includes a County park located adjacent to Broome 3, Hawkins Pond State Forest.

- Approximately 16% of the landscape is in agricultural or open land cover. The statewide average is 18%. Approximately 1% of the landscape is in shrub/scrub or seedling/ sapling vegetation compared to 2% in the surrounding ecoregion. This cover type is scattered throughout the landscape along the interface between agricultural lands and forest land.

- Bluestone quarries are a common feature in this portion of the state. The landscape area includes at least 55 bluestone quarries, all located east of Binghamton.

- Several gas wells are located in the landscape, south of Broome-Tioga 1 in Pennsylvania.

- Approximately 5% of the landscape is in developed residential/ commercial land cover.

- There are no known **old growth** forest areas in the landscape.

- Nearly all of the Unit is within a landscape forest "Linkage Zone" as determined by the New York Natural Heritage Program. The "Linkage Zones" are based on 2012 GIS analysis performed by New York Natural Heritage staff. The analysis used computer modeling to determine potentially desirable pathways for species migration between large forest matrix blocks in New York State. The "Linkage Zone" identified connects the Chenango Highlands forest matrix block located north of the Unit in western Chenango County with the Canonsville Matrix Block to the east and the Connecticut Hill Matrix Block to the west. Connectivity corridors may be important to allow for species movements across the landscape as an adaptation strategy if they shift their ranges over time. For additional information, see Chapter 2, page 88 of the strategic plan at http://www.dec.ny.gov/lands/64567.html.

- The landscape is dominated by mid-aged to mature forest cover with comparatively little early successional, seedling/ sapling habitat.

Table 14. Land Use and Land Cover for the Landscape Surrounding the Unit Compared to Surrounding Ecoregion.

Land Use or Land Cover	Unit Landscape: 3 Mile Distance Around Unit		New York High Allegheny Plateau Ecoregion (8,709,409 acres)	
	Acres	% of Unit Landscape	Current Percent of Ecoregion	20 Year Forecast, Percent Change
Deciduous Forest	78218	45.6	47.0	-0.1
Mixed Forest	37,640	22.0	12.2	+ 0.8
Agricultural – Cropland, pasture	27,021	15.8	22.1	- 3.5
Conifer Forest	12,932	7.5	6.8	- 0.1
Developed, residential and commercial	8113	4.7	4.7	+ 1.8
Open Water	1,971	1.2	1.1	+ < 0.1
Forest Wetland	1,883	1.1	2.9	- < 0.1
Shrub & Brush Rangeland (seedling/sapling)	1,866	1.1	2.1	+ 0.9
Non-forested Wetland	837	0.5	0.2	- <0.1
Grass/ herbaceous	715	0.4	0.8	+ 0.2
Barren land – mines quarries, gravel pits	159	0.1	0.1	+ 0.1
Total		100	100	

Source: Landscape data for the Unit was derived from 2011 National Land Cover Multi-Resolution Land Characteristics, 2014 edition, data set. For additional information about this data set see: http://www.mrlc.gov/. New York High Allegheny Plateau Ecoregion data is from NYS Strategic Plan for State Forest Management (SPSFM).

Landscape Trends

One of the most significant historical trends in the landscape is that areas of early successional vegetation have declined as abandoned farmland has matured into forest cover. This loss of agricultural land is expected to continue in the future as shown in the table above. The Ecoregion forecast predicts a loss of agricultural land, but an approximately equal shift of an increase in shrub-brush land cover. This will provide a temporary increase in habitat for those species that can use this cover type. However, these lands will eventually grow into forest cover, losing their ability to support early successional associated species. Development of early successional cover types has been identified as a need in the SPSFM to promote habitat diversity for the many declining species of birds and other animals dependent upon early successional habitat conditions. See Section F. Wildlife Resources in this plan for information on species that require early successional habitat.

Forest management can provide early-successional habitat through the implementation of even-aged forest regeneration practices. However, private non-industrial forest lands of the region are typically treated with partial harvests leaving roughly similar **residual stand structure**s of mid-aged forests after the harvest. These privately owned forests are also usually harvested before they reach the late successional stage of development.

Late successional forests are those areas where there is a significant component of trees greater than 140 years old. The trees in forests of this age are beginning to develop old-growth characteristics such as large size, large standing snags, large cavities, rough bark and large fallen logs. While no wildlife species on the Unit are exclusively dependent upon old forest conditions for habitat, many are often associated with these types of areas. Late successional forests are also important because they may provide superior habitat quality for some species also found in other forest conditions. State lands have the unique opportunity to provide late successional forest conditions on the landscape because of their long term continuity of ownership. In contrast, private lands in New York State have a relatively short average length of ownership resulting in little opportunity for the long term consistency of planning needed to allow forests to reach the late successional stage of development. In New York State, most late successional forests are on the Catskill and Adirondack Forest Preserve lands. However, there are no known examples of late successional forests in the landscape surrounding the Unit.

Resource Demands on the Unit

The charge of the Conservation Department in 1929 was to acquire lands adapted for reforestation and establish thereon forests for watershed protection, timber production, recreation and kindred purposes. Seventy-five plus years after the passing of the State Reforestation Act and the Hewett Amendment by the State Legislature, New York State continues to benefit from the careful management of natural resources on these State Forests.

Society's demand for natural resources continues to increase. In the United States, consumption of wood, water and non-renewable mineral resources surpasses that of other industrialized and developing countries. On a more local scale, recent trends reflect an ever steady to increasing demand for the natural resources available from State Forest lands throughout New York including those within the Broome State Forests Unit. The recent trend of business and industry capitalizing on global markets has spurred an increased demand for both hardwood and softwood lumber production on a regional scale. The desire for more domestic sources of oil and gas by our expanding economy has also added to the demand for exploration and extraction of these natural resources from both public and private lands within New York.

Larger tracts of public ownership allow for greater flexibility in protecting, managing or extracting natural resources as compared to private lands with similar resources. Although the vast majority of land acreage throughout Central New York is held in private ownership, the individual parcels tend to be on a much smaller acreage scale as compared to the public land holdings. The private lands are held by a wide array of landowners exercising many diverse management views and actions throughout their time of ownership. Combined with frequent ownership changes and increased parcelization of existing properties, private lands and their associated natural resources tend to be in a much greater state of flux than those of the public lands.

The historic ownership of the State Reforestation Areas has allowed for several generations of resource managers to consider long range planning with a commitment to quality natural resource management. Societal views of natural resource management continually demand higher standards for sustainable practices and responsible management for the betterment of all people. State Forests will play a vital role in the balancing of natural resource use and protection for the foreseeable future.

Forest Products

Timber

Timber resources on the Unit include hardwood and softwood **sawtimber**, **pulpwood**, and firewood. Some of the factors affecting timber demand on the Unit include timber value, distance

to markets, timber species and quality, the availability or scarcity of similar timber in the area, international trade policies and market demand.

The demand for timber on the Unit is part of the larger regional timber market which is part of the global market for wood products. For example: hardwood trees grown and cut on the Unit's State forests are often purchased by local loggers or sawmills, sawn into lumber at a mill within the region, and may eventually end up in a consumer product sold in Europe, Asia, or South America. The United States is a large part of the global market and has the highest per capita wood consumption of any nation on the planet. Wood products have been essential to the development of our country and continue to be an essential need of our society. As worldwide population continues to increase and the economies of other countries develop, there will be a continued long term increase in the global timber demand.

The continuous, long term management of State Forests has resulted in a timber resource of very high quality. New York's State forests have been certified through the Sustainable Forestry Initiative® (SFI®) 2010 - 2014 Standard and the Forest Stewardship Council® (FSC®) FSC-US Forest Management Standard (v1.0). This process evaluates the Department's forest management program for the use of sustainable forestry practices which have met the policies and principles of the SFI and the FSC. Certification by these organizations indicates that the landowner is using scientifically, environmentally, socially and economically sustainable forestry practices.

At the regional scale, there is a steady demand for hardwood sawtimber from regional sawmills. **Appendix VII** illustrates the change in price for black cherry, white ash, hard maple, red maple and red oak based upon figures from the DEC **Stumpage** Price Report for the Western/Central region of New York State. The graph displays the trends in stumpage prices paid for standing timber based upon data for the 2007 season through the 2016 season. Market prices for hardwood sawtimber steeply declined from 2006 to 2011. The prices stabilized in 2012. Since 2014, black cherry, hard maple and red oak prices have been roughly flat while white ash prices have increased substantially. The value of high quality hardwood logs throughout New York and the northeast had reached historic high levels in 2004-2005 until this recent market decline. High quality hardwood stumpage prices depend on new home construction, especially homes with high-end cabinetry and flooring. Demand for hardwood lumber and the coinciding hardwood stumpage are expected to increase as the demand for new home construction increases and the state of the economy improves. While the local demand for hardwood sawtimber has been steady, competition for hardwood timber sales has declined due to a variety of factors including the presence of fewer sawmills compared to the 1990s.

The market for spruce is almost exclusively for saw logs. There are no spruce sawmills in New York State, so nearly all spruce logs are sold and trucked north to Canadian sawmills which process the logs into lumber. The Canadian demand for spruce logs fluctuates along with the general state of the economy since most Canadian mills are only hauling logs back north after they have delivered a load of retail products into New York State. The other primary factor affecting the demand for

spruce logs is the demand for new home construction since spruce lumber is primarily used for wood framing.

There has been a steady demand for red pine sawtimber from regional industries which manufacture log homes, landscaping wood, fencing and utility poles. Because of the abundance of pine plantations on State forests and their scarcity on private lands, State lands are the primary source for the regional industries that use red pine.

The demand for softwood pulpwood is very limited due to the long trucking distance to the nearest paper mills. When diesel fuel prices are high, it limits the distance from which it is profitable to ship pulpwood. At times, some pulp mills are paying a higher price for pulpwood from State Forests since it is "green certified".

As both plantation pine and spruce stands continue to mature, the supply of softwood sawtimber is expected to increase for the near foreseeable future. The supply of this softwood resource is expected to change over time as these stands reach and pass their economic and biological maturity.

At the local scale, there is a somewhat different demand for wood products. While many local loggers supply larger mills with hardwood logs, lesser valued products such as hemlock or larch logs and firewood can be profitably cut and sold to local markets. Hemlock and larch are often sawn by small local band mills for use in barn construction. Firewood is cut by individuals for their own use or for resale to home owners.

The demand for timber on the Unit also is an indicator of those employed in the forest products sector of the economy who views State forests as a source of work. One rough measure of this is the number of people who want to receive notice of timber sales from State forests on the Unit. Currently over 60 individuals or companies have expressed interest in purchasing timber sales within the Unit. Most of these companies or individuals are located in central New York.

The rise in hardwood timber values during the late 1990's and early 2000's has been an incentive for **selective cutting** or **high-grading** on many private forest lands in the region. This is a type of logging where the trees of highest value and quality are cut from the wood lot, leaving a forest of low quality trees with reduced potential for growing high quality sawtimber in the future. If this trend continues, the future demand for high quality timber from State forests may increase as those high quality trees become increasingly scarce on private lands.

The original softwood tree planting of the 1930s was intended to bring abandoned farmland back into productive forests. Much of this effort was to conserve and restore soil productivity and control erosion from these sites. Throughout New York, thousands of acres were planted to the various softwood species in a relatively short time frame. Since then, the opportunity to replant on State lands has been limited by the lack of newly acquired agricultural lands and the gradual

succession of plantations to natural hardwood species. As the number of plantation acres on State Forests is inevitably reduced over time, the supply of softwood timber will subsequently decrease in the long run.

Information on upcoming timber expected to be produced from timber management activities on the unit is contained in the land management action schedules in Part III of this plan.

The authority to sell forest products from NYSDEC administered lands is provided by the Environmental Conservation Law. To perpetuate the growth, health and quality of the forest resources, the Department has implemented a sustained yield timber management program for State Forest lands.

Forest stands being considered for timber harvesting are selected based on the following criteria:

1) Adequate access;
2) Wildlife considerations;
3) Present and future forest health concerns (including invasive plants and pests);
4) Current distribution of vegetative stages within the unit management land area and surrounding landscape, including the eco-regional habitat gaps as per the Strategic Plan for State Forest Management;
5) Ability to regenerate stands (if a regeneration harvest);
6) Existing timber and vegetation management needs from other unit management plans;
7) Market conditions;
8) Potential growth response of stands to treatment
9) Presence of rare, threatened and endangered species and unique natural communities

By law, any trees to be removed in a harvest must be designated and paid for prior to removal. Designation (marking) of trees is made by NYS DEC forestry staff. After designation is completed, a fair market appraisal is conducted. No products may be sold at less than the fair market value. Forest stands are selected for harvest based on the criteria outlined above, and the desired future conditions identified by this Unit Management Plan

The Environmental Conservation Law requires that different procedures are employed based on the appraised value of a timber sale. Sales that are appraised greater than $10,000 are called revenue sales and sales that are appraised at less than $10,000 are known as local sales. Revenue sales contracts must be approved by DEC's Central Office staff, and revenue sale contracts valued at $25,000 or more must be approved by the Office of the State Comptroller. The Regional Forester has the authority to execute local sale contracts. All sales valued at more than $500 (and

those less than $500 which are thought to have substantial public interest) are publicly advertised and competitively bid.

Non-Timber Forest Products

Non-timber forest products include all forest products except trees that are of value to people for their use. Examples include maple syrup, nuts, forest plants, fungi, decorative greens, and fish and game species.

The most desired non-timber forest product is deer during the fall hunting season. Venison provides a source of healthy, low fat protein for the families of successful hunters. Hunters also pursue wild turkey, ruffed grouse and other game species for their food value. Trappers seek furbearers such as mink, muskrat, beaver, coyote and fox for their pelts. New York City is a center for fur garment production and sales and the largest fur export markets are to China and Russia. The demand and price for fur tends to fluctuate with winter temperatures and the economies in North America, China and Russia.

While there is little demand for other non-timber forest products, local people are known to collect leeks, berries, mushrooms and fiddleheads (immature ferns) for food.

In 2012, there were approximately 2,400 gallons of maple syrup produced on 28 farms in Broome County. This is a 28% increase in sap production from 2007 suggesting a stronger demand for maple syrup in the immediate future.
https://www.nass.usda.gov/Publications/AgCensus/2012/Full_Report/Volume_1,_Chapter_2_County_Level/New_York/st36_2_037_037.pdf

There have been no specific requests or demands addressed to the Department for the collection of maple syrup or any other non-timber forest product on the Unit.

Mineral Resources

Oil and gas production from State Forest lands where the mineral rights are owned by the state, are only undertaken under the terms and conditions of an oil and gas lease. As surface managers, the Division of Lands and Forests will evaluate any concerns as they pertain to new natural gas leases on State Forest lands. Consistent with past practice, prior to any new leases, DEC will hold public meetings to discuss all possible leasing options and environmental impacts. A comprehensive tract assessment will be completed as part of this process. For more information on natural gas and other mineral resource policies, please see SPSFM page 225 at http://www.dec.ny.gov/64567.html

Hard Rock Mineral Resources

Hard rock mineral deposits available in this portion of New York State include shale, bluestone, topsoil, sand and gravel quarries. These sites are regulated by the DEC through permitting and compliance inspections. There are presently no commercial mining contracts, permits, or other mineral resource operations on any of the State Forests of this Management Unit.

A unique feature of this part of New York State is the abundance of bluestone quarries located east of Binghamton, on hill tops of private lands around the Unit. Most of these quarries are small operations, less than five acres in size. There is a concentration of bluestone quarries in the Town of Windsor around the areas of Broome 3, Hawkins Pond State Forest, and Broome 5, Skyline Drive State Forest. Approximately a half dozen are within a mile of Broome 3. Additional bluestone quarries are located throughout the Town of Sanford and also in southern part of the Town of Conklin. The proximity to the state forests of these operations varies but Broome 4 (Marsh Pond State Forest), Broome 6 (Cascade Valley State Forest), Broome 7 (Beaver Pond State Forest) and Broome 8 (Whitaker Swamp State Forest) all have at least one quarry within 1,000 feet of their respective state forest boundaries.

Sand and gravel mines in the vicinity of the Unit are limited to the Susquehanna River valley and its tributary, Cascade Creek. There are approximately one dozen active sand and gravel operations near the Unit ranging in size from three to ninety acres. Since the state forests on the unit do not border the Susquehanna River valley, there is limited potential for sand and gravel operations to occur adjacent to state land. The closest sand and gravel operation to any of the forests is a twenty acre mine over two miles to the east of Broome 3 (Hawkins Pond State Forest).

One shale pit is located on the Unit which is used to provide surface material for Department roads, parking areas and log landings. This mine is operated under the regulatory threshold as less than 750 cubic yards or 1,000 tons of material is removed within any 12-successive calendar months. Therefore, it is not subject to jurisdiction under the Mined Land Reclamation Law and there is no requirement for a New York State mining permit. There is currently no public demand for sand, gravel or other hard rock mineral resources on the Unit.

Energy Demand

The United States is the largest single energy-consuming nation in the world. The 2015 New York State Energy Plan examined the State's energy consumption and projected needs to 2030. As reported in the plan, natural gas represents about 34 % of New York's total energy use. During the period 2012 through 2030, natural gas use in New York State is projected to increase by an annual rate of 1.1%. Over this period natural gas use by the residential and commercial sectors are expected to increase annually by about 0.1% and 0.8% respectively. Natural gas wells in New York State provide less than 1% of volume of gas needed to meet the state's annual demand. The remainder comes into the state primarily through pipelines from Pennsylvania, Ohio, West Virginia, the Gulf Coast region and Canada.

Industry demand for access to the Marcellus and Utica shale formations as well as the development of gas fields in the vicinity of the Unit are the result of increased global demand for energy. In December 2014 the Governor and the Commissioners of the Department of Health (DOH) and DEC announced that the DOH had completed its public health review of NYS DEC's SGEIS on the Oil, Gas and Solution Mining Regulatory Program and recommended that **high-volume hydraulic fracturing** should not move forward in New York State.

Oil, Gas and Solution Exploration and Development

The geographic area comprising the Broome State Forest UMP, though large, has had relatively limited oil and gas activity. To the west and northwest of Tracy Creek State Forest (Broome-Tioga 1), over forty wells were drilled in an area between the Susquehanna River and the Pennsylvania state border in the Town of Owego and the eastern area of the Town of Nichols. The closest of these wells to Tracy Creek State Forest is approximately five miles to the northwest. The wells were drilled in the late 1980s to early 1990s and targeted the Oriskany formation. Most of these did not produce commercially and were eventually plugged and abandoned. In the early 2000s, additional wells were drilled by the CNY Oil & Gas Company. These wells, in addition to the remaining earlier wells, were pooled together to form a gas storage field known as the Stagecoach Storage Field. CNY Oil & Gas Company currently has 25 wells in the storage field with 13 active storage wells and 12 monitoring wells.

The most recent drilling activity which resulted in production was in the area to the northeast of the city of Binghamton, approximately ten miles to the north of Skyline Drive State Forest (Broome 5). Approximately one dozen exploratory wells were drilled from the mid-1990s to the early 2000s that targeted the Oriskany, Helderberg and Trenton/Black River formations. Most of these were not considered viable wells and were plugged and abandoned immediately after they were drilled except for three of them which were drilled to the Trenton/Black River formation. These three wells were originally drilled by Belden & Blake Corporation and are currently operated by Chesapeake Appalachia L.L.C. Only one of these wells has produced any commercial quantities of gas, for a period from 2003 to 2007. All three wells are currently shut-in.

Future Leasing Activity

Initial title review indicates the State owns the mineral estate under all State Forests covered by this Unit Management Plan, with the qualification that mineral reservations may exist and no expressed or implied warranty of title is being offered in this document. As of 2016, there are no oil and gas lease agreements pertaining to the mineral estate under the State Forests contained in this plan. In the future, the State may receive requests to nominate some or all of the tracts contained in this Unit for oil and gas leasing. Additional information on oil and gas leasing procedures can be found in Chapter 5 of the Strategic Plan for State Forest Management, which can be found online at http://www.dec.ny.gov/docs/lands_forests_pdf/spsfmfinal.pdf.

For further information on oil, gas and solution mining operations, contact the NYSDEC Mineral Resources staff, Region 8, 6274 East Avon-Lima Road, Avon, New York 14414-9591. For further information on mining and mined land reclamation, contact the NYSDEC Mineral Resources staff, Region 7, 615 Erie Blvd. West, Syracuse, New York 13204.

Under Article 7 of the Public Lands Law, any citizen of the United States may apply for permission to explore and/or extract any mineral on State lands. However, to protect surface resources, current Department policy is to decline any commercial mining application(s) pertaining to any lands covered by this Unit Management Plan.

Biological Resources

State forests were established in part, to meet the public demand for biological resources. The abandoned crop lands and eroding pastures were replanted with trees to prevent erosion and provide a timber resource for future generations. Biological resources have always been a public demand of State forests as expressed through the participation in traditional activities such as hunting, fishing and trapping. More recently, increasing interest in birding and general wildlife viewing activities, as well as the greater awareness of human impacts on the natural world has created additional interest in the management of public lands for a variety of biological-based values. These values may include commodity products such as timber or fur as well as non-commodity values such as trophy deer, small game, species diversity or old growth forests.

An important variety of biological resources exist on the Unit. Conservation of those resources is an increasing significant societal demand. Varied habitat types across the forests provide diverse conditions to support an array of species. No comprehensive study has been made on the forests for a wholly inclusive list of species, but recognized fish, birds, mammals, reptiles, and amphibians are listed in several of the included appendices In 2004 the New York Natural Heritage Program (NHP), which is a partnership between DEC and the State University of New York College of Environmental Science and Forestry, conducted an inventory for rare plants, animals, and significant ecological communities on these forests. That inventory is used to help identify, track, protect, and manage biodiversity. The survey did not discover the presence of any significant ecological communities or rare plants or animals (see also the Rare Species and Significant Ecological Communities section).

The value of biological resources is often difficult to quantify since they are not easily measured in economic terms. The demand and potential conflict over how best to manage biological resources is expected to increase as the awareness of human induced impacts on the natural world multiply in the future.

Recreation Resources

The mission of the DEC Division of Lands and Forests is *"to care for and enhance the lands, forests and natural resources in the State of New York for the benefit of all through the care, custody, and control of state-owned lands, and promotion of the use and protection of all natural resources."* This is a broad mission which reflects that DEC has many other responsibilities beyond satisfying public recreation desires. Rather, recreation opportunities are provided on DEC lands that are compatible with other multiple uses and the ecosystem management approach described previously in this plan.

The Broome State Forests Unit is used by many people for a wide variety of recreational activities. Parcelization and residential occupancy have restricted the access to private lands, resulting in an increased public use on State Forests. Activities people enjoy on the unit include, but are not limited to, pleasure driving, hunting, snowmobiling, hiking, horse riding, mountain biking, cross-country skiing, camping, wildlife/ nature observation, trapping, and fishing.

In New York State, the demand for outdoor recreation is periodically assessed by the Department of Parks, Recreation and Historic Preservation (OPRHP). The most recent assessment is published in the Statewide Comprehensive Outdoor Recreation Plan (SCORP), 2014-2019 (NYS OPRHP, 2014). While New York's population is expected to remain fairly constant through 2025, there will be a large increase in the number of people 65 and older. This aging of New York's population is the largest factor affecting future recreation trends. This will result is less future demand for highly vigorous activities such as team and court sports and increased future demand for less physically demanding activities such as picnicking, walking and nature observation. The 2013 General Recreation Survey surveyed the preferred activities of New Yorkers age 65 – 85. The top activities listed that may also occur on the Unit, included walking or day hiking, visiting nature areas, fishing, camping, and cross-country skiing or snowshoeing (SCORP 2014-2019). There will also be increased demand for *universally accessible* recreation opportunities as the number of people with limited mobility is expected to increase due to the aging of the population.

The following information about recreation activities includes observation about how people use on the Unit for their activities combined with broader future demand information derived from the SCORP 2014-2019 report.

Demand for Trail-Based Activities

The most popular trail-based activities hiking and snowmobiling.

Snowmobiling - During the winter, snowmobiles are the primary use on the Unit. While there are no designated snowmobile trails on the unit, people will often ride on unplowed roads. One indication of snowmobile demand is the number of registrations. The number of Statewide snowmobile registrations steadily climbed each year from 1991 to a peak during the season of

2002-2003 at about 172,200. The season of 2011-2012 had a large drop in registrations across New York State to about 90,400 but that was probably due to the unusually warm and snow-free winter. Statewide snowmobile registrations for the 2013-2014 season was 115,982. This is a slight decrease of 758 or 0.6% from the number for the 2012-2013 season. The demand from snowmobile clubs to route trails onto public lands is increasing due to conflicts associated with parcelization, concern for snowmobiler safety and changes in ownership of private lands.

Walking for Pleasure/ Jogging/ Day Hiking – Based on the 2013 General Public Recreation Survey, SCORP reports that walking, jogging, and day hiking are the most popular outdoor activity. Over 88% of the population between ages of 18-85 participate in these activities. Recreational day hikers use the trails on Broome 3 and Broome 8. Local use numbers are not available for the Unit but SCORP forecasts a stable demand in the future.

Cross-country skiing/ Snowshoeing – The public can enjoy these activities on Broome 3, Hawkins Pond State Forest. Current use level for these winter activities on the Unit is generally low and is further limited by winter snow conditions.

Mountain Biking – General bicycling (including both on and off-road use) was the fourth most popular activity in the 2013 General Public Recreation Survey. While the Unit does not have trails designated for off-road biking, the numerous dirt roads are well suited to this activity. Despite this, there appears to be low demand for this activity on the unit.

Demand for Dispersed Use Activities

Hunting & Trapping – Deer and turkey are the most popular game species pursued by hunters on the Unit. In addition, bear can also be hunted on the Unit. People also enjoy small game hunting for grouse, woodcock, squirrel, rabbit, waterfowl, raccoons, coyotes and foxes. Trappers pursue beaver, mink, muskrat, fox and other fur bearers on the Unit. Trapping popularity usually fluctuates with fur prices.

Camping – SCORP forecasts a slight decrease in statewide demand for camping. Demand for camping on this Unit is expected to remain steady. Most of the camping occurs during the deer hunting season as it is done by hunters camping on the forests.

Fishing – There are very limited opportunities to do this activity on the Unit. Most of the waters on the Unit are small streams. Small stream trout fishing for brook and brown trout is the primary fishing opportunity available. Demand is expected to remain stable.

Auto Touring & Nature/ Wildlife Observation – There are no specific records for local participation in this activity. While SCORP does not address these activities, their demand is expected to increase because they are sedentary types of recreation that can be enjoyed by an aging population.

Geocaching – Geocaching is a growing outdoor activity where people use GPS units to locate hidden "treasures". This is a challenging family activity that may be enjoyed by both the young and old visitors on the Unit. When doing this activity, it is often a surprise to discover an unusual item at the hidden treasure site. People post the general location of geocache sites in internet forums so that other people can try to find them. Geocache sites are located on the Unit.

ATV Use - Currently, illegal off-road vehicle and ATV use occurs on the Unit at various locations. It is unknown if this activity is increasing or decreasing. For information on DEC's policy regarding ATV use on State Forests, please refer to Chapter 5, page 213 of the Strategic Plan for State Forest Management.

For further discussion of the DEC's recreation goals and objectives on State Forests, please see Chapter 5 of the Strategic Plan for State Forest Management, which can be found online at

http://www.dec.ny.gov/docs/lands_forests_pdf/spsfmfinal.pdf

Management Constraints on the Unit

Physical Constraints

Steep slopes
Wetlands
Geological characteristics
Soil characteristics
Climatic conditions
Storm damage
Potential insect and disease infestations and associated quarantines
Limited access
Presence of cultural resources
Electrical transmission and telephone lines
Deeded rights-of-way
Buried telecommunication lines
Fragmented configuration of State land
Vegetation composition

Administrative Constraints

Budget limitations
Staffing shortages
Availability of Operations work crews
Fluctuations in wood markets
Lack of demand for some wood products
Contract procedures

Societal Influences

There are differing public opinions on the management practices and uses of State Forests. All opinions are considered, but the degree to which they can be satisfied will vary. There are special interest groups for hunting, horseback riding, off-highway vehicles, bird watching, and many other recreational pursuits. There are industry demands for timber, natural gas, cell tower sites, field stone, rights-of-way and more. All of these demands need to be reviewed for their compatibility with the current laws, regulations, land management policies, the environmental conditions and the objectives for the forest property. It is recognized that these societal influences are dynamic and, if the State Forest resources are to continue to benefit the interests of the public, some flexibility must be incorporated into the management of these resources.

Department Rules, Regulations and Laws

Appendix IX lists the Department's Rules, regulations and laws governing management activities on the Unit. For additional information on the Department's Rules, regulations and laws, see Chapter 7 of the New York State Strategic Plan for State Forest Management.

Vision Statement

We inherit a legacy of change from the original virgin forests to agricultural land clearing, to farm abandonment, forest re-establishment and management. We direct our future management to achieve or sustain the desirable forest conditions that follow.

By the middle of the 21st century, The Broome State Forests Unit will exhibit the following:

- A full range of forest succession, from open land to **climax forest**.

- A full range of forest **age class**es, from seedling-sapling to very large trees.

- Soil and water resources protected from degradation.

- Pleasant settings where people can enjoy a variety of outdoor recreational activities.

- A landscape of public and private land ownerships implementing compatible ecosystem-based management.

- A sustainable supply of raw material for the local forest product industry.

- Forests which serve as outdoor classrooms for environmental education.

- Forests which showcase good ecosystem management, and which are a source of pride for Broome County residents and all New Yorkers.

Privately owned forested areas may become fragmented as a result of parcelization and development. State forests function as “islands of stability”, and will always provide forest habitat in the changing landscape. These lands are also a steady source of forest products which provide jobs to help support local economies.

The Broome State Forests Unit will be managed in a sustainable manner by promoting ecosystem health, enhancing landscape biodiversity, protecting soil productivity and water quality. In addition, the State Forests on this unit will continue to provide the many recreational, social and economic benefits valued so highly by the people of New York State. DEC will continue the legacy which started more than 80 years ago, leaving these lands to the next generation in better condition than they are today.

This plan sets the stage for DEC to reach these ambitious goals by applying the latest research and science, with guidance from the public, whose land we have been entrusted to manage.

Goals and Objectives

GOAL 1: Provide Healthy and Biologically Diverse Forest Ecosystems.

Biodiversity is the sum total of all forms of life including genes, microbes, fungi, plants, animals and **ecosystems** (Hunter 1999). State forests are managed for a variety of resources used by society including commodities such as timber, firewood and natural gas.

The Broome State Forests Unit offers an opportunity to blend conservation of biodiversity with commodity production and public recreation. Furthermore, these forests are under the single, stable ownership of New York State so that long-term conservation practices can be implemented.

State Forests on this unit will be managed using an ecosystem management approach which will holistically integrate principles of landscape ecology and multiple use management to promote biodiversity, while enhancing the overall health and resiliency of the State Forests. Ecosystem management is a process that considers the total environment - including all non-living and living components; from soil micro-organisms to large mammals, their complex interrelationships and habitat requirements and all social, cultural, and economic factors. For more information on ecosystem management, see SPSFM page 39 at http://www.dec.ny.gov/lands/64567.html.

The Broome State Forests management plan has been developed using the following Principles of Ecosystem Management:

a). A landscape perspective will be considered when setting objectives.

b). Maintain a variety of forested, open and aquatic habitats for diverse plant and animal species.

c). Water quality and sensitive sites will be protected from degradation.

d). At least 30% of the forest acreage will be maintained with a cover type which includes a significant component of conifer species.

e). Similar management direction schemes will be grouped to enhance the value of respective habitats.

f). Corridors of unbroken forest canopy will be maintained along streams.

g). Approximately 5% of the Unit will be maintained in low vegetation, exclusive of wetlands, such as brush openings, grass or seedling/sapling forest.

h). Site specific actions will be used to enhance wildlife habitat. These actions will include even-aged cuttings of aspen to enhance grouse habitat, apple tree **release** and cavity tree retention to protect the habitats of cavity-nesting birds and mammals.

i). Natural regeneration will be favored over planting. Reforestation of a site by planting will be considered if natural regeneration is unsuccessful, or if desired species are absent.

j). The use of pesticides including herbicides, insecticides, or growth retardants, will only be used where necessary.

k). Invasive exotic plant species will be eliminated or controlled.

The long-term maintenance of biodiversity on any ownership is a lofty goal. Achieving this goal will be increasingly complicated in the future due to the continuing influence of external factors on the forest environment such as acid precipitation, climate change and invasive exotic species. Furthermore, the current knowledge of many species is insufficient. In addition, the fields of conservation biology, wildlife and forest ecology continue to evolve and provide new insights on the impacts of human activities on forest resources. In the absence of sufficient knowledge, decisions in this plan have leaned toward the values of conserving forest biodiversity rather than resource extraction.

Objective 1.1 Protect soil and water quality by preventing erosion, compaction and nutrient depletion.

Protection of soil and water quality is one of the highest management priorities and is the foundation of sustainable forest management. Headwaters streams of the Chenango and Susquehanna Rivers are located on the Unit and management activities on these State Forest impacts downstream water quality. The greatest threat to water quality on the Unit is the potential disturbances to any streambed or adjacent area along with any soil erosion flowing into a water body. The primary management objective for all of the streams on the Unit is to maintain good water quality by maintaining stream bank stability. Good water quality in these streams will help to ensure good water quality in their receiving waters.

The following are actions that will strive to protect the soils and waters of the Unit.

Action 1.1.1 Follow the DEC Special Management Zone (SMZ) Guidelines on all areas identified as a special management zone. These SMZ areas consist of **buffer strip** areas surrounding water bodies, streams, wetlands, vernal pools and spring seeps. The buffered areas will have different management action restrictions along with varying buffer widths depending upon the sensitivity of the **riparian** area designated. These rules are designed to minimize impacts to aquatic habitats from actions associated with gas and mineral extraction or forest management. For additional

information on the protection of soil and water quality as well as SMZs, see the Strategic Plan for State Forest Management pages 107-110.

Action 1.1.2 Comply with the NYS publication Best Management Practices for Water Quality as described in the Strategic Plan for State Forest Management pages 110-112 during all timber harvesting and other management activities.

Action 1.1.3 Monitor BMP implementation by evaluating control structures after construction to assess effectiveness. A Statewide monitoring system will be implemented as per the SPSFM pg. 114.

Action 1.1.4 Maintain water quality standards during road maintenance on state forest lands including, but not limited to, ditch cleaning, stream bank stabilization, and culvert replacement. Road maintenance activities will comply with Bureaus of Fisheries and Habitat guidelines or as per the guidelines on the Department website at: http://www.dec.ny.gov/permits/49060.html and http://www.dec.ny.gov/permits/49066.html. Undersized culverts can prevent the movement of fish, particularly wild brook trout, in headwater streams effectively reducing the amount of available habitat. When existing undersized culverts are replaced, future culverts will be installed consistent with Department Stream Crossing Guidelines and Best Management Practices.

Action 1.1.5 Restrict commercial use of water located wholly within the Unit. Well drilling will not be permitted for any personal or commercial water extraction.

Action 1.1.6 Protect 161 acres of forested wetlands, shrub wetlands, open wetlands, ponds and riparian forests. Ponds, wetlands and riparian forests are extremely complex and diverse ecosystems that provide environmental, biological and recreational benefits. They are distinct ecological communities that support a diversity of plant and animal species not often found elsewhere in the landscape (Calhoun, p. 300, Brinson, p. 652 in Hunter 1999 and Hunter 1991).

Protection of riparian zones will maintain stream bank stability to ensure a clean supply of water and protect the habitat of native fish and other species inhabiting these areas. Timber harvesting, gas well development and road construction are not permitted in wetland and riparian forests. Logging trails may cross riparian zones using Best Management Practices to protect water quality. Riparian forests are vulnerable to impacts resulting from logging and drilling with the potential of increasing stream sedimentation, disrupting habitat conditions and diminishing overall watershed quality. In the absence of disturbance, these areas will develop into late successional forest. See **Appendix XI** "Management Direction" maps.

Action 1.1.7 Protect 139 acres of steep slopes and inaccessible sites by limiting management actions. Timber harvesting will not be permitted on steep slopes in excess of 40% because the terrain is extremely vulnerable to soil erosion. Sites having conditions suitable for management are designated inaccessible if riparian, wetland and other protection zones will be impacted as a

result of management activities or if the environmental cost of establishing access outweighs the benefits derived from the management activity.

Action 1.1.8 Construct log landings and clearings for other management activities on slopes ≤10%. Significant slope modification increases the potential of impacting drainage patterns and creating abrupt and permanent contrasts in landscape patterns.

Action 1.1.9 Protect the water quality and habitat of all classified trout C(t) streams by complying with recommendations from the Bureau of Fisheries and the Bureau of Environmental Permits.

Action 1.1.10 During all management activities, protect water quality through the use of Best Management Practices on those areas of the Unit designated by DEC as High Conservation Value Forest. This area is located on Broome 3, 4, 5, 6 and Broome-Tioga 1.

Action 1.1.11 Protect the forest and streams on the Unit from impacts associated with brine application to roads.

The development of gas drilling in central New York has led to the practice of disposing gas well production fluids, known as brine, onto town roads. Brine consists of the fluids produced by a gas well after the drilling phase is completed. This practice is allowed under permit (a Beneficial Use Determination) issued from the DEC Division of Materials Management. The permits may be issued when requested by a waste transporter and where approved by the town government. The permit allows the conditional spreading of gas well brine on town roads for the beneficial purposes of road de-icing, dust suppression and road surface stabilization.

The Unit contains a wide variety of road conditions, some of which are more suitable for brine application than others. Application of brine on unsuitable roads may cause negative impacts to streams, wetlands and forest vegetation due to the high amounts of salts, heavy metals and other chemicals. Unsuitable roads may contain impermeable surfaces, surfaces that cannot be graded, lack of ditches, poor drainage or potholes with standing water.

The towns within the Unit have received written notice of the following roads where the application of brine will not be allowed on the State-owned portion of the road:

Table 15. Roads on the Unit Where Brine Application is Prohibited

State Forest	Town(s)	Road Name
Broome 3	Windsor	McAllister Road
Broome 3	Windsor	Scouten Hill Road
Broome 4	Sanford	Bryce Road
Broome 4 & 7	Sanford	Marsh Pond Road
Broome 5	Windsor	Skyline Drive Truck Trail
Broome 5	Conklin & Windsor	Grange Hall Road
Broome 6	Windsor	Cascade Valley Road
Broome 7	Sanford	Huggins Road
Broome-Tioga 1	Vestal	Crumm Road
Broome-Tioga 1	Vestal	Collins Road

Objective 1.2 Provide forest vegetation types or features which are declining or rare in the landscape to enhance wildlife habitat diversity.

State lands comprise a significant portion of the landscape and are unique in that they have stable ownership and can be managed over long time frames for habitat conditions that can complement the surrounding privately owned landscape.

The landscape analysis used in this planning process indicates that only 1% of the landscape surrounding the Unit is in early successional shrub/scrub or seedling/ sapling vegetation. Also, due to past demands to clear land and a need for wood products in the late 1800s and early 1900s, there is little to no known late successional forest types in the landscape. The Unit has very little (1 acre) grassland. The Department considers this region of the State to have only a marginal potential for grassland habitat management. As a result, it is not designated as a Grassland Focus Area. While the Unit has limited potential for grassland habitat management, it can provide areas of **seedling/sapling** early successional habitat while also targeting other areas for the eventual development of late successional forest stands which are often lacking on private lands.

Early successional habitat consists of areas dominated by grass or other herbaceous vegetation, shrub lands or young (seedling/sapling) forest cover. Recent research has also shown that upland early successional habitats are heavily used by a wide variety of mature forest songbirds (Vitz, A.C., Rodewald, A.D., 2006, Chandler, C.C. et al., 2012). Specifically, mature forest songbirds were found to use the interior of small clearcuts (10-23 acres) during their post-fledgling period. The species using these areas included many that are typically considered “forest interior” species including ovenbird, wood thrush and scarlet tanager. It is thought that the mature forest birds use early successional areas because of the abundant food and cover these areas provide.

Although there has been much concern among conservationists about the decline of mature forest birds, surveys have shown that species dependent upon early successional habitats are declining

even more rapidly. Much of the decline of early successional dependent species has occurred as a result of forest development on abandoned agricultural lands. In a forested landscape, even-aged management practices can provide habitat for these declining early successional species without necessarily conflicting with the needs of mature forest songbirds.

The New York State Comprehensive Wildlife Conservation Strategy (CWCS) plan recommends maintaining or increasing the amount of early successional forest and shrub land in the Susquehanna Basin. According to the CWCS, 92% of the bird species that depend upon early successional habitat are in decline in New York State. Some of the species designated in the CWCS as Species of Greatest Conservation Need that require early successional habitat include American woodcock, brown thrasher, Canada warbler, ruffed grouse and willow flycatcher. See Section F. Wildlife Resources in this plan or the CWCS, Susquehanna Basin, at http://www.dec.ny.gov/animals/30483.html for additional information.

Late successional habitat consists of forests with mature and older trees, greater than 140 years of age. Late successional forests may have been previously logged but are beginning to develop old growth forest attributes such as large tree size, large downed logs, large snags, cavities and species such as mosses, lichens, fungi and insects that are typically found in old growth forests. Hunter (1990) suggests that old forests are important because they represent the most biologically diverse portion of the successional sequence and, that with few old stands remaining, there is a scarcity of late successional habitats. These areas of significantly large and older trees also have social value and are appreciated by many people as places to camp, relax and reconnect with nature.

Action 1.2.1 Increase the amount of early successional habitat on the Unit.
Early successional habitat consists of a variety of vegetative conditions. The Unit has 43 acres of upland old field or shrub habitat that will be maintained. Over the next 20 years, early successional habitat will be provided on the Unit through even-aged regeneration harvests. Stands containing a significant amount of aspen comprising 88 acres will be managed on a 60 year **rotation** to enhance and perpetuate aspen **forest type** and early successional forest cover. Even-aged management using a 100 - 125 year rotations will be conducted on 953 acres of the Unit. These areas, consisting of conifer plantations and native hardwoods will provide early successional forest cover at the time of regeneration. See Appendix IX “Management Direction” maps for locations of these areas.

Any treatments involving clearcutting will comply with the Department’s program policy *ONR-DLF-3 / Clearcutting on State Forests (2011)*. Information on this policy can be found at http://www.dec.ny.gov/docs/lands_forests_pdf/policysfclearcutting.pdf.

Action 1.2.1.1 Create larger landings, ½ acre to 1 acre, during applicable commercial forest product sales in even-aged stands.

Forest product landings or decks are areas where forest products are cut to market length and/or sorted, stockpiled and loaded on trucks for hauling to market. Increasing the size of these openings will provide more open land habitat. This practice of increasing landing size will only be done in areas of the Unit under even aged management and in applicable locations. Seeding and mulching of landings will be required after grading where heavy soil disturbance has occurred. Grasses and legumes provide herbaceous food and cover and reduce erosion.

Action 1.2.2 Increase the amount of late successional stage forest on the Unit.
Forested areas designated to be excluded from timber harvesting which will develop into late successional forests consist of 435 acres, or 8% of the Unit. These areas include stands excluded from timber management to protect wetlands, riparian areas, steep slopes or other sensitive sites, visual buffers, areas that are inaccessible and Natural Areas. These protected areas are often in corridors linking streams with wetland areas to improve landscape connectivity. **Natural Areas** are forests withdrawn from consideration for timber production, natural gas exploration and other direct human disturbances. Within natural areas ecological patterns and processes will operate without direct human intervention and, together with riparian and wetland forests, these upland stands will develop late successional characteristics with old trees, large snags, cavity trees and large volumes of downed logs.

Natural areas are a critical component of any effort to conserve biodiversity because they develop ecological conditions distinct from those in forests managed for commodity production. Disturbances associated with timber harvesting and mineral extraction, however sensitive to biodiversity and environmental concerns, will trigger change that set them apart from natural areas. Natural areas also provide important reference areas against which to compare changes in working forests, such as the long-term effects of timber harvesting on biodiversity. In the absence of logging and gas drilling, natural areas along with other protected stands will develop into late successional forests, conditions that are relatively scarce within the larger rural landscape of Broome County.

See **Appendix X** “Management Direction” maps for locations of protected or natural areas.

Objective 1.3 Protect at-risk species and significant ecological communities.

At-risk species are those species having the New York State legal status of Endangered or Threatened. Significant ecological communities are those unique areas identified by the New York State Natural Heritage Program as being significant due to rarity or high-quality status. For additional information on at-risk species and communities, see the SPSFM, Chapter 3, pgs. 115-126. There are no known occurrences of significant ecological communities on the Unit.

Action 1.3.1 Protect any occurrences of at-risk species and significant ecological communities, if they become identified in the future. Management actions may be done to improve or enhance habitat necessary for at-risk species and communities in the future.

Action 1.3.2 Conduct a survey, for rare species or communities by Natural Heritage staff as time and resources become available, of any newly acquired lands and protect any new finds of at-risk species and significant ecological communities identified by New York State Natural Heritage.

A review of the State Forest Predicted Richness Overlay GIS data layer shows the *potential* occurrence of the rare species listed in the tables below. Sites where these potential occurrences are located will be protected and/or surveyed before any potential site disturbing activities occur.

Table 16. Rare Plant Species that May Potentially Occur on the Unit

Forest	Common Name, *Scientific name*	Habitat
Broome 5	Arctic rush, *Juncus trifidus*	Rock cliffs and ledges
Broome 7	Drummonds's Rock-cress, *Boechera stricta*	Rocky ledges, ravines; also disturbed areas including trails & mowed areas.

Source: State Forest Predicted Richness Overlay GIS Data Layer

Table 17. Rare Animals that May Potentially Occur on the Unit

Forests	Species	Scientific Name	Habitat Use
Broome 5, 6	Arrowhead spiketail	*Cordulegaster obliqua*	Not listed
Broome 4, 6, 7, 8, 9	Bald eagle	*Haliaeetus leucocephalus*	Breeeding & nonbreeding
Broome 3, 4, 8	Brook snaketail	*Ophiogomphus aspersus*	Not listed
Broome 3, 8	Comet darner	*Anax longipes*	Not listed
Broome 3, 8	Comet darner	*Anax longipes*	Not listed
Broome 3	Extra-striped snaketail	*Ophiogomphus anomalus*	Not listed
Broome 5, 6	Longtail salamander	*Eurycea longicauda*	Not listed
Broome 3, 7, 8	Pied-billed grebe	*Podilymbus podiceps*	Not listed
Broome 3, 4, 5, 6, 7, 8, 9, Broome-Tioga 1	Timber rattlesnake	*Crotalus horridus*	Hibernacula, basking, gestating

Source: State Forest Predicted Richness Overlay GIS Data Layer

Objective 1.4 Conserve and Enhance Fish and Wildlife Habitat.

This plan includes multiple strategies to conserve and enhance fish and wildlife habitat. In addition to the actions listed below, see Objectives 1.1, 1.2 and 1.3 and their corresponding actions.

Action 1.4.1 Retain snags, cavity trees, reserve trees, conifers, **coarse woody material (CWM)** and **fine woody material (FWM)** as specified in the Division of Lands and Forests policy for retention on State Forests, *ONR-DLF2 / Retention on State Forests (2011)*. This policy sets forth guidelines for maintaining or obtaining a minimum number of retention trees within a forest stand. A detailed description of the retention policy may be found at http://www.dec.ny.gov/docs/lands_forests_pdf/policysfrention.pdf.

A variety of habitat structures are necessary components for biological diversity. These structures, live or dead, serve as biological legacies, providing habitat, shelter, feeding substrates, or nesting sites for a wide array of species. This Department policy addresses the retention of these important habitat structures and features in forest stands that are actively managed for timber production. Retaining these features will maintain the habitat for the wide array of forest wildlife species that depend upon them.

Action 1.4.2 Improve habitat for Species of Greatest Conservation Need.
See Objective 1.2 corresponding actions.

Action 1.4.3 Manage North American Beaver *(Castor canadensis)* where their actions threaten rare species or ecological communities, roads, culverts, trails or other access related infrastructure. Beaver are an important part of aquatic ecosystems because of their ability to create diverse habitat conditions that are beneficial to a wide array of species. They are an abundant species on the Unit. However, their actions can also have negative impacts to rare species or access infrastructure resulting in the need for costly repairs. Beaver problems will be addressed on a case by case basis after consultation with Bureau of Wildlife staff.

Action 1.4.4 Protect active nesting sites for raptors listed as species of Special Concern.

Many raptors in New York are listed as species of special concern. Within the Unit, these include: Sharp-shinned Hawk, Cooper's Hawk, Northern Goshawk and Red-shouldered Hawk. Each species has specific habitat requirements when nesting. The 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. The 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.

Bureau of Wildlife Staff will monitor the nesting status after implementation of the recommended management strategies to further our understanding of the nesting behavior and protection needed for these species. When specific management strategies for individual species are developed, they will be incorporated into the management plan.

Action 1.4.4.1 Permit licensed falconers to remove only one raptor **eyas** from the Unit every three (3) years, and in compliance with ECL Article 11 and 6 NYCRR Part 173. Permits for this activity are issued by the Bureau of Wildlife.

Action 1.4.4.2 Provide and maintain forest stand types acceptable for nesting habitat for northern goshawks on the Unit. Maintain 1,944 acres of mixed hardwood-conifer forest type consisting of white pine, hemlock, red pine, larch and hardwood species for the next 20 to 25 years. A significant amount of additional suitable habitat will also be present in stands managed for timber. The suitability of these areas will shift over the landscape depending upon harvest intensity, time since last harvest and size class of the stand.

Action 1.4.4.3 Continue to cooperate with the Bureau of Wildlife's effort in monitoring and providing data for research on the status of northern goshawks and other raptors to ensure their sustainable populations and to ensure that our knowledge of the natural history and ecology of these raptors continues to increase. Regional Forestry staff will consult with Bureau of Wildlife staff when raptor nest sites are discovered in the process of planning or conducting activities on State forests.

Action 1.4.5 Protect the habitat of any other at-risk or Special Concern species discovered on the Unit. Bureau of Wildlife staff will be consulted for habitat protection priorities if any at-risk or Special Concern species are found on the Unit.

Action 1.4.6 Favor mast producing trees during stand thinning treatments.

Action 1.4.7 Thin pole size stands to enhance **stand structure** and promote timber growth. Pole size stands often have the least downed wood, and little ground vegetation. Thinning of these stands will add downed woody debris and stimulate vegetation regeneration on the forest floor. (See Stand Management Tables for firewood thinning, pulpwood thinning, and non-commercial **timber stand improvement** thinning).

Action 1.4.8 Erect nest boxes for waterfowl around ponds and open wetlands.
The Department will encourage partnerships with private individuals or organizations to improve waterfowl habitat on the Unit.

Objective 1.5 Monitor Ecosystem Health and Develop Response Strategies to Minimize Impacts from Damaging Agents.

Ecosystems are active and can change slowly over time or quickly from other influences. Periodic monitoring of the Unit is necessary to determine if change is occurring and if it is detrimental or beneficial to the Unit. With limited resources, it is unrealistic to monitor everything that may or can change. We can however monitor key species or community types which are indicators of a healthy ecosystem. Information gained from monitoring of forest cover and community types, rare plant & animal species, insect and disease outbreaks and invasive species enable Department staff to decide on the appropriate actions to take.

Action 1.5.1 Conduct periodic forest inventory of the State Forests within the Unit. Forest stands scheduled for silvicultural treatments will be analyzed prior to treatment. A post-harvest inventory will be conducted in treated stands.

Action 1.5.2 Monitor Rare Species and Species of Special Concern through efforts by the New York Natural Heritage Program and develop an action plan as appropriate.

Action 1.5.3 Participate in the implementation of systemic statewide early detection program(s) to minimize amount of time between infestation and detection. Conduct annual insect and disease aerial surveys. As resources are available the Division will continue to conduct the aerial surveys for the entire state including this Unit.

Action 1.5.4 Monitor invasive species populations and encourage other partners or outside agencies to conduct periodic invasive species assessments of the Unit.

Action 1.5.4.1 Eradicate, where feasible, populations of invasive species using approved procedures. This may be accomplished through Regional staff, contracts or grant opportunities. Mechanical and/or approved chemical treatments may be applied depending upon the characteristics of the infestation. Chemical treatments will only be applied where mechanical methods will not be effective. Application of the herbicides or pesticides will be done according to the specifications of the label to protect water quality and prevent impacts to non-target species. All applications will comply with the State Environmental Quality Review law and State regulations.

Action 1.5.4.2 When invasive species are found, document or map their location and develop rapid and long term response capabilities at the local level to minimize degree of impact.

Action 1.5.4.3 Abide by all Federal and State restrictions and regulations as well as Departmental guidelines recommended in the SPSFM for the identification, prioritization and eradication of any invasive species found on the Unit.

Action 1.5.5 Support research and technology transfer on significant insects and diseases and their impacts on forest resources.

Action 1.5.6 Attempt to positively identify causal agents for all significant forest damages, in collaboration with state and local experts.

Objective 1.6 Apply forest management principles and silvicultural systems to maintain or enhance ecosystem health and biodiversity.

One of the previously mentioned principles for maintaining biodiversity is the maintenance of landscape diversity. This is the diversity, size and spatial arrangement of habitat conditions.

In the process of forest management to produce wood products, foresters use two silvicultural systems which mimic natural disturbance patterns and create distinct habitat conditions. The two systems are referred to as even-aged and uneven-aged management.

Even-Aged Silviculture

An even-aged stand is one whose individual trees originated at approximately the same time, either naturally or by planting. As it grows, it may undergo various intermediate thinnings during its development, and is ultimately removed in one or more major harvest cuts after which a new stand is released or established. Such a stand, consequently, has a beginning and an ending time. The rotation is the number of years from establishment to maturity.

Even-aged management is important because young, dense stands of trees and other plants are established when stands are regenerated. Early forest developmental stages are beneficial to many species of wildlife. Even-aged management favors the establishment of shade intolerant tree species such as cherry, oak and ash. These species have some of the highest timber values. Even-aged management also favors the establishment of many of the hard mast species such as hickory and oak. The even-aged conifer plantations on the Unit are mostly red pine, Norway spruce, or mixtures of these two species.

A disadvantage of even-aged management can be the perception of adverse aesthetic impacts. At the end of the rotation, the mature **overstory** is harvested to release the young trees already established. This presents foresters with a challenge, especially for large-acreage stands: How to regenerate shade-intolerant species, while avoiding complete overstory removal? Part of the solution is to use **group selection** described below under uneven-aged management. In addition, conservation of biodiversity requires a full range of habitats, from patchy, open lands and young forests associated with even-aged management, to large, contiguous, mature forests associated with the uneven-aged system.

Uneven-aged Silviculture

The uneven-aged management system establishes or maintains at least three age classes ranging from seedling-sapling to large sawtimber within one stand. This system maintains a mature or nearly mature forest canopy, indefinitely. Many wildlife species require mature, interior forest habitat. They include fisher, red-shouldered hawk and many neotropical migrant birds such as warblers, vireos and flycatchers. During timber harvests, if single-tree selection is used, shade tolerant species regenerate, such as hemlock, beech and sugar maple. To regenerate shade intolerant species such as oak, ash or cherry, group selection is used. During harvests, groups of overstory trees are cut to create openings from one-quarter acre to one acre in size. Undesirable striped maple, ironwood and beech saplings are cut to allow establishment of desired species. Where beech is scarce, it may be favored for its mast (beechnuts). In addition, during harvests in uneven-aged stands, all age classes are “tended” or thinned as needed. Such thinnings typically

favor oak, maple, ash and cherry trees which are already established, raising their relative density in the stand. As their presence in the stand increases, so does their quantity of seed produced. This increases their long-term chances for successful regeneration.

Group selection will also be used to manage roadside Norway spruce plantations. For aesthetic reasons, future, even-aged management cutting of the entire overstory in these stands would be unacceptable. Experience has shown that adequate spruce regeneration can be established by cutting small, quarter-acre patches or strips.

Nearly all of the stands on the unit are presently even-aged as a result of agricultural abandonment and clearcutting in the early 1900's. Most stands on the Unit are approaching maturity. Smaller, more remote stands, which contain a significant oak or cherry component will be maintained as even-aged. The same direction will be set for the red pine plantations. This species does not naturally regenerate as well as the other tree species, since it is not well-adapted to the shallow, poorly drained soils of the Unit. It is also susceptible to windthrow when it becomes over-mature for the site. For these reasons, red pine plantations will eventually be converted to even-aged hardwood seedling-sapling stands.

There are a few large even-aged Northern hardwood-oak stands on the unit which will present a challenge to foresters in the future. The largest is a 154-acre stand on Broome #8. The next treatment will be an even-age crown thinning to favor the best **crop trees**. However, if these stands continue to be managed as even-aged, subsequent treatments would include a seed cut to start advanced regeneration, followed by a release cut, harvesting the mature timber. To eventually remove the entire overstory over such a large area would be aesthetically unacceptable. Instead, these stands have been given an uneven-aged management direction for the long-term. Treatments in the distant future will use group selection to regenerate oak. **Conversion** of these stands occurs over many treatments, and so, it may be many decades before stands acquire an uneven-aged structure. As stated in the Preface, future updates of this plan may adjust the management direction for these and other stands as public needs and landscape conditions evolve.

Hemlock is a native evergreen conifer which is shade tolerant and regenerates easily using single-tree selection. It is desirable for its winter color and thermal cover for wildlife. In order to maintain large trees for aesthetics and mature interior habitat, the Northern hardwood-hemlock stands will be managed as uneven-aged. Because of the factors stated above, the Unit's overall uneven-aged management acreage is greater than the even-aged acreage.

Forest product sales are the primary means of achieving the desired stand structures. The **cutting cycle** is the time span between treatments (e.g. timber harvests) in an uneven-aged stand. The thinning cycle is the interval between treatments in an even-aged stand. Intervals of approximately 25 years will be used for all stands. The age of trees at maturity for timber purposes varies, and depends on species, site and growing space. Red pine may be mature at

seventy years, whereas Norway spruce and hardwoods may mature at one hundred years of age or more as long as they maintain good health.

Some trees of unique characteristics and size will be left as **biological legacy trees** as determined by the forester and in compliance with the DEC Program Policy, ONR-DLF-2 / Retention on State Forests.

Action 1.6.1 Manage the Unit's forests using silvicultural treatments for all forest cover types at a total annual average harvest of 108 acres per year for the 20 year planning period.

Action 1.6.2 During the next 20 years, maintain at least 2,235 acres (42%) of the Unit in a conifer component comprised of both planted and naturally reproducing conifer species. Natural conifer forest types comprised of stands containing hemlock and white pine will be maintained on 1,525 acres or 28% of the Unit. At least 195 acres (4%) of the Unit will be maintained in conifer plantation forest types consisting of primarily Norway spruce.

The DEC Region 7 guideline has been to maintain a minimum of 20% of each State Forest in conifer cover. Conifer trees provide a variety of special functions for many species of wildlife. Conifer forests moderate temperature extremes, which can help provide winter thermal cover, help moderate snow depth, provide shelter from wind and provide escape cover on a year-round basis. Conifer stands provide valuable habitat for many groups of wildlife species, including white-tailed deer, grouse, wild turkey and various species of raptors.

Action 1.6.3 Manage 367 acres of conifer plantations (with varying amounts of mixed hardwoods) using the even-aged system with the goal of eventually converting them to native hardwoods or naturally regenerated conifers. The Unit contains a total of 2,226 acres (41% of the Unit) of conifer plantations or mixed hardwoods with plantation conifers in pole timber or larger size class. Non-native conifer plantations on the Unit consist of primarily red pine and Norway spruce along with minor amounts of larch and white pine. The majority of these plantations were established between 1934 and 1964 with the trees now between about 50 and 80 years old.

Red pine is not native to this portion of New York State and is vulnerable to damage from wind storms due to it being planted on shallow soils in many areas of the Unit. While many red pine plantations have grown well for decades, the older plantations are now at or near maturity. Many sites have trees with declining vigor as indicated by thin **crown**s. Red pine is adapted to reproduce on seedbeds after a fire has occurred. Otherwise, it only appears to regenerate in areas receiving full sunlight with exposed mineral soil, such as on logging trails in **clear cuts**. Therefore, widespread natural reproduction of this species is not possible on the Unit.

Harvesting of the plantations will create important early successional conditions on the Unit which will provide habitat for many declining Species of Greatest Conservation Need (see Table 3). All management of plantations will comply with the Department program policy ONR-DLF-1 /

Plantation Management on State Forests (2011). More information on the Plantation Management policy can be found at http://www.dec.ny.gov/docs/lands_forests_pdf/policysfplantation.pdf .

Action 1.6.4 Manage 1,042 acres using **even-aged silvicultural systems**. Areas designated for even-aged management include a mix of conifer plantations and native hardwoods.

Action 1.6.4.1 Manage 540 acres using the even-aged system in Northern hardwood, oak or mixed northern hardwood-oak forest types.

Action 1.6.4.2 Manage 135 acres using the even-aged system in pioneer hardwood forest types.

Action 1.6.5 Manage 3,680 acres using **uneven-aged silvicultural systems**. Areas designated for uneven-aged management include primarily native hardwoods and hemlock.

Action 1.6.5.1 Manage 2,206 acres using the uneven-aged system in Northern hardwood, oak or mixed northern hardwood-oak forest types.

Action 1.6.5.2 Manage 1,192 acres using the uneven-aged system in hardwood hemlock or hardwood white pine forest types.

Action 1.6.5.3 Manage 283 acres using the uneven-aged system in Norway spruce and Norway spruce-red pine forest types.

Objective 1.7 Establish adequate regeneration of desired tree species so that within 10 years of plan implementation stands that are five years or older since being timber harvested are at least 50% stocked with desirable regeneration.

Repeated browsing by deer often results in the proliferation of interfering woody (striped maple, beech and hophornbeam) and herbaceous vegetation (hay-scented and New York fern) in the forest understory. These interfering species are either not preferred by deer or are resistant to the effects of repeated browsing. Furthermore, the presence of interfering species above threshold stocking levels will prevent the establishment of other tree species, resulting in greatly reduced vegetation diversity and severely limited potential for future timber production (Bashant & Nyland, et al., 2005).

Excessive deer browsing can also reduce understory plant species diversity. Forest herb species sensitive to deer browse such as trillium, Canada mayflower, Indian cucumber and others can be severely reduced in abundance or eliminated after years of repeated browsing. Furthermore, excessive deer browsing resulting in altered understory plant communities can have secondary impacts such as reducing the diversity of breeding birds.

The Department will use the following strategies to achieve successful regeneration:

Action 1.7.1 Increase the intensity of the timber harvest using large group selection and patch cuts along with individual tree selection in stands designated for uneven-aged management.

Including the use of large group selection and patch cuts along with individual tree selection will create larger canopy gaps, up to one acre in size. This will have a variety of benefits including the potential for both shade tolerant and intolerant species of forest regeneration. Any regeneration that does become established in the larger gaps should grow at a faster rate, so that it can grow above the reach of deer more quickly.

Action 1.7.2 Remove interfering vegetation at select locations where it dominates the forest understory.

Interfering vegetation typically consists of dense stocking of New York or hayscented fern, beech, striped maple or hophornbeam in the forest understory. In areas where they dominate the forest understory, they can prevent the establishment of other species. Where interfering vegetation exceeds threshold levels and restricts the establishment of desirable tree species, a variety of methods will be used to reduce its dominance in the understory. These methods will include cutting of individual stems and herbicide application where necessary. Herbicides will only be applied where mechanical methods will not be effective. When herbicides are applied, the least toxic and most specific type of application will be used to achieve the desired objective. The preferred methods include backpack spraying of the foliage and applying herbicide to the cut stumps or bark of individual trees. The application methods will also include provisions for protecting future stand species diversity since the objective is not to eliminate all interfering vegetation, but to reduce its dominance to allow other species to grow. Application of the herbicides will be done according to the specifications of the label to protect water quality and impacts to non-target species. All herbicide applications will comply with the State Environmental Quality Review law and State regulations.

Action 1.7.3 Implement an annual cyclic regeneration inventory to assess regeneration development 5-10 years after silvicultural treatments that were intended to develop desirable regeneration after harvest. An inventory of regeneration development will provide information necessary to evaluate the effectiveness of stand treatments. Silvicultural practices may then be modified to improve effectiveness of stand treatments.

Table 18. Present and Future Cover Types

Vegetation Type	Present Acres	% of Unit	Objective Acres	% of Unit
Northern Hardwoods & Oak types, Pioneer Hardwoods	2,843	53	2,858	54
N. Hardwoods/ Oak & Natural Conifer	1,485	28	1,874	35
N. Hardwoods/ Oaks & Plantation Conifer	84	2	425	8
Plantation Conifer	745	14	0	0
Grass, Old Field, Brush, Apple	44	<1	44	<1
Ponds & Wetlands	113	2	113	2
Roads, Shale pits	59	1	59	1
Total	5,373	100	100	100

GOAL 2: Protect and Maintain State Forest Assets and Visual Resources of the Unit

State Forest assets on this Unit include historic or cultural resources, vehicle access infrastructure, shale or gravel pits, and boundary lines. This Unit also includes many visual resources important to the public such as scenic views from roads, trails, ponds and streams. The importance of the visual resources and the public's perception will always be considered in the decision making and implementation of activities on this Unit.

Objective 2.1 Preserve and Protect Historic and Cultural Resources on the Unit

Historic and archaeological sites located on State Forests, as well as additional unrecorded sites that may exist, are protected by provisions of the New York State Historic Preservation Act (SHPA-Article 14 PRHPL), Article 9 of the Environmental Conservation Law, 6NYCRR Section 190.8 (g) and Section 233 of Education Law. 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. In some cases, additional protection may be afforded these resources by the Federal Archaeological Resources Protection Act (ARPA). *(SPSFM pg141)*

Cultural resources on the Unit offer clues about the historic relationship between people and nature. Farm sites, graveyards, stonewalls and similar artifacts reveal cultural practices and provide clues about settlement patterns. Preservation of cultural resources will ensure that future generations have access to information about the past.

Action 2.1.1 Protect all cultural resource sites, including new discoveries as a result of management activities on the Unit. Stone walls and other structures will not be dismantled, and

efforts will be made to accommodate access using existing gateways. Hedgerows, shade and fruit trees, and other ornamental plants associated with cultural sites will not be harvested.

Action 2.1.2 Follow all standard operating procedures for managing historic and cultural resources once developed and implemented as part of the SPSFM stated actions (HC Action 1).

Action 2.1.3 Implement a systematic and comprehensive archaeological inventory of the Unit as outlined in the SPSFM actions HC Action 2.

Objective 2.2 Maintain and enhance vehicle access infrastructure which includes forest access roads, haul roads, access trails, gates, parking areas, and associated facilities.

Action 2.2.1 Implement a standard process as identified in the SPSFM (pg 168) for assessing State Forest infrastructure needs and assign maintenance schedule priorities and budgets.

Action 2.2.2 Maintain 2.4 miles of Public Forest Access Roads (PFAR) and 0.2 miles of haul roads and all associated road culverts.

These roads provide the primary means of access for these forests. Routine upkeep includes ditch and culvert maintenance. The roadsides are mowed annually. Periodic maintenance includes grading and crowning every other year and periodic road resurfacing with new gravel or shale and culvert replacement.

Action 2.2.3 Maintain one shale pit to provide material for the maintenance of Department facilities.

The shale pit located on Broome 5 will be maintained to provide surface material necessary for roads, trails, parking areas and log landings. Shale or gravel extracted from these pits will be utilized exclusively for State land construction projects and will not be made available for commercial use. If annual extractions are determined to be greater than 1,000 tons or 750 cubic yards of material removed in any 12 successive calendar months, then a mined land reclamation permit and a Mined Land Use Plan will be required. Regional staff from the Division of Mineral Resources will be consulted at that time.

Action 2.2.4 Maintain three gates on the Unit; two are located on Broome 8 and one on Broome 3.

Objective 2.3 Maintain Boundary lines to identify State property and prevent timber theft and encroachments

Establishing visible boundary lines is a basic requirement for resource management and protection.

Action 2.3.1 Repaint boundary lines on a seven-year cycle utilizing DEC's Operations crews.

Table 19. Boundary Line Maintenance Schedule

Year	State Forest	Miles
2021	Broome 3	4.6
2023	Broome 4	7.7
2020	Broome 5	7.5
2021	Broome 6	6.0
2023	Broome 7	11.2
2022	Broome 8	6.0
2022	Broome 9	5.7
2021	Broome-Tioga 1	9.6
Total		**58.3**

Action 2.3.2 Identify and complete survey requests through the Bureau of Real Property as priorities and budgets allow. Priority surveys to complete include possible trespasses on Broome 4 and Broome-Tioga 1.

Objective 2.4 This Unit will be managed so that the overall quality of the visual resources is maintained or improved.

State lands are dominated by forest cover which has created a unique visual character of these areas compared to roads through private lands. The visual resources of the Unit will be considered when planning management actions near roads, trails or high use recreational facilities. The visual quality along these roads and trails today is different from what it was 50 years ago and will change in the future. The forests on the Unit are a dynamic resource that is constantly changing in response to human or natural events. Timber harvesting, insect or disease infestation, or extreme weather events all have the ability to impact and change this visual resource. For additional information on the management of visual resources, see the *SPSFM, 2011, pg127*.

Action 2.4.1 Manage road corridors for visual qualities associated with a forested landscape. The Unit includes Public Forest Access Roads and town roads. The visual resources along these corridors will be considered when planning management actions. Hazard trees will be removed for road maintenance. Trees along roads or trails may be harvested or retained depending upon site conditions and specific management objectives. The forest will change in response to management actions and natural events, but a forested character will remain along road and trail corridors. Fallen treetops will be hauled back from trails and roads and the treetops in the corridors will be cut down close to the ground to maintain visual qualities.

Action 2.4.2 Follow all guidelines, yet to be developed for visual impact assessment and mitigation around timber harvests, mineral extraction sites and infrastructure. The SPSFM has scheduled this guidance to be developed and will include an updated Timber Management Handbook.

Action 2.4.3 Follow all visual resource protection requirements identified in the DEC policies for retention, plantation management and clearcutting.

Action 2.4.4 Construction materials which are aesthetically pleasing and complement the setting will be used for the construction of any necessary structures or barriers on the Unit.

GOAL 3: Provide Forest Based Recreational Opportunities Compatible with the Units Resources.

State lands offer opportunities for recreational activities that are best enjoyed in remote, relatively undisturbed natural areas. Such activities typically require only a minimum of facility development or site disturbance. Activities meeting these criteria are compatible with maintaining and protecting the natural character and features of State land. Visitors to State Forests do not pay admission fees, and limited facility development and associated construction and maintenance costs are consistent with this principle.

In managing the recreational resources on the Unit many factors are considered. Constraints consist of property size, shape, topography, soils, access, wetlands, streams, existing uses, capital, staff, suitability, as well as enacted rules, regulations, policies, and laws. Other factors like nearby recreational opportunities, public input, history, cover type, maintenance, environmental impact, and general demand are considered also.

For further discussion of DEC recreation goals and objectives for State Forests, see Chapter 5 of the Strategic Plan for State Forest Management at http://www.dec.ny.gov/docs/lands_forests_pdf/spsfmfinal.pdf .

Objective 3.1 Provide recreational opportunities compatible with the resources on the Unit and maintain recreational facilities to ensure ecosystem sustainability.

State forests are best suited to low impact recreational activities that require a minimum amount of facility development and maintenance. Recreational activities shall not have negative impacts to rare species or ecological communities or cause degradation of the soil, water or vegetation resources on the Unit. This objective focuses on the tasks needed to provide and maintain high quality recreational facilities while also protecting the environmental integrity of the Unit.

Action 3.1.1 Maintain 2.2 miles of cross-country ski trail on Broome 3.

Action 3.1.2 Encourage groups or individuals to participate in volunteer programs to promote the resources on the Unit or to help maintain the public use facilities on the Unit. The Department's ability to provide the needed funds and staffing to adequately maintain or improve recreational facilities is limited. Help from volunteers can be instrumental in improving, maintaining or preventing closure of recreation facilities. Volunteer Stewardship Agreements and DEC Volunteer programs allow volunteers the opportunity to propose activities that help the Department to achieve the goals and objectives for the Unit. Volunteer group activities may include group hikes, historic tours, birding walks or surveys, organized group hiking or snowmobile events and other Department approved group activities. Maintenance activities suitable for volunteer participation include upkeep of trails, parking areas, camping sites, cultural resources, wildlife habitat and removal of invasive plant species. Group activities involving 10 or more people may require a special permit. Applications and information are available through the Sherburne Lands & Forests office.

Action 3.1.3 Continue to allow dispersed recreation activities for which no trails or amenities exist or will be provided, such as hunting, trapping, hiking, fishing and nature observation.

Action 3.1.4 Maintain recreational facilities to provide a safe user experience by periodically closing trails impacted by timber harvests or extreme weather events.

Action 3.1.5 Prohibit public ATV use on the Unit in accordance with the Department's State Forest ATV policy as stated in the Strategic Plan for State Forest Management, 2010. As described in the SPSFM, ATV use is only compatible with State Forest management goals under the conditions described below:

"…the Department will not permit ATV use on State Forests, except;

- as may be considered to accommodate a "connector trail" through Unit Management Planning or a similar public process; and
- on those specific routes designated for use by DEC-issued Motorized Access Permit for People with Disabilities (MAPPWD)."

For additional information on the State forest ATV policy, see p. 222 of the Strategic Plan for State Forest Management at http://www.dec.ny.gov/docs/lands_forests_pdf/spsfmfinal.pdf

Action 3.1.6 Maintain the two camp sites on Broome 4 as primitive camp sites.
These camp sites will be maintained removing litter or safety hazards. Steel fire rings have been installed here in the past but have since been stolen/vandalized. They will be replaced as funding allows.

Objective 3.2 Provide recreational opportunities that are universally accessible and comply with the Americans with Disabilities Act.

Application of the Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA), along with the Architectural Barriers Act of 1968 (ABA) and the Rehabilitation Act of 1973; Title V, Section 504, 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 prohibiting discrimination against people with disabilities in employment practices, use of public transportation, use of telecommunication facilities and use of public accommodations. Title II of the ADA requires, in part, that reasonable modifications must be made to the services and programs of public entities, 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 an undue financial or administrative burden.

Title II also requires that new facilities, and parts of facilities that are newly constructed for public use, are to be accessible to people with disabilities. In rare circumstances where accessibility is determined to be structurally impracticable due to terrain, the facility, or part of facility is to be accessible to the greatest extent possible and to people with various types of disabilities.

Consistent with ADA requirements, the Department incorporates accessibility for people with disabilities into the planning, construction and alteration of recreational facilities and assets supporting them. This UMP incorporates an inventory of all the recreational facilities or assets supporting the programs and services available on the unit, and an assessment of the programs, services and facilities on the unit to determine the level of accessibility provided. In conducting this assessment, DEC employs guidelines which ensure that programs are accessible, including buildings, facilities, and vehicles, in terms of architecture and design, transportation and communication to individuals with disabilities.

Any new facilities, assets and accessibility improvements to existing facilities or assets proposed in this UMP are identified in the section containing proposed management actions.

The Department is not required to make each of its existing facilities and assets accessible as long as the Department's programs, taken as a whole, are accessible.

For copies of any of the above mentioned laws or guidelines relating to accessibility, contact the DEC Universal Access Program Coordinator at 518-402-9428 or UniversalAccessProgram@dec.ny.gov

Universal access will be provided unless it fundamentally alters the character or recreational programs of the area. This objective strives to maximize accessibility while protecting the natural setting to the greatest extent possible, thereby preserving the fundamental experience for all. A

minimal tool approach will be used to implement this vision, resulting in projects that blend into the natural environment and protect the landscape.

Action 3.2.1 Upgrade 2.2 miles of ATV Access Route trail for people with qualifying disabilities on Broome 8. This trail will be upgraded to a firm and stable surface with erosion control structures installed as needed.

Action 3.2.2 Upgrade one designated camping site at Marsh Pond to accessible standards to provide access for people with disabilities.

Objective 3.3 Provide and enhance information on the Unit.

This Unit contains numerous recreational opportunities that can be utilized throughout the year at various locations. The public is often not aware of available opportunities or the rules and regulations for appropriate Some of these opportunities may not be known or apparent to the public. Each of the opportunities may also have specific rules or regulations, which people may be unaware of. Clear and accurate information is needed to inform the public about what recreational opportunities are available as well as the rules or regulations on state forest use. This will improve the public's use of the Unit as well as protect the resource from inappropriate or illegal activity.

Action 3.3.1 Develop and install kiosks describing the recreational opportunities of the Unit including designated trails, camping facilities, trail closures, access points and rules and regulations for State lands.

- Standard design kiosks including a map, interpretive text and rules and regulations will be installed at Broome 5, 7, 9 and Broome – Tioga 1. Each kiosk will also include a designated off-road parking area.

Action 3.3.2 Improve the availability of information to the public on the internet about the Unit. Current information about the Unit available on the DEC web site includes maps of the forests, descriptions of the forests, rules and regulations, and directions to the forests.

- Provide smart phone quick response bar codes (QR codes) at all new kiosks to access information about the Unit.

Action 3.3.3 Maintain all signs communicating information to the public on the Unit. This includes:

- Identification sign for Truck Trails
- Eight wooden State forest identification signs
- Installed State forest kiosks

- Designated parking area signs

Action 3.3.4 Construct and install State forest ID signs on Broome 7, 9 & Broome-Tioga 1.

Goal 4: Provide Economic Benefits to the People of the State

ECL §1-0101(1) provides in relevant part that "It is hereby declared to be the policy of the State of New York to conserve, improve and protect its natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall *economic* and social well- being" (emphasis added). In considering all proposed actions, DEC will attempt to balance environmental protection with economic benefit.

New York's State forests provide economic benefits to the People of the State through the variety of goods and services they produce as well as the tax revenue they provide to local communities. Goods provided by State forests include timber from the sale of forest products, fish and wildlife obtained for consumption, and potential mineral resources such as gas. Services provided by State forests include the opportunity for a wide variety of recreation activities and the services their natural ecosystems provide which help sustain and fulfill human life.

Objective 4.1 Provide a steady flow of forest products through sustainable forest management.

New York's public and private forests contribute over $9.9 billion annually to the State's economy through the forest products industry, while forest-based recreation activities contribute $8.2 billion in sales annually to New York's economy (North East State Foresters Association, 2013). Over 43,000 people are directly employed in forest-based manufacturing industries and about 32,000 people are employed in forest recreation based businesses.

Each 1,000 acres of forest timberland in New York supports 2.7 forest-based manufacturing jobs. (North East State Foresters Association 2013). State forests make important contributions to these economic categories resulting in economic benefits to local communities and their larger surrounding areas.

For additional information about forest product sales from State forests, see the Chapter 6 of the Strategic Plan for State Forest Management.

Action 4.1.1 Treat an average of approximately 108 acres each year through timber sales. Timber sold from the Unit will be purchased by businesses for manufacturing products such as construction lumber, paper, flooring, furniture, veneer, utility poles, fencing, pallets and fuel wood. These products are manufactured and sold locally and internationally in the global wood products market. The sale of timber provides jobs to loggers, truck drivers, and employees in wood

products manufacturing businesses as well as revenue to New York State. Acres treated will be dependent upon staffing and suitable markets.

Objective 4.2 Provide Property Tax Income to Local Governments and Schools.

Action 4.2.1 Maintain annual tax payments to local governments and schools.

The State provides annual payments of approximately $77,851 (2016 data) in combined town, and school taxes on the lands in this Unit. See **Appendix VIII** for additional information.

Objective 4.3 Evaluate and consider surface disturbance associated with natural gas exploration, production and development on the Unit compatible with the goals and objections of the plan.

Action 4.3.1 Make no decision with respect to surface disturbances associated with oil and gas exploration, development and extraction on this unit in this management plan.

Should any portion, or all of the unit be nominated for oil and gas exploration, development and extraction, this will trigger a new public process before final decisions are made with respect to the proposal(s). The Department will conduct a tract assessment of the Unit and hold a public meeting to receive comments in regard to the proposal(s). A 30-day public comment period would then follow the public meeting. The Department will consider all comments and the tract assessment prior to making a decision. If the Department decides to go forward with a lease proposal, the Division of Lands and Forests will collaborate with the Division of Mineral Resources to incorporate special conditions into the proposed lease. These conditions would include, but not be limited to criteria for site selection, mitigation of impacts and land reclamation upon completion of the proposal.

Action 4.3.2 Restrict surface mining.

Restrict surface mining of stone, shale, sand, gravel or other aggregate and underground mining of "hard rock" minerals such as metal ores, gem minerals, and salt. The Department's current policy is to decline any commercial mining application(s) pertaining to any lands covered by this UMP as these activities are not compatible with the purposes for which State Forests were purchased.

Objective 4.4 Provide support to local communities through forest-based tourism.

New York forest-based recreations and tourism businesses employ about 32,000 people and support a payroll of $965 million annually (North East State Foresters Association, 2013). Recreation activities enjoyed on the Unit, such as hunting, snowmobiling, and hiking contribute to the local economy through the participant's purchase of supplies, food and lodging.

Action 4.4.1 Develop cooperative partnerships with organizations individuals or communities to sustain or enhance forest-based tourism activities that are consistent with this plan and State forest rules and regulations. The Volunteer programs will be used to formalize such partnerships. The Department will also support approved volunteer activities that are consistent with the goals and objectives of this plan.

Action 4.4.2 Promote public awareness through kiosks, brochures, and Department website development to be utilized by local communities. See actions 3.3.1, 3.3.2 and 3.3.3.

Objective 4.5 Protect rural character and provide ecosystem services and open space benefits to local communities.

The presence of State forests maintains the rural character of much of New York State. Undeveloped lands, such as State forests, provide many important ecosystem services to society such as wildlife habitat, buffering of downstream communities from floods, pollination of crops, insect pest control, clean water and clean air. They also provide open space benefits such as free public recreational opportunities and places for relaxation and escape from the disruptions and stresses associated with urban areas.

Action 4.5.1 The Department will pursue possible purchases of lands, from willing sellers only, in fee or through conservation easement parcels (in-holdings and parcels bordered on two or three sides by State lands) that will consolidate State ownership or protect at-risk species or ecological communities. Acquisition of such lands will improve public and administrative access and provide larger consolidated blocks of State land for improved protection of rare species and enhanced recreational opportunities. For more information on the Departments land acquisition priorities please refer to the SPSFM page 149 at http://www.dec.ny.gov/lands/64567.html.

Management Action Schedules

Tables of Land Management Actions

1. Land Management Actions Code Definitions

The following tables present a 20-year schedule of planned management actions. The first table is referenced by forest, then stand number. The State Forest Stand Mosaic Maps for this Unit show the specific forest stand locations. The second table is referenced by the year of scheduled management in the Year Sequence column. Year one in the "Year Sequence" column will be the year when permanent staffing is first appointed to implement the treatments in this schedule. Stand treatments will be implemented sequentially from that date forward.

Abbreviations or codes for the following tables are listed below:

DEFINITIONS OF CODES USED

Vegetation Type Codes	Definition
APP	Apple
BR	Brush, woody shrub species
HEM	Hemlock
HIC	Hickory
JL	Japanese larch
NH	Northern hardwoods
NS	Norway spruce
OAK	Oak species
OPEN	Areas dominated by herbaceous species not mowed for habitat
PH	Pioneer hardwoods - aspen
PIT	Shale or gravel pit
POND	Natural open water bodies, including beaver ponds
RP	Red pine
WET-ALDER	Wet areas dominated by alder or other wetland shrub species
WET	Wet areas dominated by non-woody vegetation
WP	White pine
WS	White spruce

Objective Type Code	Definition
APP	Apple
BR	Brush or woody shrub species
GR	Grass spp.
HEM	Hemlock
HIC	Hickory
JL	Japanese larch
NH	Northern hardwoods
NS	Norway spruce
OAK	Oak species
OPEN	Areas dominated by herbaceous species not mowed for habitat
OLD FIELD	Grassy or herbaceous areas mowed for habitat
PH	Pioneer hardwoods
PIT	Shale or gravel pit
POND	Man-made or natural, including beaver ponds
WET-ALDER	Wet areas dominated by alder or other wetland shrub species
WETLAND	Wet areas dominated by non-woody vegetation
WP	White pine
WS	White spruce

Management Direction Code	Definition
APP	Apple trees.
BR	Brush: Shrub species other than apple.
E	Even-aged: 100-160 year rotation for natural stands; up to 140 years for plantations.
ES	Even-aged, Short Rotation: Approximately 60 year rotations to maintain pioneer hardwoods such as aspen.
NA	Natural Area: Forest area managed to grow to and sustain a climax condition.
PIT	Shale Pit
U	Uneven-aged: Stands managed to develop multiple age classes with a 20 year **cutting interval**.
UL	Uneven-aged, Long Cutting Interval: Stands managed using the Uneven-aged system with a greater than 20 year cutting interval.
ZA	Protection – Inaccessible: Stands which are not environmentally or economically feasible to access.
ZR	Protection - Riparian: Stands excluded from harvesting to protect stream banks and other zones near water features.
ZS	Protection – Steep: Stands excluded from harvesting to protect steep slopes.
ZV	Protection – Visual: Stands excluded from harvesting to protect visual resources.
ZW	Protection – Wetlands: Stands excluded from harvesting to protect wetlands.

Treatment Code	Definition
FW	Firewood thinning
GC	Aspen clearcut to regenerate aspen for ruffed grouse and other species.
GS	Group selection: removal of trees in groups up to 2 acres in size to regenerate a mix of species with various **shade tolerance**s.
MOW	Mow to maintain grass or prevent succession to forest cover
PU	Spruce harvest - pulp or sawtimber
RA	Release apple trees
RC	Red pine overstory removal to release advance regeneration.
RE	Remove over-story trees to maintain grass or brush types.
RT	Pine or larch thinning
ST	Sawtimber harvest: Harvest of mostly sawtimber trees in a natural stand.
TSI	Timber stand improvement: A non-commercial thinning to improve stand quality.

2. Table of Forest Stand Management Actions

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 03	1	31	NH-HEM-OAK	ST	140	U	NH-HEM-OAK	ST	19
BROOME 03	2	25	PH-OAK	ST	142	E	OAK	ST	11
BROOME 03	3	2	RP	ST	235	E	NH-WP	RC	3
BROOME 03	4	16	NH	PT	136	E	NH	TSI	19
BROOME 03	5	60	NH-OAK	ST	100	U	NH-OAK	ST	-
BROOME 03	6	60	NH-OAK	SS	0	E	NH-OAK	TSI	-
BROOME 03	7	4	WETLAND	-	0	ZW	WETLAND	none	-
BROOME 03	8	5	OAK	ST	110	E	OAK	FW	7
BROOME 03	9	22	NH	ST	98	U	NH	ST	-
BROOME 03	10	17	NH	PT	136	U	NH	FW	11
BROOME 03	11	6	NH-WP-HEM	ST	164	NA	NH-WP-HEM	none	-
BROOME 03	12	23	NH-HEM	ST	111	U	NH-HEM	ST	19
BROOME 03	13	5	RP	PT	186	E	NH	RT	-
BROOME 03	14	4	NH	PT	90	U	NH	FW	-
BROOME 03	15	11	NH	ST	85	U	NH	ST	-
BROOME 03	16	6	RP	ST	194	E	NH	RT	9
BROOME 03	17	19	NH-OAK	ST	130	U	NH-OAK	ST	11
BROOME 03	18	1	RP-JL	PT	150	E	NH-JL	TS	-
BROOME 03	19	1	BR-APP	SS	0	BR-A	BR-APP	RE	-
BROOME 03	20	1	RP	PT	173	E	NH	TS	-
BROOME 03	21	2	NH-OAK	ST	150	U	NH-OAK	FW	7
BROOME 03	22	17	RP	ST	252	E	NH	TSI	-
BROOME 03	23	3	RP	ST	180	E	NH	RT	9
BROOME 03	24	3	PH	ST	75	U	NH	ST	-
BROOME 03	25	1	GRASS	-	0	GR	GRASS	MOW	1
BROOME 03	26	13	NS-RP	ST	184	U	NS-NH	RT	-
BROOME 03	27	12	NS-RP	ST	186	U	NS-NH	RT	-

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 03	28	9	RP-NS	ST	226	U	NH-NS	RT	-
BROOME 03	29	52	NH-HEM	ST+	169	U	NH-HEM	ST	19
BROOME 03	30	15	RP-NS	ST	180	U	NH-NS	RT	9
BROOME 03	31	28	NH	ST	149	U	NH	ST	7
BROOME 03	32	7	RP-NS	ST	234	U	NH-NS	RT	-
BROOME 03	33	4	RP-NH-NS	ST	206	E	NH-NS	RT	3
BROOME 03	34	8	RP-NS	ST	138	U	NH-NS	RT	-
BROOME 03	35	39	NS-RP	ST	146	U	NH-NS	RT	-
BROOME 04	1	155	NH	ST	133	U	NH-OAK	ST	-
BROOME 04	2	21	NH-OAK	ST	116	E	NH-OAK	ST	18
BROOME 04	3	17	NH-OAK-HIC	PT	89	E	NH-OAK-HIC	FW	-
BROOME 04	4	24	NS	ST	194	U	NS-NH	PU	12
BROOME 04	5	7	NS	ST	190	U	NS-NH	PU	12
BROOME 04	6	6	HEM-NH	ST	160	U	HEM-NH	ST	12
BROOME 04	7	3	NH-OAK	ST	140	ZR	NH-OAK-HEM	none	-
BROOME 04	8	20	NH	ST	114	U	NH	ST	-
BROOME 04	9	69	NH-HEM	ST	166	NA	NH-HEM	none	-
BROOME 04	10	29	RP	PT	223	E	NH	RT/RC	-
BROOME 04	11	5	OAK	ST	117	U	OAK	ST	-
BROOME 04	12	14	NH-HEM	ST+	164	NA	NH-HEM	none	-
BROOME 04	13	9	NH	ST+	151	NA	NH	none	-
BROOME 04	14	24	NH	ST	136	U	NH	ST	-
BROOME 04	15	11	NH-HEM	ST	127	ZV	NH-HEM	none	-
BROOME 04	16	4	NS	PT	215	U	NS-NH	PU/TSI	-
BROOME 04	17	3	NH-OAK	PT	136	E	NH-OAK	ST	12
BROOME 04	18	3	OAK-WP-HEM	ST	83	ZV	OAK-WP-HEM	none	-
BROOME 04	19	6	NH-HEM	ST	130	ZV	NH-HEM	none	-
BROOME 04	20	28	POND	-	0	ZW	POND	none	-

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 04	21	63	NH	ST	133	U	NH-HEM	ST	-
BROOME 04	22	91	NH	ST	143	U	NH	ST	-
BROOME 04	23	181	NH-HEM	ST	132	U	NH-HEM	ST	-
BROOME 04	24	8	NH	ST	97	E	NH	ST	12
BROOME 04	25	8	NS	PT	184	U	NS-NH	PU	12
BROOME 04	26	51	NH-HEM	ST+	154	U	NH-HEM	ST	16
BROOME 04	27	2	NH-HEM	ST	117	U	NH-HEM	ST	-
BROOME 04	28	3	NH	PT	56	U	NH	FW	-
BROOME 04	29	3	NS	SS	50	E	NH-NS	TSI	-
BROOME 04	30	13	WET-ALDER	-	0	ZW	WET-ALDER	none	-
BROOME 04	31	2	POND	-	0	ZW	POND	none	-
BROOME 04	32	1	NS	PT	193	U	NS-NH	TSI	12
BROOME 05	1	4	NH-HEM	ST	0	ZR	NH-HEM	none	-
BROOME 05	2	28	NH-HEM	ST	140	U	NH-HEM	ST	7
BROOME 05	3	3	NH-HEM	ST	135	U	NH-HEM	ST	7
BROOME 05	4	20	HEM	ST	170	U	HEM	ST	7
BROOME 05	5	3	WETLAND	-	0	ZW	WETLAND	none	-
BROOME 05	6	48	NS	ST	210	U	NS-NH	PU	-
BROOME 05	7	20	NH-HEM	ST	143	U	NH-HEM	ST	7
BROOME 05	8	8	NH-OAK	ST	103	U	NH-OAK	ST	-
BROOME 05	9	16	NS	ST	185	U	NS-NH	PU	14
BROOME 05	10	13	NH-HEM	ST	128	U	NH-HEM	ST	-
BROOME 05	11	21	NS	ST	182	U	NS-NH	PU	-
BROOME 05	12	17	OAK-NH	ST	95	U	OAK-NH	ST	-
BROOME 05	13	30	OAK-NH	ST	80	U	OAK-NH	ST	-
BROOME 05	14	6	NS	PT	200	U	NS-NH	PU	14
BROOME 05	15	3	PH-OAK-NS	PT	130	E	OAK-NS	TSI	-
BROOME 05	16	5	OAK	ST	100	E	OAK	ST	-

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 05	17	13	NH-OAK	PT	109	E	NH-OAK	TSI	-
BROOME 05	18	5	OAK-NH	ST	110	U	OAK-NH	ST	14
BROOME 05	19	6	OAK	PT	97	U	OAK	ST	-
BROOME 05	20	3	NH-OAK	PT	104	U	NH-OAK	ST	-
BROOME 05	21	18	OAK-NH	ST	112	U	OAK-NH	ST	14
BROOME 05	22	4	RP	ST	200	E	NH	RT	-
BROOME 05	23	13	OAK-HIC-NH	ST	100	E	OAK-HIC-NH	ST	-
BROOME 05	24	1	RP-WP	ST	140	E	NH-WP	RT	-
BROOME 05	25	10	NH-OAK	ST	93	E	NH-OAK	ST	-
BROOME 05	26	11	NH	SS	30	E	NH	TSI	-
BROOME 05	27	2	NH	ST	75	U	NH	ST	-
BROOME 05	28	13	NH-OAK-HEM	ST+	134	U	NH-OAK-HEM	ST	-
BROOME 05	29	3	NH-OAK	PT	105	E	NH-OAK	TSI	-
BROOME 05	30	20	NH	SS	30	E	NH	TSI	-
BROOME 05	31	25	OAK-NH	ST+	103	E	OAK-NH	ST	7
BROOME 05	32	7	HIC-NH-OAK	ST	105	E	HIC-OAK	ST	-
BROOME 05	33	18	OAK-NH	ST	104	U	OAK-NH	ST	-
BROOME 05	34	13	OAK-NH	ST	104	U	OAK-NH	ST	-
BROOME 05	35	1	PIT	-	0	PIT	PIT	none	-
BROOME 05	36	4	OAK	ST	86	E	OAK	ST	-
BROOME 05	37	4	OAK	PT	87	U	OAK	FW	-
BROOME 05	38	4	OAK	ST	102	U	OAK	ST	-
BROOME 05	39	9	OAK	ST	86	U	OAK	ST	-
BROOME 05	40	32	OAK	ST	100	U	OAK	ST	-
BROOME 05	41	13	RP	ST	172	E	NH	RT	-
BROOME 05	42	9	RP	PT	224	E	NH	RT	-
BROOME 05	43	22	OAK-NH	ST	100	U	OAK-NH	ST	-
BROOME 06	1	13	NH-OAK	ST	103	U	NH-OAK	ST	18

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 06	2	70	HEM-NH	ST	140	U	HEM-NH	ST	18
BROOME 06	3	9	PH	PT	100	ES	PH	GC	2
BROOME 06	4	8	RP	PT	208	U	NH-WP	RT	6
BROOME 06	5	4	POND	-	0	ZW	POND	none	-
BROOME 06	6	10	RP	PT	164	E	NH	RT	10
BROOME 06	7	11	NH	ST	114	U	NH	ST	18
BROOME 06	8	20	RP	PT	209	E	NH	RT	4
BROOME 06	9	7	NH	ST	124	U	NH	ST	-
BROOME 06	10	32	NH	ST	168	U	NH	ST	-
BROOME 06	11	77	NH-HEM	ST	110	U	NH-HEM	ST	-
BROOME 06	12	15	NH	ST	106	U	NH	FW	-
BROOME 06	13	64	RP	PT	195	E	NH	RT	6
BROOME 06	14	59	HEM-NH	ST	138	U	HEM-NH	ST	18
BROOME 06	15	95	NH	ST+	169	U	NH	ST	-
BROOME 06	16	3	NH	PT	70	U	NH-WP	FW/TS	-
BROOME 06	17	11	RP	PT	187	E	NH	RT	10
BROOME 06	18	5	WETLAND	-	0	ZW	WETLAND	none	-
BROOME 06	19	4	RP	PT	100	E	NH	RT	-
BROOME 06	20	9	NH-HEM	ST	138	ZR	NH-HEM	none	-
BROOME 06	21	2	RP	PT	160	E	NH	TSI	10
BROOME 07	1	9	NH-HEM	PT	158	U	NH-HEM	ST	6
BROOME 07	2	36	NH-OAK	ST	139	U	NH-OAK	ST	6
BROOME 07	3	6	NH	PT	112	U	NH	TSI	6
BROOME 07	4	43	NH	ST	132	U	NH	ST	6
BROOME 07	5	11	NH-HEM	ST	141	U	NH-HEM	ST	6
BROOME 07	6	19	PH	PT	108	ES	PH	GC	2
BROOME 07	7	116	NH-OAK	ST	135	U	NH-OAK	ST	-
BROOME 07	8	22	NH-HEM-OAK	ST	132	U	NH-HEM-OAK	ST	14

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 07	9	11	NH-HEM-OAK	ST	156	U	NH-HEM-OAK	ST	14
BROOME 07	10	25	NH	ST	142	U	NH	ST	14
BROOME 07	11	27	NH	ST	117	U	NH	ST	14
BROOME 07	12	12	WP-NH	ST	136	U	WP-NH	ST	14
BROOME 07	13	1	PH	PT	73	ES	PH	GC	-
BROOME 07	14	4	PH	PT	98	ES	PH	GC	2
BROOME 07	15	6	NH	ST	141	U	NH-HEM	ST	10
BROOME 07	16	8	HEM-NH	ST	120	ZV	HEM-NH	none	-
BROOME 07	17	32	NH	ST	121	U	NH-HEM	ST	20
BROOME 07	18	4	HEM	PT	80	ZV	HEM	none	-
BROOME 07	19	3	WETLAND	-	0	ZW	WETLAND	none	-
BROOME 07	20	3	HEM-NH	ST	167	U	HEM-NH	ST	20
BROOME 07	21	6	NH	ST	97	U	NH	ST	20
BROOME 07	22	10	RP	PT	176	E	NH	RT	10
BROOME 07	23	4	NH	SS	0	ZV	NH	none	-
BROOME 07	24	14	POND	-	0	ZW	POND	none	-
BROOME 07	25	19	NH-WP	ST	155	U	NH-WP	FW/TSI	10
BROOME 07	26	4	NH-OAK	ST	102	U	NH-OAK	FW/TSI	-
BROOME 07	27	56	NH	ST	107	U	NH	ST	-
BROOME 07	28	15	NH-OAK	ST	146	U	NH-OAK	ST	8
BROOME 07	29	7	NH	ST	133	U	NH	ST	8
BROOME 07	30	7	PH	PT	0	ES	PH	GC	8
BROOME 07	31	20	HEM-NH	ST	188	U	HEM-NH	ST	8
BROOME 07	32	30	NH	ST	136	U	NH-HEM	ST	8
BROOME 07	33	5	RP	PT	225	E	NH-WP	TSI	10
BROOME 07	34	18	NH-HEM	ST	138	U	NH-HEM	ST	20
BROOME 07	35	10	NH	ST	140	U	NH-HEM	ST	20
BROOME 07	36	29	NH-HEM	ST	112	U	NH-HEM	ST	20
BROOME 07	37	37	NH-HEM	ST+	125	ZS	NH-HEM	none	-

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 07	38	20	NH-HEM	ST	96	U	NH-HEM	ST	-
BROOME 07	39	19	NH-HEM	ST	141	U	NH-HEM	ST	20
BROOME 07	40	54	NH-HEM	ST	90	U	NH-HEM	ST	-
BROOME 08	1	27	NH	PT	81	U	NH	TSI	-
BROOME 08	2	16	OAK-NH-HEM	ST	155	U	OAK-NH-HEM	ST	9
BROOME 08	3	5	NH	PT	116	ZS	NH	none	-
BROOME 08	4	3	BR	-	0	BR	BR	RE	9
BROOME 08	5	4	NS	PT	85	U	NS-NH	PU	-
BROOME 08	6	10	RP	ST	190	E	NH	RT	3
BROOME 08	7	34	NH	PT	105	U	NH-OAK	TSI/ST	-
BROOME 08	8	78	NH-OAK	SS	0	E	NH-OAK	FW	-
BROOME 08	9	7	BR	-	0	BR	BR	RE	-
BROOME 08	10	11	RP	PT	158	E	NH	RT	18
BROOME 08	11	4	NH-OAK	PT	83	U	NH-OAK	ST	-
BROOME 08	12	5	RP	PT	200	E	NH	RT	3
BROOME 08	13	12	JL-NH	ST	125	E	NH-JL	RT	18
BROOME 08	14	4	NH-HEM	PT	128	U	NH-HEM	ST	-
BROOME 08	15	2	NH	SS	0	E	NH	FW	-
BROOME 08	16	5	RP	PT	180	E	NH	RT	3
BROOME 08	17	1	NS	SS	0	E	NH-NS	PU	-
BROOME 08	18	6	BR	-	0	BR	BR	RE	9
BROOME 08	19	9	NH	ST	104	U	NH	TSI/ST	18
BROOME 08	20	2	WP	PT	223	U	WP	TSI	9
BROOME 08	21	4	JL	ST	130	E	NH-JL	RT	18
BROOME 08	22	5	NH-OAK	PT	100	E	NH-OAK	FW	18
BROOME 08	23	8	OAK-NH	PT	114	E	OAK-NH	TSI	18
BROOME 08	24	5	NH-OAK	PT	76	E	NH-OAK	FW	-
BROOME 08	25	2	RP	ST	158	E	NH	RT	3

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 08	26	93	NH-OAK	PT	125	U	NH-OAK	ST	-
BROOME 08	27	28	HEM-NH	ST	136	U	HEM-NH	ST	17
BROOME 08	28	43	HEM-NH	PT	185	NA	HEM-NH	none	-
BROOME 08	29	14	WETLAND	-	0	ZW	WETLAND	none	-
BROOME 08	30	62	NH-OAK	PT	126	U	NH-OAK	ST	-
BROOME 08	31	12	NH-HEM	PT	141	U	NH-HEM	ST	13
BROOME 08	32	5	NH	PT	120	NA	NH	none	-
BROOME 08	33	4	HEM-NH	ST	170	NA	HEM-NH	none	-
BROOME 08	34	36	NH-HEM	PT	178	U	NH-HEM	ST	13
BROOME 08	35	4	RP	PT	173	E	NH	TSI	3
BROOME 08	36	50	NH-HEM	ST	133	U	NH-HEM	ST	13
BROOME 08	37	15	HEM-WP	ST	156	NA	HEM-WP	none	-
BROOME 08	38	9	POND	-	0	ZW	POND	none	-
BROOME 08	39	17	NH-HEM-OAK	PT	191	U	NH-HEM-OAK	ST	13
BROOME 08	40	61	HEM-NH	ST	166	U	HEM-NH	ST	13
BROOME 08	41	2	POND	-	0	ZW	POND	none	-
BROOME 08	42	27	NH	ST	145	U	NH	ST	13
BROOME 08	43	59	NH	ST	67	U	NH	ST	-
BROOME 09	1	72	NH	ST	123	U	NH	ST	-
BROOME 09	1	18	NH-HEM	ST	167	ZS	NH-HEM	none	-
BROOME 09	2	12	BR	-	0	BR	BR	RE	-
BROOME 09	3	9	NH	PT	97	U	NH	TSI	-
BROOME 09	4	100	NH	ST	145	U	NH-HEM	ST	5
BROOME 09	5	25	NH-HEM	ST	96	U	NH-HEM	ST	-
BROOME 09	6	10	NH-OAK	ST	100	E	NH-OAK	ST	19
BROOME 09	7	1	POND	-	0	ZW	POND	none	-
BROOME 09	8	2	NH-HEM	PT	165	ZV	NH-HEM	none	-
BROOME 09	9	14	NH	PT	84	U	NH	TSI	-

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 09	10	11	PH	SS	49	ES	PH	GC	2
BROOME 09	11	8	NH-HEM	PT	183	ZW	NH-HEM	none	-
BROOME 09	12	7	NH	PT	130	E	NH-HEM	TSI	19
BROOME 09	13	7	BR	-	0	BR	BR	RE	-
BROOME 09	14	2	RP	PT	242	E	NH	TSI	-
BROOME 09	15	13	WS	PT	113	E	WS-NH	TSI	-
BROOME 09	16	6	RP	PT	226	E	NH	TSI	-
BROOME 09	17	5	NH	PT	105	E	NH	TSI	-
BROOME 09	18	3	HEM-NH	ST	182	ZR	HEM-NH	none	-
BROOME 09	19	22	NH	ST	75	U	NH	ST	-
BROOME 09	20	78	NH	ST	121	U	NH-HEM	ST	-
BROOME 09	21	20	NH	ST	109	U	NH	TSI	19
BROOME 09	22	6	NH	SS	0	E	NH	FW	-
BROOME 09	23	10	NH	ST	98	U	NH	ST	-
BROOME 09	24	20	NH	SS	0	E	NH	FW	-
BROOME 09	25	2	PH	PT	75	ES	PH	GC	2
BROOME 09	26	15	NH	PT	127	U	NH	TSI	19
BROOME 09	27	36	NH	PT	139	U	NH	ST	11
BROOME 09	28	2	NH	SS	0	E	NH	TSI	3
BROOME 09	29	2	NH	PT	150	E	NH	ST	11
BROOME 09	30	4	BR	-	0	BR	BR	RE	11
BROOME 09	31	27	PH	SS	0	ES	PH	GC	2
BROOME 09	32	7	POND	-	0	ZW	POND	none	-
BROOME 09	33	4	BR	-	0	BR	BR	RE	11
BROOME 09	34	7	HEM-NH	PT	196	ZV	HEM-NH	none	-
BROOME 09	35	5	NH-OAK	PT	140	E	NH-OAK	ST	11
BROOME 09	36	12	NH	SS	0	E	NH	TSI	-
BROOME 09	37	9	NH	ST	140	U	NH	ST	11
BROOME 09	38	1	NH	SS	0	E	NH	TSI	-

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME 09	39	75	NH	PT	110	U	NH	ST	19
BROOME 09	40	29	HEM-NH	PT	159	ZV	HEM-NH	none	-
BROOME 09	41	6	NH	SS	0	E	NH	TSI	-
BROOME 09	42	2	NH	SS	0	E	NH	TSI	-
BROOME 09	43	8	NH	ST	148	ZA	NH	none	-
BROOME-TIOGA 1	1	12	OAK-NH	PT	118	ZA	OAK-NH	none	-
BROOME-TIOGA 1	2	18	RP	ST	166	ZA	NH	none	-
BROOME-TIOGA 1	3	20	RP	ST	160	ZA	NH	none	-
BROOME-TIOGA 1	4	16	OAK-NH	ST	107	ZA	NH	none	-
BROOME-TIOGA 1	5	9	HEM-OAK	ST+	160	NA	HEM-OAK	none	-
BROOME-TIOGA 1	6	0	HEM-OAK	ST	95	NA	HEM-OAK	none	-
BROOME-TIOGA 1	7	8	OAK-NH	ST	91	U	OAK-NH	ST	-
BROOME-TIOGA 1	8	11	RP	PT	200	E	NH	TSI	9
BROOME-TIOGA 1	9	2	RP	ST	220	E	NH	TSI	9
BROOME-TIOGA 1	10	15	NS	ST	95	U	NH-NS	PU	-
BROOME-TIOGA 1	11	3	NH	ST	100	U	NH	ST	-
BROOME-TIOGA 1	12	16	OAK-HEM	ST	121	U	OAK-HEM	ST	20
BROOME-TIOGA 1	13	33	NH-OAK	ST	103	E	NH-OAK	ST	20
BROOME-TIOGA 1	14	14	HEM-NH-OAK	ST	121	U	HEM-NH-OAK	ST	20
BROOME-TIOGA 1	15	43	RP	PT	182	E	NH	RT	9
BROOME-TIOGA 1	16	13	NS	ST	153	U	NS-NH	PU	10
BROOME-TIOGA 1	17	13	OAK-NH	ST	92	E	OAK-NH	ST	20
BROOME-TIOGA 1	18	9	NH-HEM	ST	130	U	NH-HEM	FW/TSI	20
BROOME-TIOGA 1	19	3	NS	PT	160	E	NS-NH	PU	10
BROOME-TIOGA 1	20	3	WET-ALDER	-	0	ZW	WET-ALDER	none	-
BROOME-TIOGA 1	21	7	PH	PT	66	ES	PH	GC	2
BROOME-TIOGA 1	22	7	NS	ST	144	U	NS-NH	PU	10
BROOME-TIOGA 1	23	3	NH-WP	ST	97	U	NH-WP	FW	-

Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment	Year Sequence
BROOME-TIOGA 1	24	8	NS	ST	154	U	NS-NH	PU	10
BROOME-TIOGA 1	25	16	OAK	ST	84	E	OAK	ST	-
BROOME-TIOGA 1	26	1	NS	PT	155	E	NS-NH	PU	9
BROOME-TIOGA 1	27	5	HEM-OAK	ST	137	U	HEM-OAK	ST	-
BROOME-TIOGA 1	28	14	OAK	ST	112	E	OAK	ST	20
BROOME-TIOGA 1	29	37	NS	ST	159	U	NH-NS	PU	10
BROOME-TIOGA 1	30	7	NH-OAK	ST	97	E	NH-OAK	TSI	20
BROOME-TIOGA 1	31	40	OAK-NH	PT	101	E	OAK-NH	FW	-
BROOME-TIOGA 1	32	13	OAK-WP	ST	84	U	OAK-WP	ST	-
BROOME-TIOGA 1	33	18	PH	ST	105	E	NH-OAK	FW	-
BROOME-TIOGA 1	34	8	WP-NH	ST	140	U	WP-NH	FW/TSI	-
BROOME-TIOGA 1	35	7	RP	ST	130	E	NH	RT	9
BROOME-TIOGA 1	36	4	WP	ST	125	U	WP-NH	ST	-
BROOME-TIOGA 1	37	2	RP	ST	190	U	NH-WP	RT	9
BROOME-TIOGA 1	38	33	NH-WP-NS	ST	97	U	NH-WP-NS	PU	-
BROOME-TIOGA 1	39	3	RP	ST	178	U	NH-WP	RT	9
BROOME-TIOGA 1	40	4	HEM-WP	ST	70	ZR	HEM-WP	none	-
BROOME-TIOGA 1	41	2	POND	-	0	ZW	POND	none	-
BROOME-TIOGA 1	42	4	HEM-NH	ST	210	ZA	HEM-NH	none	-

3. Table of Schedule of Stand Treatments

Year Sequence	Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment
1	BROOME 03	25	1	GRASS	-	0	GR	GRASS	MOW
2	BROOME 06	3	9	PH	PT	100	ES	PH	GC
2	BROOME 07	6	19	PH	PT	108	ES	PH	GC
2	BROOME 07	14	4	PH	PT	98	ES	PH	GC
2	BROOME 09	10	11	PH	SS	49	ES	PH	GC
2	BROOME 09	25	2	PH	PT	75	ES	PH	GC
2	BROOME 09	31	27	PH	SS	0	ES	PH	GC
2	BROOME-TIOGA 1	21	7	PH	PT	66	ES	PH	GC
3	BROOME 03	3	2	RP	ST	235	E	NH-WP	RC
3	BROOME 03	33	4	RP-NH-NS	ST	206	E	NH-NS	RT
3	BROOME 08	6	10	RP	ST	190	E	NH	RT
3	BROOME 08	12	5	RP	PT	200	E	NH	RT
3	BROOME 08	16	5	RP	PT	180	E	NH	RT
3	BROOME 08	25	2	RP	ST	158	E	NH	RT
3	BROOME 08	35	4	RP	PT	173	E	NH	TSI
3	BROOME 09	28	2	NH	SS	0	E	NH	TSI
4	BROOME 06	8	20	RP	PT	209	E	NH	RT
5	BROOME 09	4	100	NH	ST	145	U	NH-HEM	ST
6	BROOME 06	4	8	RP	PT	208	U	NH-WP	RT
6	BROOME 06	13	64	RP	PT	195	E	NH	RT
6	BROOME 07	1	9	NH-HEM	PT	158	U	NH-HEM	ST
6	BROOME 07	2	36	NH-OAK	ST	139	U	NH-OAK	ST
6	BROOME 07	3	6	NH	PT	112	U	NH	TSI
6	BROOME 07	4	43	NH	ST	132	U	NH	ST

Year Sequence	Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment
6	BROOME 07	5	11	NH-HEM	ST	141	U	NH-HEM	ST
7	BROOME 03	8	5	OAK	ST	110	E	OAK	FW
7	BROOME 03	21	2	NH-OAK	ST	150	U	NH-OAK	FW
7	BROOME 03	31	28	NH	ST	149	U	NH	ST
7	BROOME 05	2	28	NH-HEM	ST	140	U	NH-HEM	ST
7	BROOME 05	3	3	NH-HEM	ST	135	U	NH-HEM	ST
7	BROOME 05	4	20	HEM	ST	170	U	HEM	ST
7	BROOME 05	7	20	NH-HEM	ST	143	U	NH-HEM	ST
7	BROOME 05	31	25	OAK-NH	ST+	103	E	OAK-NH	ST
8	BROOME 07	28	15	NH-OAK	ST	146	U	NH-OAK	ST
8	BROOME 07	29	7	NH	ST	133	U	NH	ST
8	BROOME 07	30	7	PH	PT	0	ES	PH	GC
8	BROOME 07	31	20	HEM-NH	ST	188	U	HEM-NH	ST
8	BROOME 07	32	30	NH	ST	136	U	NH-HEM	ST
9	BROOME 03	16	6	RP	ST	194	E	NH	RT
9	BROOME 03	23	3	RP	ST	180	E	NH	RT
9	BROOME 03	30	15	RP-NS	ST	180	U	NH-NS	RT
9	BROOME 08	2	16	OAK-NH-HEM	ST	155	U	OAK-NH-HEM	ST
9	BROOME 08	4	3	BR	-	0	BR	BR	RE
9	BROOME 08	18	6	BR	-	0	BR	BR	RE
9	BROOME 08	20	2	WP	PT	223	U	WP	TSI
9	BROOME-TIOGA 1	8	11	RP	PT	200	E	NH	TSI
9	BROOME-TIOGA 1	9	2	RP	ST	220	E	NH	TSI
9	BROOME-TIOGA 1	15	43	RP	PT	182	E	NH	RT
9	BROOME-TIOGA 1	26	1	NS	PT	155	E	NS-NH	PU
9	BROOME-TIOGA 1	35	7	RP	ST	130	E	NH	RT

Year Sequence	Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment
9	BROOME-TIOGA 1	37	2	RP	ST	190	U	NH-WP	RT
9	BROOME-TIOGA 1	39	3	RP	ST	178	U	NH-WP	RT
10	BROOME 06	6	10	RP	PT	164	E	NH	RT
10	BROOME 06	17	11	RP	PT	187	E	NH	RT
10	BROOME 06	21	2	RP	PT	160	E	NH	TSI
10	BROOME 07	15	6	NH	ST	141	U	NH-HEM	ST
10	BROOME 07	22	10	RP	PT	176	E	NH	RT
10	BROOME 07	25	19	NH-WP	ST	155	U	NH-WP	FW/TSI
10	BROOME 07	33	5	RP	PT	225	E	NH-WP	TSI
10	BROOME-TIOGA 1	16	13	NS	ST	153	U	NS-NH	PU
10	BROOME-TIOGA 1	19	3	NS	PT	160	E	NS-NH	PU
10	BROOME-TIOGA 1	22	7	NS	ST	144	U	NS-NH	PU
10	BROOME-TIOGA 1	24	8	NS	ST	154	U	NS-NH	PU
10	BROOME-TIOGA 1	29	37	NS	ST	159	U	NH-NS	PU
11	BROOME 03	2	25	PH-OAK	ST	142	E	OAK	ST
11	BROOME 03	10	17	NH	PT	136	U	NH	FW
11	BROOME 03	17	19	NH-OAK	ST	130	U	NH-OAK	ST
11	BROOME 09	27	36	NH	PT	139	U	NH	ST
11	BROOME 09	29	2	NH	PT	150	E	NH	ST
11	BROOME 09	30	4	BR	-	0	BR	BR	RE
11	BROOME 09	33	4	BR	-	0	BR	BR	RE
11	BROOME 09	35	5	NH-OAK	PT	140	E	NH-OAK	ST
11	BROOME 09	37	9	NH	ST	140	U	NH	ST
12	BROOME 04	4	24	NS	ST	194	U	NS-NH	PU
12	BROOME 04	5	7	NS	ST	190	U	NS-NH	PU
12	BROOME 04	6	6	HEM-NH	ST	160	U	HEM-NH	ST

Year Sequence	Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment
12	BROOME 04	17	3	NH-OAK	PT	136	E	NH-OAK	ST
12	BROOME 04	24	8	NH	ST	97	E	NH	ST
12	BROOME 04	25	8	NS	PT	184	U	NS-NH	PU
12	BROOME 04	32	1	NS	PT	193	U	NS-NH	TSI
13	BROOME 08	31	12	NH-HEM	PT	141	U	NH-HEM	ST
13	BROOME 08	34	36	NH-HEM	PT	178	U	NH-HEM	ST
13	BROOME 08	36	50	NH-HEM	ST	133	U	NH-HEM	ST
13	BROOME 08	39	17	NH-HEM-OAK	PT	191	U	NH-HEM-OAK	ST
13	BROOME 08	40	61	HEM-NH	ST	166	U	HEM-NH	ST
13	BROOME 08	42	27	NH	ST	145	U	NH	ST
14	BROOME 05	9	16	NS	ST	185	U	NS-NH	PU
14	BROOME 05	14	6	NS	PT	200	U	NS-NH	PU
14	BROOME 05	18	5	OAK-NH	ST	110	U	OAK-NH	ST
14	BROOME 05	21	18	OAK-NH	ST	112	U	OAK-NH	ST
14	BROOME 07	8	22	NH-HEM-OAK	ST	132	U	NH-HEM-OAK	ST
14	BROOME 07	9	11	NH-HEM-OAK	ST	156	U	NH-HEM-OAK	ST
14	BROOME 07	10	25	NH	ST	142	U	NH	ST
14	BROOME 07	11	27	NH	ST	117	U	NH	ST
14	BROOME 07	12	12	WP-NH	ST	136	U	WP-NH	ST
16	BROOME 04	26	51	NH-HEM	ST+	154	U	NH-HEM	ST
17	BROOME 08	27	28	HEM-NH	ST	136	U	HEM-NH	ST
18	BROOME 04	2	21	NH-OAK	ST	116	E	NH-OAK	ST
18	BROOME 06	1	13	NH-OAK	ST	103	U	NH-OAK	ST
18	BROOME 06	2	70	HEM-NH	ST	140	U	HEM-NH	ST
18	BROOME 06	7	11	NH	ST	114	U	NH	ST

Year Sequence	Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment
18	BROOME 06	14	59	HEM-NH	ST	138	U	HEM-NH	ST
18	BROOME 08	10	11	RP	PT	158	E	NH	RT
18	BROOME 08	13	12	JL-NH	ST	125	E	NH-JL	RT
18	BROOME 08	19	9	NH	ST	104	U	NH	TSI/ST
18	BROOME 08	21	4	JL	ST	130	E	NH-JL	RT
18	BROOME 08	22	5	NH-OAK	PT	100	E	NH-OAK	FW
18	BROOME 08	23	8	OAK-NH	PT	114	E	OAK-NH	TSI
19	BROOME 03	1	31	NH-HEM-OAK	ST	140	U	NH-HEM-OAK	ST
19	BROOME 03	4	16	NH	PT	136	E	NH	TSI
19	BROOME 03	12	23	NH-HEM	ST	111	U	NH-HEM	ST
19	BROOME 03	29	52	NH-HEM	ST+	169	U	NH-HEM	ST
19	BROOME 09	6	10	NH-OAK	ST	100	E	NH-OAK	ST
19	BROOME 09	12	7	NH	PT	130	E	NH-HEM	TSI
19	BROOME 09	21	20	NH	ST	109	U	NH	TSI
19	BROOME 09	26	15	NH	PT	127	U	NH	TSI
19	BROOME 09	39	75	NH	PT	110	U	NH	ST
20	BROOME 07	17	32	NH	ST	121	U	NH-HEM	ST
20	BROOME 07	20	3	HEM-NH	ST	167	U	HEM-NH	ST
20	BROOME 07	21	6	NH	ST	97	U	NH	ST
20	BROOME 07	34	18	NH-HEM	ST	138	U	NH-HEM	ST
20	BROOME 07	35	10	NH	ST	140	U	NH-HEM	ST
20	BROOME 07	36	29	NH-HEM	ST	112	U	NH-HEM	ST
20	BROOME 07	39	19	NH-HEM	ST	141	U	NH-HEM	ST
20	BROOME-TIOGA 1	12	16	OAK-HEM	ST	121	U	OAK-HEM	ST
20	BROOME-TIOGA 1	13	33	NH-OAK	ST	103	E	NH-OAK	ST
20	BROOME-TIOGA 1	14	14	HEM-NH-OAK	ST	121	U	HEM-NH-OAK	ST
20	BROOME-TIOGA 1	17	13	OAK-NH	ST	92	E	OAK-NH	ST

Year Sequence	Forest	Stand	Acres	Vegetation Type	DBH	BA	Management Direction	Objective Type	Treat-ment
20	BROOME-TIOGA 1	18	9	NH-HEM	ST	130	U	NH-HEM	FW/TSI
20	BROOME-TIOGA 1	28	14	OAK	ST	112	E	OAK	ST
20	BROOME-TIOGA 1	30	7	NH-OAK	ST	97	E	NH-OAK	TSI

4. Annual Summary of Stand Treatment Schedule

Year Sequence	Pine	Spruce	Hardwood Sawtimber	Firewood	TSI	Other	Total
1							0
2						80	80
3	30				2		32
4	20						20
5			100				100
6	72		105				177
7			124	7			131
8			72			7	79
9	79	1	16		15	9	120
10	31	68	6	19	7		131
11			96	17		8	121
12		39	17		1		57
13			202				202
14		22	121				143
15							0
16			51				51
17			28				28
18	27		183	5	8		223
19			191		58		249
20			207	9	7		223
Total	**259**	**130**	**1,519**	**57**	**98**	**104**	**2,167**
Average	13	6	76	3	5	5	**108**

The Pine column includes acres of stands harvested in which the primary species are red pine, scotch pine, white pine, or larch. The Spruce column includes acres of stands scheduled for harvest in which the primary species are Norway spruce or white spruce. Hardwood Sawtimber includes acres of northern hardwood stands scheduled for harvest of sawtimber. These stands also include varying amounts of firewood. The Firewood column includes the acres of stands scheduled for harvest in which firewood is the primary product. The TSI column lists acres designated for pre-commercial thinning. The Other column includes acres of noncommercial stand treatments for activities such as clearcuts for grouse habitat and cutting trees to release apple trees or improve wildlife habitat.

5. Brushland Maintenance

Forest	Stand	Acres	Treated Acres	Year Sequence
BROOME 8	4	3	3	9
BROOME 8	18	6	6	9
BROOME 9	30	4	4	11
BROOME 9	33	4	4	11

6. Pioneer Hardwood Maintenance for Grouse

Forest	Stand	Acres	Acres to Cut	Year Sequence
BROOME 6	3	9	2	2
BROOME 7	6	19	2	2
BROOME 7	14	4	2	2
BROOME 9	10	11	2	2
BROOME 9	25	2	2	2
BROOME 9	31	27	2	2
BROOME-TIOGA 1	21	7	2	2
BROOME 7	30	7	1	8

7. Boundary Line Maintenance Schedule

Year	State Forest	Miles*
2021	Broome 3	4.6
2023	Broome 4	7.7
2020	Broome 5	7.5
2021	Broome 6	6.0
2023	Broome 7	11.2
2022	Broome 8	6.0
2022	Broome 9	5.7
2021	Broome-Tioga 1	9.6
Total		**58.3**

* Length determined by GIS boundary data.

Management Actions for Facilities and Information

1. Scheduled Actions

Year Sequence	Action	Description
1	Action 3.3.4	Construct and install State forest ID signs on Broome 7, 9 & Broome-Tioga 1.
1	Action 3.2.1	Upgrade 2.2 miles of ATV Access Route trail for people with qualifying disabilities on Broome 8. This trail will be upgraded to a firm and stable surface with erosion control structures installed as needed.
2	Action 3.3.1	Install kiosks and associated parking spots on Broome 5 & 7.
4	Action 3.3.1	Install kiosks and associated parking spots on Broome 9 and Broome-Tioga 1.
5	Action 3.2.2	Upgrade one designated camping site at Marsh Pond to accessible standards to provide access for people with disabilities.

2. Annual, Ongoing Management Actions and Those Performed as Needed

Action	Description
Action 2.2.2	Perform maintenance on 2.4 miles of Public Forest Access Roads including annual mowing and periodic grading, resurfacing and culvert replacement.
Action 2.2.3	Maintain one shale pit on Broome 5
Action 3.1.1	Maintain 2.2 miles of ski trail on Broome 4 to provide a safe user experience. Trails may be periodically closed due to timber harvests or extreme weather events.
Action 3.1.6	Maintain the two designated camp sites on Broome 4.
Action 3.2.1	Maintain 2.2 miles of ATV Access Route for people with qualifying disabilities on Broome 8.
Action 3.3.3	Maintain all signs and kiosks communicating information to the public on the Unit.

Glossary

Access trails - may be permanent, unpaved and do not provide all-weather access with the Unit. These trails are originally designed for wood product removal and may be used to meet other management objectives such as recreational trails. These trails are constructed according to Best Management Practices.

Age class - trees of a similar size originating from a single natural event or regeneration activity. *see* cohort.

Beech bark disease - an 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.

Best management practices - a practice or a combination of practices that are designed for the protection of water bodies and riparian areas and determined to be the most effective and practicable means of controlling point and non-point source water pollutants.

Biological diversity (Biodiversity) - the variety, abundance, and interactions of life forms found in areas ranging in size from local through regional to global. Biodiversity considers both the ecological and evolutionary processes, functions, and structures of plants, animals and other living organisms, as well as the variety and abundance of species, communities, gene pools, and ecosystems.

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

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

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

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

Clear cut - a harvesting and regeneration technique that removes all the trees, regardless of size, on an area in one operation. This practice is done in preparation of the re-establishment of a new forest through reforestation, stump sprouting, or changing habitats, i.e., from forest to brush or grass cover.

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

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

Conifer - a cone-bearing tree, also referred to as softwood; *note* the term often refers to gymnosperms in general.

Conversion - a change from one silvicultural system to another or from one tree species to each other.

Corridor - 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.

Cover type - the plant species forming a majority of composition across a given area.

Crop tree - any tree selected to become a component of a future commercial timber harvest.

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

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

Cutting cycle - the number of years between harvest or regeneration cuts in a stand.

Cutting interval - the number of years between treatments in a stand.

Deciduous - tree and shrub species that lose their leaves in autumn.

Defoliation - the partial or complete loss of leaves, usually caused by an insect, disease, or drought.

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.

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. Windstorms and fire are examples of natural disturbance.

Ecological Community - 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.

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.

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. Means keeping natural communities of plants, animals, and their environments healthy and productive so people can benefit from them year to year.

Edge - the more or less well-defined boundary between two or more environmental features, e.g. a field adjacent to a woodland or the boundary of different silvicultural treatments.

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.

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.

Even-aged system - 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.

Exotic - a plant or species introduced from another country or geographic region outside its natural range.

Eyas - A nestling (unfledged) hawk or falcon, especially one to be trained for falconry.

Fine Woody Material (FWM) - any piece(s) of small dead woody material on the ground in forest stands or in streams.

Forbs - Herbaceous flowering plants that are not grasses, sedges or rushes.

Forest - an assemblage of trees and associate organisms on sites capable of maintaining at least 60% crown closure at maturity.

Forest Stewardship Council - A non-profit organization devoted to encouraging the responsible management of the world's forests.

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.

Forest type - a category of forest usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees.

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

Fragmentation - the process by which a landscape is broken into small islands of forest within a mosaic of other forms of land use or ownership - islands of a particular age class that remain in areas of younger-aged forest - fragmentation is a concern because of the effect of noncontiguous forest cover on connectivity and the movement and dispersal of animals in the landscape.

Grassland - land on which the vegetation is dominated by grasses, grass-like plants, or forbs.

Group selection - an uneven-aged silvicultural practice where mature trees are removed in small groups (typically the diameter of the grouping is twice the average tree height) for the purpose of establishing a new age class of trees within the stand.

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.

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

Haul roads - permanent, unpaved roads, not designed for all-weather travel, but are constructed primarily for the removal of wood products and provide only limited access within the Unit. As such, these roads may or may not be open for public use. The standards for these roads are those of Class C roads.

Herbicide - a chemical used for killing or controlling the growth of plants.

High-grading - the removal of the most commercially valuable trees (high-grade trees), often leaving a residual stand composed of trees of poor condition or species composition.

High-volume hydraulic fracturing – The stimulation of a well using 300,000 or more gallons of water as the base fluid for hydraulic fracturing for all stages in a well completion, regardless of whether the well is vertical or directional, including horizontal. The 300,000-gallon threshold is the sum of all water, fresh and recycled, used for all stages in a well completion. Well stimulation requiring less than 300,000 gallons of water as the base fluid for hydraulic fracturing for all stages in a well completion is not considered high-volume.

Invasive species - a species that is non-native to the ecosystem under consideration; and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Late Successional Forest – Those areas where there is a significant component of trees greater than 140 years old. Forests in this age are beginning to develop old-growth characteristics such as large size, large snags, large cavities, rough bark and large dead trees and fallen logs.

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.

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

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

Native species - an indigenous species that is normally found as part of a particular ecosystem.

Natural area - an ecological community where physical and biological processes are allowed to operate without direct human intervention. (Helms, 1998)

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

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.

Old growth -

1.) forests that approximate the structure, composition, and functions of native forest prior to European settlement. They vary by forest type, but generally include more large trees, canopy layers, standing snags, native species, and dead organic matter than do young or intensively managed forests.

2.) the definition of "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 all of these factors that combine to 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, arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor, featuring (1) canopy gaps formed by natural **disturbances** creating an uneven canopy, and (2) a conspicuous absence of multiple stemmed trees and coppices. Old growth forest sites typically (1) are characterized by an irregular forest floor containing an abundance of coarse woody materials 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 understory displays well developed and diverse surface herbaceous layers.

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

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

Plantation - 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.

Public forest access roads - permanent, unpaved roads marked for motor vehicle use. They may be designed for all-weather use depending on their location and surfacing. These roads provide primary access within the Unit. The standards for these roads are those of the Class A and Class B access roads.

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

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

Regeneration - naturally or artificially established seedlings or saplings existing in a forest stand.

Release -
1.) a treatment designed to free trees from undesirable, usually overtopping, competing vegetation.

2.) a treatment designed to free young trees not past the sapling stage from undesirable competing vegetation that overtops or closely surrounds them.

Residual stand - a stand composed of trees remaining after any type of intermediate harvest.

Riparian zone - an area adjoining a body of water, normally having soils and vegetation characteristic of 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.

Rotation - the period of years required to establish and grow timber crops to a specified maturity. Rotation being the predetermined time frame between successive harvest/ regeneration cuts in a given stand under even-aged management.

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

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

Seedling - a young tree originating from seed that is less than 4 feet tall.

Seedling/sapling - trees less than 6 inches diameter at breast height.

Selective cut - a type of exploitation cutting that removes only certain species (a) above a certain size, (b) of high value; known silvicultural requirements and/or sustained yields being wholly or largely ignored or found impossible to fulfill. (Ford-Robertson, F. C. 1971)

Shade tolerance - the ability of a tree species to germinate and grow at various levels of shade.
1.) Shade tolerant: having the capacity to compete for survival under shaded conditions.
2.) Shade intolerant: having the capacity to compete for survival only under direct sunlight conditions; light demanding species.

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.

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.

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.

Stand - 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.

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 downed woody debris.

State Forest / State Reforestation Area - lands owned by the State of New York, administered by the Department of Environmental Conservation 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).

Stumpage - The value of timber as it stands uncut.

Succession - the natural series of replacements of one plant community (and the associated fauna) by another over time and in the absence of disturbance.

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.

Temporary Revocable Permit (TRP) - a Department permit which authorizes the use of State land for a specific purpose for a prescribed length of time.

Thinning - a silvicultural treatment made to reduce stand density of trees primarily to improve growth of remaining trees, enhance forest health, or recover potential mortality.

Threatened species - a species likely to become endangered in the foreseeable future, throughout all or a significant portion of its range, unless protected.

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.

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.

Uneven-aged system - a planned sequence of treatments designed to regenerate a stand with three or more age classes.

Uneven-aged stand/forest - a stand with trees of three or more distinct age classes, either intimately mixed or in small group

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.

Wetland - 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.

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APPENDICIES

APPENDIX I Wetlands

Classified Freshwater Wetlands on the Unit

Forest	Description	Wetland ID	Legal Class	Acres on the Unit*
Broome 4	Marsh Pond	GS-1	2	28.6
Broome 7	Beaver Pond	A-5	2	16.6
Broome 8	Whitaker Swamp	D-2	2	13.9

*Wetlands often extend across boundary lines onto adjacent private lands. Only the area on the Unit is listed.

Unclassified Freshwater Wetlands on the Unit

FOREST	STAND	ACRES	FOREST TYPE
Broome 3	7	3.3	Open wetland
Broome 4	31	1.4	Pond
Broome 5	5	3.3	Open wetland
Broome 6	5	3.6	Pond
Broome 6	18	7.4	Open wetland
Broome 7	19	3.8	Open wetland
Broome 8	38	9.4	Pond
Broome 8	41	2.4	Pond
Broome 9	7	2.4	Pond
Broome 9	32	6.4	Pond
Broome-Tioga 1	20	2.7	Alder wetland
Broome – Tioga 1	41	1.7	Pond

APPENDIX II Code Definitions

Code Definitions for Protective Status of Wildlife on the Unit

The protective status of species listed in Appendices III, IV, and V is based on Federal and State regulations. Following column entries for common and scientific names, a "protective status" category appears. The following definitions are adopted for the terms as used in The Checklist of Amphibians, Reptiles, Birds, and Mammals of New York State, Including their Protective Status.

Code	Federal Definitions
E	*Endangered Species* are determined by the U. S. Department of the Interior to be in danger of extinction throughout all or a significant portion of their range. All such species are fully protected, including their habitat.
T	*Threatened Species* are determined by the U. S. Department of the Interior as likely to become endangered within the foreseeable future throughout all or a significant portion of their range. All such species are fully protected.
UN	*"Unprotected"* under Federal Law.
Code	**State Definitions**
P	*Protected* wildlife means "wild game, protected wild birds, and endangered species of wildlife" as defined in the Environmental Conservation Law.
E	*Endangered Species* are determined by the DEC to be in imminent danger of extinction or extirpation in New York State, or are federally listed as endangered. All such species are fully protected under New York State Environmental Conservation Law.
T	*Threatened Species* are determined by the DEC as likely to become endangered within the foreseeable future in New York State, or are Federally listed as threatened. All such species are fully protected under the New York State Environmental Conservation Law.
SC	*Special Concern Species* are those native species that are not yet recognized as endangered or threatened, but for which documented evidence exists relating to their continued welfare in New York State. The Special Concern category exists within DEC rules and regulations, but such designation does not in itself provide any additional protection. However, Special Concern species may be protected under other laws.
GS	*Game species* are defined as "big game", "small game", or "game bird" 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.
UN	*Unprotected* means that the species may be taken at any time without limit. However, a license to take may be required.

APPENDIX III Birds

Species of Birds On or In the Vicinity of the Broome State Forests Unit.

Confirmed Species of Breeding Birds On or Within the Vicinity of the Unit

Common Name	Scientific Name	Breeding Status	NY Legal Status
American Black Duck	*Anas rubripes*	CO	Game Species
American Crow	*Corvus brachyrhynchos*	CO	Game Species
American Kestrel	*Falco sparverius*	CO	Protected
American Redstart	*Setophaga ruticilla*	CO	Protected
American Robin	*Turdus migratorius*	CO	Protected
Bald Eagle	*Haliaeetus leucocephalus*	CO	Threatened
Baltimore Oriole	*Icterus galbula*	CO	Protected
Barn Swallow	*Hirundo rustica*	CO	Protected
Belted Kingfisher	*Megaceryle alcyon*	CO	Protected
Black-and-white Warbler	*Mniotilta varia*	CO	Protected
Black-capped Chickadee	*Poecile atricapillus*	CO	Protected
Black-throated Green Warbler	*Dendroica virens*	CO	Protected
Blue Jay	*Cyanocitta cristata*	CO	Protected
Blue-headed Vireo	*Vireo solitarius*	CO	Protected
Blue-winged Warbler	*Vermivora pinus*	CO	Protected
Bobolink	*Dolichonyx oryzivorus*	CO	Protected
Broad-winged Hawk	*Buteo platypterus*	CO	Protected
Brown-headed Cowbird	*Molothrus ater*	CO	Protected
Canada Goose	*Branta canadensis*	CO	Game Species
Canada Warbler	*Wilsonia canadensis*	CO	Protected
Carolina Wren	*Thryothorus ludovicianus*	CO	Protected
Cedar Waxwing	*Bombycilla cedrorum*	CO	Protected
Chestnut-sided Warbler	*Dendroica pensylvanica*	CO	Protected
Chipping Sparrow	*Spizella passerina*	CO	Protected
Cliff Swallow	*Petrochelidon pyrrhonota*	CO	Protected
Common Grackle	*Quiscalus quiscula*	CO	Protected
Common Merganser	*Mergus merganser*	CO	Game Species
Common Raven	*Corvus corax*	CO	Protected
Common Yellowthroat	*Geothlypis trichas*	CO	Protected
Cooper's Hawk	*Accipiter cooperii*	CO	Protected-Special Concern
Dark-eyed Junco	*Junco hyemalis*	CO	Protected
Downy Woodpecker	*Picoides pubescens*	CO	Protected
Eastern Bluebird	*Sialia sialis*	CO	Protected

Common Name	Scientific Name	Breeding Status	NY Legal Status
Eastern Kingbird	*Tyrannus tyrannus*	CO	Protected
Eastern Meadowlark	*Sturnella magna*	CO	Protected
Eastern Phoebe	*Sayornis phoebe*	CO	Protected
Eastern Towhee	*Pipilo erythrophthalmus*	CO	Protected
European Starling	*Sturnus vulgaris*	CO	Unprotected
Field Sparrow	*Spizella pusilla*	CO	Protected
Gray Catbird	*Dumetella carolinensis*	CO	Protected
Great Blue Heron	*Ardea herodias*	CO	Protected
Hairy Woodpecker	*Picoides villosus*	CO	Protected
Hooded Merganser	*Lophodytes cucullatus*	CO	Game Species
House Finch	*Carpodacus mexicanus*	CO	Protected
House Sparrow	*Passer domesticus*	CO	Unprotected
House Wren	*Troglodytes aedon*	CO	Protected
Indigo Bunting	*Passerina cyanea*	CO	Protected
Killdeer	*Charadrius vociferus*	CO	Protected
Least Flycatcher	*Empidonax minimus*	CO	Protected
Magnolia Warbler	*Dendroica magnolia*	CO	Protected
Mallard	*Anas platyrhynchos*	CO	Game Species
Mourning Dove	*Zenaida macroura*	CO	Protected
Mourning Warbler	*Oporornis philadelphia*	CO	Protected
Northern Cardinal	*Cardinalis cardinalis*	CO	Protected
Northern Flicker	*Colaptes auratus*	CO	Protected
Ovenbird	*Seiurus aurocapilla*	CO	Protected
Pileated Woodpecker	*Dryocopus pileatus*	CO	Protected
Prairie Warbler	*Dendroica discolor*	CO	Protected
Purple Finch	*Carpodacus purpureus*	CO	Protected
Red-bellied Woodpecker	*Melanerpes carolinus*	CO	Protected
Red-eyed Vireo	*Vireo olivaceus*	CO	Protected
Red-winged Blackbird	*Agelaius phoeniceus*	CO	Protected
Ring-necked Pheasant	*Phasianus colchicus*	CO	Game Species
Rock Pigeon	*Columba livia*	CO	Unprotected
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	CO	Protected
Ruffed Grouse	*Bonasa umbellus*	CO	Game Species
Savannah Sparrow	*Passerculus sandwichensis*	CO	Protected
Scarlet Tanager	*Piranga olivacea*	CO	Protected
Song Sparrow	*Melospiza melodia*	CO	Protected
Tree Swallow	*Tachycineta bicolor*	CO	Protected
Tufted Titmouse	*Baeolophus bicolor*	CO	Protected

Common Name	Scientific Name	Breeding Status	NY Legal Status
Turkey Vulture	*Cathartes aura*	CO	Protected
Veery	*Catharus fuscescens*	CO	Protected
White-breasted Nuthatch	*Sitta carolinensis*	CO	Protected
White-throated Sparrow	*Zonotrichia albicollis*	CO	Protected
Wild Turkey	*Meleagris gallopavo*	CO	Game Species
Wood Duck	*Aix sponsa*	CO	Game Species
Wood Thrush	*Hylocichla mustelina*	CO	Protected
Yellow Warbler	*Dendroica petechia*	CO	Protected
Yellow-bellied Sapsucker	*Sphyrapicus varius*	CO	Protected
Yellow-rumped Warbler	*Dendroica coronata*	CO	Protected
Yellow-throated Vireo	*Vireo flavifrons*	CO	Protected

Probable Species of Breeding Birds On or Within the Vicinity of the Unit

Common Name	Scientific Name	Breeding Status	NY Legal Status
Alder Flycatcher	*Empidonax alnorum*	PR	Protected
American Goldfinch	*Spinus tristis*	PR	Protected
Black-billed Cuckoo	*Coccyzus erythropthalmus*	PR	Protected
Blackburnian Warbler	*Dendroica fusca*	PR	Protected
Black-throated Blue Warbler	*Dendroica caerulescens*	PR	Protected
Brown Creeper	*Certhia americana*	PR	Protected
Brown Thrasher	*Toxostoma rufum*	PR	Protected
Chimney Swift	*Chaetura pelagica*	PR	Protected
Eastern Wood-Pewee	*Contopus virens*	PR	Protected
Great Crested Flycatcher	*Myiarchus crinitus*	PR	Protected
Great Horned Owl	*Bubo virginianus*	PR	Protected
Hermit Thrush	*Catharus guttatus*	PR	Protected
Northern Mockingbird	*Mimus polyglottos*	PR	Protected
Red-breasted Nuthatch	*Sitta canadensis*	PR	Protected
Red-tailed Hawk	*Buteo jamaicensis*	PR	Protected
Ruby-throated Hummingbird	*Archilochus colubris*	PR	Protected
Spotted Sandpiper	*Actitis macularius*	PR	Protected
Swamp Sparrow	*Melospiza georgiana*	PR	Protected
Warbling Vireo	*Vireo gilvus*	PR	Protected
Winter Wren	*Troglodytes troglodytes*	PR	Protected
Yellow-billed Cuckoo	*Coccyzus americanus*	PR	Protected

Possible Species of Breeding Birds On or Within the Vicinity of the Unit

Common Name	Scientific Name	Breeding Status	NY Legal Status
American Woodcock	*Scolopax minor*	PO	Game Species
Barred Owl	*Strix varia*	PO	Protected
Blue-gray Gnatcatcher	*Polioptila caerulea*	PO	Protected
Cerulean Warbler	*Dendroica cerulea*	PO	Protected-Special Concern
Eastern Screech-Owl	*Megascops asio*	PO	Protected
Evening Grosbeak	*Coccothraustes vespertinus*	PO	Protected
Golden-crowned Kinglet	*Regulus satrapa*	PO	Protected
Grasshopper Sparrow	*Ammodramus savannarum*	PO	Protected-Special Concern
Green Heron	*Butorides virescens*	PO	Protected
Louisiana Waterthrush	*Seiurus motacilla*	PO	Protected
Marsh Wren	*Cistothorus palustris*	PO	Protected
Nashville Warbler	*Vermivora ruficapilla*	PO	Protected
Northern Goshawk	*Accipiter gentilis*	PO	Protected-Special Concern
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	PO	Protected
Northern Waterthrush	*Seiurus noveboracensis*	PO	Protected
Osprey	*Pandion haliaetus*	PO	Protected-Special Concern
Red-shouldered Hawk	*Buteo lineatus*	PO	Protected-Special Concern
Sharp-shinned Hawk	*Accipiter striatus*	PO	Protected-Special Concern
Willow Flycatcher	*Empidonax traillii*	PO	Protected

Data source: 2000-2004 New York State Breeding Bird Atlas Data. Atlas data blocks: 4065C, 4065D, 4365C, 4365D, 4465C, 4465D, 4466D, 4565B, 4565D, 4566A, 4566C, 4664A, 4665C.

APPENDIX IV Reptiles & Amphibians

Reptiles and Amphibians on or In the Vicinity of the Broome State Forests Unit.

Common Name	Scientific Name	NY Legal Status
Bullfrog	*Rana catesbeiana*	Game Species
Gray Treefrog	*Hyla versicolor*	Game Species
Green Frog	*Rana clamitans melanota*	Game Species
Northern Leopard Frog	*Rana pipiens*	Game Species - No Season
Northern Spring Peeper	*Pseudacris c. crucifer*	Game Species
Pickerel Frog	*Rana palustris*	Game Species - No Season
Wood Frog	*Rana sylvatica*	Game Species
Eastern American Toad	*Bufo a. americanus*	Game Species
Allegheny Dusky Salamander	*Desmognathus ochrophaeus*	Game Species - No Season
Northern Dusky Salamander	*Desmognathus fuscus*	Game Species - No Season
Northern Redback Salamander	*Plethodon c. cinereus*	Game Species - No Season
Northern Slimy Salamander	*Plethodon glutinosus*	Game Species - No Season
Northern Spring Salamander	*Gyrinophilus p. porphyriticus*	Game Species - No Season
Northern Two-lined Salamander	*Eurycea bislineata*	Game Species - No Season
Red-spotted Newt	*Notophthalmus v. viridescens*	Game Species - No Season
Common Garter Snake	*Thamnophis sirtalis*	Game Species - No Season
Eastern Milk Snake	*Lampropeltis t. triangulum*	Game Species - No Season
Eastern Ribbon Snake	*Thamnophis sauritus*	Game Species - No Season
Northern Redbelly Snake	*Storeria o. occipitomaculata*	Game Species - No Season
Northern Ringneck Snake	*Diadophis punctatus edwardsii*	Game Species - No Season
Northern Water Snake	*Nerodia s. sipedon*	Game Species - No Season
Smooth Green Snake	*Liochlorophis vernalis*	Game Species - No Season
Timber Rattlesnake	*Crotalus horridus*	Threatened
Common Snapping Turtle	*Chelydra s. serpentina*	Game Species
Painted Turtle	*Chrysemys picta*	Game Species - No Season
Wood Turtle	*Clemmys insculpta*	Game Species - No Season, *SC

Data source: NYS Reptiles and Amphibians Atlas from 1990-1999.

APPENDIX V Mammals

Mammals on or In the Vicinity of the Broome State Forests Unit.

Common Name	Scientific Name	Status	Protective Status	
			Fed Status	State Status
American Beaver	Castor canadensis	Confirmed	UN	UN
Big Brown Bat	Eptesicus fuscus	Confirmed	UN	UN
Black Bear	Ursus americanus	Predicted	UN	GS
Bobcat	Lynx rufus	Confirmed	UN	GS
Common Muskrat	Ondatra zibethicus	Predicted	UN	GS
Common Raccoon	Procyon lotor	Predicted	UN	GS
Coyote	Canis latrans	Confirmed	UN	GS
Deer Mouse b	Peromyscus maniculatus	Predicted	UN	UN
E. small-footed Myotis	Myotis leibii	Predicted	UN	UN
Eastern Chipmunk	Tamias striatus	Predicted	UN	UN
Eastern Cottontail	Sylvilagus floridanus	Predicted	UN	GS
Eastern Gray Squirrel	Sciurus carolinensis	Predicted	UN	GS
Eastern Mole	Scalopus aquaticus	Predicted	UN	UN
Eastern Pipistrelle	Pipistrellus subflavus	Predicted	UN	UN
Eastern Red Bat	Lasiurus borealis	Predicted	UN	UN
Fisher	Martes pennanti	Predicted	UN	GS
Fox Squirrel	Sciurus niger	Predicted	UN	GS
Gray Fox	Urocyon cinereoargentus	Predicted	UN	GS
Hairy-tailed Mole	Parascalops breweri	Predicted	UN	UN
Hoary Bat	Lasiurus cinereus	Predicted	UN	UN
House Mouse	Mus musculus	Predicted	UN	UN
Indiana Myotis	Myotis sodalis	Predicted	E	E
Least Shrew	Cryptotis parva	Predicted	UN	UN
Little Brown Myotis	Myotis lucifugus	Confirmed	UN	UN
Long-tailed Shrew	Sorex dispar	Predicted	UN	UN
Long-tailed Weasel	Mustela frenata	Predicted	UN	GS
Masked Shrew	Sorex cinereus	Predicted	UN	UN
Meadow Jumping Mouse	Zapus hudsonius	Predicted	UN	UN
Meadow Vole	Microtus pennsylvanicus	Predicted	UN	UN
Mink	Mustela vison	Predicted	UN	GS
N. Short-tailed Shrew	Blarina brevicauda	Predicted	UN	UN
Northern Flying Squirrel	Glaucomys sabrinus	Predicted	UN	UN
Northern Long-eared Bat	Myotis septentrionalis	Predicted	UN	UN
Norway Rat	Rattus norvegicus	Predicted	UN	UN
Porcupine	Erethizon dorsatum	Predicted	UN	UN

Common Name	Scientific Name	Status	Protective Status	
			Fed Status	State Status
Pygmy Shrew	Sorex hoyi	Predicted	UN	UN
Red Fox	Vulpes vulpes	Predicted	UN	GS
Red Squirrel	Tamiasciurus hudsonicus	Predicted	UN	UN
River Otter	Lutra canadensis	Confirmed	UN	GS
Rock Vole	Microtus chrotorrhinus	Confirmed	UN	UN
Short-tailed Weasel (Ermine)	Mustela erminea	Predicted	UN	UN
Silver-haired Bat	Lasionycteris noctivagans	Predicted	UN	UN
Smoky Shrew	Sorex fumeus	Predicted	UN	UN
Snowshoe Hare	Lepus americanus	Predicted	UN	GS
Southern Bog Lemming	Synaptomys cooperi	Predicted	UN	UN
Southern Flying Squirrel	Glaucomys volans	Predicted	UN	UN
Southern Red-backed Vole	Clethrionomys gapperi	Predicted	UN	UN
Star-nosed Mole	Condylura cristata	Predicted	UN	UN
Striped Skunk	Mephitis mephitis	Predicted	UN	GS
Virginia Opossum	Didelphis virginiana	Predicted	UN	GS
Water Shrew	Sorex palustris	Predicted	UN	UN
White-footed Mouse	Peromyscus leucopus	Predicted	UN	UN
White-tailed Deer	Odocoileus virginianus	Confirmed	UN	GS
Woodchuck	Marmota monax	Predicted	UN	UN
Woodland Jumping Mouse	Napaeozapus insignis	Predicted	UN	UN
Woodland Vole	Microtus pinetorum	Predicted	UN	UN

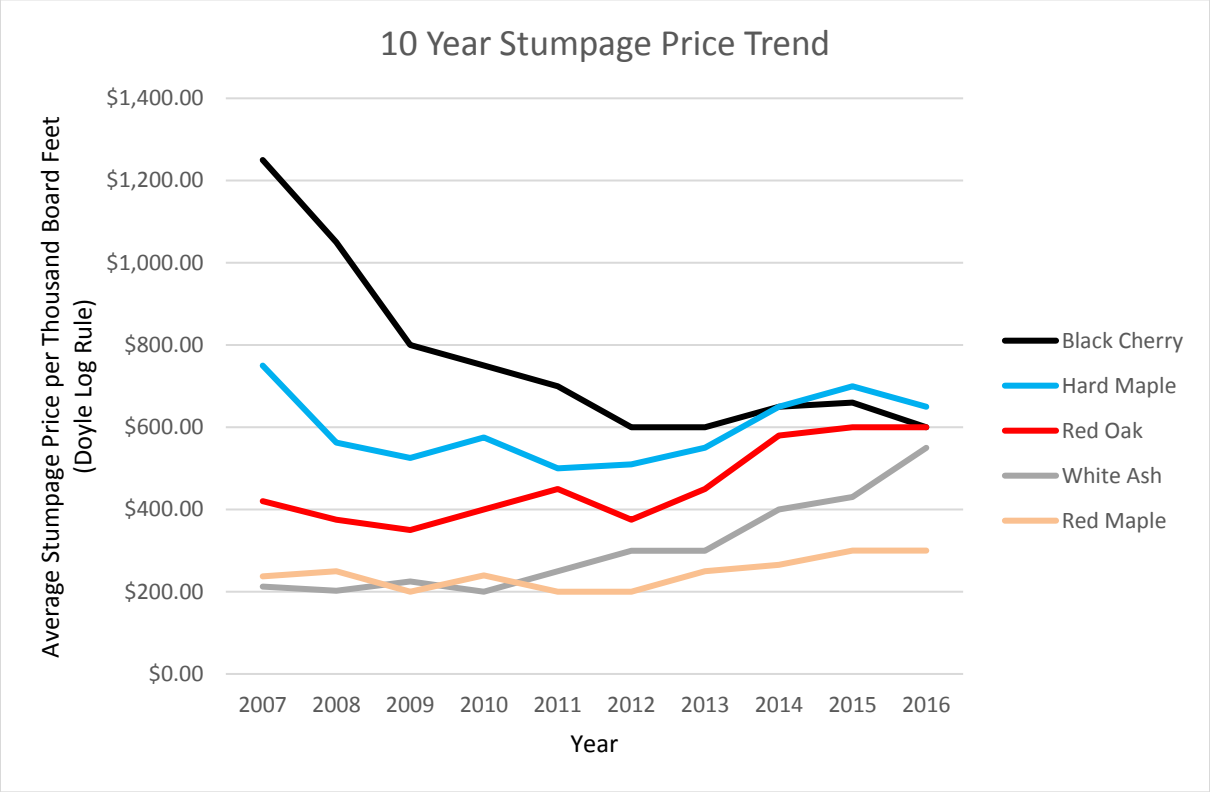
Data source: Adapted from The New York Gap Program, U.S. EPA EMAP Hexagons 443, 474, 477 & 480.

APPENDIX VI Fish

Resident Fish Species on the Unit

Water Body Name	Forest	Water ID #	Year Surveyed	Species Found
Trib to Susquehanna River	Broome 4	SR-118	1935	Creek chub
Marsh Creek	Broome 4	D-71-10-7	1935	Common shiner
				Blacknose dace
				Longnose dace
				Creek chub
Marsh Creek	Broome 4	D-71-10-7	1956	Central stoneroller
				Blacknose dace
				Longnose dace
				Creek chub
Trib to Cascade Creek	Broome 6	SR-94-1	1954	Blacknose dace
				Creek chub
Trib to Oquaga Creek	Broome 7	D-71-10-10	1967	American eel
				Brook trout
				Chain pickerel
				Central stoneroller
				Cutlips minnow
				Golden shiner
				Common shiner
				Blacknose dace
				Longnose dace
				Creek chub
				Fallfish
				Brown bullhead
				Stonecat
				Pumkinseed
				Largemouth bass
				Johnny darter

Appendix VII Ten Year Stumpage Price Trends



Source: NYS DEC Stumpage Price Reports, based on median values from winter reports.

APPENDIX VIII Property Taxes

2016 Local Taxes Paid of the Unit

State Forest	County	Town	Acres	Assess-ment	Town Taxes	County Taxes	School Taxes	Special District Taxes	Total Taxes
Broome 3	Broome	Windsor	540	268,400	$548	$0	$7,793	$292	$8,632
Broome 4	Broome	Sanford	893	510,800	$1,087	$0	$11,829	$330	$13,246
Broome 5	Broome	Kirkwood	195	185,200	$576	$0	$6,652	$274	$7,502
Broome 5	Broome	Windsor	338	138,500	$283	$0	$4,021	$20	$4,324
Broome 6	Broome	Windsor	533	251,600	$514	$0	$7,305	$300	$8,119
Broome 7	Broome	Sanford	791	480,100	$1,022	$0	$16,618	$310	$17,951
Broome-Tioga 1	Broome	Vestal	435	548,300	$2,475	$0	$12,425	$315	$15,216
Broome-Tioga 1	Tioga	Owego	75	94,100	$100	$0	$2,533	$227	$2,860
Total Taxes					**$6,604**		**$69,178**	**$2,069**	**$77,851**

Broome 8 and Broome 9 are tax exempt since they were purchased under the 1960's Bond Act.

APPENDIX IX Department Laws, Rules, Regulations and Policies

A. 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 51	Implementation of Environmental Quality Bond Act/1972
ECL Article 52	Implementation of Environmental Quality Bond Act/1972
ECL Article 71	Enforcement

B. Rules & Regulations Pertaining to New York State Public Lands

Title 6 of *the New York Code of Rules and Regulations* - Part 190 - Use of State Forests

Section 190.1 - Fire - no fires permitted except for cooking, warmth, or smudge. Also specifies depositing matches, etc. and using live trees for fuel prohibited.

Section 190.2 - Signs and structures - no person shall deface, mutilate or destroy, etc. This section also includes the prohibition of placing trash, garbage, etc.

Section 190.3 - Camping sites - sites must be kept neat, 150 feet from trail, road, stream, pond, spring, etc. and includes emergency closure times and elevation restrictions.

Section 190.4 - Camping permits - camping at one site for four nights or more without a permit is prohibited, length of stay specified, camping restricted to posted areas, group size specified and age of permittee.

Section 190.5 - Permissible structures - no permanent structures allowed, no transfer of existing structures, listing of reasons for cancellation of existing permits for lean-to (open camps).

Section 190.6 - Open camps - specifies number of days a lean-to may be occupied, what constitutes an enclosure, etc.

Section 190.7 - Public campgrounds - Lists of additional public use requirements when a public campground exists on state land.

Section 190.8 - General - a long list of prohibitions for the public use of State lands including gambling, use of snowmobiles, toboggans and sleds on ski trails, sale of alcohol, speed limit on truck trails, deface, remove, destroy vegetation without a permit, etc. This section allows the use

of horses except on intensively developed facilities (listed). This section was updated in 2009 with many new provisions pertaining to recreational trails, use of motor boats, harvesting of berries, etc.

Section 190.9 - Use of pesticides on State lands - none allowed except by written permission.

Section 190.10 - Unique Areas - special regulations listed by area.

Section 190.11 - Environmentally sensitive lands - lists the sections above that apply to people using sensitive lands (Sections 190.0 - 190.9) seems redundant.

Section 190.12 - Conservation Easements - Applies to all easement lands that the public has a right to access. Goes on to list general prohibitions on use, then lists areas under easements.

Section 190.13 - 190.22 - Repealed or not in use.

Section 190.23 - Specific Areas - List of Ski Centers: Belleayre, Gore and Whiteface.

Section 190.24 - Boat launch sites - specific rules of public use of launch sites.

Section 190.25 - 190.33 - Regulations for specific areas such as Zoar Valley, Lake George, the Olympic Area, etc.

C. State Forest Camping Regulations

1. Campsites must be kept clean. These are “carry-in -carry-out” areas.
2. Camping is prohibited within 150' of any road, trail, stream, or body of water, except where sites have been designated by the Department.
3. Camping is allowed for up to 3 nights without a permit. Campers occupying a site for more than 3 nights are required to obtain a written permit from the Sherburne DEC office. There is currently no fee for the permit.
4. Permits will be issued for a maximum of 10 days. A permit will not be renewed to the same person for the same site during the same calendar year.
5. Groups of 10 or more persons are required to obtain a camping permit for any length of stay.
6. Camping is prohibited in any area that is posted against camping.
7. All camping equipment and supplies must be removed from State land when the users have completed their stay.
8. No permits will be issued to persons under 18 years of age.
9. Campers are required to obtain a permit for any length of stay in a Wildlife Management Area. These permits are available from the Cortland DEC office.
10. Campers may use tents or trailers, but no permanent structures, such as tent platforms or lean-tos, may be constructed for camping.

11. Lean-tos that are provided by the DEC may not be occupied for more than 3 successive nights or for more than 10 nights in any one calendar year, if others wish to use the site.
12. Only dead and down wood may be used for campfires. Fires must be extinguished when the site if not occupied.
13. There is no fee for camping on State Forests.

D. Department Policies

Unit Management Planning	Prescribed Fire	Pesticides
Motor Vehicle use	Inventory	Recreational Use
Timber Management	Acquisition	Public Use
Temporary Revocable Permits	Road Construction	State Forest Master Plan
Plantation Management	Retention	Clearcutting

APPENDIX X SEQR Considerations

This Plan and the activities it recommends will be in compliance with State Environmental Quality Review (SEQR), 6NYCRR Part 617. The State Environmental Quality Review Act (SEQRA) requires the consideration of environmental factors early in the planning stages of any proposed action(s) that are undertaken, funded or approved by a local, regional or state agency. The Strategic Plan for State Forest Management (SPSFM) serves as the Generic Environmental Impact Statement (GEIS), regarding management activity on State Forests. To address potential impacts, the SPSFM establishes SEQR analysis thresholds for each category of management activity.

STATE ENVIRONMENTAL QUALITY REVIEW ACT

This Unit Management Plan (UMP) does not propose pesticide applications of more than 40 acres, any clearcuts of 40 acres or larger, or prescribed burns in excess of 100 acres. Therefore the actions in the plan do not exceed the thresholds set forth in the Strategic Plan/Generic Environmental Impact Statement for State Forest Management**.**

This Unit Management Plan also does not include any of the following:

1. Forest management activities occurring on acreage occupied by protected species ranked S1, S2, G1, G2 or G3
2. Pesticide applications adjacent to plants ranked S1, S2, G1, G2 or G3
3. Aerial pesticide spraying by airplane or helicopter
4. Any development of facilities with potable water supplies, septic system supported restrooms, camping areas with more than 10 sites or development in excess of other limits established in this plan.
5. Well drilling plans
6. Well pad densities of greater than one well pad in 320 acres or which does not comply with the limitations identified through a tract assessment
7. Carbon injection and storage or waste water disposal

Therefore, the actions proposed in this UMP will be carried out in conformance with the conditions and thresholds established for such actions in the Strategic Plan/Generic Environmental Impact Statement, and do not require any separate site specific environmental review (see 6 NYCRR 617.10[d]).

Actions not covered by the Strategic Plan/Generic Environmental Impact Statement.

Any action taken by the Department on this unit that is not addressed in this Unit Management Plan and is not addressed in the Strategic Plan/Generic Environmental Impact Statement may need a separate site specific environmental review.

APPENDIX XI Maps of the Broome State Forests Unit

- Land Cover Within 3 Miles of the Broome Unit Management Area
- Roads and Topography
- Soil Series & Drainage Classes
- Water Resources and Special Management Zones
- Current Cover Type and Year Last Managed
- Proposed Management Direction
- Future Cover Type and Sequence of Planned Treatments
- Recreation Facilities and Infrastructure
- State Forest Stand Mosaics